Un premier pas vers la mesure de la performance du système de soins de santé belge

KCE reports 128B

Le Centre fédéral d'expertise des soins de santé

Présentation :   Le Centre fédéral d'expertise des soins de santé est un parastatal, créé le 24 décembre 2002 par la loi-programme (articles 262 à 266), sous tutelle du Ministre de la Santé publique et des Affaires sociales, qui est chargé de réaliser des études éclairant la décision politique dans le domaine des soins de santé et de l'assurance maladie.

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PRÉFACE

Si nous sommes en meilleure santé et vivons plus longtemps en bonne santé qu'il y a 50 ou 100 ans, c'est bien sûr en raison d'une meilleure hygiène générale, d'une alimentation plus saine, de conditions de travail plus sécurisantes, d'un habitat mieux adapté, d'un mode de vie plus sain, … mais aussi grâce à des soins de santé préventifs et curatifs plus performants. Que notre système de santé soit plus performant qu'il y a tant de décennies ou que dans d'autres pays beaucoup moins riches, est assez évident. Mais à quel niveau se situe notre performance par rapport à nos voisins ? A quelle distance sommes-nous de l'objectif que nous voudrions atteindre ? Sommes-nous sur la bonne route ou faut il ajuster le tir ? Ne perdons nous pas de vue des aspects importants de la santé ou, plus grave, ne négligeons nous pas certains groupes ? Pour pouvoir répondre à ces questions, il a été demandé au KCE et à l'ISP, en collaboration avec toutes les instances fédérales et fédérées, d'examiner s'il était possible de construire une sorte de cockpit du système.

Ce rapport vous fera découvrir un premier prototype. Il présente déjà toute une série d'indicateurs mais nous sommes encore loin d'une vitesse de croisière. Il y a encore beaucoup de cases vides dans le tableau de bord, certains instruments de mesure sont insuffisamment validés, d'autres encore trop incomplets pour rendre déjà une image exhaustive de la performance de notre système de soins de santé. Néanmoins, pas mal d'enseignements peuvent en être tirés.

Le lecteur attentif pourra ainsi déjà distiller un certain nombre de forces et de faiblesses de notre système à partir de l'ensemble encore limité d'indicateurs qui sont présentés. Le plus important à ce stade du processus est cependant de se pencher surtout sur les forces et les faiblesses du système de mesure lui même, et que sur base des lignes directrices élaborées dans ce rapport, nous puissions rapidement éclairer les points qui restent obscurs. Ainsi par exemple, où en sommes-nous en matière de santé mentale ? Dans quelle mesure notre système est-il réellement orienté vers le patient ?

Il s'agit incontestablement d'un travail de longue haleine auquel nous nous sommes attelés avec de nombreux partenaires que nous souhaitons remercier. Sans la collaboration de tous ceux qui sont à la source des données et des actions de santé, il n'est pas possible de construire un outil complet et à jour. Pour qu'il atteigne pleinement ses potentialités, il faudra en outre s'en servir à bon escient à travers une confrontation permanente et bi directionnelle entre les objectifs d'une politique de soins de santé et les résultats enregistrés. La poursuite d'une bonne collaboration entre les instances fédérales et fédérées sera aussi indispensable. A cet égard, l'accueil favorable de ce rapport par la Conférence Interministérielle est un signe très positif.

Jean Pierre CLOSON	Raf MERTENS
Directeur général adoint	Directeur général

Résumé

INTRODUCTION

Le 27 juin 2008, les ministres de la Santé des 53 pays de la zone européenne de l'OMS ont signé la Charte de Tallin sur les systèmes de santé[a]. Par cette signature, les états membres se sont engagés, entre autres, à « promouvoir la transparence et rendre des comptes au sujet de la performance des systèmes de santé grâce la publication de résultats mesurables ». Pour réaliser cet engagement, il est primordial d'assurer un suivi et une évaluation de la performance des systèmes de santé et de garantir une coopération équilibrée avec les parties prenantes, à tous les échelons de gouvernance.

À la différence des pays voisins, notamment les Pays-Bas et le Royaume-Uni, l'expérience et les compétences spécialisées de la Belgique en matière d'évaluation de la performance du système de santé se limitent à quelques initiatives et autres études (dont certaines font l'objet d'une discussion au chapitre 4 du rapport scientifique). Cependant, aucune de ces études ne s'inscrit dans le cadre d'une évaluation systématique de la performance. En outre, si l'on examine les données relatives à la Belgique qui sont présentées par des organisations internationales comme l'OCDE et l'OMS, on constate qu'elles sont souvent incomplètes ou manquantes.

La présente étude a pour objectif d'une part d'étudier les manières possibles de concevoir un système d'évaluation de la performance du système de soins de santé et d'autre part d'examiner leur application possible en Belgique tout en construisant et en mesurant un premier ensemble d'indicateurs.

Vu que l'objectif ultime d'un système de santé performant doit être de contribuer à la santé de la population, l'évaluation d'un tel système ne peut se limiter à celle des soins de santé mais doit idéalement aussi prendre en compte les autres déterminants de la santé. Pourtant le présent rapport n'abordera quasiment que les soins de santé, parce que d'une part c'est la mission qui a été confiée au KCE et d'autre part parce que les moyens et le temps disponibles pour ce projet étaient limités.

PHASE CONCEPTUELLE

REVUE DE LA LITTÉRATURE

Méthodologie

Une étude de la littérature portant sur les systèmes d'évaluation des soins de santé disponibles au niveau international s'est fondée sur une recherche dans Medline et EMBASE combinée à un examen de la littérature grise (Google et sites Internet spécifiques). Cette revue s'est concentrée sur sept pays (Australie, Canada, Pays-Bas, Nouvelle-Zélande, Suède, Royaume-Uni et États-Unis) et quatre organisations internationales (Fonds du Commonwealth, Commission européenne, OCDE et OMS).

Une réunion avec des experts des Pays-Bas, du Canada (Ontario), de l'OCDE et de l'OMS a été organisée afin de valider les principaux constats issus de l'étude de la littérature, de compléter les informations manquantes et de débattre des points forts et des points faibles de leur système d'évaluation de la performance.

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a   http://www.euro.OMS.int/document/e91438.pdf

Résultats

Dans les 11 systèmes étudiés, nous avons constaté des différences au niveau de l'interprétation de la performance, et notamment une absente patente de cohérence sur les termes des principales dimensions de la performance. Alors que certains pays ou organisations focalisent leur attention sur la qualité des soins (comme l'Agency for Health Care Research and Quality [AHRQ] du Royaume Uni ou les Health Care Quality Indicators [HCQI] de l'OCDE), la plupart des systèmes étudiés considèrent la qualité des soins comme étant un des aspects de la performance. Les dimensions couvertes dans la plupart des systèmes de mesure de la performance sont : l'efficacité (n= 11), l'efficience (n = 10), l'accessibilité (n= 9), l'équité (n= 9), l'orientation patient (n= 8) et la sécurité (n= 7).

Plusieurs systèmes de mesure de la performance soulignent la corrélation entre la performance des systèmes de santé et d'autres concepts essentiels, comme la santé (« état de santé » ou « état de santé et résultats pour la santé »), les déterminants de la santé et les caractéristiques des systèmes de santé.

Une description plus détaillée de ces systèmes de mesure peut être trouvée au chapitre 2 du rapport scientifique.

CADRE CONCEPTUEL POUR LA MESURE DE LA PERFORMANCE DU SYSTÈME DE SOINS DE SANTÉ BELGE

Sur base de la revue de littérature, un cadre conceptuel a été développé pour la mesure de la performance du système de soins de santé belge. Des experts externes et un comité d'accompagnement regroupant les principaux stakeholders ont été informés et consultés à différentes étapes de la construction de ce cadre conceptuel.

La Figure 1 fournit un aperçu des concepts inclus dans le cadre conceptuel de même que leurs corrélations. Les définitions de tous les concepts et dimensions inclus sont débattues au chapitre 3 du rapport scientifique.

Ayant choisi une approche holistique de la performance du système de santé, nous faisons la distinction entre trois étages interconnectés, comprenant l'état de santé, les déterminants non médicaux de la santé et le système de santé.

Le système de santé comprend 5 domaines : la promotion de la santé, les soins préventifs, les soins curatifs, les soins à long terme et les soins aux personnes en fin de vie. La performance du système de santé, qui est présentée et analysée pour chacun des domaines du système de santé, comporte 4 dimensions principales : la qualité, l'accessibilité, l'efficience et la durabilité. La dimension 'qualité' est quant à elle subdivisée en 5 sous-dimensions : l'efficacité, l'adéquation (appropriateness en anglais), la sécurité, la centralité du patient et la continuité.

L'équité représente une dimension faîtière en ce sens qu'elle peut intervenir au niveau de chacun des domaines envisagés. Comme dans la littérature, on ne trouve aucun consensus sur une définition correcte de l'équité, aucun choix a priori n'a été posé dans le présent projet. Dans ce qui suit, une première approche a été tentée mais il reste clairement encore beaucoup de travail à ce sujet.

Figure 1. Conceptualisation de la performance du système de santé belge
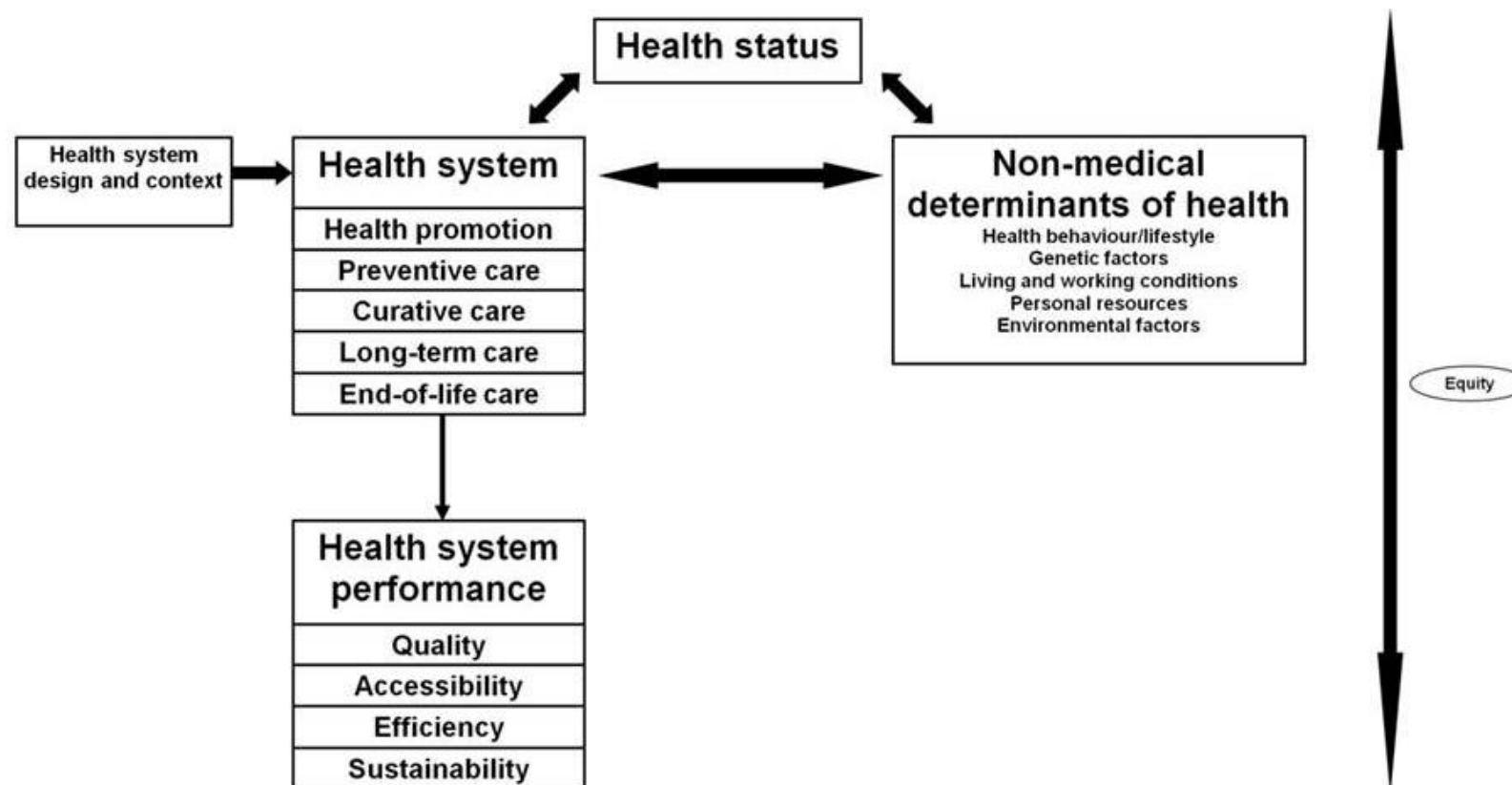
DÉVELOPPEMENT D'UN ENSEMBLE D'INDICATEURS DE PERFORMANCE

Procédure de sélection

Les indicateurs néerlandais (n=229) et canadiens (n=46) ont été pris comme base de départ. Après deux tours de sélection, au cours desquels les indicateurs ont été appréciés sur base de leurs caractéristiques essentielles (càd validité, fiabilité, caractère relevant, interprétabilité, faisabilité a priori et actionnabilité), la liste a été ramenée à 28 indicateurs (figure 2). Toutefois, comme cette sélection apparaissait insatisfaisante, d'autres sources ont été prises en compte, parmi lesquelles quelques initiatives belges et les indicateurs de l'AHRQ. Après consultation des experts externes, un consensus a été atteint pour inclure 55 indicateurs (47 indicateurs primaires et 8 secondaires liés à un indicateur primaire).

Figure 2. Procédure de sélection des indicateurs de performance
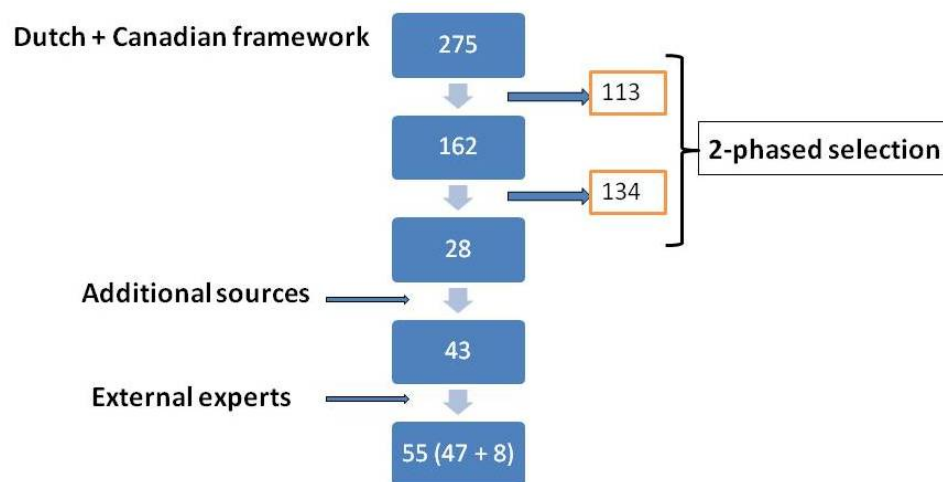
Tour d'horizon des indicateurs sélectionnés

Si l'on considère chaque indicateur dans sa dimension principale (certains indicateurs concernent plusieurs dimensions de la perfomance), la sélection finale contient surtout des indicateurs d'efficacité (n=23), de durabilité (n=8), de sécurité (n=8) et d'adéquation (n=7) (tableau 1).

Tableau 1. Tour d'horizon des indicateurs de performance sélectionnés.

Dimensions	Soins préventifs	Soins curatifs	Soins à long terme	Génériques
Efficacité réelle	• Dépistage du cancer du sein avec mammotest chez les femmes âgées de 50-69 ans • Autre cliché mammaire chez les femmes âgées de 50-69 ans • Dépistage du cancer du col de l'utérus chez les femmes âgées de 25-64 ans • Dépistage du cancer colorectal cancer chez les sujets de 50 ans et plus • Vaccination contre la grippe • Couverture vaccinale des enfants de 2 ans • Taux d'hospitalisation en soins aigus pour cause de pneumonie ou de grippe • Pourcentage de fumeurs quotidiens • Consommation de fruits et légumes • Consommation d'alcool • Consommation de sel • Allaitement maternel • Contrôles annuels chez le dentiste • Dents cariées, manquantes et obturées à l'âge de 12 ans • Dépistage cardiovasculaire chez les sujets âgés de 45-75 ans	• Taux de survie à 5 ans dans le cancer du côlon • Mortalité infantile • Mortalité prématurée • Taux de survie à 5 ans dans le cancer du sein • Taux de survie à 5 ans dans le cancer du col de l'utérus • Mortalité à l'hôpital après une fracture de la hanche • Mortalité à l'hôpital consécutive à une pneumonie d'origine communautaire	• Amputations majeures liées au diabète	
Adéquation	• Cliché mammaire chez les femmes âgées de moins de 50 ou de plus de 71 ans	• Utilisation et vitesse de diffusion des techniques chirurgicales peu invasives • Utilisation de protocoles ou de recommandations de bonne pratique spéciaux dans les procédures à haut risque ou complexes • Nombre de césariennes pour 1000 naissances d' enfant vivant • Hystérectomie par classe sociale		• Prescriptipn conformément aux recommandations de bonne pratique
Sécurité		• Incidence des effets indésirables graves d'une transfusion sanguine • Incidence des infections liées aux soins	• Incidence des escarres a. Dans les centres de prise en charge de longue	• Nombre d'infections nosocomiales à MRSA • Nombre de prescriptions

Dimensions	Soins préventifs	Soins curatifs	Soins à long terme	Génériques
		de santé • Incidence des escarres dans les hôpitaux • Incidence des infections postopératoires du site chirurgical	durée b. Chez les sujets à risque	d'antibiotiques • Exposition aux radiations médicales
Continuité		• Durée moyenne du séjour		• Nombre de personnes non inscrites auprès d'un médecin généraliste (MG)
Accessibilité	• Couverture des soins de santé infantiles préventifs dans les groupes à haut risque		• Coûts supplémentaires liés à la maladie chez les patients chroniques	• Nombre de médecins et d'infirmières • Situation de la population en matière d'assurance • Montant de la participation aux coûts et du ticket modérateur
Efficience		• Hospitalisations de jour chirurgicales	• Utilisation des technologies de prise en charge à domicile et part des patients dialysés sous dialyse à domicile	
Durabilité				• Dépenses de soins de santé en fonction du Système des Comptes de la Santé (SHA - System of Health Accounts) • Système du maximum à facturer • Niveau de qualification des prestataires de soins de santé • Nombre de diplômés en sciences médicales et infirmières • Budget annuel du Fond spécial de Solidarité • Nombre de MG qui utilisent un dossier médical électronique • Nombre de jours-patients en soins aigus par tête • Nombre de lits en soins aigus

Pour l'équité, aucun indicateur spécifique n'a été sélectionné mais nous avons décidé d'utiliser les résultats d'un sous-ensemble d'indicateurs repris dans d'autres dimensions pour lesquels des stratifications complémentaires sont effectuées à propos de l'équité.

La stratégie de sélection choisie a entraîné des lacunes dans la couverture de certaines dimensions de la performance (par exemple, la centralité du patient et la continuité) et de certains domaines des soins de santé comme les soins aux patients en fin de vie. D'autres domaines pour lesquels aucun indicateur n'a été inclus sont la santé mentale et les soins aux personnes âgées, ces indicateurs n'étant apparus qu'en faible nombre dans les sources consultées.

En conséquence, l'évaluation de la performance du système des soins de santé belge, telle qu'elle est présentée dans le présent rapport, se concentre essentiellement sur les aspects cliniques des soins de santé. Des dimensions de la performance telles que la centralité du patient ou l'équité ne sont pas faciles à capturer et suscitent de vifs débats. Pour ces raisons, l'évaluation de ces dimensions nécessite la création de groupes de travail ad hoc.

L'ÉTUDE PILOTE

MÉTHODOLOGIE

Pour chaque indicateur inclus, une fiche technique a été élaborée, avec les informations suivantes : source de l'indicateur, numérateur et dénominateur, harmonisation éventuelle par rapport à la définition utilisée dans d'autres pays, raison d'être de l'indicateur, caractéristiques, sources des données, résultats et indicateurs apparentés. A chaque fois, les données disponibles les plus récentes ont été utilisées ; dans de nombreux cas, elles correspondaient à 2007. Chaque fiche a été validée par des experts compétents dans le domaine.

DISPONIBILITÉ DES INFORMATIONS LIÉES AU SYSTÈME DE SOINS DE SANTÉ EN BELGIQUE

Rapportage aux organisations internationales

La disponibilité des données belges nécessaires pour le rapportage à l'OCDE (Eco-Santé OCDE 2008) et à l'OMS (base de données « la Santé pour Tous »), a été analysée. Un aperçu très détaillé de ces données est disponible dans le Supplément 1 de ce rapport. En ce qui concerne le rapportage à l'OCDE, 13% de toutes les variables requises font totalement défaut en Belgique, tandis que pour 15 autres pourcents d'entre elles, les données sont manquantes après 2005. Les données indisponibles sont notamment liées aux domaines suivants : état de santé (y compris la mortalité), la protection sociale ainsi que les ressources en soins à long terme et leur utilisation.

Aux fins du rapportage à l'OMS, 4% de toutes les variables requises font défaut pour la Belgique, tandis que pour 69 autres pourcents d'entre elles, les données sont manquantes après 2005. Les données indisponibles sont notamment liées aux domaines suivants: mortalité, mode de vie et environnement.

Aperçu des données de santé belges

Nous avons procédé à un inventaire de 131 bases de données potentiellement utiles pour un système de performance des soins de santé. A cet effet, nous sommes partis de l'inventaire KCE des bases de données de santé[2] et de Morbidat[3] mis au point pas l'Institut Scientifique de Santé Publique (ISSP). La description de chaque base de données a été actualisée et ensuite validée par le responsable de la base de données. Une description complète de ces données est disponible dans le Supplément 2 du rapport.

RÉSULTATS DE L'ÉTUDE PILOTE

Le chapitre 6 du rapport scientifique est consacré à la construction d'un prototype de système de mesure de la performance.

Les résultats de cette étude pilote donnent une image contrastée du système de soins de santé belge (tableau 2) mais qui ne peut certainement pas être considérée comme déjà très fiable vu le nombre encore réduit d'indicateurs à partir desquels elle se dessine. D'une manière générale, le score du système semble bon en ce qui concerne l'accessibilité ; moyen à bon en ce qui concerne la sécurité ; moyen en ce qui concerne l'efficacité des soins préventifs, l'adéquation ou le carcatère justifié des soins, l'efficience et la durabilité. L'efficacité des soins curatifs et la continuité ressortent assez mal cotées par les indicateurs retenus dans l'étude pilote. Différentes inégalités ont été constatées mais doivent être examinées de plus près du point de vue de l'équité.

Les résultats et les conclusions de cette étude pilote doivent être interprétés avec précaution en raison de l'évaluation fragmentaire de certaines dimensions, en particulier en ce qui concerne l'efficacité des soins curatifs (manque de données sur les résultats cliniques) et la continuité (petit nombre d'indicateurs). De plus, des dimensions comme l'orientation-patient et l'équité ne peuvent être ignorées lorsqu'on veut faire une évaluation complète de la performance du système de soins de santé belge.

Le tableau 2 donne une vue d'ensemble des forces et des faiblesses du système de soins de santé belge telles qu'elles ressortent de l'étude pilote. Sans vouloir être exhaustifs et tout en tenant compte du caractère préliminaire de cette étude, quelque suggestions d'amélioration sont également avancées.

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[2]   Van De Sande S, De Wachter D, Swartenbroekx N, Peers J, Debruyne H, Moldenaers I, et al. Inventaire des banques de données de soins de santé - Supplément. Objective Elements - Communication (OEC). Bruxelles : Centre fédéral d'expertise des soins de santé (KCE); 2006. KCE reports 30 Suppl (D2006/10.273/16).

[3]   http://www.iph.fgov.be/epidemio/morbidat/FR/MbframFR.htm

Tableau 2. Forces et faiblesses du système de soins de santé belge ressortant de l'ensemble actuel des indicateurs de performance*.

Dimensions	Forces	Faiblesses	Évolutions	Actions proposées
Efficacité réelle				
Soins préventifs	Couverture vaccinale moyenne à bonne			
		Faible couverture du dépistage du cancer en comparaison avec d'autres pays (*p ex., le taux de couverture pour le dépistage du cancer du sein dans la population cible se montait à 33.7% en 2007*)	Couverture du dépistage du cancer en augmentation (+)	Déployer davantage d'efforts pour améliorer la couverture du dépistage du cancer dans toutes les régions
		Importantes variations régionales au niveau de la couverture du dépistage du cancer		
	Résultats moyens pour la promotion de la santé	Inégalités dans les comportements conscients de santé responsables	Tendance positive pour la promotion de la santé (+)	Intensifier les efforts pour atteindre les groupes socio-économiques moins favorisés
Soins curatifs		Absence de données sur la mortalité nationale		
		Taux élevé de mortalité à l'hôpital (pour la fracture de la hanche et la pneumonie)		Recherches ultérieures avec ajustements en fonction du risque
Adéquation	Recours important aux techniques chirurgicales peu invasives		Évolution positive pour les techniques chirurgicales peu invasives (+)	
		Nombre élevé d'hystérectomies en comparaison avec d'autres pays (*2.8 pour 1000 femmes adultes en 2007*)	Régression du nombre total d'hystérectomies (+)	Intensifier les efforts pour mettre en œuvre les recommandations de bonne pratique clinique
	Nombre de césariennes en dessous de la moyenne internationale (*199 vs. 237 [moyenne EU-15] pour 1000 naissances d'enfant vivant en 2006*)		Nombre de césariennes en hausse (-)	
		Exposition élévée aux	Exposition aux radiations	Le cas échéant, encourager

Dimensions	Forces	Faiblesses	Évolutions	Actions proposées
		radiations médicales	médicales en augmentation (*2.15 mSv par tête in 2005 vs. 2.42 mSv par tête en 2008*) (-)	l'utilisation de procédures moins irradiantes, par exemple, l'IRM
		Taux élevé de mammographies dans le groupe de femmes non éligibles pour le dépistage de masse		Investiguer l'adéquation de ces mammographies (Projet KCE prévu en 2010)
Sécurité	Sécurité relativement bonne pour le patient hospitalisé	Exposition aux radiations médicales en hausse		
			Incidence du MRSA en baisse (+)	
Continuité		Durée de séjour supérieure à la moyenne UE-15		Examiner les raisons de cette durée de séjour plus longue
		Nombre relativement faible de patients dotés d'un dossier médical global (DMG), avec des variations régionales importantes	Nombre de patients dotés d'un DMG en augmentation (+)	Intensifier les efforts pour que le DMG soit appliqué dans toutes les régions
Accessibilité	Couverture élevée de l'assurance soins de santé (*98.6% de la population totale en 2007*)	Disponibilité en personnel difficile à évaluer		Un cadastre du personnel médical est nécessaire
	Systèmes de protection sociale disponibles	Tickets modérateurs relativement élevés		Augmenter la comparabilité internationale des données du système des comptes de la santé
Efficience	Nombre de procédures chirurgicales en hospitalisation de jour supérieur au niveau international		Évolution vers davantage de soins en ambulatoire et en hospitalisation de jour (+)	
		Soins inadéquats		Intensifier les efforts pour mettre en œuvre les recommandations de bonne pratique clinique
	En général, organisation plus efficace des soins aux patients hospitalisés (recours aux techniques chirurgicales peu invasives, itinéraires cliniques)	Durée du séjour supérieure à la moyenne UE-15		

Dimensions	Forces	Faiblesses	Évolutions	Actions proposées
Durabilité	Nombre élevé de diplômés en médecine et en sciences infirmières	Adéquation incertaine entre la disponibilité en personnel et les besoins de la population		Besoin de données sur les diplômés en sciences infirmières ; d'une analyse fouillée des besoins du personnel médical en tenant compte des évolutions démographiques et épidémiologiques de même que de l'état de santé de la population
	Utilisation moyenne du dossier médical électronique en comparaison avec d'autres pays	Dépenses de santé totales relativement élevées		

* Pour certains indicateurs, les résultats les plus récents sont donnés à titre d'exemple en italique et entre parenthèses

ENQUÊTE AUPRÈS DES PARTIES PRENANTES

MÉTHODOLOGIE

Une liste des parties prenantes a été dressée, comprenant les catégories suivantes : autorités en matière de santé publique (fédérales et régionales), associations de prestataires de soins de santé, décideurs politiques, mutuelles et autres (y compris des institutions scientifiques et des organisations non gouvernementales).

Un questionnaire de questions ouvertes a été rédigé en néerlandais et en français et avait pour vocation de comprendre les besoins des parties prenantes, mais également leur attentes par rapport à un système de mesure de la performance. Le questionnaire a été encore légèrement adapté sur base de trois interviews pilotes.

Une première analyse de tous les entretiens personnels a été menée sur la base des transcriptions intégrales des entretiens. Pour garantir une interprétation exhaustive et cohérente, une majorité des entretiens a été analysée par deux consultants travaillant chacun de manière indépendante. Ensuite, une seconde analyse thématique des résultats a été effectuée.

RÉSULTATS DE L'ENQUÊTE

En général, l'accueil des parties prenantes face à l'initiative est positif. Un très petit nombre d'entre elles seulement (n=2) sont moins positives, en raison de leurs doutes quant à la faisabilité de l'instauration d'un tel système.

On peut répartir les besoins des parties prenantes en quatre catégories principales:

- besoin d'*évaluation* des décisions et actions prises et, par conséquent, nécessité de disposer des informations permettant de telles évaluations.

- Besoin d'*amélioration* du système de soins de santé existant.

- Besoin de *justification* et de transparence et donc d'un changement de mentalité.

- Besoin d'information pour les *comparaisons internationales.*

Les principaux obstacles mentionnés quant à l'utilisation du rapport sont la résistance escomptée de la part des groupes qui se sentiraient menacés par les résultats, la culture ambiante et la complexité du système de santé belge.

Les principaux risques évoqués sont l'absence de concrétisation dans des actions à prendre sur base des résultats, la complexité du système d'évaluation et du sujet en soi, l'utilisation à mauvais escient des résultats et une focalisation sur les comparaisons plutôt que sur les améliorations.

En ce qui concerne l'implémentation, les points d'attention suivants sont mis en avant:

L'élément essentiel est l'utilisation des données pour améliorer les décisions. Pour les parties prenantes, ce n'est pas le rapport en soi qui importe, mais l'usage que l'on en fera.

- L'impact du rapport serait accru si sa publication allait de pair avec des initiatives visant à déclencher un débat fondé sur les résultats.

- En soi, l'exercice présente une valeur ajoutée élevée: il institue un dialogue et une collaboration entre les institutions.

- Une stratégie de communication est nécessaire pour le rapport.

LIMITATIONS DE L'ÉTUDE

Quelques limitations ont déjà été signalées plus haut. De manière résumée, les limitations suivantes doivent être soulignées :

- De nombreuses lacunes dans l'étude pilote, notamment en ce qui concerne certaines dimensions de la performance (centration-patient, continuité, équité), sous dimensions (culturelles, psychologiques, accessibilité à temps), domaines de soins de santé (soins aux personnes âgées, santé mentale). Dans certaines dimensions pour lesquelles des indicateurs ont été sélectionnés, ce sont des données adéquates qui font défaut.

- En raison de la centration du projet, certains determinants (non médicaux) de la santé ont été insuffisamment étudiés. Certains de ces déterminants sont fort corrélés aux soins de santé (tabagisme, obésité, etc) et il est possible de les influencer.

- Le manqué d'indicateurs de centration-patient découle de la procedure de selection choisie, mais témoigne aussi du peu d'informations existantes à ce sujet.

CONCLUSION

Le rapport montre qu'il est possible de démarrer un système de mesure de la performance en Belgique, pourvu que certaines conditions soient remplies. Ce premier exercice a mis en évidence qu'une collaboration efficace entre les administrations et le organisations de soins de santé était possible. Il reste cependant des lacunes importantes en ce qui concerne la disponibilité des données.

RECOMMANDATIONS[d]

- **Moyens à mettre en oeuvre**

  o **La construction d'un ensemble complet et élaboré d'indicateurs doit être plannifiée et consolidée. Le personnel nécessaire à cet effet doit être prévu.**

  o **L'utilisation d'un système de mesure de la performance n'a de sens que par rapport à des objectifs préalablement fixés auquels le système permet de se comparer. Il convient donc de définir clairement des objectifs et de chercher les indicateurs qui permettent d'évaluer dans quelle mesure ils sont atteints.**

  o **Des rapports devraient être publiés régulièrement et prendre en considération les exigences en matière de fourniture de données des organisations internationales (OCDE, OMS) de même que la périodicité de certaines données de santé belges (par exemple, l'Enquête de Santé). Un rapport annuel semble raisonnable, à tout le moins pour certains indicateurs, à condition que du personnel soit prévu en suffisance.**

- **Portée (scope) du système de mesure de la performance**

  o **La première des priorités est de combler les lacunes mises en évidence dans ce rapport.**

  o **Pour pouvoir évaluer le système des soins de santé de manière valable, toutes les dimensions de la perfomance doivent être prises en compte. Pour certaines dimensions (orientation-patient et équité) et pour certains domaines de soins (maladies chroniques et soins de fin de vie), des groupes de travail spécifiques doivent être mis sur pied pour garantir que toutes les sources de données soient bien consultées de même qu'une définition correcte des indicateurs et une utilisation de données adéquates pour mesurer ces indicateurs. Par ailleurs, l'inclusion d'organisations de patients dans le groupe des parties prenantes interrogées pourrait contribuer à combler ces lacunes.**

  o **L'angle de vue du système de performance ne doit pas être limité aux soins de santé mais doit aussi inclure d'autres aspects comme les déterminants non médicaux de la santé. Certains de ces déterminants sont d'ailleurs fortement liés aux soins de santé (par ex. le tabagisme, l'obésité, …) et il est possible de les influencer.**

  o **Le choix des indicateurs doit être ajusté en fonction de la politique de santé que l'on souhaite suivre en Belgique.**

  o **Lors de la sélection des indicateurs, il faut trouver un équilibre entre les indicateurs déjà inclus (suivi) et les nouveaux indicateurs qui reflètent l'évolution des soins de santé. Les banques de données disponibles doivent être consultées pour créer ces nouveaux indicateurs. Cela exigera une collaboration étroite entre les gestionnaires de banques de données.**

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[d]   Le KCE reste seul responsable des recommandations faites aux autorités publiques

- **Conditions pour rendre le système opérationnel**

  o **Une condition primordiale à la mise en place d'un système d'évaluation de la performance est la participation de toutes les administrations de santé et la collaboration entre celles-ci. Les responsabilités propres de chacune dans le cadre du système d'évaluation de la performance doivent être clairement définies.**

  o **Le groupe de travail responsable de la sélection, de l'évaluation et du rapportage des indicateurs de performance doit être épaulé par un conseil scientifique consultatif reflétant toutes les compétences pertinentes.**

  o **Un groupe de travail devrait être constitué par la Conférence interministérielle afin d'évaluer et d'assurer le suivi de l'utilisation du rapport.**

  o **L'interprétation de la mesure de la performance postule que l'on ne prenne pas seulement en compte des données de soins de santé. D'autres facteurs, comme le contexte du système de santé et les déterminants non médicaux de la santé doivent être pris en considération également.**

- **Rassemblement des données**

  o **Les fournisseurs de données devraient être impliqués tôt dans la procédure de définition et de mesure des indicateurs.**

  o **Chaque fournisseur de données devrait nommer une « personne de contact unique » afin de faciliter la transmission des données.**

  o **La disponibilité des données (notamment sur les causes de la mortalité, la survie au cancer à 5 ans, etc.) devrait être améliorée, non seulement pour garantir un système d'évaluation de la performance qui soit efficace, mais aussi pour combler les lacunes concernant les exigences en termes de fournitures de données formulées par les organisations internationales.**

  o **En général, les résultats sont présentés au niveau national. Le cas échéant et si nécessaire, les résultats pourraient être rapportés davantage dans les détails (par exemple, au niveau régional, au niveau des hôpitaux, etc)**

- **Utilisation et diffusion**

  o **Les résultats du présent rapport sont préliminaires et doivent dès lors être utilisés comme tels.**

  o **Afin de garantir une utilisation et une interprétation correctes du rapport, il convient d'élaborer un plan de communication et de diffusion. En tant que chefs de file des institutions dans le domaine de la santé, tant l'INAMI que le SPF Santé, Sécurité de la Chaîne alimentaire et Environnement (via l'ISP) devraient jouer un rôle proactif dans la communication, la diffusion et l'utilisation du présent rapport, notamment, en organisant des séminaires et en débattant des résultats avec les politiques responsables et/ou en présentant le rapport au Parlement.**

  o **Les indicateurs inclus dans le présent rapport ont pour fonction de lancer des signaux. Les résultats devraient être épluchés plus en détail par les agences et organisations responsables. Il est souhaitable qu'un groupe de travail politique identifie à l'avance les services et organisations responsables pour mettre en œuvre les améliorations souhaitées.**

SPF SANTE PUBLIQUE, SECURITE DE LA CHAINE ALIMENTAIRE ET ENVIRONNEMENT

FOD VOLKSGEZONDHEID, VEILIGHEID VAN DE VOEDSELKETEN EN LEEFMILIEU

Conférence Interministérielle Santé Publique

Interministeriële Conferentie Volksgezondheid

A

"Performance du système de soins de santé"

Groupe de travail intercabinets "Performance du système de soins de santé"

"Performantie van het gezondheidszorg-systeem"

Interkabinettenwerkgroep "Performantie van het gezondheidszorgsysteem"

RÉUNION

26 AVRIL 2010

VERGADERING

26 APRIL 2010

"Performance du système de soins de santé"

Groupe de travail intercabinets "Performance du système de soins de santé"

Mission

- Analyser les résultats du rapport martyr sur la performance des soins de santé en Belgique;
- Définir, si nécessaire, une stratégie de communication des résultats du rapport martyr;
- Se prononcer sur la suite du projet et en particulier:
  - définir les accents spécifiques éventuels à compléter ou à développer;
  - préciser la fréquence de publication des rapports;
- Repréciser, si nécessaire, les modalités de collaboration entre administrations et l'organisation du projet.

Résumé des activités

La conférence interministérielle (CIM) a été sollicitée le 15 décembre 2009 sur le rapport zéro intitulé "Performance du système de santé belge". Un groupe de travail s'est réuni le 24 mars pour confirmer les conclusions de la note de décembre rappelée ci-dessous et agréer la poursuite du projet.

Le groupe de travail a également proposé que le groupe inter-administration formule des propositions concrètes quant aux modalités de communication du rapport. Celui-ci s'est réuni le 1er avril 2010.

Le présent rapport est basé sur les conclusions de ces 2 groupes de travail.

Pour rappel, en mars 2008, la conférence interministérielle (CIM) a été informée par la Ministre fédérale de la Santé Publique et des

"Performantie van het gezondheidszorgsysteem"

Interkabinettenwerkgroep "Performantie van het gezondheidszorgsysteem"

Missie

- De resultatent te analyseren van de sneuveltekst over de performantie van het gezondheidssyteem in Belgïe;
- Indien, nodig, een strategie te bepalen voor het communiceren van de resultaten van de sneuveltekst;
- Zich uit te spreken over de voortzetting van het project, en in het bijzonder:
  - over de eventuele specifieke accenten die moeten gelegd of uitgewerkt;
  - over de frequentie voor het publiceren van de verslagen;
- Zo nodig, de nadere regels voor de samenwerking tussen de administraties en de projectorganisatie opnieuw te preciseren.

Samenvatting werkzaamheden

Op 15 december 2009 werd de interministeriële conferentie (IMC) haar mening gevraagd over het zero-rapport getiteld "performantie van het Belgische gezondheidssysteem". Op 24 maart kwam er een werkgroep samen om de conclusies te bevestigen van de nota van december die hieronder wordt herhaald, en om de voortzetting van het project goed te keuren.

De werkgroep heeft eveneens voorgesteld dat de interadministratieve werkgroep concrete voorstellen formuleert aangaande de manieren waarop over het rapport gecommuniceerd zal worden. Die kwam samen op 1 april 2010.

Dit rapport is gebaseerd op de conclusies van die 2 werkgroepen.

Ter herinnering, in maart 2008 werd de interministeriële conferentie (IMC) door de federale Minister van Volksgezondheid en

Affaires sociales de l'élaboration d'un rapport sur la performance du système de santé en Belgique à réaliser par le KCE et l'ISP et coordonné par l'INAMI pour fin 2009.

En décembre 2008, la CIM a marqué son intérêt pour le projet en signant une déclaration d'intention pour demander à l'ensemble des administrations compétentes
• de participer aux réunions de coordination à l'initiative de la coordination du projet;
• de répondre aux sollicitations des responsables du projet en temps opportun.

Ce rapport répond à une des priorités en matière de santé publique conclue dans l'accord gouvernemental fédéral du 18 mars 2008 à savoir que: "les performances de notre système de santé y compris en ce qui concerne la qualité seront évaluées sur base d'objectifs mesurables".

Ce rapport est aussi destiné à répondre à certains principes de la charte de Tallin du 28 juin 2008 à laquelle la Belgique a souscrit. Cette charte demande notamment aux pays signataires de "promouvoir la transparence et rendre des comptes quant à la performance des systèmes de santé, dans la production de résultats mesurables".

Une bonne gouvernance du système implique de s'accorder sur les standards de performance de notre système, faciliter la collecte et le regroupement des informations, bâtir une politique d'actions cohérente en vue d'améliorer la performance et mettre en place un système de reportage et rendre des comptes.

La gamme d'intervention comprend le préventif, le diagnostic, le curatif et le palliatif, et inclut les fonctions de santé publique suivantes: surveillance, protection et promotion de la santé, prévention des maladies, et l'évaluation du système.

Sociale Zaken ingelicht over de uitwerking van een rapport over de performantie van het gezondheidssysteem in België dat door het KCE en het WIV moet worden gerealiseerd en gecoördineerd door het RIZIV tegen eind 2009.

In december 2008 heeft de IMC haar belangstelling getoond voor het project door een intentieverklaring te ondertekenen om aan alle bevoegde administraties het volgende te vragen:
• dat ze zouden deelnemen aan de coördinatievergaderingen op initiatief van de projectcoördinatie
• dat ze tijdig zouden antwoorden op de verzoeken van de projectverantwoordelijken

Dit verslag beantwoordt aan één van de prioriteiten op het vlak van de volksgezondheid zoals afgesloten in het federaal regeerakkoord van 18 maart 2008, met name: « de performanties van ons gezondheidssysteem met inbegrip van de kwaliteitsperformanties zullen op basis van meetbare doelstellingen worden gemeten »

Dit verslag is ook bestemd om te beantwoorden aan bepaalde principes van het handvest van Tallinn van 28 juni 2008 dat België onderschreven heeft. Dat handvest vraagt onder meer aan de ondertekenende landen om « de transparantie te bevorderen en te rapporteren over de performantie van de gezondheidssystemen om op die manier meetbare resultaten te verkrijgen ».

Een goed beheer van het systeem vereist dat men het eens raakt over de performantiestandaarden van ons systeem, dat de inzameling en groepering van informatie wordt vergemakkelijkt, dat er een coherent actiebeleid wordt opgebouwd om de performantie te verbeteren, dat er een rapporteringssysteem wordt geïmplementeerd en tot slot dat er wordt gerapporteerd.

Het interventiegamma omvat het preventieve aspect, de diagnose, het curatieve en palliatieve aspect en omvat de volgende volksgezondheidsfuncties : toezicht, bescherming en bevordering van de gezondheid, preventie van de ziekten en de evaluatie van het systeem.

Le projet a été dessiné comme suit:
1)   Faire l'inventaire des systèmes de performance dans les autres pays afin d'élaborer un cadre conceptuel pour la Belgique;
2)   Réaliser un état des lieux des informations existantes et valider les outils;
3)   Faire l'inventaire des besoins pour un tel outil auprès des décideurs;
4)   Rédiger un rapport martyr sur la performance du système de santé belge;
5)   Faire en sorte que le rapport puisse être utile à la bonne gouvernance.

Le rapport réalise les 4 premiers points :
1) Le cadre conceptuel met l'accent sur les valeurs partagées du système de santé à savoir:
- la qualité qui se décline en efficacité, pertinence, sécurité, continuité et de l'attention portée au patient ("patient centerdness") ;
- l'accessibilité ;
- l'efficience ;
- la pérennité et
- l'équité ;

2) L'état des lieux quant à la disponibilité des données a révélé que manquent ou sont fournies avec retard
- 29 % des données OCDE
- 73 % des données OMS

Les lacunes sont liées principalement aux données de mortalité et dans une moindre mesure liées aux soins chroniques.

3) L'inventaire des besoins auprès des décideurs souligne l'intérêt de disposer d'un outil commun et partagé entre administrations pour
- valider les comparaisons internationales,
- évaluer les programmes de santé,
- améliorer la performance du système de santé et
- rendre des comptes.

4)   Le rapport martyr a dressé un set volontairement réduit de 55 'indicateurs de performance. L'objectif n'était pas ici d'être exhaustif dans chaque (sous-)dimension, mais

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Het project werd als volgt uitgetekend:
1)   de inventaris opmaken van de performantiesystemen in de andere landen teneinde een conceptueel kader voor België uit te werken
2)   een stand van zaken opmaken van de bestaande informatie en de instrumenten valideren
3)   de inventaris opmaken van de behoeften voor een dergelijk instrument bij de beleidsvoerders
4)   Een sneuveltekst opmaken over de performantie van het Belgische gezondheidssysteem
5)   Ervoor zorgen dat het verslag nuttig kan zijn voor een goed beheer.

Het verslag realiseert de eerste 4 punten:
1) Het conceptuele kader legt de nadruk op de gedeelde waarden van het gezondheidssysteem, met name:
- de kwaliteit vertaalt zich in efficiëntie, relevantie, veiligheid, continuïteit en aandacht voor de patiënt (« patient centerdness ») ;
- toegankelijkheid ;
- efficiëntie;
- duurzaamheid en
- billijkheid ;
-

2) Uit de stand van zaken betreffende de beschikbaarheid van de gegevens bleek dat
- 29 % van de OESO-gegevens
- 73 % van de WGO-gegevens
ontbreken of met vertraging bezorgd zijn.
De lacunes houden hoofdzakelijk verband met mortaliteitsgegevens en in mindere mate met chronische zorg.

3) De inventaris van de behoeften bij de beleidsvoerders wijst op het belang om te beschikken over een gemeenschappelijk instrument dat wordt gedeeld tussen administraties om
- de internationale vergelijkingen te valideren,
- de gezondheidsprogramma's te evalueren,
- de performantie van het gezondheidssysteem te verbeteren en
- te rapporteren.

4) In de sneuveltekst is een set uitgewerkt die vrijwillig is beperkt tot 55 'performantie-indicatoren'. Bedoeling was hier niet om in elk (sub)aspect exhaustief te zijn, maar te

de choisir des indicateurs valides. Le pragmatisme a orienté les choix. Dans ce rapport zéro, le choix privilégie les indicateurs validés dans les rapports de performance étranger ou proposés au niveau international pour profiter le cas échéant de valeurs de comparaison. Il ne s'agit pas d'un set définitif : dans le futur ce set pourrait évoluer vers des indicateurs plus spécifiques des particularités de notre système de santé, tout en gardant en tête l'objectif de pilotage (mesure de l'évolution).

L'interprétation des résultats se veut globalisante, étant donné que le degré de performance s'apprécie en fonction de l'équilibre entre les différentes fonctions/dimensions. Dans un tel modèle, un indicateur isolé a peu de signification. Ce qui n'empêche pas de mettre un accent particulier ou prioritaire sur certains aspects.

Tous les volets n'ont pas encore été décrits entièrement faute d'indicateurs valides ou de disponibilité d'information. 18 indicateurs sur 55 n'ont pas été documentés:
- Ainsi certaines dimensions et sous dimensions sont mal ou peu couvertes :
    • l'attention portée au patient
    • la continuité ou de
    • l'équité
- certains domaines des soins de santé ne sont pas documentés ou insuffisamment :
    • les soins de fins de vie
    • les soins chroniques
    • les soins aux personnes âgées
    • les soins psychiatriques

Bien qu'incomplet et perfectible, le mérite de ce rapport est son objectivité et l'approche globale qu'il propose.

Ce rapport donne une première impression de la performance de notre système. Aucun résultat n'est franchement mauvais, mais ces résultats sont interpellant à plus d'un titre.

La Belgique dépense plus de 32 milliards d'euros pour la santé en 2007, ce qui représente un des chiffres le plus important d'Europe en termes de

kiezen voor geldige indicatoren. Er werd gekozen voor pragmatisme. In dit zero-rapport is er gekozen voor indicatoren die gevalideerd werden in de buitenlandse performantierapporten of die op internationaal vlak werden voorgesteld om desgevallend gebruik te maken van vergelijkingswaarden. Het gaat niet om een definitieve set: in de toekomst zou deze set kunnen evolueren naar meer specifieke indicatoren van de bijzonderheden van ons gezondheidssysteem, waarbij de begeleidingsdoelstelling (meten van de evolutie) voor ogen wordt gehouden.

Het is de bedoeling dat de resultaten globaal worden geïnterpreteerd, aangezien de graad van performantie wordt beoordeeld op basis van het evenwicht tussen de verschillende functies/aspecten. In een dergelijk model heeft een afzonderlijke indicator weinig betekenis. Wat niet wegneemt dat er specifiek of prioritair nadruk kan worden gelegd op bepaalde aspecten.

Alle gedeeltes zijn nog niet volledig beschreven bij gebrek aan geldige indicatoren of door het ontbreken van informatie. 18 op 55 indicatoren werden niet gedocumenteerd:
    • Zo zijn bepaalde aspecten en subaspecten slecht of weinig in kaart gebracht:
    • de aandacht die aan de patiënt wordt geschonken
    • de continuïteit of
    • de billijkheid
bepaalde domeinen van de gezondheidszorg zijn niet of onvoldoende gedocumenteerd:
    • de zorg bij het levenseinde
    • de chronische zorg
    • de ouderenzorg
    • de psychiatrische zorg

Alhoewel het onvolledig en niet perfect is, is de verdienste van dit verslag de objectiviteit ervan en de algemene aanpak die het voorstelt.

Dit verslag geeft een eerste indruk van de performantie van ons systeem. Geen enkel resultaat is eerlijk gezegd slecht, maar deze resultaten zijn om meerdere redenen opmerkelijk.

België gaf in 2007 meer dan 32 miljard euro uit voor gezondheidszorg, wat één van de hoogste cijfers in Europa is op basis van het

% de produit national brut ou de dépenses par habitant : les indicateurs montrent une Belgique en bonne position en matière de disponibilité de ressources et ou de pénétration de nouvelles techniques.

Les résultats suivent-ils les moyens investis? Le rapport apporte une réponse mitigée à cette question : si la situation de la Belgique n'est pas mauvaise et en évolution positive, elle est cependant en retard dans quelques domaines sur la moyenne européenne : les marqueurs relatifs à la qualité des soins interpellent en matière de pertinence et de continuité des soins et l'efficacité globale des soins peut difficilement être appréciée par manque de données complètes sur la mortalité et la survie.

Dans le domaine de la prévention et de la promotion de la santé, si les taux de vaccination en Belgique sont parmi les plus élevés au monde, il y a des efforts à réaliser en matière de dépistage et de promotion dont la couverture est très différente selon le statut socio-économique du bénéficiaire.

Enfin le dernier objectif du projet consiste selon la charte de Tallin, à faire du rapport un outil de bonne gouvernance. Ce point n'est pas couvert par le rapport, mais des recommandations sont adressées par les auteurs:
- A long terme, ce rapport devrait servir à suivre l'évolution chiffrée d'objectifs explicites de la politique de santé.
- A court terme il convient de s'assurer d'une stratégie de communication et d'information adéquate.

En sus de ce rapport plusieurs points positifs ont été réalisés grâce à ce projet :
- La mise en place d'une collaboration active continue et régulière entre administrations a été un facteur d'appropriation essentiel dans l'élaboration et la perception du rapport.
- La mise en place d'une coordination inter-administration pour améliorer et coordonner la fourniture des données à l'union européenne, à l'OMS et à l'OCDE, sous la coprésidence des SPF Santé

percentage van het bruto nationaal product of van de uitgaven per inwoner: de indicatoren tonen aan dat België een goede positie bekleedt wat betreft beschikbaarheid van resources en/of doorbraak van nieuwe technieken.

Volgen de resultaten de geïnvesteerde middelen? Het verslag geeft een gemengd antwoord op deze vraag: alhoewel de situatie van België niet slecht is en positief evolueert, loopt België achter op het Europese gemiddelde in enkele domeinen: de indicatoren betreffende de zorgkwaliteit zijn opmerkelijk wat betreft de relevantie en zorgcontinuïteit en de algemene efficiëntie van de zorg kan moeilijk worden beoordeeld bij gebrek aan volledige gegevens over de mortaliteit en de overleving.

Hoewel op het vlak van de preventie en de bevordering van de gezondheid het vaccinatiepercentage in België bij de hoogste ter wereld behoort, moeten er inspanningen worden geleverd op het vlak van de opsporing en de bevordering waarvan de dekking zeer varieert afhankelijk van de sociaal-economische status van de rechthebbende.

Tot slot bestaat de laatste doelstelling van het project er volgens het handvest van Tallinn in om van het verslag een instrument van goed beheer te maken. Dit punt wordt niet in kaart gebracht in het verslag, maar de auteurs doen aanbevelingen:
- Op lange termijn zou dit verslag moeten dienen om de becijferde evolutie van expliciete doelstellingen van het gezondheidsbeleid op te volgen.
- Op korte termijn moet er een adequate informatie- en communicatiestrategie worden gegarandeerd.

Bovenop dit verslag werden er verschillende positieve punten gerealiseerd dankzij dit project:
- De uitbouw van een regelmatige en continue actieve samenwerking tussen de administraties was een essentiële factor in de uitwerking en de perceptie van het verslag.
- De invoering van een coördinatie tussen administraties om de levering van de gegevens aan de Europese Unie, de WGO en de OESO onder het

publique et affaires sociales (CIM d'octobre 2009)
- Une réflexion critique sur la nature des données à transmettre au niveau international et sur les conclusions que ces organismes tirent sur la Belgique.
- Une réflexion quant à l'optimalisation et l'exploitation des banques de données disponibles en Belgique.

Actions proposées

En conclusion, compte tenu de ces éléments, la CIM se félicite du résultat obtenu qui démontre la faisabilité d'un tel outil pour la Belgique, même si celui-ci doit encore être façonné en fonction des attentes des utilisateurs. Aussi la CIM,

1)   En termes de communication

mandate le Groupe de coordination inter-administration sur base du rapport présent établi en fonction des éléments développés dans le rapport KCE de communiquer sous forme d'une plaquette pour le 1er septembre 2010, laquelle doit être validée par le groupe de travail « Intercabinets ».

2)   En termes de suivi de projet

Encourage sans délai la prolongation du projet afin de promouvoir l'utilisation de l'outil et d'en assurer la récurrence;

Propose la rédaction d'un prochain rapport sur la performance d'ici fin décembre 2012 avec les objectifs suivants:
- affiner et adapter le set d'indicateurs en prenant en compte les spécificités du système de santé belge afin de rendre des comptes et suivre l'évolution du système

- compléter les domaines et les thématiques non encore couverts

covoorzitterschap van de FOD's Volksgezondheid en Sociale Zaken (IMC van oktober 2009) te verbeteren en te coördineren.
- Een kritische reflectie over de aard van de gegevens die op internationaal vlak moeten worden verzonden en over de conclusies die deze organen trekken over België.
- Een reflectie over de optimalisering en de exploitatie van de in België beschikbare gegevensbanken

Voorgestelde acties

Ter conclusie, rekening houdend met die elementen is de IMC verheugd over het behaalde resultaat, dat aantoont dat een dergelijk instrument haalbaar is voor België, zelfs al moet het nog verder worden uitgebouwd op basis van de verwachtingen van de gebruikers.

1)   Op het vlak van communicatie

geeft de groep voor coördinatie tussen administraties ook de opdracht om, op basis van het huidige rapport dat werd opgesteld in functie van de elementen die werden ontwikkeld in het KCE-rapport, tegen 1 september 2010 te communiceren aan de hand van een folder die door de Interkabinettenwerkgroep moet gevalideerd worden.

2)   Op het vlak van opvolging van het project

Stimuleert de IMC onverwijld de verlenging van het project om het gebruik van het instrument te bevorderen en om ervoor te zorgen dat het gebruikt blijft worden;
Stelt de IMC voor dat er tegen eind december 2012 een volgend verslag wordt opgesteld over de performantie met volgende doelstellingen:
- de set met indicatoren aanpassen en verfijnen door rekening te houden met de kenmerken van het Belgische gezondheidssysteem teneinde te rapporteren en de evolutie van het systeem op te volgen
- de domeinen en thema's aanvullen die nog niet behandeld werden

A cette fin la conférence interministérielle souhaite que la bonne coordination entre administrations pour la réalisation de ce projet soit maintenue et encourage les administrations respectives, sous réserve des disponibilités en termes de charge de travail, à participer activement au projet lorsqu'elles sont sollicitées.

3) Confie à un groupe de travail sous l'égide de la commission interministérielle le soin d'analyser les résultats du rapport et de fixer les priorités éventuelles.

Daartoe hoopt de interministeriële conferentie dat de goede coördinatie tussen de administraties voor de uitvoering van dat project behouden blijft en moedigt ze de respectievelijke administraties aan om – behoudens hun beschikbaarheid in termen van werklast - actief deel te nemen aan het project wanneer hen dat wordt gevraagd.

3) De IMC vertrouwt aan een werkgroep onder leiding van de interministeriële commissie de zorg toe om de resultaten van het rapport te analyseren en om eventuele prioriteiten te stellen.

Scientific summary

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LIST OF ABBREVIATIONS

95%CI	95% confidence interval
AB	Antibiotics
AHRQ	Agency for Healthcare Research and Quality
AOM	Acute Otitis Media
APR-DRG	All-Patient Refinded Diagnosis Related Group
ATC	Anatomical Therapeutic Chemical
BCR	Belgian Cancer Registry
BDMS	Banque de Données Medico-Sociales
BelHIS	Belgian Longitudinal Health Information System
BSHC	Belgian Superior Health Committee
CABG	Coronary Artery Bypass Graft
CAP	Community Acquired Pneumonia
CEBAM	Belgian Centre for Evidence Based Medicine
CHU	Centre Hospitalier Universitaire
CIHI	Canadian Institute for Health Information
CMH	Cochran-Mantel-Haenszel test
CS	Caesarean section
CT	Computed Tomography
CZV	Centre for Health Services and Nursing Research
DDD	Defined Daily Dose
DMFT	Decayed, Missing and Filled Teeth
DPT	Diphteria, Pertussis, Tetanus
EARSS	European Antimicrobial Resistance Surveillance System
ECDC	European Centre for Disease Prevention and Control
ECHI	European Community Health Indicators
EHCI	Euro health consumer index
EU	European Union
FOBT	Faecal occult blood test
FPS	Federal Public Service
FTE	Full-time equivalent
GDP	Global Domestic Product
GMD	Global Medical File
GP	General Practitioner
HCQI	Healthcare Quality Indicators Project
HD	Haemodialysis
HELICS	Hospital in Europe Link for Infection Control through Surveillance
Hib	Haemophilus influenzae type b
HIS	Health Interview Survey

HMP	Health Monitoring Programme
HSMR	Hospital Standardized Mortality Ratio
HTA	Health Technology Assessment
ICD-9-CM	International Classification of Disease, 9th revision
ICU	Intensive Care Unit
IMA	Intermutualistic Agency
IOM	Institute of Medicine
IPH	Institute of Public Health
KCE	Belgian Healthcare Knowledge Centre
MAB	Maximum Billing System
MBR	Measles, Mumps, Rubella
MCD	Minimal Clinical Dataset
MDC	Major Disease Category
MRI	Magnetic Resonance Imaging
MRSA	Methicillin-resistant Staphylococcus aureus
NBHW	National Board of Health and Welfare
NGO	Non-governmental organization
NHMBWG	National Health Ministers' Benchmarking Working Group
NHPC	National Health Performance Committee
NHQR	National Healthcare Quality Report
NHS	National Health Service
NIHDI	National Institute for Health and Disability Insurance
NSIH	National Surveillance of Infections in Hospitals
OCMW/CPAS	Public Municipal Welfare Centres
OECD	Organisation for Economic Co-operation and Development
ONE	Office de la Naissance et de l'Enfance
PAF	Performance Assessment Framework
PATH	Performance Assessment Tool for quality in Hospitals
PD	Peritoneal dialysis
PI	Performance indicator
PPP	Purchasing Power Parity
PTCA	Percutaneous Transluminal Coronary Angioplasty
PWDO	Pensioners, Widows, Persons with disabilities and Orphans
PWI	Postoperative wound infections
PYLL	Potential Years of Life Lost
RIVM	Rijsinstituut voor Volksgezondheid en Milieu
SALAR	Swedish Association of Local Authorities and Regions
SHA	System of Health Accounts
SPOC	Single Person of Contact
SSF	Special Solidarity Fund

SSI	Surgical site infections
THE	Total Health Expenditure
TRALI	Transfusion related acute lung injury
UCL	Université Catholique de Louvain
UK	United Kingdom
ULB	Université Libre de Bruxelles
US	United States
UTI	Urinary Tract Infection
VUB	Vrije Universiteit Brussel
WHO	World Health Organization

1 INTRODUCTION

On June 27th 2008, Ministers of health from the 53 countries of the WHO European Region signed the Tallinn charter on health systems (http://www.euro.who.int/document/e91438.pdf). By signing this charter, the Member States committed themselves, among other things, to "promote transparency and be accountable for health system performance to achieve measurable results". Monitoring and evaluation of health system performance and balanced cooperation with stakeholders at all levels of governance are essential to realize this commitment.

Several neighbouring countries, such as the Netherlands (www.rivm.nl/) and the UK (http://www.healthcarecommission.org.uk/), have years of experience with health system performance measurement, and can provide relevant information that serves international comparisons, such as performed by the OECD [1] and WHO [2]. On the contrary, the information relating to Belgium is not the result of a systematic reflection. Indeed, the Belgian experience and expertise in health system performance assessment is limited. The KCE performed a number of nationally validated and publicly available international comparisons of specific topics or practices in health care, e.g. hospital accreditation, financing of hospital drugs, etc, together with an inventory of the utility and shortcomings of existing health care databases and of international methods for clinical quality, equity and safety measurement (www.kce.fgov.be). Also, the IPH performed a number of studies related to patient satisfaction and accessibility of health care (health surveys, nursing homes, etc.) (http://www.iph.fgov.be/). However, none of these studies are part of a systematic performance assessment.

The present study aims to explore the possibilities to set up a performance measurement system for the Belgian health care system. It is therefore to be considered a methodological report. In a first conceptual phase, the indexed and grey literature will be searched to identify international experiences with performance measurement (what conceptual framework is used? which performance indicators are included? etc.) (chapter 2). International experts will be contacted to explore the strengths and weaknesses of their performance measurement system, its validation and evaluation, and its use by policy makers. Building on this international comparison, and after consultation of experts in the field, a conceptual framework will be developed for Belgium (chapter 3). Through a formal consensus procedure and based on the availability of data (chapter 4) and key characteristics of indicators, a performance indicators set will be selected (chapter 5). A feasibility study of these indicators will ultimately lead to a 'healthcare system performance report' (chapter 6). Since this project is to be considered a pilot study, the 'healthcare system performance report' presented in chapter 6 should be regarded as a prototype of how such a report could look like.

Importantly, stakeholders will be involved at different stages of the project. First, a stakeholders' survey will be done in parallel with the actual project. The results of this survey are presented in chapter 7. Furthermore, the progress of the project will be discussed with a guidance group at different time points. The composition of this group is provided in the colophon of this report.

Finally, the necessary expertise and capacity will be explored for the implementation of the system (chapter 8). If this project is considered successful, a more continuous and systematic measurement can be set up.

2   INTERNATIONAL EXPERIENCES WITH HEALTH (CARE) PERFORMANCE MEASUREMENT

2.1   RESEARCH QUESTIONS

Which health (care) performance systems exist worldwide?

1. Why were they set up?
2. Which conceptual frameworks are used?
3. Which performance indicators are included?
4. How are these performance system validated?
5. How are they used by policy makers?
6. How are they evaluated?

2.2   METHODOLOGY

2.2.1   Literature search

The literature review is based on a Medline and EMBASE search (see appendix 1 for search strings), which was combined with a search of the grey literature (Table 1). Google was searched using the following key words in combination: health system, healthcare system, health care system, performance. A pre-assessment of the literature using these sources identified seven countries (Australia, Canada, The Netherlands, New-Zealand, Sweden, UK and US) and four international organisations (Commonwealth Fund, European Commission, OECD, and WHO) with experience in performance measurement. It was decided to focus the search on these countries and organisations.

The search was limited to articles or reports published since 2000. Language was restricted to English, Dutch and French. Since this part of the literature review is purely descriptive, all research designs and article types were included. The search was conducted between May and August 2008.

Table 1: Overview of literature sources.

Indexed literature
OVID Medline
EMBASE
Grey literature
Internet (Google)
Websites:
• www.ahrq.gov
• www.oecd.org
• www.rivm.nl
• www.who.int
• www.healthcarecommission.org.uk
• www.nhs.uk
• www.healthindicators.org
• www.aihw.gov.au
• www.cmwf.org

2.2.2 Contact of international experts

A meeting with experts[a] from The Netherlands, Canada (Ontario), OECD and WHO was organized in order to validate the key findings resulting from the literature study and to complete lacking information. Moreover the strengths and weaknesses of their performance measurement system, its validation and evaluation, and its use by policy makers were discussed.

Some recommendations were formulated regarding the instauration of a national performance measurement system. These recommendations will be discussed in the chapter on the implementation of a Belgian health (care) performance system.

2.2.3 Data extraction

All identified performance systems were tabulated, extracting the following information (if available):

- Country/organisation of origin
- Conceptual framework, including definitions, dimensions, etc.
- Included performance indicators per dimension: definition, units of measurement, year(s) of measurement, advantages and disadvantages
- Operational issues: indicator selection, data collection, strengths and weaknesses of performance system, use of results, system evaluation, etc.

2.3 EXISTING HEALTH (CARE) PERFORMANCE SYSTEMS

2.3.1 General description

2.3.1.1 Australia

In 1996, the National Health Ministers' Benchmarking Working Group (NHMBWG) published the first Australian national report on health sector performance indicators [3], commissioned by the Australian Health Ministers' Conference. Two subsequent reports were published in 1998 and 1999 [4, 5]. In August 1999, the Australian Health Ministers established the National Health Performance Committee (NHPC) to continue the work of the NHMBWG. Subsequently, three additional reports were published, the last being in November 2004 [6-8]. In this National Report on Health Sector Performance Indicators 2003 [8], results of 44 performance indicators were included (see below).

In 2001, the NHPC published a conceptual framework that is derived from the Canadian framework (see below) and consists of three interrelated tiers: 'Health Status and Outcomes', 'Determinants of Health' and 'Health System Performance' [9] (see appendix 2). Four dimensions are presented in the 'Health Status and Outcomes' section and include health conditions, human function, life expectancy and wellbeing, and deaths. The 'Determinants of Health' are grouped into environmental factors, socioeconomic factors, community capacity, health behaviours and person-related factors. Finally, 'Health System Performance' has been grouped into nine dimensions of performance: effective, appropriate, efficient, responsive, accessible, safe, continuous, capable and sustainable. Quality and equity are considered to be integral and overarching parts of the framework.

The aim of this framework is [9]:

- to support benchmarking for health system improvement
- to provide information on national health system performance
- to facilitate the use of data at the health service unit level for benchmarking purposes.

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a   The Netherlands: Gert Westert, Rijksinstituut voor Volksgezondheid en Milieu (RIVM); Canada (Ontario): Eugene Wen, Canadian Institute for Health Information (CIHI), OECD: Sandra Garcia-Armesto; WHO: Michaela Schiotz

2.3.1.2   Canada

In 1999, the Canadian Institute for Health Information (CIHI) and Statistics Canada jointly launched a project on health indicators [10]. Since then, a report is published annually answering two basic questions: how healthy are Canadians? and how is Canada's healthcare system performing? The project builds on the Health Indicator Framework, which consists of four tiers: 'Health Status', 'Non-Medical Determinants of Health', 'Health System Performance' and 'Community and Health System Characteristics' (see appendix 2). 'Health System Performance' is defined in terms of eight dimensions: acceptability, accessibility, appropriateness, competence, continuity, effectiveness, efficiency and safety. In 2004 equity was introduced as an overarching dimension.

The purpose of the project is [10]:

- to report on the health of Canadians and the health system
- to compile and make this information widely available
- to support regional health authorities in monitoring progress in improving and maintaining the health of the population and the functioning of the health system for which they are responsible.

A hampering factor to implement a national healthcare performance measurement system is the Canadian federal system. Healthcare performance measurement is mainly handled by the provincial governments who can delegate tasks to the regional health authorities. In order to stimulate intergovernmental cooperation, several consultation processes on the Health indicator framework and the development of new indicators are organised. According to CIHI, their health indicator system has been reviewed and evaluated in different approaches, including focused groups, expert reviews, Audit General's audit and national consensus conferences every five years, in which federal, provincial and local governments, researchers, hospital staff working with data are involved (Wen EY, personal communication). The Health Indicator Framework and the included indicators have been revised and expanded based on feedbacks from those evaluations.

The local health regions, provincial and national Ministry of Health, policy makers and the general public (mostly through news media) are the users of the information coming from the health indicator system (Wen EY, personal communication). Policy makers use the information as evidence in their consideration for related policies. For example, CIHI publicly released the Hospital Standardized Mortality Ratio (HSMR) of large hospitals in November 2007. This has led to broad debate and attention to hospital mortality and overall healthcare quality issues. Short after the report being released, the Minister of Health and Long-term Care of Ontario province announced that all hospitals were required to publicly release their mortality and patient safety performance measurements. In a recent further announcement, the Ministry has set specific deadlines for hospitals to comply (Wen EY, personal communication).

Currently there's a broad coverage in data collection on acute care, but data on long-term care and some primary healthcare data are partly lacking.

2.3.1.3   The Netherlands

In 2006 and 2008, the National Institute for Public Health and the Environment (RIVM) published the first and second report on the performance of the Dutch healthcare (www.rivm.nl). The Dutch Ministry of Health identified 26 indicator domains for the Dutch healthcare that are crucial to establishing its performance and the actual state of healthcare. The RIVM rearranged these domains under three system goals the health minister bears overall responsibility for: quality, access and costs. The underlying conceptual framework for the performance indicators is mainly based on an extensive international literature review [11, 12]. In the framework, four specific healthcare needs were identified: staying healthy (prevention), getting better (cure), living with illness or disability (long-term care), and end-of-life care (see appendix 2). For each healthcare need, performance is presented and analysed in terms of quality, access and costs. These three system goals were further subdivided into fifteen indicator domains.

The 3 selected system goals and 26 indicator domains are in line with the policy of the Ministry of Health. The subdivision into functions and performance aspects enable a broad picture of healthcare to be presented and to fulfil a broad signalling function (www.rivm.nl).

The process of the performance measurement system was submitted for evaluation to an international audit of 5 international experts. Furthermore, every 2 years a scientific committee composed of different universities and institutes and a committee composed of members of the institutes that deliver the data are set up to guarantee the scientific status of the process. Particularly, in the second group there are intense discussions on the possibilities of use of data.

Policy makers use the information resulting from the performance measurement system as a basis for healthcare policy. For instance, hospital-specific mortality ratio (HSMR) was used by inspectors to monitor the effectiveness of hospitals. As a consequence policy makers are encouraged to reflect in advance on which specific domains the performance report should focus.

A trend reported by the RIVM is the measurement of the correlation between patient expectations (based on population surveys) and hospital outcome (Westert G, personal communication).

2.3.1.4   *New Zealand*

Since 2001, the New Zealand's Ministry of Health annually publishes its Health and Independence Report (http://www.moh.govt.nz/healthindependencereports). In the 2007 report, progress against 39 headline indicators is provided [13]. These indicators are aligned with the nine goals in the Ministry of Health's outcomes framework (see appendix 2), which has three outcome levels that are logically connected and flow through to the Ministry's actions:

- Societal outcomes – healthy New Zealanders: These are the health and disability support outcomes valued by the Government and citizens, which are necessary for healthy New Zealanders. They are influenced by the health and disability support sectors and broader activities of the Government and society.

- System outcomes – a fair and functional health system: These are outcomes that reflect the health and disability support system's achievements, encompassing how people access services, the quality and effectiveness of services, the extent to which the system uses public resources in the best way, and how the system interacts with other sectors to enhance health and independence outcomes.

- Ministry outcomes – ensuring the system works for all New Zealanders: These are outcomes that reflect the levers the Ministry has available to it to achieve a well-functioning health and disability support system. These outcomes are largely determined by the functions the Ministry performs.

2.3.1.5   *Sweden*

In a joint project, the Swedish Association of Local Authorities and Regions (SALAR) and the Swedish National Board of Health and Welfare (NBHW) already published 2 reports on the healthcare quality and efficiency in 21 Swedish county councils and healthcare regions [14]. Seventy-five quality and performance indicators were grouped in 4 main areas: 'Medical Results', 'Patient Experiences', Availability of Care' and 'Costs'. This quality and performance measurement serves two purposes. First, it is intended to inform the public and to stimulate the debate on healthcare quality and efficiency. Second, the results are used to stimulate and support local and regional efforts to improve healthcare services in terms of clinical quality and medical outcomes, as well as patient experience and efficient resource use.

2.3.1.6   *UK*

In 1999, a National Performance Frameworks initiative created the NHS Performance Assessment Framework (PAF) [15]. Conceptually, the framework is based on a balanced scorecard approach, which implies that 'the overall set of indicators should give a balanced picture of the organization's performance, reflecting the main aspects, including outcomes and the users' perspective'. Six areas of performance were identified, including 'health improvement', 'fair access', 'effective delivery of appropriate healthcare', 'efficiency', 'patient/carer experience', and 'health outcomes of NHS care'. Within the PAF, a set of 'national headline NHS Performance Indicators' gives a summary of NHS activities, addressing a wide range of issues such as mental health, cancer treatment, waiting lists, access to GPs, overall population health, and staffing.

The framework is intended to be used [15]:

- to move towards assessing performance of the NHS in the round, covering quality and efficiency
- encourage benchmarking between similar NHS organisations
- to underpin national and local performance and accountability arrangements.

2.3.1.7   *US*

In 1999, the United States' Congress mandated that the Agency for Healthcare Research and Quality (AHRQ) produce an annual report on healthcare quality in the United States (www.ahrq.gov). The National Healthcare Quality Report (NHQR) includes a broad set of performance measures that is used to monitor the progress toward improved healthcare quality in the US. In 2007, the NHQR was built on 218 measures and focused on 41 core measures [16]. Besides the NHQR, the AHQR also publishes the National Healthcare Disparities Report (NHDR) which uses the same measures of healthcare quality.

AHRQ contracted with the Institute of Medicine (IOM) to work on a conceptual framework for the NHQR. The IOM recommended a conceptual framework that can be depicted as a matrix including both dimensions of care (effectiveness, safety, timeliness, patient centeredness, equity) and patient needs (staying healthy, getting better, living with illness or disability, coping with the end of life) (see appendix 2).

2.3.1.8   *Commonwealth Fund*

The Commonwealth Fund is a US private foundation that aims to promote a high performing healthcare system in terms of better access, improved quality, and greater efficiency (www.commonwealthfund.org). At the invitation of the Fund, 5 countries – Australia, Canada, New Zealand, the UK, and the US – collaborated in a project (the Commonwealth Fund's International Working Group on Quality Indicators) to measure and compare the quality of the care provided through their health services [17]. In 2004, a first report provided detailed data on 40 key healthcare quality indicators. Using the Canadian Performance Framework as the organizing construct for defining the quality dimensions, the Working Group focused its initial efforts on five subdomains of health system performance: effectiveness, appropriateness, accessibility, continuity, and acceptability.

2.3.1.9   *OECD*

Building on the work of the Commonwealth Fund's International Working Group on Quality Indicators and a similar effort by five Scandinavian countries (Denmark & Greenland, Finland, Iceland, Norway and Sweden) under the auspices of the Nordic Council, the OECD initiated the International Healthcare Quality Indicators Project (HCQI) in 2003. The long term objective of this project is to develop a set of indicators that can be used to raise questions for further investigation concerning quality of healthcare across countries. The comparability of the data was a priority criterion to determine the suitability of the indicators.

A first working paper presented a conceptual framework proposing answers to two main issues: what concepts or dimensions of quality of healthcare should be measured and how should they be measured [1, 18].

The project has been divided into two phases. The initial phase concentrated on 17 available indicators of effectiveness of care [19]. The list was updated in 2007 on the basis of a second round of data collection [20]. This updated version contains 22 effectiveness indicators. Because this initial compilation was judged by the HCQI Expert Group as being too limited, a process was instituted to identify healthcare areas to add to the list. Country experts rated a set of 5 priority healthcare condition areas. A report was published in 2004 proposing a set of indicators for each area: cardiac care (17 indicators) [21], diabetes care (9 indicators) [22], primary care and prevention (27 indicators) [23], mental health (12 indicators) [24] and patient safety (21 indicators, in an updated version reduced to 15 indicators) [25, 26].

A new approach by the OECD is the description of patient experiences based on population surveys.

Another trend is the assessment of the performance of the system related to continuity of care, which is a major issue for chronic diseases such as diabetes. For example, in the last version of the report "Health at a Glance" new comparable indicators of quality of care are included, showing variations across countries in measures such as survival rates after heart attack, stroke and cancer.

Currently, a pilot project is ongoing in collaboration with the Netherlands regarding the measurement of the cost of a disease aiming in the long term to measure value for money (Garcia – Armesto S, personal communication).

The OECD Health Data are discussed in more detail in chapter 4.

2.3.1.10 *WHO*

In the World Health Report 2000, the WHO assessed the health system performance in 191 member countries [2]. Five major components of health system performance were defined (see appendix 2): the overall level of population health, the distribution of health in the population, the overall level of responsiveness, distribution of responsiveness within the population, and the distribution of the health system's financial burden within the population. Health system performance was estimated from the weighted sum of these 5 components and was compared with what might be expected given the country's level of economic and educational development. The WHO report developed three types of indicators, the first related to the effectiveness of the health system in reducing mortality and morbidity, the second related to the responsiveness of the system to the user, and the third type of indicator related to the fairness of the system. All three types of indicators are weighted and added to create a single indicator of performance.

The WHO "Health for all" database is discussed in more detail in chapter 4.

2.3.1.11 *European Commission*

A first set of European Community Health Indicators (ECHI) was produced by the ECHI-1 project and the objective of the second project (ECHI-2 project) was to continue the work on specific indicators in order to complete the European Community Health Indicators list that will serve as a basis for the European health information and knowledge system including their operational definitions [27]. The ECHI-1 and ECHI-2 projects under the Health Monitoring Programme (HMP)[b] have developed a comprehensive list of approximately 400 indicators. ECHI-2 undertook the work to select the indicators to create a short list of indicators to facilitate the harmonization of EU Member States. These ECHI projects were supervised by the DG Sanco (Health and Consumer Protection Directorate General) which covers three main domains: Food Safety, Consumer Affairs and Public Health.

Seven advisory Working Parties were created to coordinate the preparation of the indicators relating to: Lifestyles and other health indicators, Morbidity and Mortality, Health Systems, Health Environment, Mental health, Accidents and Injuries, and Community health indicators. The goal of the Health System Working Party is to facilitate the exchange and comparison of information about important aspects of health systems in the EU member States. This will enable benchmarking and performance assessment, and exchange of information about best practices. This work resulted in a list of indicators regarding access to care, quality of care (effectiveness, safety and patient centeredness), long-term sustainability of systems and context indicators about the medical supply and expenditures [28].

2.3.2 Comparison of conceptual frameworks

Several articles formed the basis for the overview of performance and/or quality frameworks presented below [1, 11, 18, 29]. Table 2 provides an overview of the main characteristics of the identified performance frameworks of the selected countries/organisations.

2.3.2.1 *Dimensions of health (care) performance*

The literature on performance measurement in healthcare is characterized by a lack of consistency in the use of terms [29]. Both performance and performance measurement have no agreed-upon definition. Based on their extensive literature search, Adair et al. preferred to define performance measurement as 'the use of both outcomes and process measures to understand … performance and effect positive change to improve care'. Performance can be defined as 'what is done and how well it is done to provide healthcare' [29].

Clearly, performance is a multidimensional concept. Arah et al. and Adair et al. already provided a nice overview of possible dimensions[c] of health (care) performance and their presence in available performance frameworks [1, 18, 29]. We completed these overviews with the health (care) performance dimensions available from the frameworks of the Netherlands, New Zealand and Sweden (Table 3). It is clear from this overview that consistency on terms for major dimensions is lacking. A definition of all dimensions is provided in Table 4.

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[b] The programme of Community action on health monitoring was adopted for the period 1 January 1997 to 31 December 2002. The aim of the programme was to produce a health monitoring system to monitor the health status in the community, facilitate the planning, monitoring and evaluation of Community programmes and to provide member states with information to make comparisons and to support their national policies (http://ec.europa.eu/health/ph_overview/previous_programme/monitoring/monitoring_en.htm).

[c] Adair et al. clearly distinguished 'domains' from 'dimensions' [30]. They defined a domain as 'a realm for grouping or classifying measures', e.g. patient's satisfaction. A dimension is defined as a parameter that extends in another direction, across which the domains might range (e.g. level of organization). In this report, the term 'dimension' will be used to cover the characteristics of performance.

Some countries or organisations focus their performance measurement on the quality of care [1, 16] or use performance more or less as a synonym of quality of care [29]. However, most selected countries and organisations consider quality of care as one aspect of performance [29]. In its World Health Report 2000, the WHO clearly distinguishes performance from goal attainment [2]. Attainment is defined as the extent to which the health system does what it is supposed to do. On the other hand, to assess the performance, the actual attainment is compared to what the system should be able to accomplish, taking into account the used resources [2]. With this definition of performance, the WHO mainly focuses on the *efficiency* of a health system. In contrast, most countries and organisations selected for this review consider efficiency as one of the many dimensions of performance or quality (Table 3).

A key dimension of performance in all frameworks is *effectiveness* (Table 3). Although subtle differences in the definition of effectiveness exist across the frameworks, a common aspect is the achievement of desirable clinical outcomes in terms of improved health.

Accessibility and equity, two closely related dimensions, are also part of the majority of the identified frameworks (Table 3). *Accessibility* is the ease with which health services are reached in terms of distance (i.e. physical access), time (relates to *timeliness*), financial, psychological and social barriers [1, 30]. A precondition is that health services are available. *Equity* covers the extent to which the health (care) system deals fairly with all concerned, in terms of costs and healthcare distribution, benefits and quality [1, 30].

Patient-centeredness corresponds to providing care that is respectful of patients and responsive to individual patient preferences, needs and values [30]. *Responsiveness* is often used as an equivalent dimension [1]. These dimensions are part of most identified frameworks (Table 3).

Other less frequent dimensions include *safety*, *appropriateness*, *continuity*, *competence*, *sustainability* and *acceptability* (Table 3). *Care environment and amenities* and *governance* are dimensions specific to the UK.

2.3.2.2 Concepts connected to performance

Several performance frameworks stress the link of the health system performance with other key concepts (Table 2), including health (or health status, or health status and outcomes), determinants of health, and the health system characteristics. In the US framework, dimensions of healthcare are connected to patient needs (staying healthy, getting better, living with illness or disability, coping with the end of life). *Health* is determined by many factors, such as *healthcare* and *non-healthcare determinants*. The latter include environment (including physical and socioeconomic factors), lifestyle (or health behaviour) and person-related factors (biological or genetic constitution) [1, 9, 10, 13].

Taking into account non-healthcare determinants broadens the conceptual approach to measuring performance [1]. Where in a 'healthcare performance' framework an assessment of the non-healthcare determinants is not emphasized, a 'health performance' framework is largely concerned with all the interrelationships among health, healthcare, and non-healthcare factors. Therefore, health performance also covers healthcare performance.

Table 2: Overview of national and international health (care) performance/quality frameworks.

Country/organisation	Level	Scope	Dimensions/domains of performance/quality	Interconnected tiers
UK (NHS)	National/ local	Health (care) performance	Health improvement Fair access Effective delivery of appropriate healthcare Efficiency Patient/carer experience Health outcomes of NHS care	-
US (AHRQ)	National	Healthcare quality	Effectiveness Safety Timeliness Patient-centeredness	*Consumers' healthcare needs:* Staying healthy Getting better Living with illness or disability Coping with end of life
Canada	National/ regional	Health performance	Acceptability Accessibility Appropriateness Competence Continuity Effectiveness Efficiency Safety Equity	Health status Non-medical determinants of health Community and health system characteristics
Australia[#]	National/ (regional)	Health performance	Effectiveness Appropriateness Efficiency Responsiveness Accessibility Safety Continuity Capability Sustainability Equity	Health status and outcomes Determinants of health
The Netherlands[$] (RIVM)	National	Health (care) performance	Quality Accessibility Cost/expenditure Equity Efficiency	Health Non-healthcare determinants of health Health system design and context
New Zealand	National	Health performance	Equity and access	Health

Country/organisation	Level	Scope	Dimensions/domains of performance/quality	Interconnected tiers
			Quality Efficiency and value for money Effectiveness Intersectoral focus	
Sweden	National/regional	Healthcare performance	Medical results Patient experiences Availability of care Costs	-
WHO	International	Health performance	Overall level of population health Distribution of health in the population Overall level of responsiveness Distribution of responsiveness within the population Distribution of the health system's financial burden within the population	-
OECD (HCQI)*	International	Healthcare quality	Quality – effectiveness Quality – safety Quality – responsiveness/patient-centeredness Accessibility Cost/expenditure Equity Efficiency	Health Non-healthcare determinants of health Health system design, policy and context
ECHI	International	Public health	Access to care Quality of care (effectiveness, safety and patient centeredness) Long-term sustainability of systems Context indicators about the medical supply and expenditures	
Commonwealth Fund#	International/national	Health performance Healthcare quality	Acceptability Accessibility Appropriateness Competence Continuity Effectiveness Efficiency Safety Equity	Health status Non-medical determinants of health Community and health system characteristics

Based on Canadian framework.

$ This framework is based on Ten Asbroek et al. (2004) and Arah et al. (2003), and was adopted by the OECD for its HCQI project.

* The OECD also has a broader health system performance framework, including the following dimensions: health improvement and outcomes, responsiveness and access, financial contribution/health expenditure, efficiency, and equity.

Table 3: Dimensions of healthcare performance.

Dimension	UK	US	Canada	Australia	Netherlands	Sweden	New Zealand	WHO	OECD	ECHI	Commonwealth Fund
Acceptability			X								X
Accessibility	X		X	X	X	X	X		X	X	X
Appropriateness	X		X	X							X
Care environment and amenities	X										
Competence/ Capability			X	X			X				X
Continuity			X	X			X				X
Effectiveness/ Improving health/ Clinical focus	X	X	X	X	X	X	X	X	X	X	X
Expenditure/Cost								X	X	X	
Efficiency	X		X	X	X	X	X	X	X	X	X
Equity		X	X	X	X	X	X	X	X		X
Governance	X										
Patient-centeredness/ Patient focus/ Responsiveness	X	X		X	X	X		X	X	X	
Safety		X	X	X	X				X	X	X
Sustainability				X	(X)					X	
Timeliness		X			X						

Table 4. Definitions of healthcare performance dimensions [1, 10, 15, 29].

Dimension	Definition
Acceptability	Conformity to the wishes, desires, and expectations of healthcare users and their families
Accessibility	The ease with which health services are reached. Access can be physical, financial, or psychological and requires that health services are a priori available
Appropriateness	The degree to which provided healthcare is relevant to the clinical needs, given the current best evidence
Care environment and amenities	The degree to which care is provided in environments that promote patient and staff well-being and respect for patients' needs and preferences in that they are designed for the effective and safe delivery of treatment, care or a specific function, provide as much privacy as possible, are well maintained and are cleaned to optimise health outcomes for patients
Competence/ Capability	The degree to which an individual's knowledge and skills are appropriate to the care/service being provided
Continuity	The extent to which healthcare for specified users, over time, is smoothly organized within providers and institutions
Effectiveness/ Improving health/ Clinical focus	The degree of achieving desirable outcomes, given the correct provision of evidence-based healthcare services to all who could benefit but not to those who would not benefit
Expenditure/ Cost	The degree of health spending (as part of efficiency)
Efficiency	Finding the right level of resources for the system and ensuring that these resources are used to yield maximum benefits or results
Equity	The extent to which a system deals fairly with all concerned. Equity deals both with the distribution of the burden of paying for healthcare and with the distribution of healthcare and its benefits among a people
Governance	A framework through which NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish
Patient-centeredness/ Patient focus/ Responsiveness	The degree to which a system actually functions by placing the patient/user at the centre of its delivery of healthcare
Safety	The degree to which the system has the right structures, renders services, and attains results in ways that prevent harm to the user, provider, or environment
Sustainability	System or organisation's capacity to provide infrastructure such as workforce, facilities and equipment, and be innovative and respond to emerging needs (research, monitoring)
Timeliness	The degree to which healthcare is provided within the most beneficial or the necessary time window

2.3.3 Operational issues of performance measurement

Adair et al. identified 4 general developmental stages in design and implementation of performance measurement systems: (1) a conceptualization/strategy stage; (2) a performance indicators selection/development stage; (3) a data collection and analysis stage; and (4) a reporting and use stage [29].

2.3.3.1   Conceptualization/strategy

A first important step is to develop a robust conceptual framework within which performance indicators can be developed, including the purpose (Table 5), approach and overall strategy of the performance measurement system [29, 31]. Ideally, this framework includes both a list of performance dimensions on the one hand and domains across which to select performance indicators on the other hand (e.g. level of healthcare system, stakeholder perspective). The conceptual frameworks of the selected countries/organisations are discussed above.

Table 5: Possible purposes of performance measurement in healthcare [29].

- To identify areas and mobilize resources for quality improvement
- To inform accreditation processes
- To assist management control of processes and activities
- To increase public accountability
- To help patients and purchasers choose among services
- To provide epidemiologic and public health data (e.g. unmet health needs, progress on health goals)

2.3.3.2   Selection and development of performance indicators

After developing a conceptual framework, the next step is to select the individual performance indicators for each dimension [29]. This step involves a choice between structure, process and outcome indicators, an appraisal of the characteristics of the candidate performance indicators, and decisions about the inclusion of composite indicators [29, 31].

Selection process of performance indicators

Ideally, formal consensus techniques, such as the RAND appropriateness method or Delphi technique, are used to select performance indicators [30]. Little information was available on the selection process used by the selected countries/organisations. The Canadian CIHI used an iterative modified Delphi process involving regional, provincial/ territorial, and other experts [10]. The OECD used a formal RAND-like procedure, where each candidate indicator was rated on a scale from one to nine [32]. The Commonwealth Fund and ECHI used an informal process and based their selection on predefined selection criteria (see next paragraph) [17, 27]. Other countries that used selection criteria are Australia and the US [9, 16]. From the other selected countries/organisations no information was available.

Characteristics of good performance indicators

Good performance indicators should exhibit certain characteristics, such as validity, reproducibility, acceptability, feasibility, reliability, and sensitivity to change (Table 6) [29-31]. No consensus exists on which characteristics are essential. Table 6 gives an overview of the characteristics used by the selected countries/organisations that have information available on this topic.

Table 6: Characteristics of good performance indicators [31] and use by health (care) performance systems.

Characteristic	Definition	Australia	US	Commonwealth Fund	ECHI	OECD
Validity	The extent to which the indicator accurately measures what it is intended to measure	X	X	X	X	X
Reliability	The extent to which there is minimal measurement error or the extent to which findings are reproducible should they be collected again by another organization	X	X	X	X	X
Sensitivity	The extent to which the measurement is discriminative in space or time				X	
Relevance/ importance	The extent to which important health conditions accounting for a major share of the burden of disease, the cost of care, or policymakers' priorities are reflected	X	X	X		X
Interpretability	The extent to which clear conclusions are possible	X	X	X		
Sensitivity to change	The extent to which the indicator reflects results of actions when measured over time	X	X			X
Feasibility	The information required for the indicator can be obtained at reasonable cost in relation to its value and can be collected, analysed and reported on in an appropriate time frame	X	X	X		X
Actionability	The extent to which action can be taken by individuals, organised groups and public and private agencies to meaningfully address this aspect or problem	X	X	X		X

Composite performance indicators

Healthcare performance measurement is a multidimensional procedure which is not easily captured by a single indicator. Nevertheless, faced with a large variety of performance information, stakeholders and policy makers can be interested in a more compact image of their healthcare system. For example, more than one indicator can be combined to form a single composite indicator of healthcare performance. A composite indicator summarizes care that is represented by individual indicators that are often related in some way, such as components of care for a particular disease or illness. A composite indicator allows for the aggregation of a wide range of performance dimensions and therefore can facilitate the comparison of different organizations or countries (Table 7). On the other hand, a global view of performance can hide the source of poor results. Above this, a global indicator depends on the quality or the availability of data of all individual indicators [33]. Table 7 provides an overview of the pros and cons of composite indicators. These pros and cons have lead to the existence of clear believers and non-believers of aggregation [34].

While some countries and organisations are shifting from global evaluation of performance to detailed results and disaggregated ranking (e.g. Healthcare Commission in England, Commonwealth Fund) [33], other organisations keep developing new composite indicators. For example in the AHRQ selection of indicators, composite indicators make up about 20% of the core measures (www.ahrq.gov).

Table 7: Pros and cons of composite indicators [34].

Pros	Cons
Can summarize complex or multi-dimensional issues in view of supporting decision makers	May send misleading policy messages if they are poorly constructed or misinterpreted
Easier to interpret than trying to find a trend in many separate indicators	May invite simplistic policy conclusions
Facilitate the task of comparing countries on complex issues in a benchmarking exercise	May be misused, e.g. to support a desired policy, if the construction process is not transparent and lacks sound statistical or conceptual principles
Can assess progress of countries over time on complex issues	The selection of indicators and weights could be the target of political challenge
Reduce the size of a set of indicators or include more information within the existing size limit	May disguise serious failings in some dimensions and increase the difficulty of identifying proper remedial action
Place issues of country performance and progress at the centre of the policy arena	May lead to inappropriate policies if dimensions of performance that are difficult to measure are ignored
Facilitate communication with general public (i.e. citizens, media, etc.) and promote accountability	Depend on the quality or the availability of data of all separate indicators

2.3.3.3 *Data collection and analysis*

This phase involves constructing an inventory of the data needed to measure the selected performance indicators, an assessment of the availability and reliability (including strengths and weaknesses) of these data, and an evaluation of the possible problems related to the data collection (e.g. gaming, unintentional under- or over-reporting, ascertainment bias, sampling error). It also involves decisions on which analysis methods and risk-adjustment techniques are needed [29].

Primary vs. secondary data

Administrative data have the advantage of being readily available and inexpensive to collect. However, important problems are reported in relation to administrative data used for performance measurement (Table 8), and in some cases primary data collection is necessary as a supplement [29]. Most selected countries/organisations use a combination of primary (e.g. surveys) and secondary data (e.g. insurance claims data, registries). In some countries a unique patient identificator is used that can identify individuals across the nation and not only on an institutional level.

Availability of data is sometimes used as a selection criterion for performance indicators [9, 10, 17, 32]. However, some countries initiated new (primary) data collection based on gaps identified through the initial indicator selection process [10].

Table 8: Potential advantages and problems with the use of administrative data for performance measurement [29, 35].

Pros	Cons
Readily available.	Lack of data for indicators that are relevant to patients/consumers, e.g. quality of life
Inexpensive to collect.	Emphasis on utilization data which poorly reflects outcomes or quality
Longitudinal follow-up possible.	Paucity of necessary data elements for sensitive case-mix or risk-adjustment
	Minimal availability or stability of data at smaller levels of aggregation
Follow-up of specific care providers possible.	General poor quality and/or utility of data collected for other than measurement purposes
Uniform registration making comparison across care providers and institutions possible.	Inability to link with other supplemental sources for technical or regulatory reasons
No bias through inclusion of only better performing care providers and institutions.	Based on events rather than persons
Possibility to study rare diseases and events.	Focus on analysis of existing data instead of the collection of more relevant data

Risk-adjustment

It is essential that the causality of observed performance indicators is attributed to the correct source(s). To avoid attribution bias, sources of random and systematic error in measurement and sampling should be carefully considered when designing a performance system [31]. Risk-adjustment is widely used by the selected countries/organisations to address this problem of attribution. It often involves using statistical modelling (e.g. age standardization, cluster analysis, multiple regression analysis) applied to large databases with information from many different sources. Apart from risk-adjustment, confidence intervals are often presented to indicate random variation.

2.3.4 Overview of available performance indicators

Some examples of possible performance indicators, extracted from existing performance systems, are provided for each dimension in Table 9. A more extensive list is provided in Appendix 3.

Table 9: Examples of performance indicators.

Dimension	Performance indicators
Acceptability	• Unmet healthcare needs
Accessibility	• The proportion of the population covered by health insurance • Waiting times for regular care (hospital care, mental healthcare and long-term care) • Adults who can sometimes or never get appointments for routine care as soon as wanted
Appropriateness	• Number of prescriptions for oral antibiotics ordered by general practitioners (GPs) for the treatment of upper respiratory tract infections • Breast conserving surgery • Number of caesarean sections
Care environment and amenities	• Number of baby-friendly hospitals • MRSA infections
Competence/ Capability	• Proportion of GP practices registered for accreditation • Medical-technical tasks carried out by general practice assistants
Continuity	• Percentage of hospital cases with discharge planning
Effectiveness/ Improving health/ Clinical focus	• Heart failure patients who received all recommended hospital care for heart failure (having evaluation of left ventricular ejection fraction and prescribed ACE inhibitor or ARB at discharge, if indicated, for

Dimension	Performance indicators
	left ventricular systolic dysfunction) • Patients with pneumonia who receive the initial antibiotic dose within 4 hours of hospital arrival • Adults with diabetes who had a foot examination in the past year • Life expectancy
Expenditure/ Cost	• Healthcare costs per capita • Expenditures on different sectors
Efficiency	• Length of stay in hospital • Surgical day case rates
Equity	• Matching of health workforce to population characteristics • Healthy life expectancy by ethnicity
Governance	• Confidence in obtaining high-quality and safe medical care when needed
Patient-centeredness/ Patient focus/ Responsiveness	• Waiting times in emergency departments • Percentage of patients who have a favourable perception of their latest visit at a health centre or the equivalent
Safety	• Adult surgery patients with postoperative venous thromboembolic events • Deaths per 1000 admissions in low-mortality DRGs • In-hospital hip fractures
Sustainability	• Graduates in pharmacy, medicine and nursing as a percentage of the total pharmacy, medical and nursing workforce
Timeliness	• Emergency department visits in which the patient left without being seen • Time to initiation of thrombolytic therapy for heart attack patients • Proportion of patients who were given a doctor's appointment within a week

3 DEVELOPMENT OF A BELGIAN HEALTH SYSTEM PERFORMANCE FRAMEWORK

3.1 METHODOLOGY

Based on the literature review and overview of existing performance systems, a matrix of performance dimensions and their appearance in the described performance systems was made.

This information was used as a starting point for a first external expert meeting on October 16th 2008.

Three main discussion points could be separated during the discussion:

1. The external experts stressed the importance of clearly defining the finality and the end users of the performance system. Possible goals are international comparison, internal accountability, description of the health status, etc. According to the experts a choice should be made and a hierarchy provided.

2. Another discussion point was the scope of the conceptual framework: health system vs. healthcare system. During the meeting, a large consensus was reached on the desirability to define the scope of the framework as broad as possible, i.e. health system (which encompasses healthcare system), even if the scope of the measurement system is the Belgian healthcare system. When evaluating the health system performance, and more particular the healthcare system performance, determinants of health other than healthcare also need to be taken into account when interpreting the results. It was also suggested by the experts to develop a framework and performance system that is integrative, i.e. incorporating and articulating all health authorities (both federal, regional and local). One way to do so is to start from the point of view of the Belgian citizen.

3. Some experts were in favour of combining the Canadian and Dutch framework, because of their complementarity and completeness when combined. Both frameworks also served as a basis for the development of other performance frameworks. This proposal was generally accepted by the group. Performance dimensions that were suggested to be added or incorporated were 'human resource management', 'sustainability', 'governance', 'health in all policies' and 'integration' (of all authorities).

The working group (consisting of the KCE, IPH and NIHDI) developed a first draft of a Belgian health system performance framework, which was fed back to the external experts and discussed during a second meeting on December 15th 2008.

3.2 BELGIAN HEALTH SYSTEM PERFORMANCE FRAMEWORK

3.2.1 Finality and intended users of the Belgian performance system

A system will be set up to measure and monitor the performance of the Belgian healthcare system. This performance system will allow the Belgian governments:

1. to be transparent and accountable for the Belgian healthcare system performance;

2. to compare it to the healthcare system performance in other countries;

3. and to monitor the healthcare system performance over time.

The ultimate goal is a high-performing health system that contributes to the health of the Belgian population. The framework is intended to support performance measurements at all levels of the health(care) system. The audience therefore is potentially very broad, including the federal and regional governments and Ministers of health and/or social security, the healthcare organisations, the individual care providers and the Belgian population.

Ideally, this performance system should connect to other existing systems and indicators available nationally and internationally.

3.2.2 Included concepts and their relations

The definition of a *health system* as proposed in the Tallinn charter is adopted for the framework: 'Within the political and institutional framework of each country, a health system is the ensemble of all public and private organizations, institutions and resources mandated to improve, maintain or restore health. Health systems encompass both personal and population services as well as activities to influence the policies and actions of other sectors to address the social, environmental and economic determinants of health' (http://www.euro.who.int/document/e91438.pdf).

Similar to the conceptual frameworks of the Netherlands and Canada (see appendix), a holistic approach of *health system performance* is adopted. Health system performance is a much broader conceptual approach to measuring performance than *healthcare system performance* by explicitly using non-medical determinants, healthcare, and contextual information to give a clearer picture of population health [1]. Three interconnected tiers are distinguished (figure 1), which, importantly, do not represent a hierarchy. The 3 tiers include:

- *Health status*: this tier addresses the question 'How healthy is the population residing in Belgium?', covering several dimensions, such as *health* (prevalence of disease, disorder, injury, trauma or other health-related states), *human functions* (alterations to body, structure or function [impairment], activities [activity limitation] and participation [restrictions in participation]), *well-being* (physical, mental, and social well-being), and *deaths*.

- *Non-medical determinants of health*: this tier encompasses the determinants that have an effect on health and on if, when and how we use care. These determinants include health behaviour/lifestyle (e.g. smoking, physical activity, etc.), genetic factors, living and working conditions, personal resources, and environmental factors (e.g. air, water, food and soil quality resulting from chemical pollution and waste disposal).

- *Health system*: this tier has been grouped into 5 domains (Table 10), including health promotion, preventive care, curative care, long-term care and end-of-life care. Health system performance, which is presented and analysed for each health system domain, is grouped into 4 main dimensions, including quality, accessibility, efficiency and sustainability (see chapter 3.2.3.1). Building on the Dutch performance framework (see appendix 2), the dimension 'quality', which has many overlapping dimensions with 'performance', is further subdivided into 5 sub-dimensions: effectiveness, appropriateness, safety, patient-centeredness and continuity.

Table 10: Definitions of health system domains.

| Health system domain	Definition
Health promotion and preventive care	Healthcare that stresses healthy behaviour, regular testing, screening for diseases, and other services that detect health problems early on or prevent them from occurring
Curative care	Healthcare that tends to overcome disease, and promote recovery
Long-term care	Variety of services which help meet both the medical and non-medical needs of people with a chronic illness or disability who cannot care for themselves for long periods of time
End-of-life care	The care of a person during the last part of their life, from the point at which it has become clear that the person is in a progressive state of decline

Health system design and context includes the important design and contextual information that may be specific to the Belgian health system, and which are necessary for interpreting the health system performance. Context should be interpreted in a broad way, encompassing both the local (national) factors that influence the health system (e.g. federal vs. regional context, legal framework, financing, etc.) and the international context factors (e.g. Europe). This also means that the articulation between the different authorities (federal, regional, local) is considered to be a characteristic of the health system influencing its performance, rather than a dimension of performance itself. An additional contextual factor is the local culture, which has an important influence on ethical questions, such as euthanasia.

As in many other performance frameworks (see appendix 2), *equity* is an overarching dimension, being considered and presented across all 3 tiers of the framework. Equity is concerned with the fairness of the distribution of healthcare across populations and with the fairness of payment for healthcare [1]. Above this, 'equity' can be estimated for non-medical determinants of health and for health status.

'*Health in all policies*' is a dimension linking non-medical determinants of health to the health system. It can be defined as a horizontal, complementary policy-related strategy contributing to improved population health (http://www.euro.who.int/document/E89260.pdf). The core of 'health in all policies' is to examine determinants of health that can be altered to improve health, but are mainly controlled by the policies of sectors other than health.

Indeed, health is determined by many interdependent factors, such as the health system (including healthcare) and other determinants of health (figure 1). In addition to its direct effects on health, the health system may act indirectly on health through its influence on non-medical determinants. For instance, lifestyle is influenced by health prevention, promotion, and protection strategies (e.g. smoking cessation campaigns). Clearly, the design of the health system and its context both influence the way the health system performs. This has also indirect effects on health, e.g. euthanasia law, reimbursement criteria etc.

Figure 1: Conceptualisation of the Belgian health system performance framework.
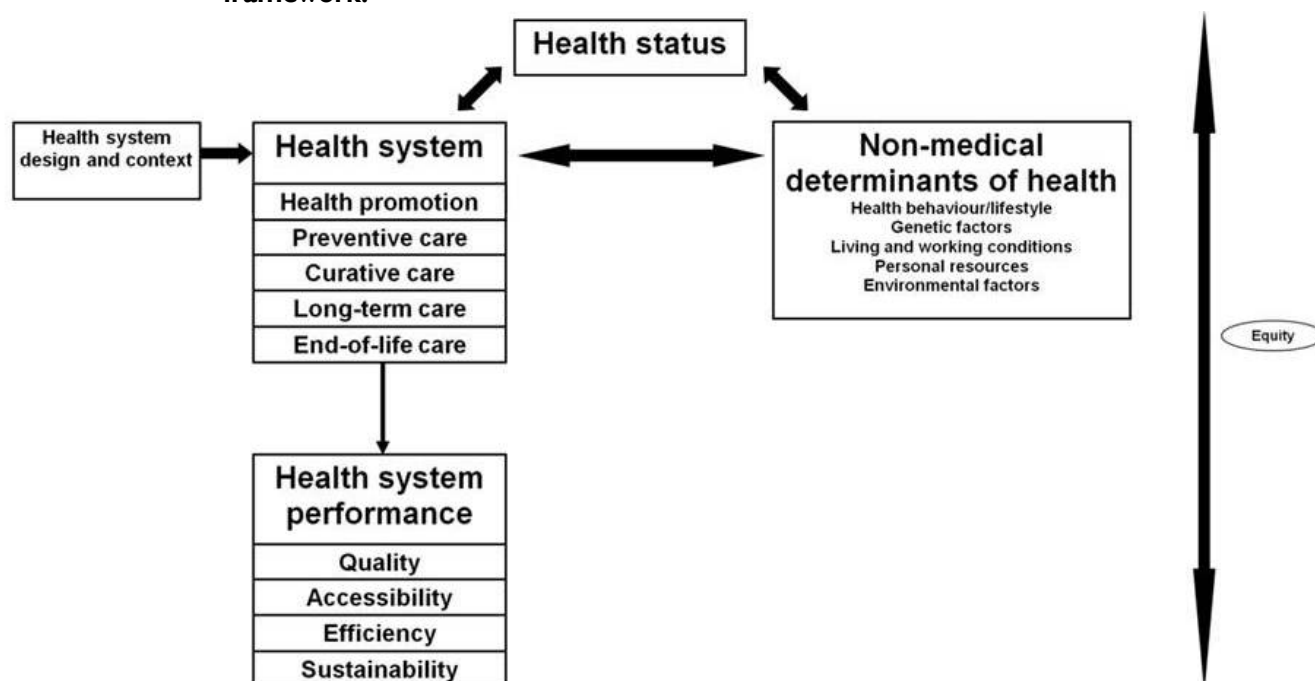
3.2.3 Health system performance

3.2.3.1 *Performance dimensions and definitions*

Health system performance is grouped into 4 dimensions, including quality, accessibility, efficiency and sustainability (figure 1).

Quality is defined as 'the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge' [30]. It is further subdivided into 5 sub-dimensions, including effectiveness, appropriateness, safety, patient-centeredness and continuity. *Effectiveness* is defined as 'the degree of achieving desirable outcomes, given the correct provision of evidence-based healthcare services to all who could benefit but not those who would not benefit' [1]. It is therefore closely related to *appropriateness*, which can be defined as 'the degree to which provided healthcare is relevant to the clinical needs, given the current best evidence' [1] and the provider's experience. The link between effectiveness and appropriateness reflects the link between outcomes and processes (see below). *Safety* can be defined as 'the degree to which the system has the right structures, renders services, and attains results in ways that prevent harm to the user, provider, or environment' [1]. Including the provider and environment in this definition extends the dimension beyond quality. *Patient-centeredness* is defined as 'providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions' [30]. The three cornerstones of evidence-based medicine, i.e. the current best evidence, patient preferences and clinical expertise, are covered by patient-centeredness and appropriateness. Finally, *continuity* addresses 'the extent to which healthcare for specified users, over time, is smoothly organised within and across providers, institutions and regions' [1], and to which the entire disease trajectory is covered. This also means that 'coordination' (i.e. smooth organisation across providers, institutions and regions) is considered to be part of continuity.

Accessibility is defined as the ease with which health services are reached in terms of physical access (geographical distribution), costs, time, cultural access (e.g. religion), psychological access, and availability of qualified personnel [1]. Access requires that health services are a priori available [1].

Efficiency is defined as the degree to which the right level of resources (i.e. money, time and personnel) is found for the system (macro-level) and ensuring that these resources are used to yield maximum benefits or results (i.e. allocative efficiency) [1].

Sustainability is the system's capacity to provide and maintain infrastructure such as workforce (e.g. through education and training), facilities and equipment, and be innovative and responsive to emerging needs [9]. Important factors for the maintenance of the workforce also include the health personnel's satisfaction and working conditions. However, these are only partly influenced by the health system, next to other contributing factors, such as labour legislation or local (hospital/organisational) factors.

3.2.3.2 *Relations between performance dimensions*

The integrative model of Sicotte et al. [36] proved to be very useful to highlight the relations between the different dimensions of performance, and can in fact be used to concretise the conceptual framework (figure 2). The model is based on the social action theory of Parsons, which identified four functions an organisation needs to balance to perform well: goal attainment, production, adaptation to the environment, and culture and values maintenance.

All four functions are well covered by the concepts and performance dimensions that were included in the proposed Belgian framework. Both 'adaptation to the environment' and 'culture and values maintenance' are largely covered by the dimension 'sustainability'. Only 'safety of patients and personnel', which is part of 'culture and values maintenance' in the integrative model (figure 2), is covered by the quality sub-dimension 'safety' in the framework. The values of the system are also part of the health system context.

'Goal attainment' is covered by the dimensions 'equity' and 'efficiency' and the quality sub-dimensions 'patient-centeredness' and 'effectiveness'. Finally, 'production' is covered by the dimension 'accessibility' and the quality sub-dimensions 'appropriateness', 'patient-centeredness' and 'continuity'. 'Productivity' and 'volume', both part of 'production' in the integrative model (figure 2), are covered by 'appropriateness', which relates the provided healthcare to clinical needs, current best evidence and providers' experience (see above).

Efficiency, effectiveness and appropriateness are clearly linked to each other. Effectiveness indicators measure the degree to which desirable outcomes are achieved, appropriateness indicators the degree to which desirable care is provided to reach these outcomes, and efficiency indicators the degree to which the right level of resources are used to reach these outcomes. This relation represents part of the tactical alignment of the integrative model (figure 2).

Accessibility is related to many other performance dimensions. Accessibility in terms of time reflects patient experiences of promptness of healthcare [1], and is therefore related to patient-centeredness and continuity. Accessibility is also linked to efficiency, in that a correct allocation of resources can increase the financial accessibility of healthcare. This also represents part of the tactical alignment of the integrative model (figure 2). Accessibility in terms of availability of qualified personnel relates to sustainability, in that the system's capacity to provide and maintain (qualified) workforce has a direct impact on its accessibility. This relation represents part of the allocation alignment of the integrative model (figure 2).

Besides the link with accessibility, sustainability is also linked to efficiency, because the degree to which the right level of resources is found for the system has a direct impact on the resources that can be used to provide and maintain infrastructure and to be innovative and responsive to emerging needs.

Finally, as an overarching dimension, equity is linked to most other dimensions of performance. It is concerned with the fairness of the distribution of effective, appropriate and efficient healthcare, with the degree to which healthcare is equally accessible for all, etc. Equity is discussed more extensively in the next chapter.

Table 11 provides an overview of how the performance dimensions are linked to Donabedian's healthcare triad of structure, process and outcome [30].

Table 11: Relation between performance dimensions and structure, process, outcome.

Dimension	Structure	Process	Outcome
Quality			
• Effectiveness			x
• Appropriateness		x	
• Safety	x	x	x
• Patient-centeredness		x	
• Continuity	x		
Accessibility	x	x	
Efficiency	x	x	x
Sustainability	x	x	
Equity	x	x	x

Figure 2: Integrative model of performance (adapted from: Champagne et al. [36]).
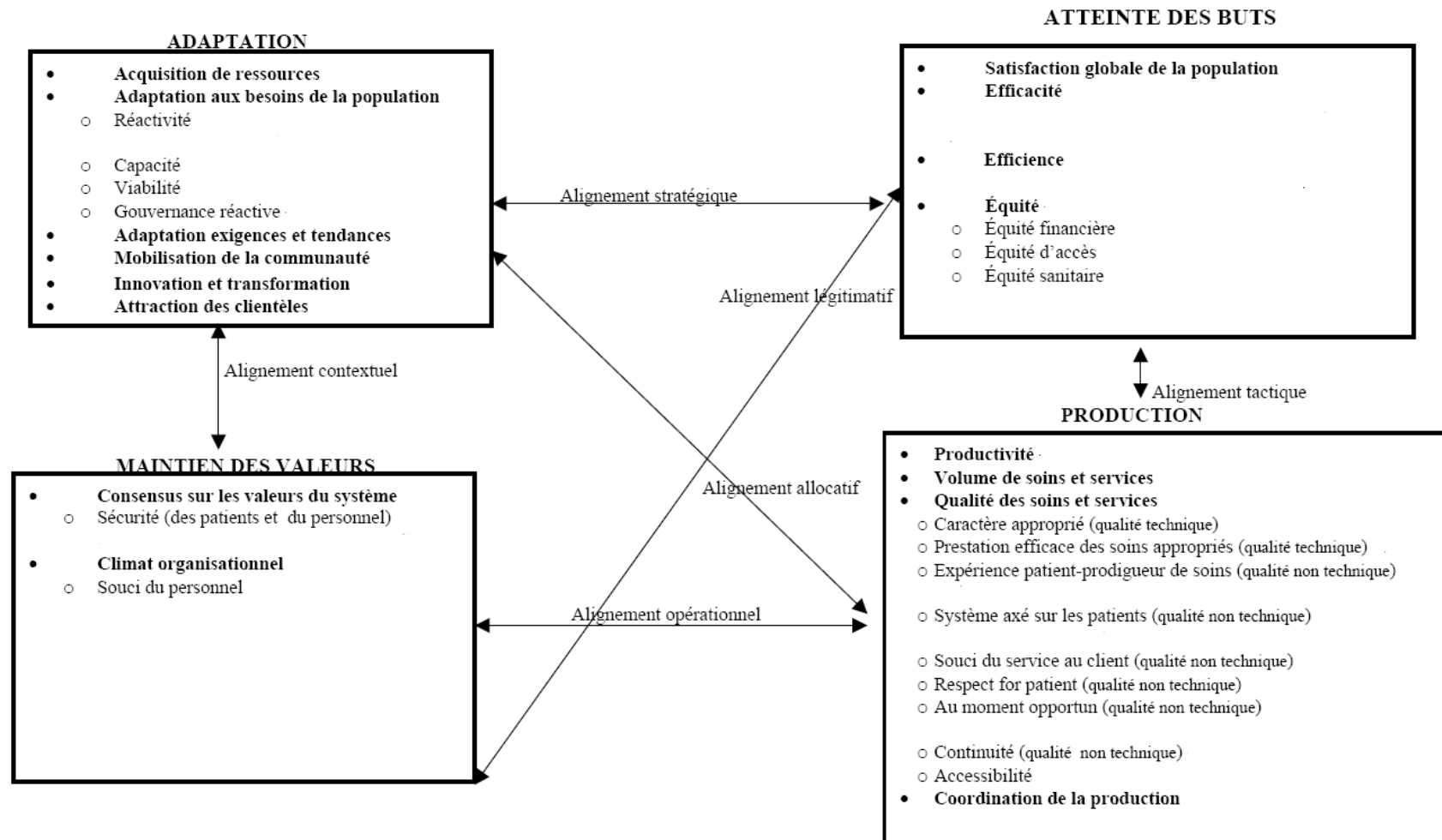
3.2.4 Equity

Equity is a controversial and difficult dimension receiving much attention of international organisations, such as the OECD and WHO [18, 31]. It is not the intention to study equity in detail in this report, which is still to be considered a pilot report, but it cannot be neglected either. The discussion and indicator results presented in this report should be considered as a starting point for a more profound study on equity of the healthcare system in Belgium.

Based on a non-systematic review of the (including grey) literature, three perspectives can be identified when considering equity of healthcare:

1. The functioning of the healthcare system
2. The financing of the healthcare system
3. The individual financial participation of the patient

Depending on the perspective, equity can be defined differently (Table 12). There is no agreement on which definition is more appropriate for which perspective, and no *a priori* choice was made for this project. This choice is difficult as it is an ideological one. Therefore, to allow a choice at the political level, a broad range of possible definitions is provided. Based on the results of the indicators, recommendations will be made on the future elaboration of this topic.

Even without a consensus about one unique definition of equity, it is generally accepted that equity can be defined as the equalization of 'something'. However, the most challenging question for philosophers and economists is probably the one posed by Sen in his Tanner lecture of 1979, i.e. 'Equality of what' [37]. Limiting the answer to the post-welfarist approaches gives a good idea of the heterogeneity of the different ideological proposals. Each of the most influencing thinkers has developed a specific approach of equity based on a given 'good', 'resource', 'result' or 'situation' to be equalized. As an illustration, the most widely known authors can be cited [37-78].

Given the complexity and heterogeneity of the different approaches, an attempt is made to provide a non-exhaustive panel of definitions of equity taking into account the three different perspectives discussed above. As to the first perspective, focusing on the functioning of the healthcare system, definitions can be related to:

- *Opportunities* for access to healthcare (equal opportunities in terms of healthcare access)
- *Use* of healthcare (equal use of healthcare)
- *Results* of the use of the heath care system (equal results in terms of health)
- *Financial individual responsibility* according to the responsibility of the individual in the illness he undergoes (equal financial participation for equal responsibility in the occurrence of the illness)
- *Needed care* (equal healthcare for equal needs)

The second and third perspective focus on the financing of the healthcare system (public sources of funding) and the cost sharing and reinsurance when the system is used. These two perspectives are complementary, but need to be distinguished. To make this distinction, two criteria are proposed. A 'financial stream' is considered to belong to the public financing if:

- it is compulsory;
- it is independent of healthcare consumption.

For instance, a *social contribution* paid by the employees and the employers is compulsory, but not linked to (or independent of) the consumption of care, and therefore belonging to the public financing. A *co-payment* is compulsory (even though it can be equal to zero for specific social classes), but is linked to the consumption of care, and therefore considered to be a type of cost-sharing. Premiums paid by individuals to private insurers are not compulsory and not linked to the consumption of care, and are therefore considered to belong to the cost-sharing.

To be complete, the 'reinsurance' organized by the public authorities, e.g. the maximum billing, and the reinsurance organized by the mutualities (complementary and free insurances) and the private sector should be mentioned. Using the concept of public and private reinsurance, the difference between the total and the net charge of the patient can be made. The net charge is defined as the total charge minus the reinsurances. The (public) reimbursements, the third payer system and the public reinsurance are financed by the public financing. The cost sharing complements this financing to cover the total healthcare expenditures. To be complete, the prevention and health promotion expenditures financed by local and regional authorities should be added.

Given this distinction between public financing and financial participation of the patient (cost-sharing), four additional definitions of equity can be proposed for the second and third perspective. As to the perspective of public financing of the system, two definitions of equity can be proposed:

- A public financing is equitable if it is proportional. This means that the average rate of 'taxation' is constant, i.e. not dependent of the level of the income. This is the case for the social contributions.

- A public financing is equitable is it is progressive. This means that the average rate of 'taxation' is increasing with the income. This is the case for the subsidies financed by the direct taxation.

Finally, as to the perspective of the financial participation of the patient, also two definitions can be proposed:

- The cost-sharing is equitable if the amount to be paid by act is fixed (not dependent of the income of the patient or of the 'sanitary attitude' of the patient).

- The cost-sharing is equitable if the financial participation is progressive with the income situation of the patient.

The three discussed perspectives need to be considered as complementary. Therefore, it should be possible to ameliorate the equitable character of the system according to one perspective when the situation is worsening according to another perspective.

These definitions are proposed regardless of the feasibility of their implementation. For instance, needs are certainly not an obvious concept to define and its measurement certainly remains a challenging activity. The responsibility of the patient in the occurrence of his/her illness is also difficult to evaluate and, beyond the ethical problems bounded to this approach, only proxies of the link between a given behaviour and the occurrence of a given pathology can be used.

Table 12: Perspectives of equity and possible definitions.

Perspective	Possible definitions
Functioning of the healthcare system	*Opportunities oriented* definition: A healthcare system is fair, when everybody (without distinction of age, sex, job type, income, education, geographical zone, urbanisation, rural aspects, life style and health status) has equal opportunities to receive the needed care. This definition implies the compensation of financial and cultural inequalities to obtain equal access for all.
	Used care oriented definition: A healthcare system is fair, when everybody (without distinction of age, sex, job type, income, education, geographical zone, urbanisation, rural aspects, life style and health status) used the same quantity of care.
	Results oriented definition: A healthcare system is fair, when everybody (without distinction of age, sex, job type, income, education, geographical zone, urbanisation, rural aspects, life style and health status) receives equal results in health terms, given the pathology they are suffering. This definition implies an unequal supply of care to obtain equal result of health – i.e. a total compensation of health inequalities.
	Individual responsibility oriented definition: A healthcare system is fair, when the effects of bad luck (events not under control of the individual, such as natural catastrophe or genetic handicap) are compensated and when the effects of option luck (events under control of the individual, such as smoking or drinking) are left to the financial individual responsibility. This definition implies a total imputation to the individual of all deprivation of health under complete or partial control of the individual.
	Needs oriented definition: A healthcare system is fair, when everybody (without distinction of age, sex, job type, income, education, geographical zone, urbanisation, rural aspects, life style and health status) receives the needed care given the pathology they are suffering and given their personal needs.
Public financing of the system	*Proportional financing oriented* definition: The financing of the healthcare system is fair when everybody participates in function of its total financial capabilities on a <u>proportional</u> way. This definition is complementary to the other definitions and implies that everybody finances the system in function of its real and total financial capacities.
	Progressive financing oriented definition: The financing of the healthcare system is fair when everybody participates in function of its total financial capabilities on a <u>progressive</u> way. This definition is complementary to the other definitions and implies that everybody finances the system in function of its real and total financial capacities.
Individual financial participation of the patient	*Lump sum co-payment oriented* definition: A healthcare system is fair, when everybody pays the same financial contribution (co-payment) when consuming a given care. This definition means that the co-payments are used to reduce the public expenditures without taking the personal situation into account.
	Progressive co-payment oriented definition: A healthcare system is fair, when everybody pays a financial contribution (co-payment) function of its social status or its financial situation when consuming a given care. This definition means that the system of co-payment reinforce the proportional or progressive character of the financing of the system.

3.3   DISCUSSION

An important achievement of the present report was the development of a broad conceptual framework of the health system performance that relied upon a consensus among Belgian experts in the field. Although the focus of the measurement system to be set up is the healthcare system performance, the chosen conceptual framework highlights the importance of other determinants of health. Indeed, where the ultimate goal is a high-performing health system that contributes to the health of the Belgian population, it is important to realise that healthcare is not the only determining factor of health.

By making explicit the 5 different health system domains, the impression is given that the existing delivery system is static and cannot evolve in time. However, this was done for reasons of visibility. Clearly, since the health system and its domains are dynamic concepts, a conceptual phase should always be part of future performance reports to re-consider the current choices. This will also allow more accurately reflecting political choices in future reports.

4 AVAILABILITY OF HEALTH (SYSTEM)-RELATED INFORMATION IN BELGIUM

4.1 DESCRIPTION OF AVAILABLE HEALTH DATA

An important phase before starting the collection of Belgian health data is to check if the necessary health data are available. This was done in two steps. First, the availability of Belgian data for the databases of the Organization for Economic Co-operation and Development (OECD Health Data 2008) and the World Health Organization (WHO European Health For All database) was investigated. This work was done in December 2008. Updates in the data afterwards were not taken in account. More detailed information can be found in Supplement 1.

Second, an inventory of useful databases in Belgium was made, and updates of descriptive information about these datasets were made. The starting point was the KCE inventory of health databases [79] and Morbidat, an initiative of the IPH, which was last updated in 2004 (http://www.iph.fgov.be/epidemio/morbidat/NL/MbframNL.htm). More detailed information can be found in Supplement 2.

4.1.1 Data availability for Belgium in international databases

4.1.1.1 OECD Health Data

The OECD Health Data (http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1) is a database which is divided in several domains: health status, healthcare resources, healthcare utilization, long-term care resources and utilization, expenditure on health, healthcare financing, social protection, pharmaceutical market, non-medical determinants of health, and demographic references.

For 13% of all variables (n = 3 965) in the dataset no data are available for Belgium (Table 13). The main gaps in the data are related to long-term care resources and utilization, healthcare resources, and expenditure on health. In 18% of the missing data, the source of the data is a Belgian counterpart. In 81% of these cases, the source is an international one (this is especially the case for data about health expenditure), while in one percent of the missing data, the source is Belgian with data compiled and calculated by an international organization.

The timeliness of the data was also investigated, considering 2005 as a cut-off point. Fifteen percent of the variables (n = 3 965) in the OECD dataset have missing data for Belgium after 2005. This delay in data was especially related to the following domains: health status, social protection, and non-medical determinants of health. In 41% of the cases for which there were only out-of-date data, the source is Belgian (especially for data about health status), while in 42% of the cases it is an international source/study which provide the data (especially data about social protection and health expenditure). In 17% of the case it concerns a Belgian source with data compiled and calculated by an international organization.

In total, almost one third (29%) of the variables in the OECD dataset has missing or out-of-date data. Thirty-one percent of these data are originating from a Belgian source, 60% from an international source/study, and 9% from an international organization which compiles and makes calculations on Belgian data. The unavailable data are particularly related to these domains: health status, social protection, and long-term care resources and utilization.

4.1.1.2   *WHO Health For All database*

The WHO Health For All database (http://www.euro.who.int/hfadb) contains information on demographic and socio-economic indicators, mortality-based indicators, morbidity, disability and hospital discharges, life styles, environment, healthcare resources, healthcare utilization and expenditure, and maternal and child health.

For 4% of the variables (n=26) in this database there are no data for Belgium (Table 13). This is especially the case for data on life styles, healthcare utilization and expenditure, and healthcare resources. Ninety-two percent of these 26 missing data are originating from a Belgian source, 4% from an international source, and 4% from a Belgian source but with calculations made by an international organization.

The timeliness of the WHO data was also considered. Sixty-nine percent of the variables (n=421) are out-of-date (i.e. not available after 2005), especially data on mortality, life styles, and environment. In 40% of these 421 data, the source is Belgian, in 6% the source is international, and in 54% there is a Belgian source but with calculations made by an international institution.

In total, 73% of the data in the WHO database are not available or out-of-date for Belgium. This is particularly the case for data concerning mortality, life styles, and environment. Forty-three percent of all the missing data for Belgium are originating from a Belgian source, 5% from an international source, and 52% from a Belgian source with calculations made by an international institution.

Table 13: Percentage missing and out-of-date data for Belgium in international databases.

	OECD (n=3965)	**WHO (n=614)**
Missing data	13% (n=525)	4% (n=26)
Data from national counterparts	18%	92%
Data from international sources / studies	81%	4%
Data from Belgian source but compiled and calculated by an international organization	1%	4%
Data available but timeliness problem*	15% (n=612)	69% (n=421)
Data from national counterparts	41%	40%
Data from international sources / studies	42%	6%
Data from Belgian source but compiled and calculated by an international organization	17%	54%
Total : no recent data available	29% (n=1137)	73% (n=447)
Data from national counterparts	31%	43%
Data from international sources / studies	60%	5%
Data from Belgian source but compiled and calculated by an international organization	9%	52%

* No data are available after 2005.

Interesting to study is whether the missing variables are the same in the two databases. In the WHO database, mortality is the dimension with most missing data, namely 100% (from here on missing data are defined as the variables with no data at all or no data after 2005). In the OECD database, mortality and morbidity are considered as one dimension, namely health status. After splitting those two, 96% of the mortality variables in the OECD dataset have missing data for Belgium. The difference between the two databases is caused by the source that is used for life expectancy. WHO uses calculations of the NIS, while OECD uses data from the Eurostat NewCronos database. The second dimension in the WHO database with a high percentage of missing data is life style (n=26, 88%).

In the OECD dataset, life style (n=23) is considered together with environment (n=6) as non-medical determinants of health. Life style has 83% missing data, which does not differ a lot from the percentage of missing data in the WHO database. As WHO has more variables in the dimension life style, the percentage missing data is higher.

As one could expect, the results are more or less the same for both databases. When looking at the total percentage of missing data, most are originating from an international source in the database of OECD, and from a Belgian source with calculations made by an international institution for the variables in the WHO dataset. In this case, it is difficult to find the cause of the delay in data. It is possible that "recent" Belgian data were delivered, but that the calculations were made after some delay, or that calculations are made on old data from Belgium. After comparison with some other countries, it was clear that for mortality (being the biggest problem for Belgium), the delay is due to the (un)availability of Belgian data that are used for the calculations.

4.1.1.3 ECHI-2 long list

Apart from the OECD and WHO databases, the variables listed in the ECHI-2 long list (European Community Health Indicators) (http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm) were also checked (n = 1 417). These variables can be divided in four domains: demography and socio-economic situation, health status, determinants of health, and health systems. The databases of WHO, OECD, Eurostat, and for some variables also the UN data were checked. For 33% (465) of the variables in the ECHI-2 long list there are no data available for no country at all. For an additional 4% (58) of the variables there are no data available for Belgium. In total, this means that for Belgium, 37% (523) of the variables are not available. Specifically for Belgium, data are lacking for education (% of population 25+ by educational level), accidental injuries at work, and work-related health problems. When the timeliness of the data is also considered, for 67% (947) of the variables data are missing or out-of date.

4.1.1.4 Discussion

Missing data, including a lack of recent data, apparently are an important problem. Both data from national and international sources/studies (which apply then to data for several countries) are missing or out-of-date, as well as data coming from national sources but calculated by international organizations.

A second problem is the comparability of data, both on a national level and on an international level. Different definitions, reference periods and calculations are used according to different sources, different institutions, and different countries. This makes it difficult to compare data through time and across countries.

Another problem is the lack of consistency of some data reported by different information counterparts to the international organisations resulting in differences in the datasets of these organisations, e.g. for the indicator "number of physicians". The definition used by the WHO for Belgium is "number of physicians licensed to practice", while the definition used by the OECD is "number of physicians who carried out at least one reimbursed medical act during the year". Different data for Belgium are thus provided to the WHO and OECD.

4.1.2 Belgian health data

A next step was to make an overview of Belgian health databases. The starting point was the KCE – Inventory of Health Care Databases, made in 2006 [79], and Morbidat, an initiative of the IPH which was last updated in 2004 (http://www.iph.fgov.be/epidemio/morbidat/NL/MbframNL.htm). An overview was made of 131 databases (see Supplement 2). The sources of these databases are various: academic, non-profit organizations, Belgian government, the Regions and Communities, private, the National Bank of Belgium, and some European Union projects.

A description of the databases was made, containing information on the managing organization, the purpose and use of the dataset, the contents, time characteristics, and the methodology and data process. Some of these databases (n=40) were discarded due to their geographical and/or temporal limitations.

After the description was updated, it was sent to the contact person(s) of the database, and to the 'single person of contact' (SPOC) for the institution for verification. After three weeks, a reminder was sent to those persons who did not yet answered to our request. In total, about 2/3 (n=60) of the 91 descriptions of the datasets were updated.

4.2 EXISTING BELGIAN INITIATIVES RELATED TO HEALTH (SYSTEM) PERFORMANCE

4.2.1 Introduction

Several initiatives are ongoing in Belgium that deal with or can be brought into relation with the performance of the health (care) system. In this chapter, an overview of these initiatives will be given, mainly to highlight possible complementarities with the present project. Importantly, it is not our intention to be exhaustive.

Some of these initiatives were also consulted for the selection of the performance indicators for the present report (see above).

4.2.2 Flemish Community

4.2.2.1 Health indicators

Preventive care is a regional responsibility in Belgium. As a consequence, Flanders has its own policy to protect and promote the health of its population, through health promotion and disease prevention. The Flemish Parliament Act on preventive health policy states as main aim of the Flemish health policy 'an improvement of public health, in particular realising health gain at the level of the Flemish population, to contribute to an increase of the quality of life'. The Flemish Parliament Act on preventive health policy also contains a fixed procedure for the development of new health targets, through the organisation of health conferences. The implementation of this preventive health policy is evidence-based. Data on the health status of the population as well as on healthcare are collected on a regular basis, and these analyses are published yearly as Flemish health indicators (Table 14). Based on evaluations of morbidity and mortality, 6 health targets for the population were set (Source: http://www.zorg-en-gezondheid.be/cijfers.aspx

Table 15). Reporting on the health indicators related to these health targets to the Flemish Government and Parliament is obligatory every 5 years.

The following areas are covered by the Flemish preventive policy:

- Health promotion: promotion of healthy diet and physical activity; prevention of tobacco use, limiting alcohol abuse and illegal drugs; injury prevention; promotion of sexual health, etc.

- Prevention of non-communicable diseases: breast and cervical cancer screening.

- Prevention of communicable diseases: vaccination programme, sexually transmitted diseases (including HIV/AIDS), tuberculosis, meningitis, legionellosis, etc.

- Occupational healthcare: the Flemish Community is responsible for the recognition of the services for industrial medicine and for the supervision on the regulations concerning welfare at the workplace. Prevention of work-related cancers and chronic diseases, of drug and alcohol consumption at work, psychological aspects of labour.

- Mental health: depression and suicide prevention.

- Health and environment: Flanders is responsible for environmental health, protecting public health against adverse effects of environmental hazards and studying the health interrelationship between people and their environment.

- Youth healthcare (including screening for metabolic diseases in newborn and vaccination of children).

Table 14: Flemish health indicators.

Health indicator
Number of deaths
Number of births
Life expectancy at birth (for men and women separately)
Age standardized death rate (average/men/women)
Birth rate (/1 000 women at the age of procreation)
Infant mortality rate (/1 000 live births)

Source: http://www.zorg-en-gezondheid.be/cijfers.aspx

Table 15: Flemish health targets.

Theme	Health target
Nutrition/exercise	Gain public health benefits by: • increasing the number of people that are sufficiently physically active (males/females, 4 age groups); decrease the percentage of sedentary people with 10% (males/females, 4 age groups); • increasing the number of people that eat a balanced diet (more vegetables/less residual food group); • keeping the number of people that have a healthy weight stable (males/females)
Suicide/depression	Reduce number of deaths
Breast cancer screening	Increase participation
Substance (ab)use (tobacco, alcohol, drugs)	Reduce use of: • tobacco (male/female adults) • alcohol (male/female adults) • illicit drugs (young adults)
Vaccination (against polio, diftheria, whooping cough, tetanus, measles, mumps and rubella)	Increase coverage
Fall prevention	Reduce number of deaths

Source: http://www.zorg-en-gezondheid.be/default.aspx?id=5368

4.2.2.2   *Clinical performance indicators*

The Flemish Community is responsible for the planning, supervision and recognition of hospitals within the Flemish Community. Planning and recognition are based on standards issued by the federal government. These concern norms for programmation – the maximal number of services – and criteria for recognition, such as some architectural regulations and provisions related to the personnel.

These federal standards are being completed with additional criteria, mainly related to quality assurance policy, set out by the Flemish Community. As of January 1st 2005, each Flemish hospital is obliged to do a periodic assessment of its quality of care (kwaliteitsdecreet 17/10/2003). Within this context, the Flemish government fed back the results of 31 indicators in March 2005 and 30 indicators in January 2008.

The Flemish Community based the selection of these indicators on the core set of clinical performance indicators developed by the Centre for Health Services and Nursing Research (see 4.2.9) and on the Performance Assessment Tool for quality in Hospitals (PATH) project. On the website of the Flemish Community, the results of 13 indicators are presented (Table 16) (http://www.zorg-en-gezondheid.be/kwaliteitsindicatoren_zh.aspx).

Table 16: Clinical performance indicators used by the Flemish Community.

Domain	Indicator
Hospital mortality	Total hospital mortality
	Hospital mortality of patients undergoing surgical treatment with low mortality risk
	Hospital mortality of patients undergoing non-surgical treatment with low mortality risk
	Hospital mortality of patients undergoing non-surgical treatment with moderate mortality risk
	Hospital mortality within 24 hours after unscheduled admission
	Hospital mortality within 24 hours after elective admission
	Hospital mortality of neonates born in the hospital
Unscheduled readmissions	Unscheduled readmissions within 7 days after discharge
Obstetrics	Proportion of caesarean sections
Mean length-of-stay	Mean length-of-stay after uncomplicated vaginal delivery
	Mean length-of-stay after hysterectomy
Day care	Surgical day case rate for cataract surgery
	Surgical day case rate for varicectomy

Source: http://www.zorg-en-gezondheid.be/kwaliteitsindicatoren_zh.aspx

4.2.3 French Community

As in the Flemish Community, the French Community has its own policy to protect and promote the health of its population through health promotion and disease prevention. This policy is targeted by a Five Year Health Promotion Plan covering:

- Health promotion: promotion of healthy diet and physical activity; prevention of addictions; injury prevention; promotion of sexual health, etc.

- Prevention of non-communicable diseases: breast and colorectal cancer screening.

- Prevention of communicable diseases: vaccination programme, sexually transmitted diseases (including HIV/AIDS), tuberculosis, meningitis, etc.

- Occupational healthcare: the Flemish Community is responsible for the recognition of the services for industrial medicine

- Youth healthcare (including screening for metabolic diseases in newborn and vaccination of children) and health at school

Table 17: French Community health indicators.

Domain	Indicator
Mortality	Overall mortality
	Cause-specific mortality
Perinatality	Annual birth rate
	Annual foetal and infant mortality
	Annual prevalence of premature birth
	Annual prevalence of low birth weight (< 2 500 g) or very low birth weight (< 1 500 g)
	Annual number and proportion of multiple births
	Annual number and proportion of caesarean sections
	Annual distribution of life births according to maternal age
	Annual socio-economic profile of births
	Maternal familial situation
Prevention	Incidence of breast cancer
	Annual mortality of breast cancer
	Annual number of mammotests in women aged 50-69
	Coverage of the mammotest in women aged 50-69
	Participation degree of women aged 50-69 to the breast cancer screening

Domain	Indicator
	programme
	Number of positive mammotests and degree of second calls in screened women aged 50-69
Child vaccination	Coverage of vaccination in children
	Evolution of coverage in children
Determinants of health	Nutrition
	Physical activity
	Smoking
	Alcohol consumption

4.2.4 Brussels Health and Social Observatory

The mission of the Brussels Health and Social Observatory is to collect, analyze and distribute information for the development of a coordinated health and poverty policy in the Brussels Capital Region. Health is one of the two core themes of the observatory. To follow-up the health of the Brussels population, several indicators are used covering domains such as mortality, perinatality and prevention (Table 18).

Table 18: Indicators used by the Brussels Health and Social Observatory.

Domain	Indicator
Mortality	Overall mortality (/100 000 inhabitants)
	Cause-specific mortality (/100 000 inhabitants)
Perinatality	Annual birth rate
	Annual foetal and infant mortality
	Annual prevalence of premature birth
	Annual prevalence of low birth weight (< 2 500 g) or very low birth weight (< 1 500 g)
	Annual number and proportion of multiple births
	Annual number and proportion of caesarean sections
	Annual distribution of life births according to maternal age
	Annual socio-economic profile of births
	Maternal familial situation
Prevention	Incidence of breast cancer
	Annual mortality of breast cancer
	Annual number of mammotests in women aged 50-69
	Coverage of the mammotest in women aged 50-69
	Participation degree of women aged 50-69 to the breast cancer screening programme
	Number of positive mammotests and degree of second calls in screened women aged 50-69
Child vaccination	Coverage of vaccination in children aged 18-24 months (by disease)
	Evolution of coverage in children aged 18-24 months
	Comparison of coverage between the Brussels Capital Region and the Walloon and Flemish Region
	Median age of administration of the hexavalent vaccine and measles-mumps-rubella
	Health professionals that administer vaccines

Source: http://www.observatbru.be/documents/indicateurs.xml?lang=nl, accessed August 17th 2009

4.2.5   Walloon Region

As in the Flemish Community, several health and healthcare indicators concerning 6 themes are published by the Walloon Region (http://socialsante.wallonie.be/tableaubordsante/pages/atlassante.php?variable=CHP0_INTRO). This 6 themes include mortality, health status, health determinants, seniors, utilisation of care, and environment (Table 18).

Table 19: Indicators used by the Walloon Region.

Theme	Indicator / indicator groups
Mortality	Overall mortality
	Premature mortality
Health status	General health status
	Cardiovascular diseases
	Osteoarticular diseases
	Respiratory diseases
	Cancer
	Metabolic diseases
	Mental health
	Accidents and traumata
	Other
Determinants of health	Nutrition
	Physical activity
	Smoking
	Alcohol consumption
Seniors	Demography
	Socioeconomic factors
	Health status
	Lifestyle
	Utilisation of care
	Socio-sanitary services
	Social life
Utilisation of care	Ambulatory care
	Hospital care
	Pharmaceutical consumption
Environment	Cardio-respiratory diseases
	Health and climate
	Infectious disease and environment
	Allergies
	Sound pollution
	Specific contaminants
	Asbestos
	Heavy metals

Source: http://socialsante.wallonie.be/tableaubordsante/pages/atlassante.php, accessed October 29th 2009

4.2.6   FPS Health, Food Chain Safety and Environment

4.2.6.1   *Multidimensional feedback to hospitals*

In 2006, the FPS Health, Food Chain Safety and Environment sent out a first report to the Belgian acute hospitals on their performance. This initiative has 3 main objectives. First, the results allow the hospitals to compare their performance to that of other institutions. Furthermore, the indicators enable an internal assessment of care processes and activities and the set-up of improvement initiatives. Finally, the results highlight deficiencies in the administrative databases and may trigger the hospitals to deliver more accurate data. This first feedback consisted of a limited set of indicators. The initiative was welcomed by the hospital sector and expanded on their demand.

In 2008, a second report was distributed. Twenty-nine indicators covering 4 performance dimensions were measured (Table 20).

Table 20: Indicators used for the multidimensional feedback of the FPS Health, Food Chain Safety and Environment.

Domain	Indicator
Clinical performance	Number of caesarean sections
	Hospital mortality after admission for myocardial infarction
	Hospital mortality after admission for hip fracture
	Hospital mortality after admission for community-acquired pneumonia
	Number of open cholecystectomies
	Hospital mortality after admission for acute stroke
	Hospital mortality after admission for congestive heart failure
Economic performance	Degree of financial independence
	Acid test
	Financial coverage
	Level of cash-flow
	Profitability (4 indicators)
	Performance in terms of length-of-stay
Capacity and innovation	Use of hospital capacity
	Return on assets
	Percentage day care
	Qualification degree of the care providers
	Specialisation degree of nursing staff
	Vacancies for nurses
	Staff turnover
	Percentage temporary workers
	Costs of informatics
	Clinical pathways
	Waste removal
Patient-centeredness	Interest for the measurement of patient satisfaction
	Information to the patient
	Education possibilities in hospital
	Mediation

4.2.6.2   *Patient safety indicators*

Building on the results of a pilot study of the CHU Liège, investigating the feasibility to extract Patient Safety Indicators from the MCD database, the FPS Health, Food Chain Safety and Environment published a first feedback report to the Belgian hospitals in April 2008. The 20 indicators used for this feedback (Table 20) were adapted from the patient safety indicator set of the AHRQ (http://www.qualityindicators.ahrq.gov/psi_overview.htm).

In general, the incidents measured with the patient safety indicators were found to be rare. With 0.011 incidents per 1 000 hospital stays, the transfusion reaction was found to be the least frequent incident.

Table 21: Patient safety indicators used by the FPS Health, Food Chain Safety and Environment.

Indicator
Complications due to anaesthesia
Hospital mortality in APR-DRGs with low mortality
Decubitus ulcers
"Failure to rescue"
Foreign body left after surgery
Iatrogenic pneumothorax
Infections caused by care
Postoperative hip fracture
Postoperative haemorrhage or haematoma
Postoperative physiological and metabolic complications
Postoperative respiratory insufficiency
Postoperative pulmonary embolisms or deep venous thrombosis
Postoperative sepsis
Wound rupture after abdominopelvic surgery
Accidental puncture or laceration
Transfusion reaction
Birth trauma of neonate
Obstetric trauma during instrument-assisted vaginal delivery
Obstetric trauma during non-instrument-assisted vaginal delivery
Obstetric trauma during caesarean section

4.2.7 National Board for Quality Promotion

The National Board for Quality Promotion (NBQP) was instaured in 2002 as a department of the Service for Medical Control of the NIHDI. Data regarding prescribing behaviour and other domains are used to provide feedback to healthcare providers (http://www.inami.fgov.be/care/nl/doctors/promotion-quality/feedbacks/). Table 22 provides an overview of the topics that were addressed by the NBQP so far.

Table 22: Feedbacks of the NBQP.

Topic	Target users of feedback
Prenatal care	General practitioners, gynaecologists, midwives
Breast cancer screening	General practitioners, gynaecologists, radiologists
Prescription of cheap medications	Physicians, dentists
Preoperative examinations	Hospitals,
Antihypertensive drugs	General practitioners, cardiologists, geriatricians, internists, nephrologists
Antibiotics	Medical houses, general practitioners
Prescribing behaviour for 9 medication classes	General practitioners, specialists

Source: http://www.inami.fgov.be/care/nl/doctors/promotion-quality/feedbacks/index.htm, accessed on July 17th 2009

4.2.8   BelHIS

BelHIS (Belgian Longitudinal Health Information System) is an ongoing project supported by the Federal Public Service (FPS) Social Security and the Federal Science Policy Office, and conducted by a consortium of the Université Libre de Bruxelles (ULB), the Université Catholique de Louvain (UCL) and the Vrije Universiteit Brussel (VUB). Its main objective is to complement the current Belgian health information system with a longitudinal perspective. For a limited number of highly relevant conditions (e.g. cancer, diabetes and arthroplasty), longitudinal indicators will be identified and defined. For these indicators, the availability of Belgian data will be assessed. Importantly, the BelHIS project mainly focuses on non-medical determinants of health, such as genetic factors, living and working conditions, lifestyle and socio-economic factors.

4.2.9   Navigator©

Navigator© is an indicator system developed by the Centre for Health Services and Nursing Research from the Catholic University of Leuven (http://www.navigator.czv.be/) aimed at continuously monitoring and improving the clinical and organizational performance in acute care hospitals, psychiatric care hospitals and nursing homes for elderly. For each type of institutions, different topics ('domains') are addressed: 15 domains for acute care hospitals (e.g. mortality, infections, patient safety, etc.), 16 for psychiatric care hospitals (e.g. use of antipsychotics, restraint on psychogeriatric unit, etc.), and 10 for nursing homes (e.g. fall incidents, nutrition, care for diabetics, etc.). For each domain and subdomains, several indicators are included. Participants choose freely which indicators they would like to monitor, according to their own priorities, data availability, etc. Participants collect their data on a monthly basis and transmit all data on a quarterly basis. Participation is not free of charge.

4.2.10   Other initiatives

Since 2005, the *Health Consumer Powerhouse* annually produces a report on the performance of the European healthcare systems [80]. A 1 000-point scale is used to rank the European countries according to the user-friendliness of their healthcare system. In 2009, 38 performance indicators were used to compare 33 countries. According to the 2008 EHCI report, Belgium is good at accessibility, but suffers on outcome quality, possibly because of a weaker reporting culture than the European average. Belgium was also found to be remarkably slow at offering access to new medicines. In 2008, Belgium ranked 12th, this year it ranked 11th.

The *Itinera Institute* was officially launched in March 2006 as an independent think tank and do tank that specifically caters for Belgium and its regions (www.itinerainstitute.org). As a think tank the institute focuses on long-term challenges, international benchmarking, and objective data as a basis to develop an agenda for policy reform for Belgium and its regions. As a do tank the institute tackles short-term policy debates and actively promotes its proposals in all relevant forums. One of its nine essential themes is healthcare. In 2008, a report was published on the Belgian Healthcare, containing facts and figures on accessibility, quality, costs, etc. [81].

5 SELECTION PROCESS AND PILOT TEST OF PERFORMANCE INDICATORS

5.1 METHODOLOGY

The set of performance indicators (PI) of the Dutch and Canadian performance system were chosen as a starting point for the selection of the Belgian performance indicators set.

In a first phase, all available PI were listed in an Excel file and categorised in the corresponding performance dimension(s) by two investigators of the team individually. To check the agreement of the two investigators, a Cohen's kappa coefficient was used.

In a second phase, all PI were scored by six working group members individually on six key characteristics using a scale from 1 (strongly disagree) to 9 (strongly agree):

1. Content validity: the extent to which the indicator captures meaningfully aspects of health system performance;

2. Reliability: the extent to which the measure provides stable results across various populations and circumstances;

3. Relevance: the extent to which important health conditions accounting for a major share of the burden of disease, the cost of care, or policymakers' priorities are reflected;

4. Interpretability: the extent to which clear conclusions are possible;

5. (A priori) feasibility: the information required for the indicator can be obtained at reasonable cost in relation to its value and can be collected, analysed and reported on in an appropriate time frame;

6. Actionability: the extent to which action can be taken by individuals, organised groups and public and private agencies to meaningfully address this aspect or problem.

The working group members were also asked to validate the categorisation of the PI, and to propose changes where necessary. Finally, all PI were scored on their international comparability based on the information available in Supplement 1.

For each PI and key characteristic a median, minimum and maximum score was calculated, together with the percentage of 'agree' scores (i.e. '7', '8' and '9' scores). The results were fed back to the working group and discussed face-to-face. The outcomes of this face-to-face discussion were a final categorisation of the PI, the removal of duplicate PI, and the exclusion of PI scoring less than 50% on the criterion 'relevance'.

In a third phase, all seven working group members were asked to independently indicate those PI that needed to be included with 'IN' and those PI that needed to be excluded with 'OUT'. In case a working group member had a neutral or no opinion, the field was left blank. To quantify the opinions, each 'IN' received a score '1' and each 'OUT' received a score '-1.5', hereby increasing the selectivity of the process. Finally, for each individual PI these scores were added up, and for each dimension the PI were sorted from high to low overall score. The results were again fed back to the working group and discussed face-to-face. In a first step, all PI with a negative score were definitively excluded, while PI with an overall score of ≥4 were considered for inclusion. In case a dimension was not covered by a PI using these selection criteria, PI with a positive score <4 were consulted or additional PI were proposed.

As the set of indicators selected so far was not considered to be sufficient, Belgian initiatives (Multidimensional Feedback to the hospitals; patient safety indicators; KCE reports) and the indicators of the AHRQ (as an important source of several FPS indicators) were consulted in a fourth phase. For logistic reasons, no specific search was done for patient-centeredness and equity indicators. This phase led to an additional selection of relevant indicators. The outcome of these phases was a pre-final indicator set.

A final step in the selection process was the discussion with an external expert team. During this discussion some indicators were excluded from the pre-final set, and a limited number was added.

5.2   RESULTS BY SELECTION PHASE

In total, 275 PI were identified in the Netherlands (n=229) and Canada (n=46) (duplicates included).

For the categorisation of these PI, there was full agreement on the indicators categorised in the dimensions 'appropriateness' and 'effectiveness'. No indicator was categorised in the dimension 'equity'. The only dimension on which the 2 independent investigators disagreed was 'sustainability'. After discussion, 136 indicators were categorised in 'quality' ('safety': n=18; 'patient-centeredness'; n=12; 'appropriateness': n=5; 'efficiency': n=94 and 'continuity': n=7), 55 in 'sustainability', 12 in 'efficiency' and 113 in 'accessibility'. Thirty indicators were categorised in two dimensions, four indicators in three dimensions and one indicator in four dimensions.

After the second phase, 113 indicators were excluded: 99 PI from the Netherlands and 14 PI from Canada. Most of the indicators that were excluded were categorised under the dimensions 'accessibility', 'effectiveness' and 'sustainability'.

After the third phase, only 28 indicators were left. However, after the consultation of additional indicator sources, the pre-final set was expanded to 43 indicators which were presented to the group of external experts. Additional relevant PI were suggested by the experts, e.g. smoking rate, hysterectomy by social class, percentage GP's who use a electronic medical file. In addition, it was advised not to focus on patient-centeredness in this pilot study. After this final phase, the indicator set consisted of 47 principal indicators. In addition, 8 secondary indicators were selected that were strongly related to a principal indicator.

When considering each indicator in its main dimension[4] (Table 23 – Table 25), the final selection contains 18 principal and 5 secondary indicators covering the dimension 'effectiveness'. 'Appropriateness' and 'safety' are both covered by 7 principal indicators. 'Safety' contains also 1 secondary indicator. 'Continuity' is covered by 2 principal indicators, 'accessibility' by 5 indicators, 'efficiency' by 2 indicators, and 'sustainability' by 6 principal indicators and 2 secondary indicators. No indicators were selected for the dimension 'patient-centeredness'.

For 'equity', it was decided to use the results of a subset of indicators categorised in other dimensions.

5.3   PILOT TESTING

For the pilot testing of the included indicators, a technical document was made of each individual indicator including the following information (see appendix 4): description, source(s) of the indicator, the numerator and denominator, harmonisation with the definition used by other organisations, the rationale behind the indicator, the indicator characteristics, the data source(s), the results and the related indicators. The most recent available data were used, in many cases corresponding to 2007.

Each document was sent to relevant experts in the field for feedback and validation.

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4   Some indicators are applicable to more than one dimension.

Table 23: Selected performance indicators by dimension: generic indicators.

Quality					Accessibility	Efficiency	Sustainability
Effectiveness	**Appropriateness**	**Safety**	**Patient-centeredness**	**Continuity**			
	Prescription according to guidelines (QA1)	Number of nosocomial MRSA infections (QS6) Sec. PI: number of AB prescriptions (QS6.1)		Number of people who are not registered with a GP (QC1)	Number of physicians and nurses (A1)		Healthcare expenditures according to the System of Health Accounts (S1) Sec. PI: maximum billing system (S1.1)
		Medical radiation exposure (QS7)			Insurance status of the population (A2)		Qualification levels of healthcare providers (S2)
					Amount of co-payments and out-of-pocket payments (A3)		Medical and nursing graduates (S3)
							Annual amount of the Special Solidarity Fund (S4)
							Number of GP's using an electronic medical file (S5)
							Acute care bed days, number per capita (S6) Sec. PI: number of acute care beds (S6.1)

Table 24: Selected performance indicators by dimension: preventive care.

	Quality					Accessibility	Efficiency	Sustainability
	Effectiveness	Appropriateness	Safety	Patient-centeredness	Continuity			
Screening	Breast cancer screening with mammotest in women aged 50-69 (QE1) Sec. PI: other mammogram in women aged 50-69 (QE1.1)	Mammogram in women aged <50 or >71 (QA2)						
	Cervical cancer screening in women aged 25-64 (QE2)							
	Colorectal cancer screening in individuals aged 50 and older (QE3)							
Vaccination	Influenza vaccination (QE4)							
	Vaccination coverage of children aged 2 (QE5)							
	Acute care hospitalisation rate for pneumonia and influenza (QE6)							
Health promotion	Percentage of daily smokers (QE7) Sec. PI: consumption of fruit and vegetables (QE7.1), alcohol consumption (QE7.2), salt consumption (QE7.3)					Coverage of preventive child healthcare in high-risk groups (A4)		
	Breast feeding (QE8)							
Regular testing	Annual check-ups at the dentist (QE9)							
	Decayed, missing and filled teeth at age 12 (QE10)							
	Cardiovascular screening in individuals age 45-75 (QE11)							

Table 25: Selected performance indicators by dimension: curative care.

Quality					Accessibility	Efficiency	Sustainability
Effectiveness	Appropriateness	Safety	Patient-centeredness	Continuity			
Colon cancer 5-year survival rate (QE12)	Utilisation of minimal and non-invasive surgical techniques (QA3a)	Incidence of serious adverse effects of blood transfusion (QS1)		Average length of stay (QC2)		Surgical day case rates (E1)	
Infant mortality (QE13) Sec. PI: premature mortality (QE13.1)	Speed of diffusion of minimal and non-invasive surgical techniques (QA3b)	Incidence of healthcare related infections (QS2)					
Breast cancer 5-year survival rate (QE14)	Use of special protocols or guidelines for high risk or complex processes (QA4)	Incidence of decubitus ulcers in hospitals (QS3)					
Cervical cancer 5-year survival rate (QE15)	Caesarean sections per 1000 live births (QA5)	Incidence of post-operative surgical site infections (QS4)					
In-hospital mortality after hip fracture (QE16a)	Hysterectomy by social class (QA6)						
In-hospital mortality for community-acquired pneumonia (QE16b)							

Table 26: Selected performance indicators by dimension: long-term and end-of-life care.

Quality					Accessibility	Efficiency	Sustainability
Effectiveness	Appropriateness	Safety	Patient-centeredness	Continuity			
Diabetes-related major amputations (QE17)		Incidence of decubitus ulcers (QS5): a. in long-term care facilities b. in individuals at risk			Additional illness-related costs for chronically ill people (A5)	Use of home care technology and proportion of renal dialysis patients using home dialysis (E2)	

6 STRENGTHS AND WEAKNESSES OF THE BELGIAN HEALTHCARE SYSTEM AS APPEARING FROM THE CURRENT SET OF PERFORMANCE INDICATORS

This chapter should be considered as a prototype of how a performance report could look like.

The results of 55 included performance indicators will be used in the present chapter to describe the performance of the Belgian healthcare system. The most recent data are used, in many cases corresponding to 2007. For each dimension of performance, facts and figures will be given first, with an interpretation and open questions discussed afterwards. For a detailed discussion of each individual indicator, appendix 4 can be consulted. It should be kept in mind that this is a pilot study and that many gaps were identified as to data availability. Above this, not all performance dimensions are fully covered by performance indicators, resulting in a narrow evaluation of these dimensions. The interpretation of the results should therefore be done with caution.

For each of the performance dimensions discussed below, some theoretical considerations discussed in chapter 3 are recapitulated to allow a better judgement of the results by the reader.

6.1 QUALITY OF HEALTHCARE

In 2006, the KCE already published a report on clinical quality indicators, which included a theoretical discussion on the definition of quality of healthcare [30]. The definition of quality used for the conceptual framework of the present report is largely based on the reflections of this 2006 report: 'the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge'.

Quality of healthcare is further subdivided into 5 sub-dimensions:

- Effectiveness: the degree of achieving desirable outcomes, given the correct provision of evidence-based healthcare services to all who could benefit but not those who would not benefit.
- Appropriateness: the degree to which provided healthcare is relevant to the clinical needs, given the current best evidence and the provider's experience.
- Safety: the degree to which the system has the right structures, renders services, and attains results in ways that prevent harm to the user, provider, or environment.
- Patient-centeredness: providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions.
- Continuity: the extent to which healthcare for specified users, over time, is smoothly organised within and across providers, institutions and regions and to which the entire disease trajectory is covered.

Effectiveness is discussed in chapter 6.1.1 to 6.1.3, each time focusing on a specific type of care as defined in the conceptual framework: preventive care and health promotion in chapter 6.1.1, curative care in chapter 6.1.2 and long-term and end-of-life care in chapter 6.1.3. The other quality of care dimensions are discussed in the subsequent chapters. Since no indicators were selected on patient-centeredness, this dimension is not discussed separately.

6.1.1   Effectiveness of preventive care

Preventive care is healthcare that stresses healthy behaviour, regular testing, screening for diseases, and other services that detect health problems early on or prevent them from occurring. In Belgium, preventive care falls under the responsibility of the regions. In 2007, 1328 million € was spent on prevention and public health services in Belgium.

Indicators

- Proportion of women age 50-69 having received screening mammotest within the last two years (QE1)[5]
- Proportion of women age 50-69 having received a mammogram within the last two years (QE1.1)[5]
- Proportion of women age 25-64 having received a Pap test within the last three years (QE2)[6]
- Proportion of individuals age 50 and older having received a FOBT within the last two years (QE3)
- Proportion of the at risk population that received a dose of influenza vaccine in the past year (QE4)
- Proportion of children who, by their second birthday, have been fully immunized against (QE5):
  - Diphtheria
  - Pertussis
  - Tetanus
  - Haemophilus influenzae type b (Hib)
  - Measles
  - Mumps
  - Rubella
  - Meningococcus
- Age/sex standardized acute care hospitalization rates for (QE6):
  - a. pneumonia
  - b. influenza

  per 100 000 population at risk
- Percentage of adolescent smokers (QE7)
- Consumption of fruit and vegetables (QE7.1)
- Alcohol consumption (QE7.2)
- Salt consumption (QE7.3)
- Breast feeding (QE8)
- Annual check-ups at the dentist (QE9)
- Decayed, missing, filled teeth at age 12 (QE10)
- Cardiovascular screening in individuals age 45-75 (QE11)

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[5]   Because of feasibility reasons, these indicators can only be calculated for women aged 50-69.

[6]   Because of feasibility reasons, this indicator can only be calculated for women aged 28-64.

6.1.1.1   Facts and figures

Screening

Population screening is a generalised and structured form of screening, and should be distinguished from opportunistic screening (patient's or physician's initiative). In Belgium, population screening is a regional responsibility. At the moment, a screening programme is implemented for breast cancer and the set-up of a programme for colorectal cancer screening is currently being piloted. Despite the European recommendations, no screening programme exists for cervical cancer screening yet.

Both the coverage of breast cancer screening in women aged 52-69 and of opportunistic cervical cancer screening in women aged 28-64 are increasing in recent years. In 2007, about 1 in 3 women aged 52-69 underwent a mammotest (within the screening programme), while another 1 in 3 women aged 52-69 underwent an other mammogram outside the screening programme. The total mammogram coverage is about the same for all ages between 52 and 69, although the rate of other mammograms slightly decreases with age. In comparison to other countries (especially the Nordic countries and the Netherlands), the coverage is moderate to low.

To improve the participation rate of the organised breast cancer screening with mammotest, awareness campaigns should be continued, emphasizing the good quality and usefulness of the test and the fact that it's for free. The characteristics of the women who never participated and the reasons for their attitude should be studied.

Also for cervical cancer, the opportunistic screening covers almost 2 in 3 women within the target population. However, the coverage clearly decreases with age. While the age group of 28-39 has a screening coverage of more than 70% in 2007, the age group of 60-64 has only a participation rate of less than 50%. With this coverage, it is estimated that about 1400 cervical cancer cases are avoided each year [82]. However, to diminish the mortality rate, more women should undergo a screening test. Again, compared to other countries, the coverage is moderate to low.

No data are yet available on colorectal cancer screening. At present, this screening is still opportunistic except for some ongoing experiments.

Vaccination

The coverage of influenza vaccination in the 65+ population has remained quite constant for the last three years. However, there is an increasing number of outpatient influenza vaccinations between 2004 and 2008. The total coverage in the 65+ population was about 63% in 2006. With this coverage rate, Belgium has an average score in Europe (Figure 3).

Figure 3: Evolution of proportion of influenza vaccinations in persons aged 65+ in selected OECD countries between 1995 and 2006.
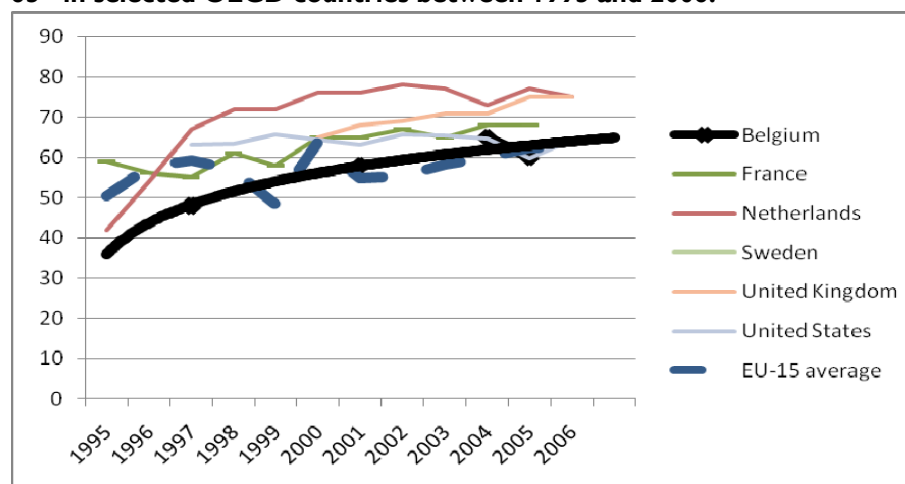
The acute care hospitalization rate for pneumonia slightly increased between 2004 and 2005 (from 952 to 1051 admissions per 100 000 inhabitants). The acute care hospitalization rate for influenza also increased, reaching a rate of 18.35 per 100 000 inhabitants in 2005. In both cases, men were relatively more affected than women.

Better results are found for the vaccination coverage in children. In recent years, the coverage rates for all vaccines increased, being above 90% for all vaccines. When compared internationally, Belgium has an average score for vaccination coverage of mumps, rubella and measles. However, the vaccination coverage of diphtheria, pertussis, tetanus and Haemophilius influenzae type B is amongst the highest worldwide.

To ameliorate vaccination rates, several factors are important. The knowledge and motivation of the population should be adequate, vaccinations should be maximally accessible to the target group, and the vaccination programme should coherent and relevant.

Health promotion

The overall tendency in the field of health promotion is positive. When looking at the evolution in time, a positive evolution can be noticed for several indicators. There were less smokers on a daily basis in Belgium in 2004 (23.7%) than in 1997 (25.5%), more people consumed at least as much as vegetables as recommended, and the percentage of children breastfed also increased. However, the percentage of people consuming fruit on a daily basis slightly decreased from 61% in 2001 to 59% in 2004. Furthermore, the percentage of problematic drinkers increased from 13.9% in 2001 to 18.2% in 2004.

To study inequalities, several characteristics, such as gender, educational level, age, employment status, geographic distribution, origin, and the level of income were taken into account. Women manifest more health conscious behaviour than men. The proportion of female daily smokers and problematic drinkers is lower than the proportion of their male counterparts. There are also more women who consume fruit and vegetables on a daily base, and women more often meet the recommendations about the consumption of salt.

There are less smokers amongst highly educated people, who also tend to consume more fruit and vegetables. However, an inverse relation was seen with alcohol use: the proportion of problematic drinkers is the highest among highly educated people. In Wallonia, highly educated mothers tend to give breastfeeding longer than lower educated mothers. In Flanders, the relation is a little bit more complex: mothers with a university degree and mothers with lower or no education show the highest percentage of breastfeeding.

Considering the income level, more or less the same pattern is observed as with the educational level. People with a high income tend to smoke less, to have more chance to become problematic drinkers, to consume more vegetables, and to give longer breastfeeding to their children (at least in Wallonia).

The largest group of smokers and problematic alcohol users is the middle-age group. Mothers between 25 and 35 years are those who breastfeed their children the most.

In conclusion, although the tendency is positive, people with a lower socioeconomic status keep manifesting less health conscious behaviour than people with a higher socioeconomic status. Above this, the gender gap also remains.

Regular testing

In 2007, 22% of the children below 18 years went to the dentist for an annual check-up (Figure 4). This percentage was higher than in 2002 (15.6%). A peak was found in the group of children between 8 and 10 years. When comparing for example to the Netherlands (55.1% for children aged 0-12 years in 2007, 64.7% for young people aged 12-18 years) [83], these results are still poor.

Recent data on the average number of decayed, missing or filled teeth at age 12 – a frequently used indicator – are not available for Belgium, but will be in 2011.

No data are available on the rate of cardiovascular screening in Belgium.

Figure 4: Percentage of children aged <18y who underwent at least one annual dental check-up, 2002 – 2007.
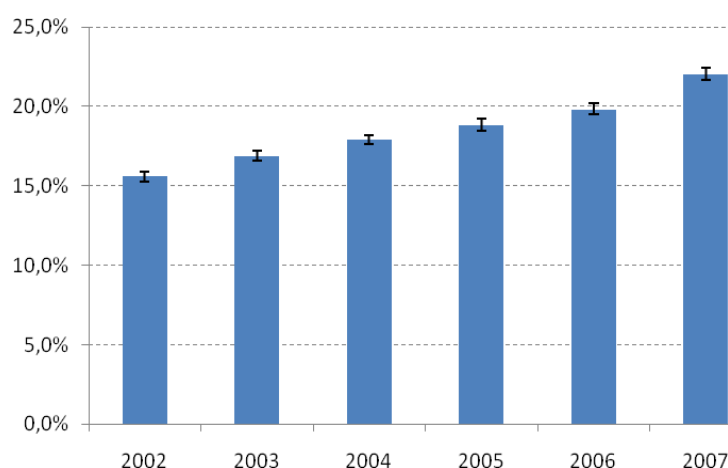
6.1.1.2   *Discussion*

The overall results of the effectiveness of preventive care are moderate to good. There is a positive tendency concerning screening (although the coverage of breast and cervical cancer screening remains moderate to low compared to other countries), vaccination, health promotion and regular testing, although there is still room for improvement. In particular, specific target groups do not seem to be reached enough, e.g. low-educated people and people with a low income. As to cancer screening, an evaluation of the success of screening programmes in other countries could be useful for Belgium. Also, further research is needed to evaluate the characteristics of the women who never participated and the reasons for this.

Key points

> - **The coverage of breast cancer and cervical cancer screening is increasing. However, it remains moderate to low compared to other countries.**
>
> - **While the immunization rate against influenza remains constant, the vaccination coverage of children has increased. For the vaccination against diphtheria, pertussis, tetanus and Haemophilius influenzae type B, the coverage is amongst the highest worldwide.**
>
> - **When looking at the health promotion indicators, in general there is a positive evolution. Certain target groups need to be reached more accurately.**
>
> - **The percentage of children aged <18y who underwent at least one annual dental check-up increased to 22% in 2007. Internationally, this remains a low score.**

6.1.2   Effectiveness of curative care

Curative care is healthcare that tends to overcome disease, and promote recovery. As in other countries, curative care is by far the largest sector within the Belgian healthcare system, covered by more than 15 billion € in 2007 according to the System of Health Accounts (see below).

Indicators

- Colon cancer 5-year survival rate (QE12)
- Infant mortality (QE13)
- Premature mortality (QE13.1)
- Breast cancer 5-year survival rate (QE14)
- Cervical cancer 5-year survival rate (QE15)
- In-hospital mortality after hip fracture (QE16a)
- In-hospital mortality for community-acquired pneumonia (QE16b)

6.1.2.1   *Facts and figures*

Cancer survival

At present, 5-year survival data are not yet available in Belgium on a national level. Until 1997, mortality data from the Belgian regions (which are necessary to calculate the survival) were merged and published by the General Direction of Statistic and Economic Information of the Federal Government [84]. These data were also used for the OECD Health data [85]. For 1998 and 1999, mortality data are also available for the 3 regions, without being merged. Between 2000 and 2003, mortality data were only available for the Flemish and Brussels Capital Region, but not for the Walloon Region.

In 2004, the mortality data were again available for the 3 regions, and were merged by the Belgian Cancer Registry (BCR) to calculate the Belgian cancer mortality [84]. These data show that for 2004 lung cancer was by far the most important cause of death by cancer in males (4 828 deaths), followed by colorectal cancer (1 453 deaths) and prostate cancer (1 377 deaths). For women, breast cancer is the most important cause of death by cancer (2 286 deaths), followed by colorectal cancer (1 388 deaths) and lung cancer (1 274 deaths).

By spring 2010, the BCR will have 1-year and 3-year survival data available for the period 2004-2005.

Infant and premature mortality

Both infant and premature mortality are widely used indicators. As a measure of unfulfilled life expectancy, the premature mortality rate is a measure that gives more weight to the death of younger people than of older people. Infant mortality is therefore an important contributor to the premature mortality.

As for cancer mortality, no national data on infant and premature mortality are available for Belgium in the absence of regular data from the Walloon Region since 1998. When only considering the data from the Flemish and Brussels Capital Regions, a decline of the infant mortality can be noticed between 1998 and 2006 (Table 27). A similar trend is also observed internationally (Figure 5). Both regions perform well in comparison to other countries, and score around the EU-15 average (3.6 deaths/ 1 000 live births in 2006). Nordic countries, such as Sweden perform clearly better, while the US has a much higher infant mortality.

Table 27: Evolution of the infant mortality (deaths/ 1 000 live births) in the Flemish and Brussels Capital Region, 1998 – 2006.

Year	Flanders	Brussels
1998	5.1	5.7
1999	4.8	5.2
2000	4.7	5.2
2001	4.5	4.6
2002	4.3	5.1
2003	4.3	5.8
2004	3.9	4.5
2005	3.9	3.3
2006	4.2	3.7

Figure 5: Evolution of infant mortality (deaths/ 1 000 live births) in selected OECD countries, 1995 – 2006.
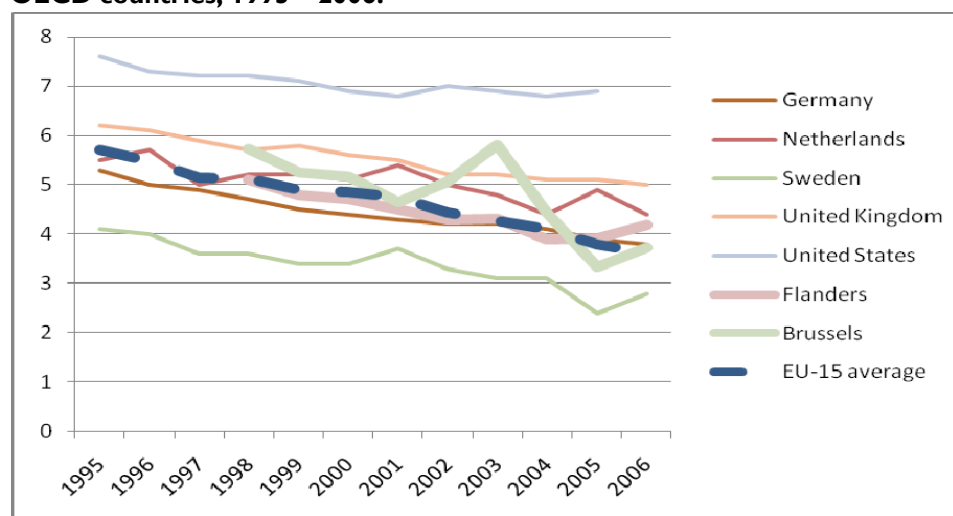
In-hospital mortality

In-hospital mortality is a strong outcome indicator of in-patient care. Both the prevention of complications and the effective treatment of these complications when they occur can reduce the in-hospital mortality. In-hospital mortality was calculated for 2 clinical conditions for the present report: hip fracture and community-acquired pneumonia (CAP). The in-hospital mortality after hip fracture slightly declined from 7.8% to 7.5% between 2004 and 2007, while the in-hospital mortality after CAP declined from 15.2% to 13.6% in the same period (Table 28). For both conditions, the mortality rate increased with age and was higher in males than in females. Importantly, the mortality rates are high compared to those reported by the AHRQ in the US (hip fracture: 7.5% vs. 3.01% in 2007; CAP: 13.6% vs. 5.49% in 2007) [86].

Table 28: In-hospital mortality after CAP and hip fracture, 2004 – 2007.

Year	CAP			Hip fracture		
	Rate	Fatalities	Cases	Rate	Fatalities	Cases
2004	15,2%	4 257	28 013	7,8%	912	11 737
2005	13,9%	4 319	30 992	7,7%	912	11 827
2006	14,5%	4 084	28 178	7,4%	883	11 930
2007	13,6%	4 179	30 640	7,5%	894	11 932

6.1.2.2 *Discussion*

For the evaluation of the effectiveness of curative care in this report, 7 outcome indicators related to mortality were selected. Most of these indicators are not measurable yet due to a lack of national data on causes of mortality. In-hospital mortality after hip fracture and CAP were found to be high compared to the US. This warrants a more in-depth analysis with adequate risk-adjustment (e.g. for comorbidities).

That the choice of these indicators provides an incomplete picture of the real effectiveness of curative care is clear. Ideally, in future reports on the Belgian healthcare performance, other outcomes and process and structure indicators related to these outcomes should be added.

Importantly, national mortality data will be available again in the near future.

Key points

- **Cancer mortality data and data on infant mortality and premature mortality are not yet available on a national level in Belgium. Data on causes of mortality are urgently needed for Belgium.**

- **Infant mortality has decreased in the Flemish and Brussels Capital Region to 4.2 and 3.7/ 1 000 live births respectively in 2006. In recent years, infant mortality fluctuated around the EU-15 average in both regions (3.6/ 1 000 live births in 2006).**

- **Compared to the US, in-hospital mortality rates after hip fracture and community-acquired pneumonia are high in Belgium. These results warrant more in-depth analysis with adequate risk-adjustment. In-hospital mortality rates for other conditions should also be examined.**

6.1.3 Effectiveness of long-term and end-of-life care

Long-term care covers a variety of services which help meet both the medical and non-medical needs of people with a chronic illness or disability who cannot care for themselves for long periods of time. End-of-life care involves the care of a person during the last part of their life, from the point at which it has become clear that the person is in a progressive state of decline.

According to the Health Interview Survey of 2004, 23.8% of the population has one or more long-standing illnesses, chronic conditions or handicaps [87]. As the population is ageing, the use of long-term care is expected to increase in the near future. In 2007, 21% of the total healthcare expenditure was spent on rehabilitative and long-term nursing care (see indicator S1).

For the present report, no indicators were found concerning end-of-life care. One indicator was selected concerning the effectiveness of long-term care.

Indicator

Number of diabetes-related major amputations per 10 000 diabetics aged 18-75

6.1.3.1 *Facts and figures*

Diabetes is a chronic metabolic disorder that can lead to microvascular and macrovascular complications, sometimes necessitating amputation. Adequate glycaemic control and treatment of other cardiovascular risk factors is known to prevent these diabetic complications. According to the Health Interview Survey, the self-reported prevalence of diabetes in Belgium rose from 2.3% in 1997 to 3.5% in 2004 [87]. However, the exact prevalence of diabetes in Belgium is unknown. Above this, the number of Belgian diabetic patients attaining internationally accepted treatment goals is unknown. Outcome indicators, such as the amputation rate, can evaluate the effectiveness of diabetic treatment.

In 2006, the diabetes lower extremity amputation rate was 21.32 per 100 000 Belgian population aged 15 or older, with more men than women undergoing amputations (33.56 vs. 11.63). Comparison with other countries is impossible at present, because different denominators are used.

6.1.4 Appropriateness

The dimension appropriateness is very much linked to effectiveness: where effectiveness is mainly linked with desirable outcomes, appropriateness concerns the provision of healthcare to the right person to reach these outcomes. This strong link between effectiveness and appropriateness explains why some of the indicators listed below are considered to be part of effectiveness in other performance systems [10, 83].

For the evaluation of appropriateness of healthcare, 7 indicators were selected. Two additional indicators categorized as safety indicator were also deemed explicative of appropriateness.

Indicators

- Percentage of cases in which GPs prescribe according to guidelines (QA1)
- Proportion of women age <50 or >71 who report receiving screening mammograms within the last two years (QA2)
- Utilisation of minimal and non-invasive surgical techniques (QA3a)
- Speed of diffusion of minimal and non-invasive surgical techniques (QA3b)
- Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes (QA4)
- Caesarean sections per 1000 live births (QA5)
- Hysterectomy by social class (QA6)
- Number of antibiotic prescriptions (QS6.1)
- Medical radiation exposure of the Belgian population (QS7)

6.1.4.1 Facts and figures

Adherence to guidelines

A classical indicator of appropriateness is the adherence to guidelines. The problem with such an indicator is that for its measurement often clinical information is needed. Although a mass of information is available in Belgium through administrative databases, this clinical information is mostly lacking. That is the reason why the adherence to 3 recommendations selected for this project (Table 29) is not measurable at the moment.

Table 29: Recommendations selected for the evaluation of the adherence to guidelines.

- Number of women with uncomplicated urinary tract infection that are treated with trimethoprim or nitrofurantoin for 3 days
- Number of individuals with acute otitis media that are not treated with antibiotics
- Number of individuals with uncomplicated hypertension that are treated with diuretics or betablocking agents

Nevertheless, interesting information on the appropriateness of care is already available from several KCE reports and NIHDI studies. For example, in the KCE report on medical houses [88], several appropriateness indicators were calculated, showing differences in the provision of care for some pathologies according to the type of healthcare provider. Differences in practice were also found for rectal cancer in the PROCARE project [89], for preoperative investigations (http://www.riziv.fgov.be/care/nl/hospitals/feedback-hospitals/index.htm), for the prescription of antibiotics (http://www.riziv.fgov.be/care/nl/doctors/promotion-quality/feedbacks/feedback-antibiotics/index.htm) and antihypertensive agents (http://www.riziv.fgov.be/care/nl/doctors/promotion-quality/feedbacks/feedback-antihypertenseurs/index.htm) and for prenatal care

(http://www.riziv.fgov.be/care/nl/doctors/promotion-quality/feedbacks/feedback-prenatal/index.htm).

When clinical data are lacking, the use of proxy indicators can provide a solution. An example of such a proxy indicator is the medical radiation exposure. In 2004, national guidelines about the referral for diagnostic imaging were elaborated by the Consilium Radiologicum [90], stressing the need to reduce the medical radiation exposure by promoting the use of newer technologies (e.g. MRI) requiring less irradiation. Despite these recommendations, the medical radiation exposure in Belgium rose from 2.15 to 2.42 mSv per capita between 2005 and 2008. The most important contributor to medical radiation is CT, accounting for 52.6% of the medical radiation in 2005 and even 58.4% in 2008 (Figure 6). The contribution of X-rays and scintigraphies is decreasing. Compared to other European countries, Belgium has a high medical radiation exposure. For 2002, the Netherlands reported a medical radiation exposure of 0.45 mSv per capita.

Figure 6: Relative contribution to medical radiation by type of examination.
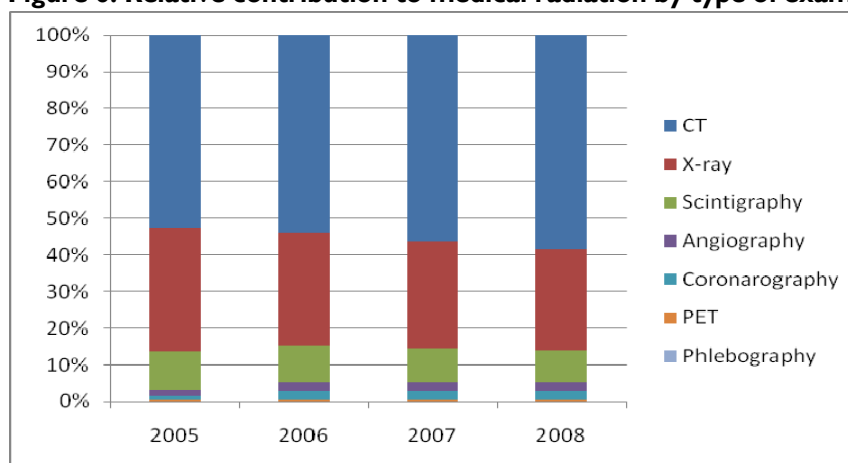
Total mammogram rate in women not eligible for population screening

Since 2001 in Flanders and 2002 in Brussels and Wallonia, a national breast cancer screening programme exists for women aged 50-69 using the mammotest. The extension of the scope of this programme to younger (40-49) and older age categories (70-79) remains controversial, and will be the subject of an upcoming KCE report in 2010.

Table 30 gives the percentage of women aged 40-49 or 72-79 having had a mammogram during the previous 2 or 3 years in the period 2004-2007. Opportunistic screening seems to be common practice in women aged 40-49, with more than one third having had a mammogram. Beyond the age of 72 years, opportunistic screening becomes less common. However, for both age categories, the rate increased between 2004 and 2007. Importantly, available data do not allow distinguishing between diagnostic mammograms and mammograms done for opportunistic screening.

Table 30: Mammogram rate in women aged 40-49 or 72-79, 2004 – 2007.

Age	Year	Mammogram received during the previous	
		2 years	3 years
40-49	2004	32.0%	38.5%
40-49	2005	33.6%	39.4%
40-49	2006	34.4%	40.4%
40-49	2007	34.7%	41.3%
72-79	2004	15.6%	20.0%
72-79	2005	16.3%	20.7%
72-79	2006	17.3%	21.9%
72-79	2007	18.4%	23.1%

Appropriate patient selection

The use of minimal-invasive techniques is a means for reducing postoperative complications, length-of-stay and costs. However, these techniques are not considered appropriate for all patients and careful patient selection is necessary. Two techniques were analysed in more detail for the present report: laparoscopic cholecystectomy and PTCA. Of all cholecystectomies performed in 2004, 85.6% were laparoscopic. This rate slightly rose to 86.7% in 2005. Between 2000 and 2005, the trend was slightly upwards in Belgium (Figure 7) and in line with that of other countries.

Figure 7: Evolution of the rate of laparoscopic cholecystectomies in selected OECD countries, 2000 – 2005.
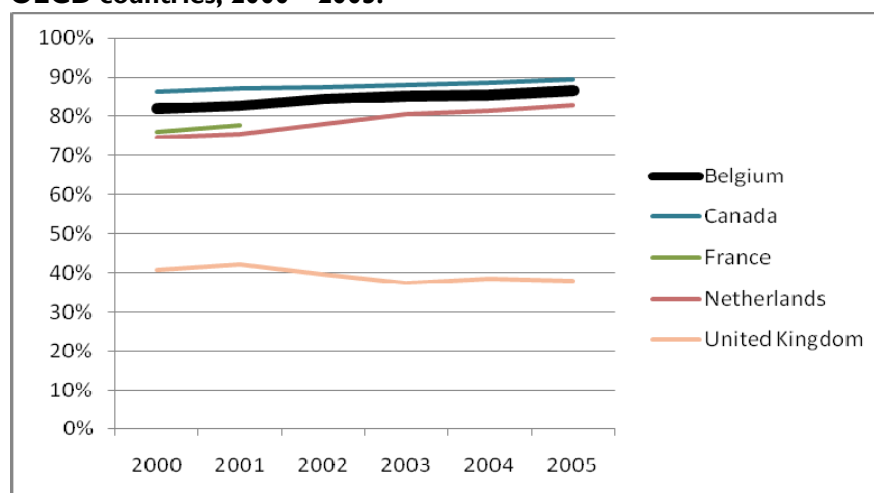
Of all revascularisation procedures ([invasive] CABGs and [non-invasive] PTCAs) performed in 2004, 73.1% were PTCAs. In 2005, the percentage of PTCAs rose to 74.6%. Similar to the rate of laparoscopic cholecystectomies, the percentage of PTCAs is gradually increasing (Figure 8), not only in Belgium but also in other OECD countries.

Figure 8: Evolution of the rate of PTCAs in selected OECD countries, 2000 – 2005.
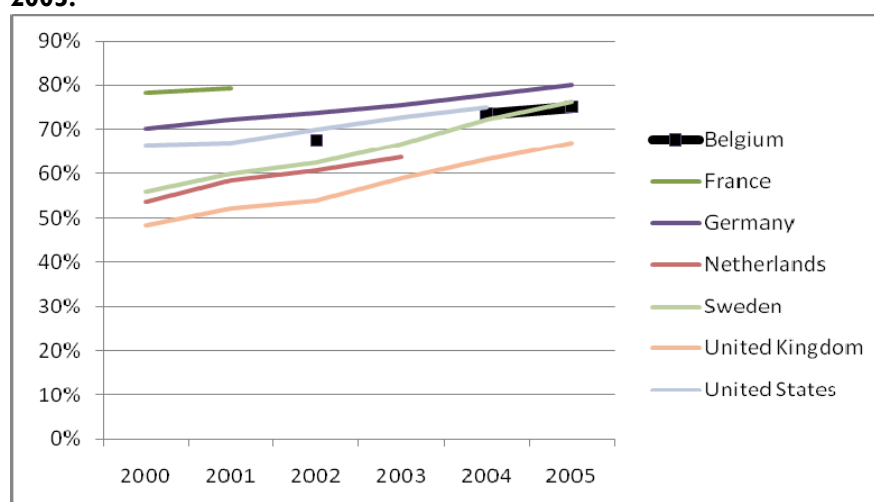
Importantly, to evaluate if this upwards trend is justified (i.e. appropriate), clinical information on the indication is needed for each individual patient receiving one of these procedures. Unfortunately, this information is lacking.

Another classical indicator of appropriateness is the caesarean section rate. The indication for a caesarean delivery largely depends on patients' clinical characteristics, but it is known that individual physician practice patterns account for a significant portion of the variation in the caesarean section rate.

As in other OECD countries, the number of caesareans per 1 000 live births is increasing in Belgium (Table 31). Nevertheless, Belgium stays well below the EU-15 average (Figure 9). Only the Netherlands, Finland and Sweden have a lower number.

Table 31: Evolution of the number of caesarean sections (CS) in Belgium between 1998 and 2004.

Year	CS/1 000 live births	Absolute number of inpatient CS
1998	144.4	16 496
1999	159.2	18 173
2000	158.0	18 149
2001	174.0	19 864
2002	181.9	20 235
2003	187.7	21 045
2004	187.8	21 710
2005	192.9	22 759
2006	198.6	24 105

Figure 9: Evolution of the number of caesarean sections per 1 000 live births in selected OECD countries between 1995 and 2006 (source: OECD).
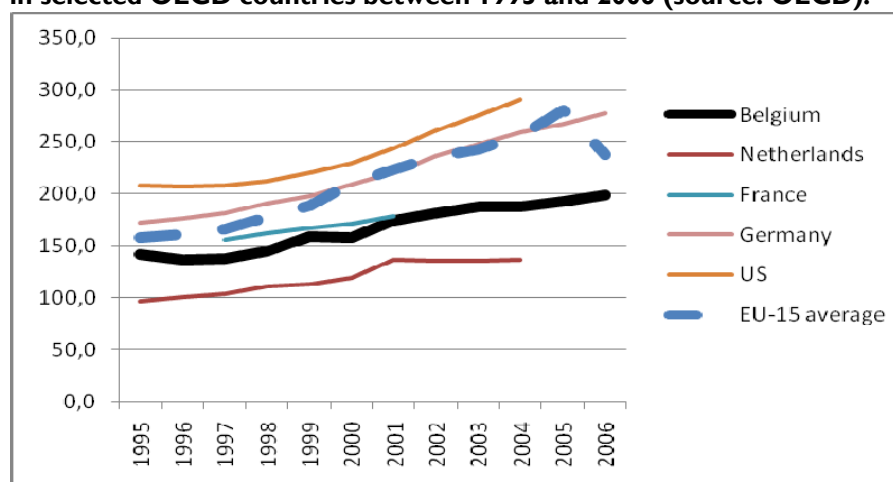
Finally, the rate of hysterectomies was also considered to be a relevant indicator of appropriateness, since a report of the Christian Sickness Funds published in 1999 showed important regional differences in the incidence of hysterectomies in Belgium [91], raising an important question about the correct indication of hysterectomy. Between 2002 and 2007, the global rate of hysterectomies per 1 000 adult women (18+) decreased from 3.67 to 2.80. In 2007, the highest rates were found in women aged 45-49 (6.82 per 1 000 women). The only social variable that was found to have an association with the rate of hysterectomies was the maximum billing system (MAB) ceilings categorisation (see chapter 6.5). In comparison to other countries, Belgium was found to have a high rate (vaginal hysterectomy only).

6.1.4.2   Discussion

Appropriateness of care is a performance dimension where a lot of improvement is possible and needed. Several indicators and reports suggest important differences in practice, raising questions about the implementation of published guidelines. Ideally, strategies to implement guidelines should accompany these guidelines once published. To evaluate this dimension in more detail, available databases (such as the Permanent sample) should be explored to create new indicators.

Key points

- **For the evaluation of appropriateness of care, clinical information is needed in addition to administrative data. However, this clinical information is often lacking. To evaluate this dimension in more detail, available databases (such as the Permanent sample) should be explored to create new indicators.**

- **Despite the existence of recommendations on the referral for diagnostic imaging, the medical radiation exposure in Belgium rose from 2.15 to 2.42 mSv per capita between 2005 and 2008. The most important contributor to medical radiation is CT (58.4% in 2008).**

- **Opportunistic breast cancer screening seems to be common practice in women aged 40-49, with more than one third having had a mammogram. Beyond the age of 72 years, opportunistic breast cancer screening becomes less common.**

- **The rate of laparoscopic cholecystectomies and PTCAs is increasing, although the appropriateness of this increase is unknown due to a lack of clinical data.**

- **The rate of caesarean sections is increasing in Belgium (198.6 per 1 000 live births in 2006). Nevertheless, Belgium stays well below the EU-15 average.**

- **Between 2002 and 2007, the rate of hysterectomies per 1 000 women decreased from 3.67 to 2.80, which is still high compared to other countries. The MAB ceilings categorisation was the only social variable found to have an association with the rate of hysterectomies.**

6.1.5 Safety

Patient safety is the protection against unnecessary harm caused by healthcare. However, from a societal perspective safety in healthcare is a much broader concept, also encompassing healthcare providers and the environment. Eight specific indicators were selected for this dimension.

Indicators

- Incidence of serious adverse effects of blood transfusion (QS1)
- Incidence of healthcare-related infections (QS2)
- Incidence of decubitus ulcers in hospitals (QS3)
- Incidence of postoperative surgical site infections (QS4)
- Incidence of decubitus ulcers in a) long-term care facilities and b) in individuals at risk (QS5)
- Number of nosocomial MRSA infections (QS6)
- Number of antibiotic prescriptions (QS6.1)
- Medical radiation exposure of the Belgian population (QS7)

6.1.5.1 Facts and figures

Healthcare-related infections

According to the European Centre for Disease Control and Prevention, more than 4 million persons are estimated to acquire a healthcare-related infection in the EU every year (www.ecdc.europa.eu). The number of deaths occurring as the direct consequence of these infections is estimated to be at least 37 000. The most frequent infections are urinary tract infections, followed by respiratory tract infections, postoperative infections and bloodstream infections. Multi-resistant Staphylococcus aureus (MRSA) is isolated in approximately 5% of all healthcare-related infections. Approximately 20–30% of the healthcare-related infections are considered to be preventable by intensive hygiene and control programmes.

In Belgium, data of the surveillance of postoperative wound infections (July 2001 – December 2003) showed that the cumulative incidence and incidence density of postoperative infections was very high compared to other countries. Especially the incidence of infections after colon surgery and hip replacement was higher than in other countries.

The incidence of nosocomial septicaemia decreased from 7.2 infections per 1 000 admissions in 2005 to 6.1 in 2008. In the period 1997-2003, 6% of the patients staying in an intensive care unit acquired a pneumonia, while 2.1% acquired a bacteraemia. Compared to other European countries, Belgium has an average incidence of infections in patients staying in an intensive care unit. The incidence of nosocomial Clostridium difficile infections increased in the first semester of 2008, but decreased again in the second semester. A positive evolution of nosocomial multiresistent Enterobacter aerogenes was found.

The incidence of nosocomial MRSA infections peaked in 2004 (3.25 per 1 000 admissions), but decreased to 2 per 1 000 admissions in 2008. The application of the recommendations for the control of MRSA (since 2003), the national hand hygiene campaigns, and the rationalization of the use of antibiotics probably influenced this positive evolution. Nevertheless, the interpretation of this indicator remains influenced by the MRSA screening practices which vary in rate and intensity between hospitals. Geographically, important differences were found: Wallonia and Brussels have a much higher incidence of nosocomial MRSA compared to Flanders (Figure 10).

Figure 10: Mean incidence of nosocomial MRSA by region (source: NSIH).
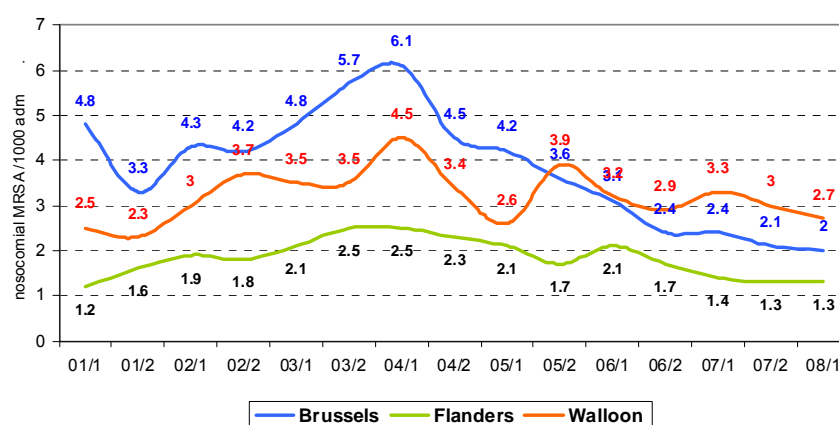
Importantly, where a decreasing trend was observed in the prescription rate of antibiotics between 1998 and 2004, in recent years the trend is again increasing. Compared to other countries, the AB prescription rate remains high (Figure 11).

Figure 11: Antibiotics (ATC J01) prescribed in Belgian, French, German, Dutch, Swedish and UK ambulatory care services (1997-2007)
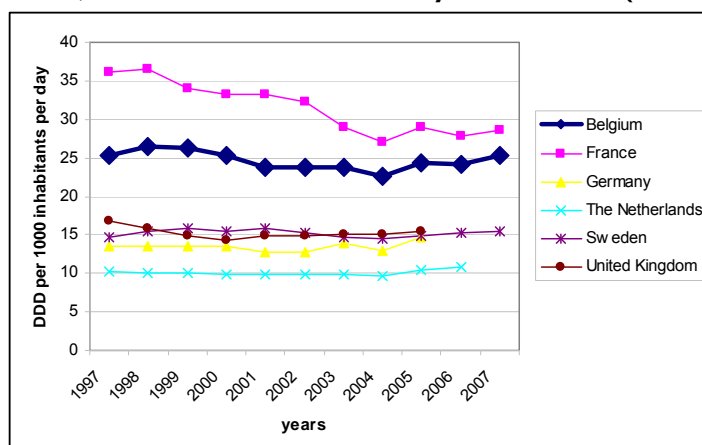
Serious adverse events after blood transfusion

The inpatient incidence rate of blood transfusions with adverse effects decreased from 0.0147 per 1 000 discharges in 2004 to 0.0096 per 1 000 discharges in 2005. This evolution is promising, although less favourable than the results presented by the AHRQ (0.004 per 1 000 discharges in 2007).

Incidence of decubitus ulcers

The inpatient incidence rate of decubitus ulcers increased from 14.85 cases per 1 000 discharges in 2004 to 16.29 cases per 1000 discharges in 2005. Compared to the AHRQ, this rate is relatively good (25.1 per 1 000 discharges in 2007). Women were more affected than men (17.58 vs. 14.88 per 1 000 discharges in 2005).

There are no data available about the incidence of decubitus ulcers in long-term care facilities and individuals at risk.

Medical radiation exposure

As stated above (see chapter 6.1.4), between 2005 and 2008 the medical radiation exposure increased to 2.42 mSv per capita, which is very high compared to other countries.

6.1.5.2   Discussion

A mixed picture was found concerning safety. While some indicators show a positive evolution (e.g. incidence of nosocomial MRSA infections), other indicators are less positive (e.g. medical radiation exposure). These results suggest that targeted actions are needed.

Key points

> - **Inpatient safety can be considered relatively good in Belgium, although the number of transfusion reactions is high compared to the US. This warrants further evaluation.**
>
> - **The incidence of nosocomial MRSA infections has decreased, but there are geographical differences.**
>
> - **Between 2005 and 2008, the medical radiation exposure increased to 2.42 mSv per capita, which is very high compared to other countries.**

6.1.6   Continuity

According to the definition used for the present project, continuity covers several aspects of healthcare:

- The extent to which healthcare for specified users, over time, is smoothly organised within providers, institutions and regions, i.e. continuity as such;
- The extent to which healthcare for specified users, over time, is smoothly organised across providers, institutions and regions, i.e. coordination;
- The extent to which the entire disease trajectory is covered.

One selected indicator measures the coordination of care considering the GP to be the central care provider. A second indicator measures the degree of continuity within acute care institutions using the length-of-stay as outcome parameter.

Indicators

- Number of people who are not registered with a GP (QC1)
- Average length-of-stay (QC2)

6.1.6.1   Facts and figures

By leaving the coordination of medical care to one central person, e.g. the GP, the quality of care is expected to increase. Referral to and communication with other care providers becomes more efficient, and double investigations or contrasting treatments can be avoided. In Belgium, no exact data are available on the number of citizens with a unique general practitioner. According to the Health Interview Survey of 2004, 95.1% of the Belgian population has a regular GP [87]. In comparison, in the Netherlands about 100% of the population has a regular GP for medical care [83].

Since 2002, the global medical file (GMD) is implemented in Belgium, where a patient can ask a unique general practitioner to manage his/her medical information. The percentage of the population with a GMD rose from 20.6% in 2002 to 32.9% in 2007. Important regional differences were found, with a higher use of the GMD in Flanders. Importantly, not having a GMD cannot be considered the same as not having a regular GP.

In recent years, there is a clear shift from inpatient care to outpatient and day care (see also chapter 6.3). Many institutions try to limit their length-of-stays by organising inpatient care more efficiently, e.g. through the use of protocols, guidelines or clinical pathways. Importantly, financial incentives to shorten the length-of-stay play an important role. As in other countries, the length-of-stay of acute stays declined in Belgium, reaching a mean of 6.74 days in 2005. Compared to the EU-15 average, the average length of stay in Belgium is about 1 day longer (Figure 12). Germany and the UK for example have a longer average length-of-stay than Belgium.

Figure 12: Evolution of the average length of acute stays in selected OECD countries between 1995 and 2006 (source: OECD).
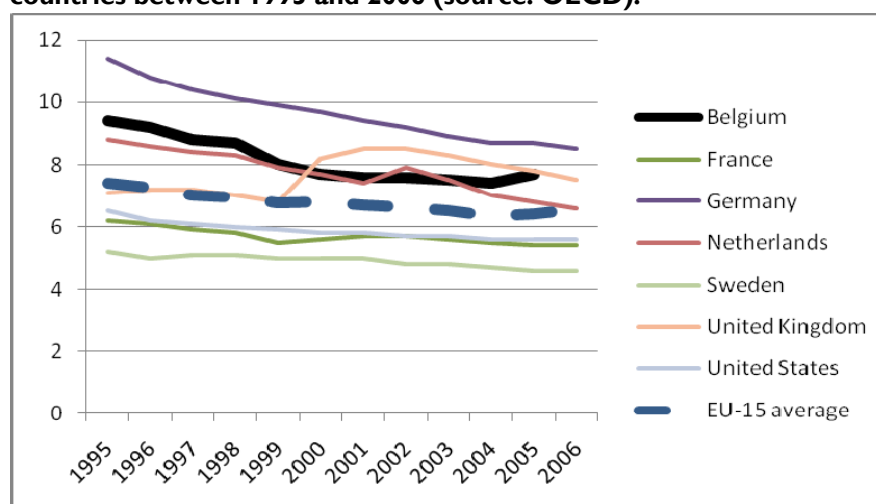
6.1.6.2   Discussion

Although it is difficult to compare with other countries, Belgium still is somewhat behind when it concerns centralisation of care with the GP as coordinator. Nevertheless, the percentage of persons with a GMD is clearly rising.

The decreasing length-of-stay of acute stays can be explained by several factors, coordinated care only being one of them. However, the evolution towards more ambulatory and day care (see also chapter 6.3) and the increasing need for a multidisciplinary approach of many diseases clearly asks for a good articulation of all treatment steps.

Key points

- **The percentage of Belgian inhabitants having a global medical file (GMD) is rising, reaching 32.9% in 2007. However, regional differences are important, and warrant targeted action.**

- **The length-of-stay of acute stays is declining in Belgium, but was about 1 day longer than the EU-15 average in 2005.**

6.2 ACCESSIBILITY OF HEALTHCARE

Accessibility is defined as the ease with which health services are reached in terms of physical access (geographical distribution), costs, time, cultural access (e.g. religion), psychological access, and availability of qualified personnel. Access requires that health services are a priori available.

The 8 indicators related to accessibility mainly cover accessibility in terms of costs and availability of qualified personnel, and to some extent also physical access. Indicators related to waiting times/lists, cultural or psychological access were not selected for this report.

Indicators

- Number of physicians and nurses per 100 000 population (A1)
- Insurance status of the population, including being uninsured (A2)
- Amount of co-payments and out-of-pocket payments (A3)
- Coverage of preventive child healthcare in high-risk groups (A4)
- Additional illness-related costs for chronically ill people (A5)
- Amount reimbursed by the maximum billing system (S1.1)
- Qualification levels of healthcare providers (S2)
- Annual amount of the Special Solidarity Fund (S4)

6.2.1.1 *Facts and figures*

Personnel availability

According to the data of the FPS Health, Food Chain Safety and Environment, the absolute number of physicians (i.e. all physicians, irrespective of their activity level) rose from 43 620 in 2005 to 44 727 in 2007 (Table 32). Importantly, the data of the FPS clearly show that the proportion of female doctors is increasing (Table 33).

Table 32: Evolution of the number of physicians in Belgium between 2005 and 2007 according to the FPS statistics.

	31/12/2005	31/12/2006	31/12/2007
Recognized GPs	14 412	14 464	14 519
GPs in training	584	503	510
Recognized specialists	21 599	22 256	22 890
Specialists in training	3 641	3 366	3 273
Physicians with particular license	3 692	3 772	3 992
Physicians with particular license in training	162	135	174
GPs with granted rights	3 477	3 647	3 651
All physicians living in Belgium*	**43 620**	**44 124**	**44 727**

Table 33: Evolution of the number of physicians in Belgium between 2005 and 2007 according to the data of the FPS, by gender.

	31/12/2005	31/12/2006	31/12/2007
Recognized physicians			
Males	68,4%	67,7%	67,0%
Females	31,6%	32,3%	33,0%
Physicians in training			
Males	43,4%	43,3%	42,1%
Females	56,6%	56,7%	57,9%

The estimation of the number of practising physicians in Belgium is much more difficult with the available data. For international comparison, the OECD uses the data available from the NIHDI (physicians 'in activity') (Table 34). Using these data, Belgium is estimated to have 4.03 physicians per 1 000 population, being amongst the highest densities in the world (Figure 13). When only taking into account the profiled physicians (i.e. physicians that provided at least 1 clinical service [consultations, visits, technical acts, but not prescriptions] during a given year or the 2 preceding years), the number of physicians per 1 000 population amounted 3.18 in 2007, which is below the EU-15 average (Figure 13). However, neither the data on physicians 'in activity', nor the data on profiled physicians take into account the real activity level of the physicians, and both can therefore be considered an overestimate.

Table 34: Evolution of the number of physicians in Belgium between 2005 and 2008 according to the NIHDI statistics.

	2005	2006	2007	2008
Recognized GPs[1]				
In activity	14 179	14 273	14 220	14 156
Profiled	12 760	12 724	12 656	
GPs in training[2]				
In activity	672	580	528	534
Profiled	421	396	353	
GPs with granted rights[3]				
In activity	3 365	3 174	3 185	3 218
Profiled	580	549	534	
Recognized specialists				
In activity	20 372	20 801	21 459	22 020
Profiled	17 864	18 175	18 719	
Specialists in training				
In activity	3 588	3 598	3 447	3 284
Profiled	1 652	1 619	1 484	
Total				
In activity	**42 176**	**42 426**	**42 839**	**43 212**
Profiled	**33 277**	**33 463**	**33 746**	

[1] NIHDI number 003-004 or 007-008; [2] NIHDI number 005-006; [3] NIHDI number 000-009, 001-002.

In 2008 the NIHDI published a study evaluating the number of active general practitioners and the number of full-time equivalents (FTE) in 2005 (http://www.riziv.fgov.be/information/nl/studies/study40/index.htm). Of the 18 473 generalists (= recognized GPs + GPs in training + GPs with granted rights) as recorded by the FPS in 2005 (Table 32), 18 216 were 'in activity' according to the NIHDI (Table 34). Of the generalists 'in activity', 13 761 were profiled. Only 12 097 of these had more than 500 patient contacts a year. Without the physicians working in medical houses, this corresponded to 8 642 FTE (defined as 41-42 working hours a week and 14-27 patient contacts a day).

Figure 13: Evolution of number of physicians per 1 000 population in selected OECD countries between 1995 and 2006.
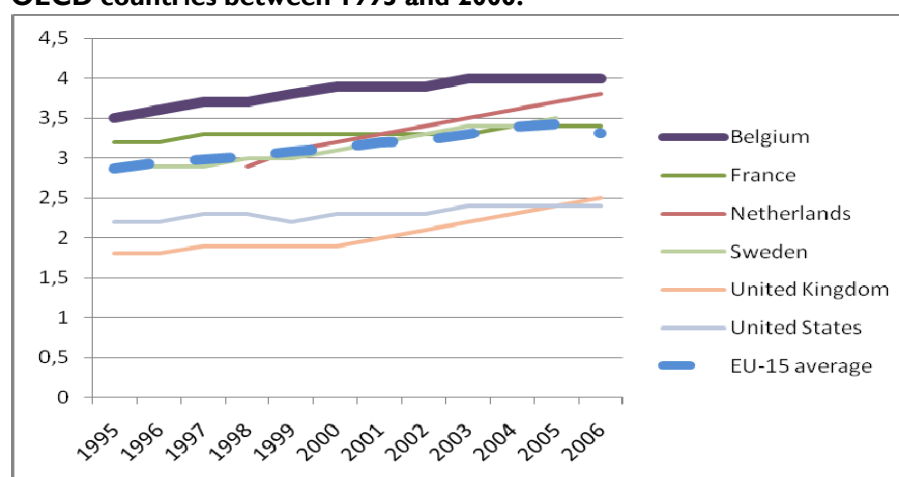
The number of active nurses in Belgium is even more difficult to estimate, since the NIHDI only acquires data on nurses with a NIHDI number, i.e. self-employed nurses and midwives. No reliable or recent data are available on the number of nurses working in hospitals or nursing homes.

In fact, the cadastre of nurses is in preparation and not up-to-date yet. Therefore, the exact calculation of the total number of nurses and the number of active nurses is impossible at the moment. Nevertheless, Pacolet estimated the number of active nurses using sector-specific sources of information, such as Finhosta, the data of the NIHDI, the Annual Report of the White-Yellow Cross, etc [92]. For the hospital sector, Pacolet et al. estimated the absolute number of nurses to be 69 218 in 2003, corresponding to 53 540 FTE. No recent data are available for other sectors, such as care homes, care and nursing homes and home care.

The yearly statistics of the NIHDI also provide an overview of the number of physicians per specialty and of other healthcare providers having a NIHDI number (http://www.riziv.fgov.be/presentation/nl/publications/annual-report/index.htm).   These data are discussed in more detail in chapter 6.4.

Financial access to care

While the proportion of uninsured Belgian inhabitants ranged between 0.6 and 0.8% until recently, a dip of 1.4% was noticed in 2007 (source: NIHDI). These data remain slightly better than those reported for the Netherlands (1.5% in 2006) [83], but slightly worse than other European countries, such as Sweden and the UK, who reach 100% (Figure 14).

Figure 14: Evolution of the health insurance coverage in Belgium and selected OECD countries, 1995 – 2007.
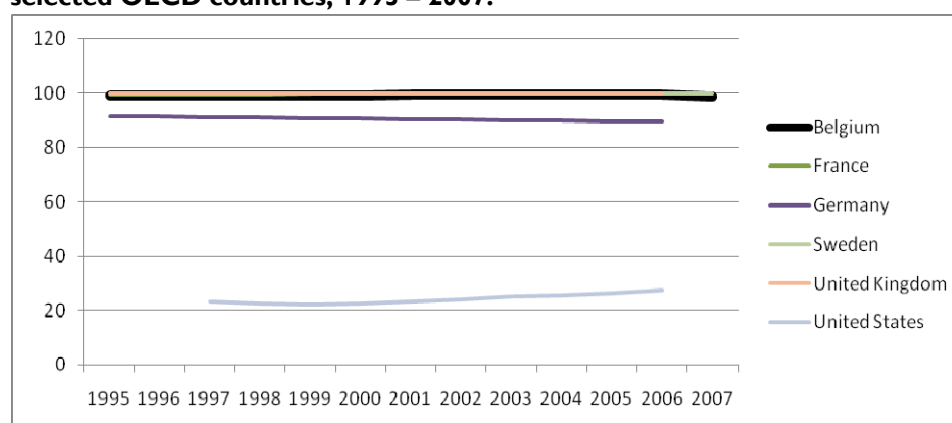
According to data of Assuralia, the percentage of individuals having a private insurance provided by a private insurer rose from 37.9% in 2001 to 49.8% in 2007 (http://www.assuralia.be/nl/stat/Gezondheid/index.asp). Data on private insurance provided by public insurers were unavailable at the time of this project.

Despite of being insured, households also spend money on the uninsured part of healthcare. Between 2003 and 2006, the out-of-pocket expenditure rose from 5.46 to 6.23 billion euro (Table 35). Per capita, the out-of-pocket expenditure rose from €526 in 2003 to €586 in 2007. Compared to other countries, Belgium has a high share of out-of-pocket expenses (19% of the THE in 2007). In the Netherlands, for example, out-of-pocket expenditure constituted only 6.2% of the total healthcare expenditure in 2006. In France and Germany, the out-of-pocket share was 6.9% and 13.7% respectively.

Nevertheless, caution is needed when comparing personal expenditures in different healthcare systems. The personal participation seems to be higher in Belgium, but contains all paramedical purchases, all non-reimbursed drugs, medical devices and materials. The net primes (primes minus reimbursements) paid to private insurers or mutualities are also included.

Table 35: Out-of-pocket expenditure in Belgium, 2003 – 2006 (source: FPS Social Security).

	2003	**2004**	**2005**	**2006**	**2007**
Out-of-pocket:					
- Absolute number*	5 458	5 812	5 743	5 691	6 227
- % of total	19,5%	19,0%	18,5%	18,0%	19.0%
- Per capita	526,05 €	557,68 €	548,11 €	539,53 €	586,03 €
Total healthcare expenditure*	27 387	29 488	30 838	31 675	32 774

* In million euro.

A population particularly vulnerable to additional healthcare costs are persons with a chronic illness or disability. At this moment, no data are available on the additional illness-related costs for these persons.

Social care nets

In Belgium, many social care nets are available to finance exceptional healthcare-related costs, such as the MAB, the OMNIO status, the system of preferential treatment, the regulation on orphan drugs, and the Special Solidarity Fund (SSF). Two social care nets are discussed in more detail, the MAB and the SSF.

The MAB was implemented in 2002. When certain income conditions are met, households whose total annual co-payments exceed a ceiling may benefit from reimbursement of co-payments. The system is articulated around different ceilings. The first ceilings are fixed at €450 and €650 for people with a low or modest income. Since the implementation in 2002, the total MAB reimbursements rapidly increased to € 289 million in 2006, afterwards slightly decreasing to € 277 million in 2008 (Table 36). In 2003, the € 199 million of the MAB reimbursements represented about 0.71% of the total healthcare expenditures. By 2007, this percentage rose to 0.87%.

Table 36: MAB reimbursements (in 1 000 euro), 2002 – 2007.

2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
87 646	198 987	238 266	252 843	288 916	286 575	277 153	304 211

The SSF is operational within the NIHDI since 1990. The SSF reimburses certain costs related to rare diseases, rare indications or the application of innovative techniques, which are not (yet) covered by the compulsory health insurance system in Belgium or any other channel (private insurance – reimbursement abroad).

The target audiences of the SSF are seriously ill patients for whom an expensive but not (yet) reimbursed treatment is essential. The amounts paid by the SSF peaked in 2004 (about € 15 million), reaching an amount of € 11.7 million in 2007 (Figure 15).

Figure 15: SSF Budget versus amounts granted and amounts paid since 1990.

Year	Budget (€)	Amounts granted (€)	Amounts paid (€)
1990	6.197.338	309.020	7.210
1991	6.197.338	767.080	321.838
1992	6.197.338	1.358.650	442.603
1993	2.478.935	1.837.150	1.211.662
1994	4.957.870	2.053.430	1.455.801
1995	497.870	1.704.630	1.363.069
1996	6.197.338	3.816.470	2.854.003
1997	6.197.338	4.802.780	3.889.873
1998	6.502.247	5.488.460	5.981.501
1999	5.453.658	5.974.000	5.248.924
2000	5.480.926	6.253.240	4.860.508
2001	8.061.497	6.600.120	8.477.758
2002	8.317.000	5.685.120	6.226.380
2003	13.017.000	14.235.080	14.430.593
2004	12.371.000	15.252.240	14.998.593
2005	22.377.000	7.184.528	7.031.980
2006	16.769.000	9.510.977	10.076.402
2007	22.090.000	11.205.651	11.661.714

Source: Annual report Special Solidarity Fund 2007

Access to preventive child healthcare

In the Flemish Community, almost 90% of the children visit a health centre of '*Kind en Gezin*' in their first year of life (Table 37). This percentage decreases with age (79.9% at the age of two, 54.8% at the age of three). In the French Community, the same trend was found (Table 38). In 2007, almost 75% of the children went to a health centre of ONE in their first year of life.

Table 37: Percentage children that visit a health centre of '*Kind en Gezin*' (source: K&G).

	1st year of life	2nd year of life	3th year of life
2000	82.0%	62.7%	
2001	82.8%	65.5%	
2002	83.5%	70.6%	
2003	85.9%	70.6%	50.7%
2004	86.7%	74.1%	55.0%
2005	88.1%	76.1%	54.0%
2006	88.9%	78.0%	55.2%
2007	89.3%	79.9%	54.8%

Table 38: Percentage children that visit a health centre of ONE (source: ONE).

	1st year of life	2nd year of life	3th year of life
2005	72.8%	70.4%	51.2%
2006	75.2%	71.6%	52.8%
2007	74.9%	72.0%	53.1%

6.2.1.2   *Discussion*

Healthcare accessibility in terms of personnel availability is difficult to evaluate in Belgium because of the absence of unequivocal data. This is true for the number of physicians, which is subject to discussion and different interpretations, depending on the source of information. However, this is even more true for other health professionals such as nurses and midwives. Accurate information on personnel availability is urgently needed in order to support the health personnel supply planning in Belgium.

In terms of financial access, the Belgian healthcare system is performing relatively well, thanks to the mandatory health insurance and the available social care nets. However, the share of out-of-pocket expenses seems to be high in comparison to other countries.

Small geographical differences in accessibility were found for preventive child healthcare.

Key points

- **The number of practising physicians 1 000 population is below the EU-15 average, although the exact number is difficult to estimate. No reliable data are available on the number of practising nurses and midwives. Accurate information on personnel availability is urgently needed.**

- **In 2007, 98.6% of the Belgian population was insured.**

- **The share of out-of-pocket expenditures was 19% of the total healthcare expenditures in 2006. This seems to be high compared to other countries.**

- **The available social care nets, such as the MAB and the Special Solidarity Fund, contribute to the financial accessibility of the Belgian healthcare system.**

- **The coverage of preventive child healthcare is moderate to good, with regional differences.**

6.3   EFFICIENCY OF HEALTHCARE

Efficiency is defined as the degree to which the right level of resources (i.e. money, time and personnel) is found for the system (macro-level) and ensuring that these resources are used to yield maximum benefits or results.

Two indicators were specifically selected for the dimension efficiency, but many others also provide information on the efficiency of the Belgian healthcare system.

Indicators

- Surgical Day Case Rates (E1)
- Use of home care technology and proportion of renal dialysis patients using home dialysis (E2)
- Utilisation of minimal and non-invasive surgical techniques (QA3a)
- Speed of diffusion of minimal and non-invasive surgical techniques (QA3b)
- Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes (QA4)
- Number of people who are not registered with a GP (QC1)
- Average length-of-stay (QC2)
- Healthcare expenditures according to the System of Health Accounts (OECD) (S1)
- Acute care bed days, number per capita (S6)

6.3.1.1 Facts and figures

Towards more ambulatory and day care

Carrying out elective procedures as day cases where clinical circumstances allow (e.g. inguinal hernia repair, circumcision, cataract surgery, etc.) saves money on bed occupancy and nursing care. The percentage of day cases amongst surgical cases rose from 33.5% in 1999 to 42.9% in 2005 (Figure 16). This is well above the EU-15 average (37.4% in 2005). This increasing trend is also observed in other OECD countries.

Figure 16: Evolution of surgical day case rate in selected OECD countries, 1995 – 2006 (source: OECD Health Data 2008).
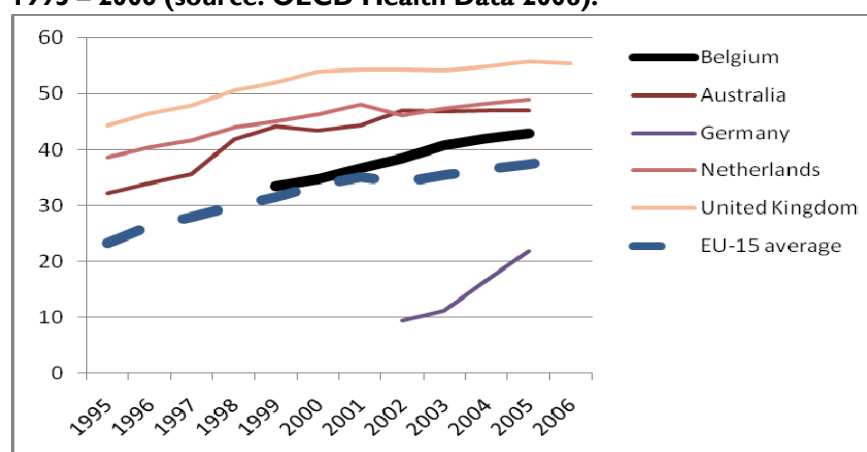
Substitution of the more expensive haemodialysis in hospital by the less expensive alternatives such as low-care haemodialysis in satellite centres and home peritoneal dialysis has been slower in Belgium than in many other countries. This is thought to be partly due to the financing mechanisms for dialysis. Since 1995, the Belgian government has modified the financing system a couple of times, with the explicit goal of introducing incentives for substitution. Overall, an increasing number of dialysis patients is identified (+12.1% between 2003 [n = 6 804] and 2006 [n = 7 630]). Furthermore, the proportion of home dialysis patients is increasing (+29.8% between 2003 [n = 554] and 2006 [n = 719]), mainly because of an increase in peritoneal dialysis (+32.8% between 2003 [n = 530] and 2006 [n = 704]). A decrease in home haemodialysis (-37.5% between 2003 [n = 24] and 2006 [n = 15]) is identified, although this concerns only small numbers. In younger age categories, the use of peritoneal dialysis is more prominent (Table 39). In the Netherlands, an opposite evolution was found, with a decrease in home dialysis from 33% in 2002 to about 25% in 2007 [83]. The relative decrease was mainly due to a drop in the number of peritoneal dialysis patients. On the contrary, the number of home haemodialysis patients rose between 1997 and 2007 from 91 to 128 respectively.

Table 39: Percentage of all dialysis patients receiving peritoneal dialysis per age category.

Age category	2003	2004	2005	2006
18-44 years	15,8%	19,1%	20,6%	20,7%
45-64 years	10,7%	11,2%	11,7%	12,6%
65-74 years	6,8%	7,8%	7,9%	8,7%
>= 75 years	4,4%	4,6%	5,2%	5,2%

6.3.1.2   *More efficient organisation of acute inpatient care*

As discussed in chapter 6.1.4, the use of minimal-invasive techniques is a means for reducing postoperative complications, length-of-stay and costs. For two therapeutic interventions, cholecystectomy and cardiac revascularisation, it was shown that the evolution is in favour of the minimal-invasive techniques. The penetration of these techniques into the Belgian hospital landscape is also positive: where the number of hospitals having ≥90% laparoscopic cholecystectomies was 53 (46.1%) in 2004, this number increased to 61 (52.6%) in 2005. For PTCAs, this evolution was also positive but less pronounced.

Many institutions use protocols, guidelines or clinical pathways to standardise well-defined care processes. Common examples are the care processes for prosthetic joint replacement, inguinal hernia repair, etc. However, the impact of the use of these instruments on patient outcomes still needs to be established in good-quality studies. Nevertheless, about two thirds of the Belgian acute hospital sites have clinical pathways for total hip and knee prosthesis and about 50% have clinical pathways for cerebrovascular accidents and diabetes.

The more prominent use of minimal-invasive techniques and the use of special protocols or guidelines outlining procedures for high risk or complex processes both contribute to a more efficient use of acute care services. In chapter 6.1.6, the decreasing length-of-stay of acute stays was already discussed. This decreasing trend coincides with a slow decrease in acute care bed days (Figure 17). The number of acute care bed days per capita was about 1.1 in 2004 and 2005. Over the last 10 years, the number of acute care bed days seems to be declining slightly in Belgium, although it is still above the EU-15 average.

Figure 17: Evolution of acute care bed days in selected OECD countries, 1995 – 2005.
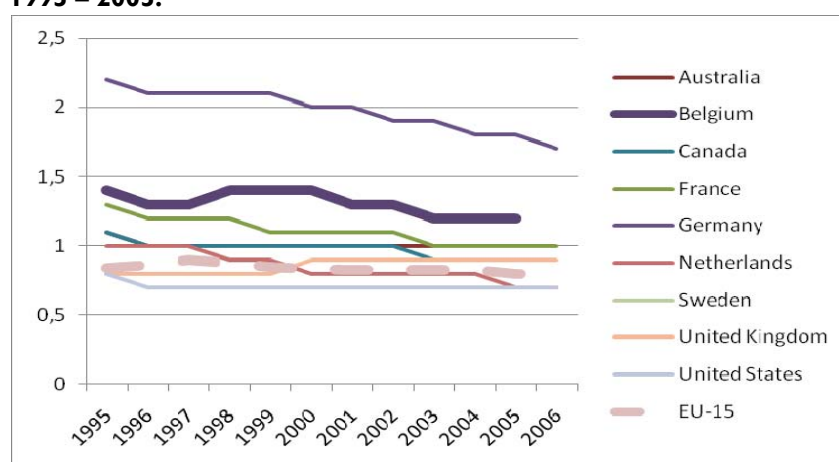
6.3.1.3   *Discussion*

As in other countries, the trend in Belgium is towards a more efficient use of care services. For some indicators, Belgium performs well, e.g. the surgical day case rate and the use of minimal-invasive techniques. For other indicators, such as the use of home care technology for renal dialysis patients, the average length-of-stay and the acute care bed days, the trend is also positive, although other countries are performing better. The same can be said about the percentage of persons with a GMD (see chapter 6.1.6), which is also an indicator of efficiency (e.g. avoidance of double investigations). Despite this positive evolution, the total healthcare expenditures keep rising (see chapter 6.4).

Key points

- **In 2005, the percentage of day cases amongst surgical cases was 42.9%, being well above the EU-15 average of 37.4%.**

- **The proportion of home dialysis patients increased with 29.8% between 2003 and 2006, mainly because of an increase in peritoneal dialysis (+32.8%). The use of peritoneal dialysis is more prominent in younger age categories.**

- **The number of acute care bed days seems to be declining slightly in Belgium, although it is still above the EU-15 average.**

6.4　　SUSTAINABILITY OF HEALTHCARE

Sustainability is defined as the system's capacity:

- to provide and maintain infrastructure such as workforce (e.g. through education and training), facilities and equipment;
- to be innovative;
- to be responsive to emerging needs.

For all three elements of the definition, specific indicators were selected.

Indicators

- Healthcare expenditures according to the System of Health Accounts (OECD) (S1)
- Amount reimbursed by the maximum billing system (S1.1)
- Qualification levels of healthcare providers (S2)
- Medical and nursing graduates (S3)
- Annual amount of the Special Solidarity Fund (S4)
- Number of GPs using an electronic medical file (S5)
- Acute care bed days, number per capita (S6)
- Number of acute care beds (S6.1)
- Utilisation of minimal and non-invasive surgical techniques (QA3a)
- Speed of diffusion of minimal and non-invasive surgical techniques (QA3b)
- Surgical Day Case Rates (E1)

6.4.1.1　Facts and figures

Maintenance of workforce: medical and nursing graduates

Since 1997, a *numerus clausus* mechanism is used to control the number of practising physicians in Belgium through a limitation of the number of medical students. In France, Germany and the Netherlands, the *numerus clausus* mechanism clearly led to a decrease in the number of medical graduates and practising physicians. According to data of the University Foundation (http://www.fondationuniversitaire.be/nl/sc_stat.php), the number of medical students graduating since 1995 is fairly stable between 1 750 and 1 950, with two peaks in 2001 (2 099 graduates) and 2003 (2 115 graduates) (Figure 18). Despite the *numerus clausus* mechanism and the resulting decrease in first admissions (Figure 19), no clear decrease was found in the number of medical graduates in 2004 and 2005 (Figure 18).

Figure 18: Evolution of the absolute number of medical graduates between 1996 and 2005.
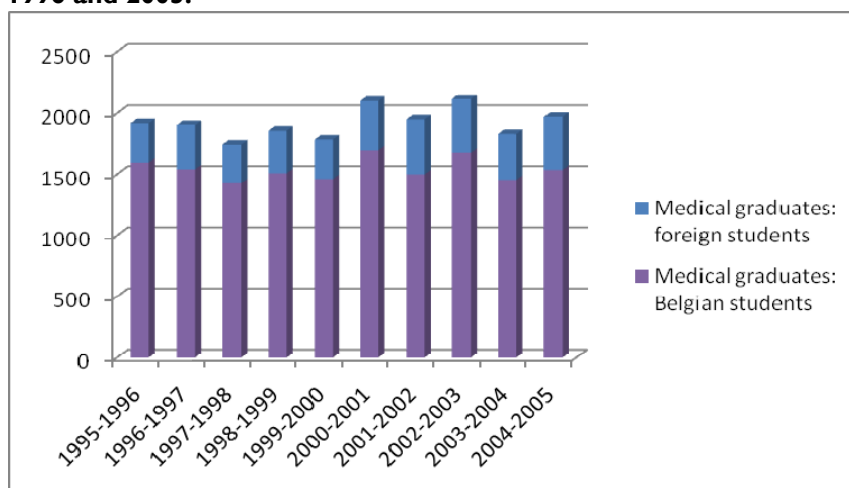
Figure 19: Evolution of the absolute number of first admissions between 1995 and 2005.
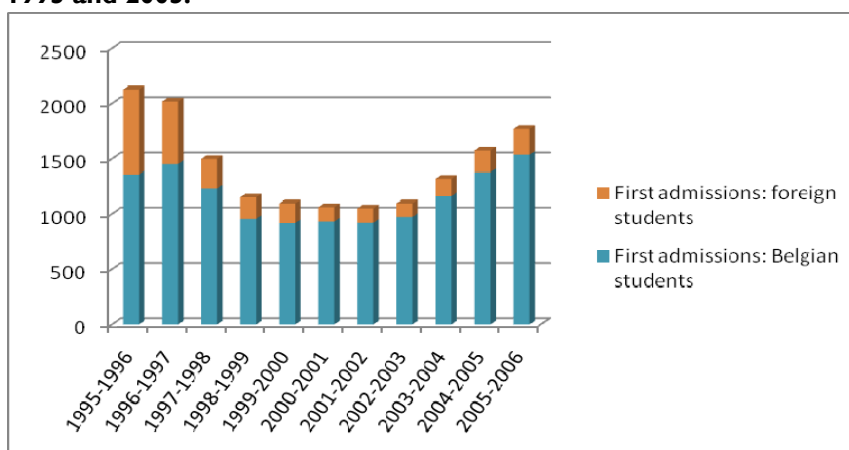
In comparison to other countries, the number of medical graduates per 100 000 population in Belgium is very high (Figure 20). It is more than twice as high as in Sweden and the UK, and even more than three times higher than in France, Germany and the US. In Europe, only Austria has a higher number (data not shown).

Figure 20: Evolution of the number of medical graduates per 100 000 population between 1995 and 2006 in a selection of OECD countries (source: OECD).
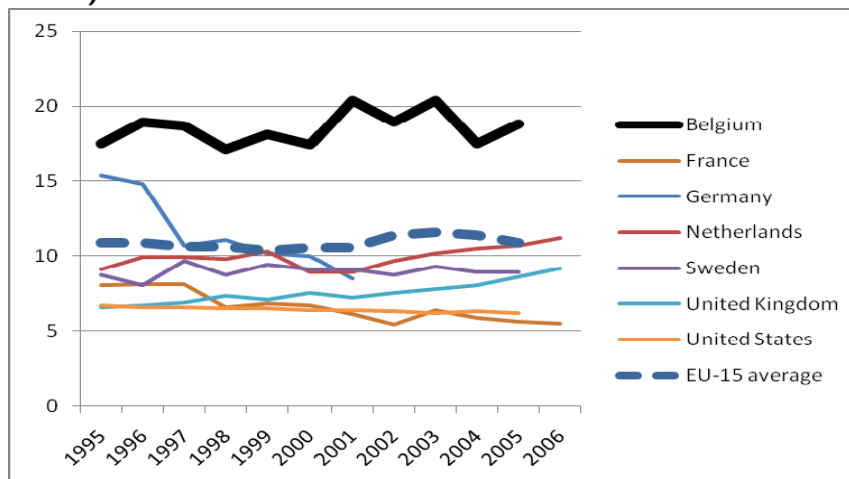
According to data from the Ministries of Education of the Communities, the total number of nursing students gradually increased from 19 314 in 2000 to 23 069 in 2007 (Figure 21). This is also true for the students admitted in the first year: the number rose from 7 986 in 2000 to 9 538 in 2007.

Figure 21: Evolution of the total number of nursing students.
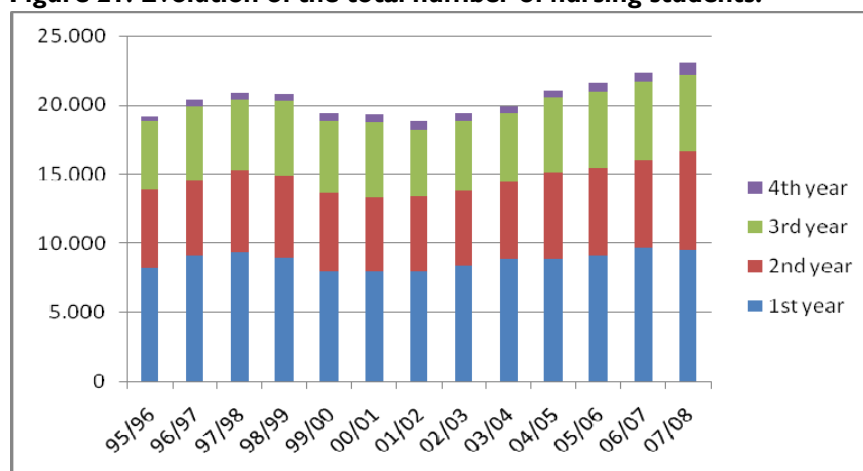
Source: www.npdata.be, accessed October 7th 2009

The calculation of the number of nursing and midwives graduates on a national level is more difficult due to different methodologies used by the different Communities [92]. In the Flemish Community, no distinction is made between the so-called first and second diplomas (i.e. a 4th specialisation year) since 1993-1994, resulting in double counts. In the French Community, this distinction still is made. However, in the French Community a lot of foreign (mainly French) students who return to their country of origin after graduating are included in the data. Data on the number of physiotherapist or paramedics retraining are unavailable. Taking these difficulties into account, Pacolet et al. estimated the total number of nursing and midwives graduates to be around 4 000 in 2003-2004 [92]. This corresponds to a number of around 38 graduates per 100 000 population, being above the EU-15 average of 30.4 in 2004.

Maintenance of workforce: specialties and qualification levels

The yearly statistics of the NIHDI provide an overview of the number of physicians per specialty and of other healthcare providers having a NIHDI number (http://www.riziv.fgov.be/presentation/nl/publications/annual-report/index.htm) (see also the technical summary of indicator S2 in appendix 4). Using these data some interesting findings emerge:

- Per 1 000 women aged 18-65 years, the number of *gynaecologists-obstetricians* 'in activity' only slightly rose from 0.408 in 2004 to 0.424 in 2007 (+3.9%), while the absolute number of gynaecologists-obstetricians 'in activity' rose from 1 335 to 1 422 (+6.5%).

- Per 1 000 children aged <12 years, the number of *pediatricians* rose from 0.908 in 2004 to 0.979 in 2007 (+7.8%), while the absolute number of pediatricians rose from 1 394 to 1 520 (+9%).

- While the absolute number of *dentists* almost remained stable between 2004 and 2007, the number per 1 000 population decreased by 2.2% from 0.801 to 0.783.

- The number of *radiotherapists-oncologists* per 1 000 cancer cases amounted to 2.69 and 2.81 in 2004 and 2005 respectively.

- The number of *geriatrists* per 1 000 population aged ≥75 years was 0.258 at the end of 2007.

Additional interesting information would emerge from the number of specialists in training to allow projections for the future.

Physicians can be <u>accredited</u> if certain conditions are fulfilled: activity level of 1 250 patient contacts/year, the completion of a Continuing Medical Education program, medical record for each patient, and compliance with specific guidelines. The proportion of accredited specialists significantly decreased (from 65.4% in 2004 to 62.3% in 2008), but remained stable for GPs (68.7% in 2008).

No data are available in Belgium on the distribution of the different qualification levels of nurses (A1 vs. A2) or physiotherapists (university degree or not) across the different sectors (hospital, long-term care, etc.).

Maintenance of facilities

Both the total number of beds (-1.3%) and the number of acute beds (-3.5%) decreased in Belgium between 2004 and 2007 (Table 40). This decrease coincides with a decreasing trend in acute care bed days (see chapter 6.3) and length-of-stay of acute stays (see chapter 6.1.6), and an increasing trend in the surgical day case rate (see chapter 6.3).

Table 40: Evolution of the number of acute care beds in Belgium, 2004 – 2008.

	2004	2005	2006	2007	2008
Total number of beds	70 990	70 864	70 526	70 409	70 084
Absolute number of acute beds	47 228	46 944	46 196	46 069	45 558
Number of acute beds / 1 000 population	4,53	4,48	4,38	4,34	

The decreasing trend in acute care beds is also apparent in other OECD countries (Figure 22). In comparison to other countries, Belgium has a rather high offer of acute care beds. In Europe, Germany has the highest number of acute care beds per capita.

Figure 22: Evolution of the number of acute care beds per 1 000 population in selected OECD countries, 1995 – 2007.
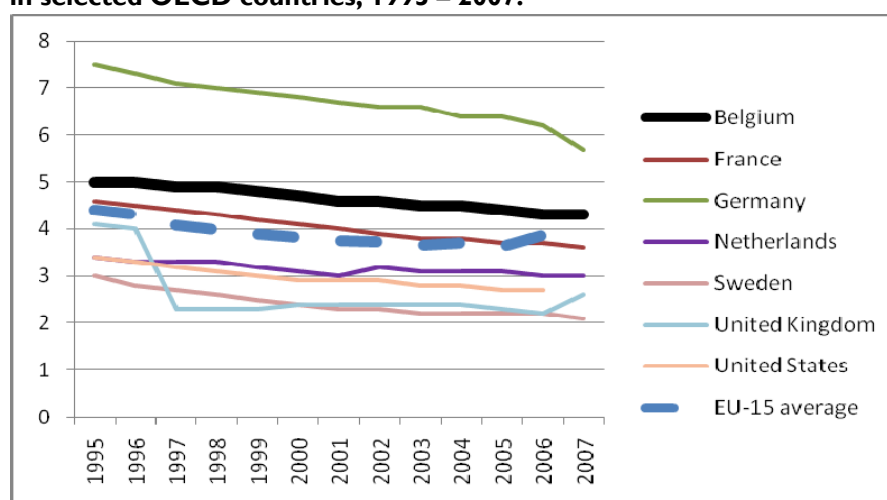
Innovation in healthcare

In Belgium, every recognized GP that uses an approved software to manage the electronic medical files of his/her patients throughout the year, has the right to receive an allowance paid by the NIHDI the year after. The physician has to ask for the allowance by fulfilling a form and make a sworn statement about the fact that the software belongs to the list of approved software. In 2008, this allowance amounted to €755.04. Of the GPs with at least 500 patient contacts a year, the number having received the allowance increased from 6 012 (55%) in 2004 to 6 985 (65%) in 2008 (Table 41). The rate of registered GPs with more than 2500 contacts having received the allowance in 2008 amounted to 74%. The rate is higher in women, in the Flemish part of Belgium and in younger GPs. Importantly, not all GPs using software apply for the allowance.

Compared to the rates mentioned in the RIVM 2008 report [83], Belgium performs only moderately on this indicator, with 60% of the practicing GPs using an electronic medical file in 2006 (Table 41). The Netherlands has the highest rates (98%), Canada the lowest (23%).

Table 41: Number of GPs (%) having received the allowance for the use of approved software, 2004 – 2008.

Number of contacts	2004	2005	2006	2007	2008
>= 500	6 012 (55%)	6 190 (57%)	6 470 (60%)	6 835 (64%)	6 985 (65%)
>=2500	4 992 (64%)	5 064 (66%)	5 274 (68%)	5 551 (73%)	5 673 (74%)

As for the use of newer minimal-invasive techniques, such as laparoscopy and PTCA, Belgium is amongst the better performing countries (see chapter 6.1.4). However, for the present report only these 2 techniques were evaluated. In future reports, this selection should be enlarged to other innovative techniques.

Responsiveness to emerging needs

As discussed in chapter 6.2, many social care nets, such as the MAB and the SSF, are available in Belgium to finance exceptional healthcare-related costs. These systems protect economically weaker groups against the financial consequences of illness.

Total healthcare expenditure

Trends in health expenditure are an important indicator of affordability, and thus sustainability. For international comparisons, the standard international definitions for healthcare and healthcare expenditure of the OECD's System of Health Accounts (SHA) are classically used. The total health expenditure (THE) in Belgium increased with 17.3% between 2003 and 2007, and fluctuated between 9.5% and 10.1% of the GDP in this period (Table 42). The THE per capita increased from 3 066 US$ PPP in 2003 to 3 461 US$ PPP in 2007, an increase of 12.9%.

Table 42: Total health expenditure in Belgium according to the System of Health Accounts, 2003 – 2007.

	2003	2004	2005	2006	2007
Absolute amount (€ million)	27 952	30 543	31 113	31 562	32 774
%GDP	9.5%	10.1%	10.1%	9.9%	10.0%
Per capita (US$ PPP)	3 066	3 272	3 301	3 332	3 461

In 2007, expenditure on curative care services accounted for more than 46% of the THE (Table 43). Of the 15 236 million € spent on curative care services, 9 003 million € (59%) was on in-patient care.

Table 43. Health expenditure per healthcare service in Belgium according to the System of Health Accounts, 2007.

Healthcare service	Expenditure (€ million)
Services of curative care	15 236
Services of rehabilitative care	1 328
Services of long-term nursing care	5 555
Ancillary services to healthcare	777
Medical goods dispensed to outpatients	5 766
Prevention and public health services	1 328
Health administration and health insurance	2 784
Total	**32 774**

Expressed as a % of the GDP, Belgium has amongst the higher THE in Europe (Figure 23). However, France, Germany and outside Europe also the US have a markedly higher THE. Similar results were found when expressed per capita (Figure 24). Again, caution is needed when comparing total healthcare expenditures. The better and more exhaustive the registration of healthcare expenditures, the higher the level of these expenditures.

Figure 23: Total health expenditure expressed as % of GDP in selected OECD countries, 1995 – 2006.
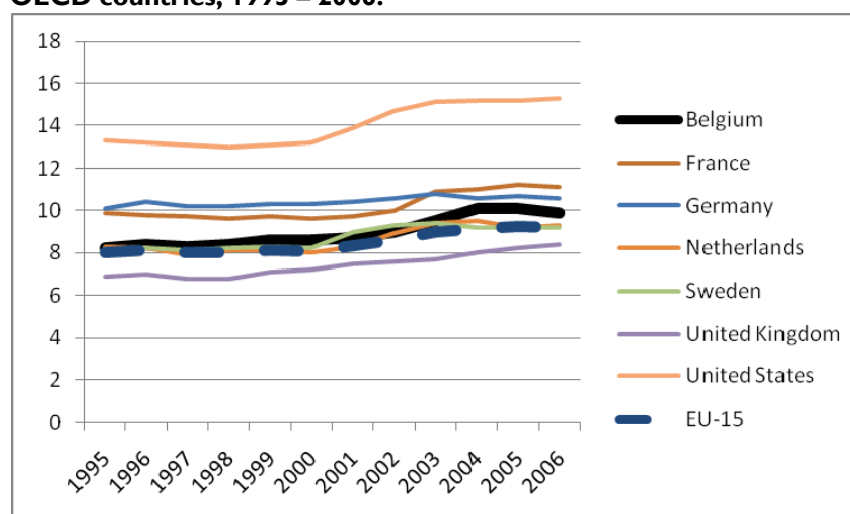
Figure 24: Total health expenditure expressed per capita (US$ PPP) in selected OECD countries, 1995 – 2006.
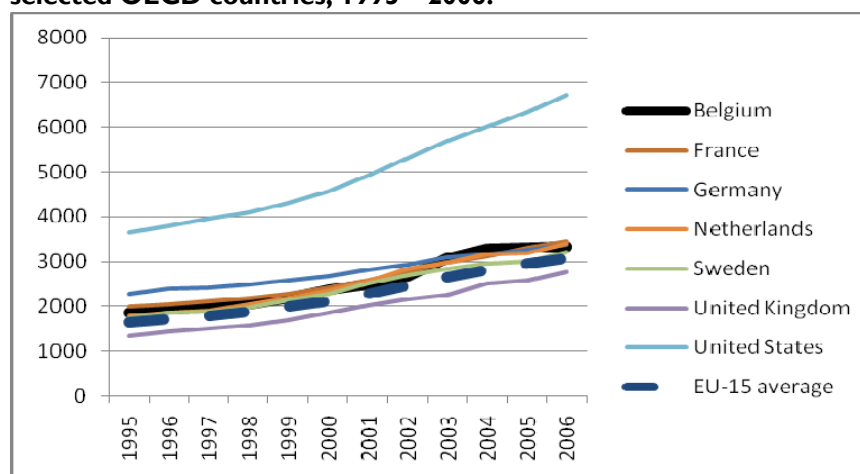
6.4.1.2   Discussion

Compared to other countries, the number of medical and nursing students in Belgium is high, at least suggesting an adequate influx of workforce in the near future. This information is important for the health personnel supply planning in Belgium. The Planning Commission 'medical supply' has the specific task to follow up this information, and is currently setting up a 'cadastre' for the medical professions, including nursing and midwifery. At this moment, this cadastre is not operational yet.

Belgium performs moderately as it comes to innovation in healthcare, with a more than moderate use of innovative techniques, but a moderate use of telematica by the medical professionals.

An important question is if all these evolutions remain affordable. With a mean annual increase of 4.3% of the total healthcare expenditure between 2003 and 2007 and a mean annual increase of 2.7% of the GDP in the same period, the answer looks quite easy.

Key points

- **The number of medical students graduating since 1995 is fairly stable between 1 750 and 1 950, with no clear influence of the numerus clausus so far. In comparison to other countries, the number of medical graduates per 100 000 population in Belgium is very high.**

- **The total number of nursing students gradually increased from 19 314 in 2000 to 23 069 in 2007. With an estimated number of around 38 nursing and midwives graduates per 100 000 population, Belgium scores above the EU-15 average of 30.4 in 2004.**

- **The evolution of the workforce of certain specialties and other healthcare professions does not follow epidemiological and demographic evolutions.**

- **In comparison to other countries, Belgium has a rather high offer of acute care beds.**

- **Sixty percent of the practicing GPs used an electronic medical file in 2006, which is moderate compared to other countries.**

- **In 2007, the total health expenditure amounted to more than € 32 billion. Expressed as a % of the GDP, Belgium has amongst the higher THE in Europe (10% in 2007).**

6.5 EQUITY IN HEALTHCARE

6.5.1 Functioning of the system

Some of the indicators presented above suggest differences in the _used care_ according to age, socio-economic factors and geographical zone. The cervical cancer screening coverage for example clearly decreases with age (Table 44): while in 2007 more than 70% of women aged 28-39 had a PAP smear during the last three years, the rate decreased to less than 50% in the age group 60-64.

Table 44: Cervical cancer screening coverage according to age (2007).

Age group	PAP smear test received during the previous	
	3 years	**4 years**
28-29	72.8%	77.7%
30-34	74.9%	80.2%
35-39	71.6%	77.3%
40-44	68.5%	73.9%
45-49	64.1%	69.1%
50-54	57.9%	63.1%
55-59	50.3%	55.2%
60-64	43.7%	48.2%

Other differences in used care according to age were found for dental check-up in children (peak of annual dental check-ups at age of 8 years), opportunistic breast cancer screening (34.7% in women aged 40-49 vs. 18.4% in women aged 72-79, in 2007) and hysterectomy (peak in age category 45-49) (Figure 25).

Figure 25: Number of hysterectomies / 1 000 Belgian adult women per age group, 2007.
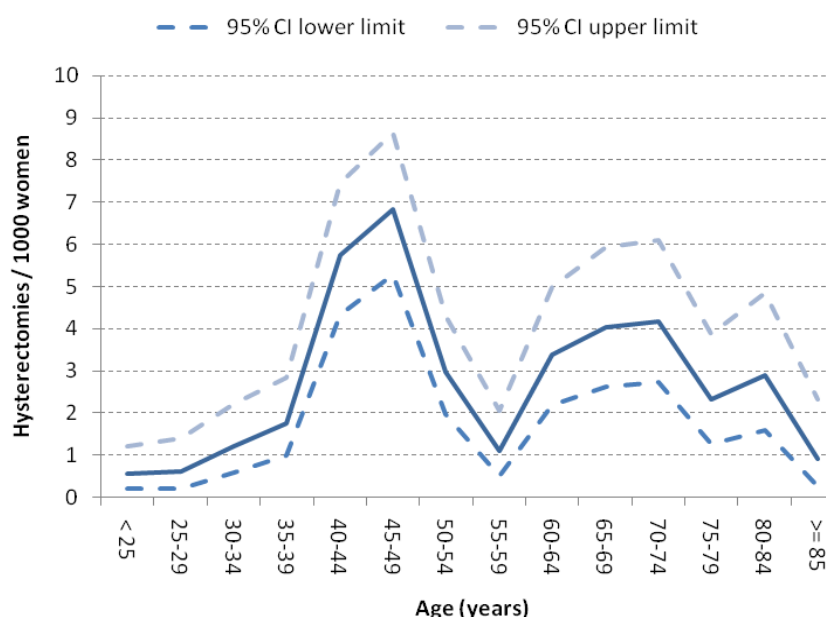
Persons in a household with an income exceeding MAB ceilings were found to have higher rates of hysterectomies. Inequalities according to several socioeconomic factors were found for breast cancer screening, MAB, and preventive dental care.

Information on inequality related to socio-economic factors can also be found in the Health Interview Survey [87]. For example, cervical cancer screening coverage was found to be higher in women with an income level > 2 500 euro (73% in 2004) compared to women with an income level < 750 euro (35% in 2004). The same inverse relationship was found between the cervical cancer screening coverage and the educational level. On the contrary, the relationship between influenza vaccination coverage and income or educational level was found to be less clear.

Similar information can be found from a recent study of the Christian Mutuality [93]. For example, in 2006 children less than 18 years belonging to the lowest income class had 36% less chance to make use of preventive dental care than children belonging to the highest income class. Similar social gradients were found for breast and cervical cancer screening coverage.

Finally, inequalities according to geographical zone were found for several indicators. As to the coverage of preventive child healthcare, almost 90% of the Flemish children visited a health centre of Kind en Gezin in their first year of life in 2007. In the Walloon Community, almost 75% of the children went to a health centre of ONE in their first year of life. The total coverage of mammography is slightly higher in the Flemish Region than in the Brussels Capital Region and the Walloon Region, but important differences are found when considering organised population screening and other mammography. Organised population screening with mammotest is much more used in Flanders than in the 2 other regions, while the use of other mammography shows opposite results. Also, the use of mammography in women aged 40-49 and 70-79 is much more established in the Brussels Capital Region and the Walloon Region. Other indicators that show a higher use in Flanders are preventive dental care, hysterectomy and the global medical file.

Some effectiveness indicators also suggest inequity in terms of _results_. For both in-hospital mortality after hip fracture and CAP, the mortality rate increased with age and was higher in males than in females (see chapter 6.1.2). The same trends were found for the hospitalisation rate of pneumonia and influenza, and for the incidence of decubitus ulcers.

Of course, it is difficult to interpret these differences without taking into account co-morbidities. Unfortunately, for other selected indicators (covering the dimensions effectiveness and safety) no such differences were evaluated.

Several selected indicators covering the dimension appropriateness are suited to detect inequality in terms of _needs_. However, to detect if a person received the needed care, clinical information is needed. As already stated above, this information is currently lacking for the selected indicators.

To detect inequality in terms of _opportunities_ and _individual responsibility_, the selected indicators were found to be inadequate.

6.5.2 Financing of the system

Since 1995, the social security is financed by a system of 'global management'. This means that it is not possible anymore to precisely determine the financial share of each area of the social security (healthcare, pensions, unemployment benefit …). In 2009, 18% of the resources of the healthcare system directly comes from the system itself (own receipts). The complementary part (82%) is coming from the global management.

The 'own receipts' and the receipts of the 'global management' are composed of social contributions, subsidies of the State, alternative financing and divers receipts.

Table 45 presents the composition of the global management for the employed workers in 2009. The most important component of the funding is represented by the social contributions paid by the employers and the employees (40.4 million € or 68% of the total). The alternative financing is increasing since 1996, in part to compensate the reduction of social contributions. The subsidies of the State are progressively decreasing since 1984. Table 45 presents the same data, but for the global management of the self-employed.

Table 45: Composition of the public financing of the 'global management' for the employed workers in 2009 (source: Vademecum of Social security).

	billion €	%
Social contributions	40.4	68.1%
Subsidies	5.9	9.9%
Alternative financing	10.2	17.2%
Allocated receipts	1.2	2.0%
Miscellaneous	1.6	2.7%
Total	**59.3**	**100.0%**

Table 46: Composition of the public financing of the 'global management' for the self-employed in 2009 (source: Vademecum of Social security).

	billion €	%
Social contributions	3.4	59.7%
Public financing of healthcare (2009)	1.3	22.7%
Alternative financing	0.9	16.0%
Allocated receipts	0.0	0.3%
Miscellaneous	0.1	1.4%
Total	**5.6**	**100.0%**

Table 47 presents the composition of the public funding of the Belgian healthcare system for the year 2009 (budgetary data). Public funding is mainly composed of 'own receipts' (4.8 million €) and transfers between the systems of the employed (19.8 million €) and self-employed (1.9 million €). Given the direct transfers of alternative financing from the global management (from employed workers 1.05 billion € and from self-employed 0.1 billion e) and applying the relative proportions of the global management of the employed workers (Table 45) and of the self-employed (Table 45),

for social contributions, subsidies, allocated receipts and miscellaneous, to the respective transfers from both systems, the composition of the public funding of the Belgian healthcare system can be calculated (last column of Table 47).

Table 47: Composition of the public funding of the Belgian healthcare system in 2009 (in billion €).

	Own receipts	Transfers from employed workers	Transfers from self-employed	Total
Social contributions	0.8	15.4	1.3	17.6 (66.0%)
Subsidies	0.0	2.2	0.5	2.7 (10.3%)
Alternative financing	2.5	1.05	0.1	3.7 (13.7%)
Allocated receipts	1.1	0.4	0.0	1.6 (5.8%)
Miscellaneous	0.3	0.6	0.0	1.0 (3.7%)
Total	**4.8**	**19.8**	**1.9**	**26.5 (100.0%)**

6.5.3 Individual participation of the patient

In Belgium, a combination of lump sum and progressive co-payment is used. Belgium has a system of compulsory health insurance, covering almost the entire population (98.6% in 2006) and with a very broad benefits package (with some restrictions for the self-employed until recently). As already mentioned, own payments by the patients are relatively high compared to other countries (19% of the total health expenditure in 2007). Nevertheless, it is difficult to compare the patients' contributions across countries since the systems are very different. Moreover, the amounts calculated for Belgium are the result of a very exhaustive inclusion of all types of financial charges.

Interesting information comes from the Health Interview Survey [87]. A clear relation was found between the income level and the postponement of medical care consumption for financial reasons (Table 48). In 2004, about 10% of the Belgian households had to postpone medical care because of financial reasons. Where almost 20% of the households with an income level of 1 000 euro or less had to postpone medical care, the percentage was only 2.5% for the highest income levels in 2004.

Table 48: Percentage of households that had to postpone medical care because of financial reasons, by income level (source: IPH).

	1997	2001	2004
< 750 euro	21.4%	23.1%	18.7%
750 – 1 000 euro	11.6%	16.7%	19.7%
1 001 – 1 500 euro	8.5%	11.8%	11.5%
1 501 – 2 500 euro	4.4%	7.6%	11.3%
> 2 500 euro	3.9%	2.7%	2.5%
Total	**8.6%**	**10.6%**	**10.6%**

Key points

- **Several indicators show inequalities in terms of used care and results.**

- **The individual participation of the patient to healthcare is relatively high in Belgium. Information coming from the Health Interview Survey suggests inequity in financial access to healthcare.**

7 IMPLEMENTATION OF A BELGIAN HEALTH PERFORMANCE SYSTEM

7.1 NATIONAL STAKEHOLDERS SURVEY

7.1.1 Introduction

The present chapter presents the results of the analysis of stakeholders' needs. It maps the needs of the various types of stakeholders that are likely to become the users of a performance measurement system. The following topics are covered in this analysis:

- stakeholders' knowledge about this KCE project;
- stakeholders' attitudes towards measuring the performance of the Belgian health (care) system;
- expectations regarding a first report on the performance of the Belgian health (care) system;
- perceived risks and potential resistance to the implementation of a measurement system of the Belgian health (care) system's performance;
- reactions to examples of indicators.

In the next chapters, the term "report" is used to refer to the present first report that will be produced as a result of the project to set up a measurement system of the Belgian health (care) system's performance.

7.1.2 Detailed description of approach

7.1.2.1 *Identification of stakeholders and sample*

The project team set up a list of stakeholders, mainly active in health and social affairs (the list can be found in appendix 5). Respondents were selected in that five categories of stakeholders were covered:

- public health authorities (Federal and Regional)
- unions (of health service providers);
- political level;
- sickness funds;
- others, which includes scientific institutions and NGOs.

7.1.2.2 *Questionnaire development*

A draft questionnaire consisting of open questions was developed in English and discussed with the project team. After validation, the questionnaire was translated into Dutch and French and both translations were reviewed by the project team. The questionnaire covered the above-mentioned topics, and aimed at understanding the needs of the stakeholders, but also their attitude regarding a performance measurement of the health (care) system.

Three pilot interviews took place to test the questionnaire and the approach. These interviews were part of the overall field work sample. Some questions were slightly adapted following this pilot phase. The main change consisted of the addition of a question to find out the respondents' prior knowledge about the study. The pilot interviews took place early May 2009. All pilot interviews were conducted by the same interviewer. A researcher of the KCE was present during all three pilot interviews.

7.1.2.3   Interview process

Of the 24 initially planned face-to-face interviews, 22 interviews took place, while 27 stakeholders were contacted. Two stakeholders refused to participate stating that they are not concerned by the project, while two other stakeholders did not respond to the request despite numerous attempts (see appendix 5).

Each interview lasted approximately one hour, and all but one (as the stakeholder refused) were taped. Two hand-outs were presented during the interview: the first, a presentation of the study, was sent beforehand; the second, a matrix with examples of indicators, was shown at the end of the interview.

All interviews were conducted in the respondent's mother language. Interviews were performed by a small team of three consultants in May and June 2009. A researcher of the KCE was present at the initial briefing of the interviewers and accompanied at least one interview of each interviewer. A transcript of all interviews was made.

7.1.2.4   Analysis process

The same three consultants who performed the interviews also did the analysis. A set of central themes for the analysis and reporting was agreed upon within the research team, corresponding essentially to the themes of the questionnaire. A first analysis of all individual interviews was conducted based on the full interview transcripts. The majority of interviews was analysed by two consultants independently to ensure a comprehensive and consistent interpretation. Subsequently, a second "thematic" analysis of the results was performed. Responses were grouped and characteristics of respondents analysed.

7.1.2.5   Comments and limitations regarding the method

The used approach is qualitative and therefore does not allow drawing quantitative conclusions.

The sample represents different categories of stakeholders as mentioned above, but actual numbers by category are small, not in the least because the potential spectrum of stakeholders in each category is actually very small.

The process to identify respondents was "top-down". Usually, the top management of the institution was the entry point. Managers sometimes decided to delegate the interview to one of their staff, or to invite staff members to be present during the interview. The consequence is that the list of respondents is constituted of (top) managers and staff at a more operational (management) level. Needs and expectations are slightly different at both levels.

The survey was conducted along the process of setting up the performance measurement system. Information presented to the respondents was therefore incomplete, e.g. the indicators were not yet defined.

7.1.3   Results

7.1.3.1   Sample description

Twenty-seven stakeholders were contacted of which 22 were interviewed.

Among the interviewed stakeholders, it is important to note that both users and suppliers of data were present (see appendix 5). This dimension is not used in the analysis as most stakeholders are both users (of the system and the report) and suppliers (of data). Only one of the stakeholders can be considered a supplier only.

Eight stakeholders were identified as being part of the Guidance group[7], and three of the stakeholders interviewed are involved in the project group.

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[7]   By Guidance group, we mean the group of mainly public institutions (administrations) that participate in regular meetings on the project.

Only four stakeholders interviewed were not aware of the project when contacted for the interview (see below).

The table below provides the actual sample distribution by category of stakeholder.

Table 49: Sample distribution over the five stakeholder categories.

Stakeholder category	Number of stakeholders included in this category
Public health authorities	8
Unions	2
Political level	3
Sickness funds	3
Other, including scientific institutions	6

Results were analysed taking into account the profile and type of stakeholder. Whenever significant differences between stakeholder groups were found, this is mentioned in the report. For most results, however, differences were not significant.

The study team also searched for other meaningful dimensions to categorise respondents. The only 'operational' dimension identified is called the "vision" of the respondent on the measurement system which can be:

- partial and analytical
- global and synthetic

Respondents having a partial and analytical vision of the measurement system being set up, consider the system from the perspective of their own organisation and therefore expect information at a rather operational level (e.g. to have results at a regional level). Whenever relevant for the results, this typology is mentioned in the results below.
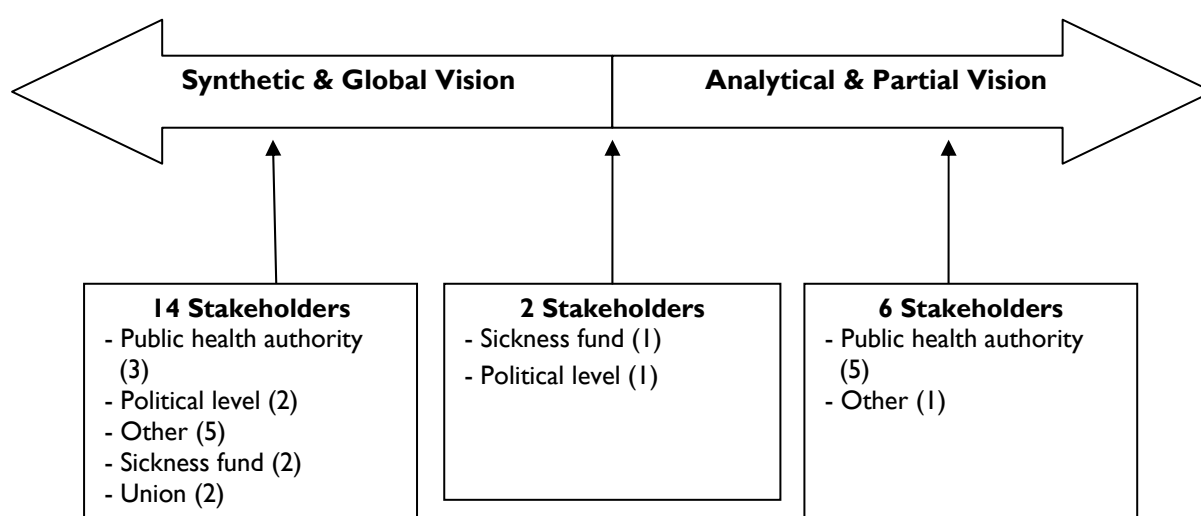
7.1.3.2   *Information on the project*

Awareness of the project

The present project is well known among most interviewed stakeholders. Only four respondents were not aware of the project before we contacted them. This can be explained by two factors:

- The regular organisation of meetings by the project team to involve stakeholders in the process of the study: all public sector institutions were invited at these meetings and these organisations constituted a large proportion of the sample;
- Most stakeholders are not only potential users of the report, but also (potential) suppliers of information to the system. Therefore, they may have been contacted by the study team.

The four organisations that were not aware of the study have diverse profiles: one union, one political, one other and one public health authority not part of the healthcare sector.

Spontaneous reactions on project presentation

The respondents received a one-page presentation of the project (see appendix 5) together with the appointment confirmation. At the start of the interview, their reactions and questions regarding this document were addressed.

The document generated different types of reactions, i.e.

- that everything is clear from the document;
- questions or doubts on the project itself;
- surprise or comments on specific points.

Arguments on the importance of the project to the respondents and their expectations regarding the proposed measurement system were also part of spontaneous reactions. These last reactions are covered in the relevant sections below.

Examples of questions that arose are:

- How will this be done in practice, how will it be implemented, e.g. how will the dimensions be covered (various respondents)?
- How is quality defined?
- Where does equity finds its place in the concept?
- Can results be given by region?
- Which indicators will be selected?
- Will it not be too academic?
- What will be the concrete output?

Aspects that triggered specific comments were:

- The choice of Canada and the Netherlands as examples on which to base the Belgian performance measurement system came as a surprise to a very well-informed person.
- Two stakeholders mentioned they would rather expect 'results' to be measured than 'performance'.

Apart from two exceptions, reactions were generally positive towards the initiative. Nearly all respondents considered it to cover a real need, either because it is important to measure the performance, or because this information is needed to compare with other countries. Another respondent had no opinion on the need. One organisation reacted very cautiously to the initiative, mainly because of questions and doubts regarding the method and the feasibility. This organisation is one of the few that was not involved in the study at all.

7.1.3.3 Attitude of stakeholders regarding performance measurement

General importance of the project

The importance attached to the project illustrates an overall positive attitude towards the initiative. The importance as expressed by stakeholders can be classified into five main categories that can be defined each by a key word (Table 50).

Table 50: Overview of five categories of general importance of the present project.

The project fills a gap	The "absence of" a measurement system is perceived as a gap, that would be filled by the project
Accountability	A lot of taxpayers' money is invested in the health sector that needs to be accounted for towards citizens. Using the results for communication purposes towards the general public is specifically mentioned for example.
Evidence-based decision-making	Many believe there is a real need for better decisions. There is a high level of expectation that the project can help to improve decision-making: - better decisions imply the saving of lives and a better quality of life; - investments should be based on results and impacts, not purely on budgetary reasons; - will lead to better policy-making: new and better measures; - better utilisation of the financial means; - need to evaluate the impact of policy decisions. Some respondents also mentioned the need for a change of culture in the Belgian health (care) system: decisions need to be based more on facts and benchmarks.
Benchmarking	The ability to compare Belgium with other countries is considered as an important motivation for the project. The inability to provide data that can be used for international comparisons is considered a major problem today which could be solved by the project. The lack of a consistent and systematic evaluation explains why Belgium is often not even appearing in international comparisons. Some respondents believe that the project will allow to prove that the Belgian system is a good system, thereby confirming what is now a mere perception.
Involvement	Involvement of stakeholders in the project is important and welcomed. Many stakeholders perceive a need for more cooperation between the various actors of the health (care) system. The project itself can contribute to achieve this higher level of cooperation. The split of responsibilities between the various policy levels in Belgium is certainly an important factor in this respect.

One of the stakeholders (an independent NGO) mentioned the importance of the use that will be made of the data and the report. This is elaborated in more detail below and corresponds to the need to use the report in decision-making.

Importance of the project for their own organisation

Out of the five aspects outlined above, the interviewees recognised the following three as particularly relevant to their own organisation:

- Accountability: to show that the resources were used efficiently, but also for reasons of transparency;

- Benchmarking: to be able to compare their own performance and (for some organisations) to actually deliver information when they are requested to;

- Cooperation with other health institutions is also mentioned as being important and corresponds to the "involvement" aspect mentioned above.

Evidence-based decision-making is less mentioned as relevant at the level of their own organisation. One (policy-making) organisation mentioned that the project is important to get input for its own policy development. Others mentioned the ability to control the impact of and improve their own work.

Expectations and needs regarding the measurement system

The respondents emphasised the following elements in relation to the project:

- There is no need to reinvent the wheel; existing indicators should be used. A duplicate data collection is to be avoided.
- Cooperation between all stakeholders is necessary for three reasons: to obtain the data; to obtain a common interpretation of results, and to develop an ownership towards the assessment, as a condition to see results translated into change.
- Comparability of data is an important requirement.
- The various 'levels' in Belgium (national, region, community, …) need to be taken into account.
- The design of the measurement system should include specifications regarding the handling and use of the data.
- The social elements of the medical components and in general non-medical components and prevention need to be addressed.
- Should be used to improve the healthcare system, not to identify those who underperform. This point is also discussed below.
- Recommendations regarding the healthcare system need to be realistic.

The needs that are expressed by the stakeholders regarding a measurement system can be grouped around four central ideas:

- To be able to deliver information about Belgium for international comparison. This is a real need for those involved in delivering this information, being a small group among the stakeholders.
- The need to evaluate actions and therefore to dispose of the information to do such evaluations.
- The need to improve the present health (care) system. This is also expressed as a need for change, which the project can contribute to.
- Accountability.

7.1.3.4   *Expectations regarding the report*

Use of existing measurement systems

The majority of the respondents do not actively use publications on performance measurement of the health (care) system, whether at Belgian or international levels. This is mainly because these publications are used by (other) staff of the organisation rather than by the persons who have been interviewed. Still, nearly all respondents know various publications or reports.

In the absence of a report on the performance of the system, the main sources mentioned covering the national level are:

- own publications and statistics: one out of three organisations explicitly mentioned internal data and/or own studies;
- KCE reports were mentioned by four respondents;
- NIHDI reports by three respondents;
- A variety of other sources were mentioned, from think tank reports, to reports from various public institutions, universities and the Belgian health interview survey.

International reports or benchmarks mentioned are mainly from the OECD (n=7) and the WHO (n=3). Reports from the European Commission and from the Commonwealth Fund were also mentioned. Other sources mentioned are national reports from other countries and other foreign publications.

As a conclusion, the statement of a stakeholder (policy maker):

"[…] il y a beaucoup d'outils statistiques mais fractionnés et pas toujours récents" (public policy institution)

Usefulness of the report

The expected usefulness of the report is similar to that of the measurement system as described above.

The aspect of "communication" appears to be more important when considering the performance report in comparison to the system. This corresponds to the need for more accountability. The report is primarily seen as a communication instrument towards the general public, and secondly, towards the stakeholders of the health system. The general public needs to be either convinced that the money is well spent, or needs to be more involved in the decision-making process. This aspect was mentioned only by (four) stakeholders with a synthetic and global vision.

The second aspect is linked to evaluation and the use of the report to trigger change. This is definitely the strongest need that appears from the interviews. There is a need for change of the system, and the report is somehow a symbol. This symbolic value corresponds to the need to feed the decision-making processes with facts and knowledge. This is why many (n=9) respondents (including all sickness funds) consider the report only as a step in a process. It is not the report that is important, but what is being done with it. For some of the respondents, the expectation is high because they are convinced there is a need to significantly improve the system and that real reform is needed. Others would rather argue for incremental change. All respondents are however convinced that improvements to the system are possible and necessary.

Two other dimensions appear as useful for stakeholders:

- the report as a source of information for the stakeholders and for international comparisons;
- as a means for networking among stakeholders: the report and the process of dialogue and discussion that they expect the report will trigger, will lead to increased (improved) networking among the various actors of the system.

What will be done with the first report?

All respondents stated that they will first read the report and examine if the content is of any use for their organisation. The regional and community public administrations stated that they will take further action if the report contains elements that are part of their competence. Five stakeholders will have an internal discussion (critical analysis) on the report. The report will be internally disseminated in four organisations and externally by two others: to international organisations and countries (by a public administration institution) and to healthcare institutions (education). The report will be compared to other information sources in three cases.

Whereas public institutions (administrative and policy) will identify action points, write recommendations, and define political conclusions and reforms; autonomous agencies and the education organisation will identify research subjects.

Types of results

Respondents experienced difficulties to describe their expectations in terms of results of the project, as the 'first report' is not concrete enough for them.

Expectations expressed cover:

- specific elements of content, based on their own field of interest (health status, efficiency of the system, satisfaction of users, …);
- conclusions and/or recommendations (and not only data or results);
- the start of a debate (or choices or questions) that will lead to improvements;
- feedback to those who have provided data, so that they can improve their data in the future;
- improvement of international comparisons.

Regional (Community) level organisations expect results at their political and administrative level.

General comments on how to improve the report

Two potential concepts of reports are spontaneously considered by respondents:

- either a factual report giving results, leaving the interpretation to the reader;
- or a report with an added value on top of the results: with interpretation, conclusions and even recommendations.

Of those respondents that expressed an opinion, about two-thirds preferred the second option.

This result shows the two dimensions of the report:

- a scientific dimension: provision of high-quality data;
- a political dimension: a means to take better decisions and feed the decision-making process.

This result also confirms the expectation and wish that this report will trigger a debate and improve decision-making. This implies that the interpretation and translation into actions is addressed after the report is published. However, in this case, it would be important to clearly integrate both. The image of the report, without the interpretation, might be negative among a large group of respondents, if actions to use the results and set in motion this improvement or change are not visibly linked to the report.

Stakeholders want a clear, well-structured document that contains charts, tables and is graphically attractive. This corresponds to the expectation that this report would also be a communication instrument towards the general public.

Two stakeholders suggest making two different versions of the report, one more technical and one for policy-makers and the public containing conclusions and illustrations.

Some general recommendations:

- don't be too academic;, but very concrete;
- as to the language: 4 stakeholders spontaneously mentioned the need for this publication to be available in our national languages.

7.1.3.5   Perceived risks and potential obstacles to implementation

Obstacles

Approximately half of the stakeholders observe obstacles at the level of setting up the measurement system. These obstacles are linked to:

- The separation of competences in the Belgian system: there is a need to agree on objectives, indicators, as one of the regions might decide not to participate or not to provide data, …;
- The quality of the available data;
- Availability or access to data (mentioned by one in three respondents).

The two first types of obstacles are sometimes mentioned as risks by respondents rather than as obstacles. The majority of perceived obstacles concern the use of the results of the report as presented in Table 51 below.

Table 51: Perceived obstacles to the implementation of a performance measurement system.

Expected resistance from stakeholders	Mentioned by one out of three respondents, all of them with a synthetic & global vision. Defensive reactions are expected from groups who feel threatened by results. Linked to this type of resistance is also an concern for being compared or the lack of readiness for transparency (see below). Organisations who explicitly say not to expect any resistance at all are all public sector institutions.
Culture	There is a need to change this mentality. Concern for comparison is mentioned by one in four respondents. Patient-centeredness and transparency are not (yet) embedded in the health system ("*in practice we are very far from that*"). Reluctance to change is also mentioned, as well as corporatism, which can be considered as a form of resistance to change, expected from certain actors of the health system.
Complexity of the health(care) system	The Belgian health(care) system is considered to be complex with various actors and a particular division of competence. This is considered as an obstacle at the level of translation of information of the measurement system into concrete decisions and actions, mainly because of the potential lack of cooperation and common view on decisions and measures to be taken.

Risks

When evaluating the risks, the same defensive reactions as described above were raised by some respondents. Further risks mentioned are:

No translation into action	The main benefit of the measurement system is to lead to decisions and actions. If this is simply a report and nothing happens, this will be a big disappointment.
Complexity	Setting up a measurement system is complex and the subject in itself is complex too. Exhaustiveness is considered as a risk by some respondents as it appears impossible to achieve. One needs to be realistic in terms of ambition, and still have an attractive final product.
Lack of continuity	The purpose of such a system is to regularly produce reports. It is seen as a risk that only one report would be published.
Activism	The fear exists that political pressure groups would use the report or results for "partisan" objectives. This is mentioned by various respondents.
Wrong focus	The focus should not be on comparison but on identifying improvements. The fear exists that users will concentrate on comparing, which can be perceived as negative (pinpointing those who do not perform well enough).This is an expression of a fear of 'naming and shaming' practice.

Other risks mentioned are:

- Privacy and data protection issues;
- That the report will be too academic;
- The difficulty to measure some of the aspects that need to be measured;
- That the link between the criteria and the actual impact on health is not explained in the report.

Solutions

The stakeholders made suggestions on how to avoid the barriers, obstacles and risks.

One basic recommendation is to avoid that the report is questioned or criticised. This can be achieved through:

- scientific excellence;

- the involvement of all stakeholders: participation increases the acceptance of the results;
- focus on subjects where choices are easier to make.

A second recommendation is linked to the communication value of the report. It should be user-friendly and have an excellent communication value. This aspect of readability is touched in more detai below.

A third and important type of recommendation is linked to the use of the report. Suggestions are:

- that the authors would be available to answer questions or help readers in interpreting the report (mentioned spontaneously by five different organisations);
- to facilitate and 'organise' the interpretation of results and translation of these into actions. Suggestions are in the form of workshops, of a big forum discussion, or by bringing experts together who assist in the interpretation and the making of recommendations;
- to create a channel whereby stakeholders can express their opinion on the contents of the report.

This last type of recommendation is compatible with the needs and usefulness of the report. The report as such is not the expected output, but what will be done with it. Stakeholders expect that the report is part of a broader exercise of dialogue and discussion in order to translate results into concrete actions.

7.1.3.6   *Examples of indicators*

Spontaneous reactions on example of indicators

Stakeholders were presented a second hand-out consisting of a table with the dimensions and elements[8] of the scope. This table also included examples of indicators.

Despite the fact that the incompleteness of the matrix was explained, some stakeholders did point out the many blanks in the matrix.

As mentioned before, some stakeholders pointed out that it is important to see which indicators already exist in order to avoid double work. One stakeholder commented that the matrix seems large, although it does correspond to his expectations.

Suggestions to add elements to the matrix:

- use individual patient information as a source for data collection and raw material for the indicators;
- one needs to be careful with this type of methodology, otherwise one ends up with too many indicators and therefore there is a need for composite indicators;
- concentrate on three axes: 1) input (being expenses and instruments); 2) output (number of performances); and 3) results.

The most interesting result was that, being confronted with the indicators, four respondents changed their overall attitude:

- the two respondents that had a rather negative or sceptical general attitude became even more sceptical or cautious after seeing the examples of indicators, mainly because the matrix was not clear to them;
- one of the three respondents that was positive but cautious at the start of the interview based on the first hand-out, became less positive. The reason was the fear that the results provided would be too synthetic and global, therefore not allowing the detailed analysis they would like to perform;

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[8]   The description of the measurement system in the first hand-out included a description of dimensions (e.g. quality) and elements that would be covered (e.g. curative care)

- a fourth respondent who was initially positive became even more enthusiastic after seeing examples of indicators.

The more negative reactions were:

- the matrix is unclear and unscientific, there is a need for a more technical approach and less interpretative indicators;
- the presentation is clear, but the matrix format makes comprehension more difficult;
- the focus seems to be on producing services and not on the output;
- this is a theoretical approach, while data collection will be problematic in reality.

Expectations and reactions regarding the dimensions and indicators of the performance measurement system

The matrix provided the same information on dimensions and elements included in the performance measurement system as the first hand-out, but the presentation in the form of a table is different and led to new reactions.

- Three stakeholders explicitly confirmed that these examples correspond to their expectations.
- The three regional public institutions would like to have results per region and one even per population (ethnic) origin.
- For two stakeholders a 'context' dimension should be added (including life expectancy, living environment, risk factors) and information on socio-economic status should also be included.
- Stakeholders for whom patient-centeredness is an important dimension, expect it to be filled with indicators and not left away.

"No indicators will be selected on patient centeredness? No, I cannot agree with this" (public administrative institution)

".. and here it is written that 'no indicators will be selected' for patient-centeredness. That is a tough one." (public administrative institution)

The quality dimension was mentioned as the most important dimension by five stakeholders as there are currently no quality indicators. It is followed by accessibility (three times) and efficiency (twice). Other dimensions were only mentioned once.

This does not mean that quality is a more important dimension, but rather reflects the lack of information regarding quality.

"As to indicators, (…), here in Belgium we have statistics on everything, except on quality, so that is where to start" (sickness fund)

Regarding the indicators, interesting suggestions and reactions are:

- One of the respondents suggested to define a standard to be reached for each indicator, to make the interpretation of results easier.
- One of the respondents suggested adding a meta-analysis of the indicators.
- Empty cells in the matrix are acceptable, but need to be explained. Stakeholders want to know why some indicators are absent (e.g. lack of data) and whether action is or can be undertaken to solve this.
- Equity: no examples of indicators were mentioned which led to a concern that the dimension would effectively be covered.
- An evaluation of the gender sensitivity of indicators was recommended by one of the respondents, as a direct reaction on the examples (a concern linked to the equity dimension).

7.1.4 Conclusions

7.1.4.1 General attitude and reactions

The general attitude of stakeholders is positive towards the initiative. Only very few (n=2) stakeholders are less positive, critical or sceptical as to the feasibility to set up such a system and to produce a report.

This positive attitude should be put into the perspective of the approach followed: the stakeholder survey took place in parallel to the development of the system. The information available to participants was therefore limited. This could be different when the first report becomes available as the concrete output might not (completely) correspond to the expectation.

Most stakeholders (14 out of 22) have a global and synthetic vision of a healthcare performance measurement system; only a minority (n=6) have a more analytical and partial vision.

7.1.4.2 Needs

Stakeholder needs can be split into four main types:

- Evaluation: the need to evaluate actions and to have the information allowing to do such evaluations.
- The need to improve the present system. This is also expressed as a need for change, which the project can contribute to.
- Accountability: the measurement system can contribute to a (necessary) change in mentality. There is a need for more evidence-based decisions, accountability and transparency.
- To be able to deliver information on Belgium for international comparison. This is a real need for those involved in delivering this information; a small group among the stakeholders.

7.1.4.3 Barriers

Main obstacles mentioned are linked to the use of the report:

Expected resistance from stakeholders	Mentioned by one out of three respondents, all of them with a synthetic & global vision. Defensive reactions are expected from groups who feel threatened by results.
Culture	There is a need to change this mentality. Fear for comparison is mentioned by one in four respondents. Patient-centeredness and transparency are not (yet) embedded in the health system ("*in practice we are very far from that*").
Complexity of the health system	The Belgian health (care) system is considered to be complex. This is regarded as an obstacle when translating results into concrete decisions and actions, mainly because of the potential lack of cooperation and common view.

7.1.4.4 Risks

No translation into action	The main benefit of the measurement system is to lead to decisions and actions. If this is simply a report and nothing happens, this will be a big disappointment.
Complexity	Setting up a measurement system is complex and the subject in itself is complex too. Exhaustiveness is considered as a risk by some respondents as it appears impossible to achieve. One needs to be realistic in terms of ambition, and still have an attractive final product.
Lack of continuity	The purpose of such a system is to regularly produce reports. It is seen as a risk that only one report would be published.
Activism	The fear exists that political pressure groups would use the report or results for "partisan" objectives.
Wrong focus	The focus should not be on comparison but on identifying improvements.

7.1.4.5   *Conclusions with regard to implementation of the system*

- Key element is the use of the data to improve decisions; it is not the report itself that matters to stakeholders, but what will be done with it.

- The impact of the report would be enhanced if the publication is combined with initiatives to trigger a debate based on the results.

- The exercise in itself carries a high added value: it creates a dialogue and cooperation between institutions that could cooperate more, value can be created through more cooperation.

- There is a need for a communication strategy for the report. A communication plan could be developed defining who is the target audience, what message to bring to which target audience and through what means.

7.2   CONTACTS WITH INTERNATIONAL EXPERTS

Some do's and don'ts for setting up a performance measurement system and developing performance indicators were listed by the experts from the Netherlands, Canada, OECD and WHO.

- In a first step, it should be clear which dimensions (indicator domains) are important for the healthcare system at the policy level and for which dimensions the policy makers want to be accountable. Then the scientific part should be focussed on and been taken out of the political environment. The results of the scientific research should afterwards be discussed with the policy makers. At the end, the selected performance indicators should reflect the political agenda.

- In a federal health system, such as the Canadian one, where federal, provincial and regional governments coexist, the communication process is of utmost importance.

- When reporting indicators' results, it's important to stay neutral towards the political environment.

- The body that is conducting the measurement has to be independent.

- When selecting indicators from the massive amount of available data, it is important to focus on longitudinal data allowing to fulfil a sentinel's role. Rather than trying to describe the entire health system based on indicators, one should focus on predefined domains with a limited number of indicators.

- Rather than immediately creating/selecting indicators, one should check the available administrative databases first and try to improve them. Unique patient identifiers should be integrated in the administrative databases.

- Avoid equity/disparities issues in the start-up phase of a measurement system, because more extensive data are needed and they are politically sensitive issues.

8   DISCUSSION

8.1   CONCEPTUAL FRAMEWORK

An achievement of the present report was the development of a broad conceptual framework of the health system performance that relied upon a consensus among Belgian experts in the field. This framework can be used for future performance reports.

By adopting a holistic approach, the relations between the health status and non-medical determinants of health on the one hand and health (care) system performance on the other hand were stressed. Although the non-medical determinants of health are not the scope of the present project, these need to be taken into account when interpreting the results of the performance measurement.

The literature that formed the basis for the development of this framework was biased in two ways. First, by restricting the language to English, Dutch and French, several international performance measurement systems were missed, for example those from some Spanish-speaking or Nordic countries. Second, the emphasis of the literature search was on epidemiological and health services research documents and less on the managerial use of performance measurement systems.

8.2   SELECTION OF INDICATORS

For the selection of performance indicators for the present report, a specific strategy was chosen, using internationally available indicators as a starting point. The formal selection process afterwards, including the validation by scientific experts at different time points, led to a broad set of indicators for some dimensions, such as effectiveness, safety and sustainability, but a very restricted or even empty set for other dimensions, such as continuity and patient-centeredness. For patient-centeredness for example, the main reason for excluding individual performance indicators was the lack of reliability due to the subjective character of the candidate indicators. Resultantly, the evaluation of the Belgian healthcare system performance as presented in this report mainly focused on clinical aspects. On the other hand, performance dimensions such as patient-centeredness and equity are not easily captured by performance indicators and are subject to much debate. Therefore, for the evaluation of these dimensions the set-up of specialised working groups may be needed.

For some dimensions, the selected indicators only cover specific aspects. The accessibility of healthcare for example is covered with indicators related to physical access (cfr. stratification of some indicators by Region), costs and availability of personnel. However, indicators about cultural access, psychological access and time (e.g. waiting lists) are not included. For the evaluation of the equity of healthcare, stratification of some indicators is done for age, sex, geographical zone and socio-economic factors. However, few or no information is available on education, life style, health status, ethnical minorities, etc. For innovation (being part of sustainability), indicators are limited to the use of the electronic medical file and minimal-invasive techniques. However, no indicators are included on the use of new technologies or on the investments in research and development.

Gaps were also identified at the level of the health system domains, in particular for end-of-life care. The absence of performance and/or quality indicators for end-of-life care was already mentioned in the recent KCE report on palliative care [94]. At present, quality indicators of end-of-life care are being developed for Belgium by the End-of-Life Care Research group. Other areas for which no indicators were included are mental health and elderly care, since only a few such indicators came up in our search. Few indicators were also selected for long-term care.

Measurability was not a determining selection criterion for the present report. This may have lead to the inclusion of performance indicators that were known to be not measurable *a priori*. However, this was a deliberate choice, in order to highlight

unavailability of data to measure potentially relevant indicators. Examples are cardiovascular screening, 5-year survival of colon, breast and cervical cancer, etc.

For future similar performance reports, other selection strategies may proof to be more appropriate, depending on the scope and needs. Where the present project started from existing performance indicators, resulting in an indicator set consisting of mainly internationally available indicators and in the gaps discussed above, a future indicator set can be supplemented with performance indicators based on an exploration of the available health data in Belgium. Contrary to many other countries, Belgium disposes of very powerful administrative databases, such as the Permanent sample. The exploration of this latter database could prove very useful to create new indicators in addition to those already selected.

In view of the objectives of the Belgian performance report (see chapter 3), several factors should play a role in the selection of relevant performance indicators. First, since one of the objectives of the performance system is to monitor the Belgian healthcare system over time, some core indicators may need to be identified that will be measured repeatedly. Second, room must be left open for the inclusion of new performance indicators. Since transparency and accountability for the Belgian healthcare system performance is one of the main goals of the measurement system, the choice of these performance indictors should be tailored to the Belgian health policy. However, this asks for a clear definition of health objectives at the federal level. Finally, a good balance must be found with indicators mainly serving for international comparison.

8.3   PILOT TEST

The pilot test showed that 35 of the 55 selected performance indicators are measurable at the moment (Table 52). Of the 20 indicators that are not or partly measurable at present, several are related to mortality (including 5-year survival rates for cancer). Indeed, data on causes of mortality are not yet available for all 3 regions. This is a major problem, not only for the set-up of a performance system, but also for the reporting to international organisations, such as OECD and WHO. However, next year national data should again be available for 2007. The upcoming European regulation in this domain should enhance the capacity to have data on causes of mortality with a delay of less than a 2-year period.

Some appropriateness and safety indicators were difficult to interpret or simply not measurable because of a lack of clinical data to clearly define populations. This is a well-known shortcoming of administrative databases. Nevertheless, as suggested by some experts, certain patient characteristics available from administrative databases (e.g. use of specific medication) can be used to delineate specific patient populations. Table 52 provides an overview of possible actions to fine-tune some indicators.

Some of the consulted experts suggested making a selection of core indicators based on the present exercise. Although it seems reasonable to propose a (core) set of indicators that will be measured periodically, it is not recommendable to reduce the total number of included indicators, being around 50 now. Indeed, the number of indicators included in the present report is relatively low compared to other national performance measurement systems (for example about 100 indicators were included in the 2008 RIVM report [83]). In view of the many gaps that are still present, several indicators will need to be added in order to provide a more complete evaluation of the Belgian health system's performance. However, some indicators that are included now, will need to be excluded from future reports. Furthermore, the information coming from some indicators can be captured in more general (or composite) indicators, e.g. cancer screening coverage or cancer survival.

Several databases and organisations proved to be important sources of information for the measurement of the included indicators. Amongst the most frequently used databases are the Health Interview Survey, the Permanent Sample and the Minimal Clinical Dataset (MCD). These 3 databases have the advantage of providing recurrent data. The HIS and Permanent Sample were found to be particularly useful to investigate socioeconomic factors, although the socioeconomic variables available in the Permanent Sample can only be considered proxy variables for the social class.

Table 52: Overview of measurability of the selected indicators and suggested actions for fine-tuning.

Indicator	Measurable?	Suggested (technical) action(s)
QE1: Breast cancer screening with mammotest in women aged 52-69	Yes	-
QE1.1: Other mammogram in women aged 52-69	Yes	-
QE2: Cervical cancer screening in women aged 28-64	Yes	-
QE3: Colorectal cancer screening in individuals aged 50 and older	No	Await results of pilot projects.
QE4: Influenza vaccination	Partly	Only consider 65+ population. More specific data on inpatient use are needed. If not possible, Pharmanet data can be used as a proxy.
QE5: Vaccination coverage of children aged 2	Yes	-
QE6: Acute care hospitalisation rate for pneumonia and influenza	Yes	Only consider 65+ population. More homogenous definition needed for acute care hospitalisation rate for pneumonia.
QE7: Percentage of daily smokers	Yes	-
QE7.1: Consumption of fruit and vegetables	Yes	-
QE7.2: Alcohol consumption	Yes	-
QE7.3: Salt consumption	Yes	Not to be included in next report, since no periodical data available.
QE8: Breast feeding	No	-
QE9: Annual check-ups at the dentist	Yes	-
QE10: Decayed, missing and filled teeth at age 12	No	Await results of study on mouth health of the Belgian population (parallel to Health Interview Survey 2008); results expected by June 2011.
QE11: Cardiovascular screening in individuals age 45-75	No	Re-define indicator (e.g. using patient characteristics available from administrative databases) to render measurable.
QE12: Colon cancer 5-year survival rate	No	Await data of the Belgian Cancer Registry (2011).
QE13: Infant mortality	No	Mortality data expected in 2010.
QE13.1: Premature mortality	No	Mortality data expected in 2010.
QE14: Breast cancer 5-year survival rate	No	Await data of the Belgian Cancer Registry (2011).
QE15: Cervical cancer 5-year survival rate	No	Await data of the Belgian Cancer Registry (2011).
QE16a: In-hospital mortality after hip fracture	Yes	Risk-adjustment needed.
QE16b: In-hospital mortality for community-acquired pneumonia	Yes	Risk-adjustment needed.
QE17: Diabetes-related major amputations	No	Re-define indicator (e.g. using patient characteristics available from administrative databases) to render measurable and

Indicator	Measurable?	Suggested (technical) action(s)
		comparable to other countries.
QA1: Prescription according to guidelines	No	Re-define indicator (e.g. using patient characteristics available from administrative databases) to render measurable.
QA2: Breast cancer screening with mammography in women aged <50 or >71	Yes	-
QA3a: Utilisation of minimal and non-invasive surgical techniques	Yes	Consider including other minimal and non-invasive surgical techniques.
QA3b: Speed of diffusion of minimal and non-invasive surgical techniques	Yes	Consider including other minimal and non-invasive surgical techniques.
QA4: Use of special protocols or guidelines for high risk or complex processes	Partly	Consider excluding indicator from next reports.
QA5: Caesarean sections per 1000 live births	Yes	-
QA6: Hysterectomy by social class	Yes	-
QS1: Incidence of serious adverse effects of blood transfusion	Yes	Specific registration needed.
QS2: Incidence of healthcare related infections	Yes	-
QS3: Incidence of decubitus in hospitals	Yes	Improved registration needed to allow distinction between prevalent and incident cases.
QS4: Incidence of post-operative surgical site infections	Yes	-
QS5: Incidence of decubitus: a. in long-term care facilities, and b. in individuals at risk	No	Registration needed. Alternatively, specific patient characteristics available from administrative databases can be used to render measurable.
QS6: Number of nosocomial MRSA infections	Yes	-
QS6.1: Number of AB prescriptions	Yes	-
QS7: Medical radiation exposure	Yes	-
QC1: Number of people who are not registered with a GP	No	Re-define indicator to render measurable.
QC2: Average length of stay	Yes	Further exploration needed to explain difference between results reported to OECD and results calculated for present report.
A1: Number of physicians and nurses	Partly	Accurate data on active care providers should become available. Need for cadastre.
A2: Insurance status of the population	Yes	-
A3: Amount of co-payments and out-of-pocket payments	Yes	-
A4: Coverage of preventive child healthcare in high-risk groups	No	-
A5: Additional illness-related costs for chronically ill people	No	Re-define indicator to render measurable.
E1: Surgical day case rates	Yes	-

Indicator	Measurable?	Suggested (technical) action(s)
E2: Use of home care technology and proportion of renal dialysis patients using home dialysis	Yes	-
S1: Healthcare expenditures according to the System of Health Accounts	Yes	-
S1.1: MAB	Yes	-
S2: Qualification levels of healthcare providers	Partly	Accurate data on active care providers should become available. Need for cadastre.
S3: Medical and nursing graduates	Partly	Data needed on nursing graduates.
S4: Annual amount of the Special Solidarity Fund	Yes	-
S5: Number of GP's using an electronic medical file	Yes	-
S6: Acute care bed days, number per capita	Yes	-
S6.1: Number of acute care beds	Yes	-

8.4   PRELIMINARY RESULTS OF THE PERFORMANCE EVALUATION

Chapter 6 is a prototype of how a performance report could look like. Based on the preliminary and fragmented information presented in chapter 6, a mixed picture of the Belgian healthcare system's performance emerges. In general, the Belgian healthcare system's performance seems to be good in terms of accessibility; moderate to good in terms of safety; moderate in terms of effectiveness of preventive care, appropriateness of care, efficiency and sustainability; but low in terms of effectiveness of curative care and continuity, based on the selected indicators and available data. Several inequalities were found, meriting further research to evaluate if inequities are underlying.

Importantly, these general conclusions should be interpreted with caution because of the fragmented evaluation of some performance dimensions, in particular effectiveness of curative care, for which data on outcomes are lacking. For continuity, the conclusions are based on a limited number of indicators.

It is also important to consider the results of individual dimensions in relation to those of other dimensions. For example, some indicators suggest that the Belgian healthcare system is increasingly efficient (e.g. more day care, use of clinical pathways, etc.), although other indicators show other signals (e.g. indicators of inappropriateness). However, this increasing efficiency is accompanied by a moderate appropriateness, and does not necessarily translate into good outcomes (effectiveness). Importantly, this increasing efficiency is not resulting in decreasing health expenditures, reaching more than 32 billion euros in 2007. A recommendation could be that the efforts should be increased to get guidelines on appropriate care implemented. Another example is that the high number of medical graduates (sustainability) not necessarily translates into a high number of clinically active physicians (accessibility), although it is difficult to assess the exact number of clinically active physicians in Belgium.

Table 53 provides an overview of some strengths and weaknesses of the Belgian healthcare system's performance based on the pilot study presented in this report. In addition, without being exhaustive and taking into account the fact that this is a first exercise, some action points are highlighted. Figure 26 provides a tool to summarize the Belgian healthcare system's performance visually, e.g. by colouring the different cells (green = good, yellow = moderate, red = bad). However, in view of the status of pilot study and the fragmented information available, no attempt was made to colour the table.

Table 53: Strengths and weaknesses as appearing from the current set of performance indicators.

Dimensions	Strengths	Weaknesses	Evolutions	Suggested actions
Effectiveness				
Preventive care	Moderate to good vaccination coverage			
		Low coverage of cancer screening compared to other countries	Increasing cancer screening coverage (+)	Increase efforts to improve cancer screening coverage in all regions
		Important regional differences in cancer screening coverage		
	Overall moderate results for health promotion	Inequalities in health promoting behaviour	Positive tendency in health promotion (+)	Increase efforts to reach socioeconomic less favourable groups
Curative care		Lack of national mortality data		
		High in-hospital mortality rates (for hip fracture and CAP)		Further exploration needed with risk-adjustment
Appropriateness	High rate of minimal-invasive techniques		Positive evolution for minimal-invasive techniques (+)	
		High number of hysterectomies compared to other countries	Decrease in overall number of hysterectomies (+)	Increase efforts to get clinical practice guidelines implemented
	Number of caesarean sections below international average		Increasing number of caesarean sections (-)	
		High medical radiation exposure	Increasing medical radiation exposure (-)	Stimulate use of less irradiating procedures, such as MRI, where appropriate
		High rate of mammograms in population not eligible for population screening		Investigate appropriateness of these mammograms (planned KCE project in 2010)
Safety	Relatively good inpatient safety	Increasing medical radiation exposure		
			Decreasing incidence of MRSA (+)	
Continuity		Length-of-stay above EU15-average		Investigate reasons for higher length-of-stay

Dimensions	Strengths	Weaknesses	Evolutions	Suggested actions
		Relatively low number of persons with GMD, with important regional differences	Increasing number of persons with GMD (+)	Increase efforts to get GMD implemented in all regions
Accessibility	High insurance coverage	Difficult to assess personnel availability		A cadastre of health personnel is needed
	Availability of social care nets	Relatively high out-of-pocket expenses		Increase international comparability of SHA data
Efficiency	Surgical day case rate above international average		Evolution towards more ambulatory and day care (+)	
		Inappropriate care		Increase efforts to get clinical practice guidelines implemented
	Overall more efficient organisation of inpatient care (use of minimal-invasive techniques, clinical pathways)	Length-of-stay above EU15-average		
Sustainability	High number of medical and nursing graduates	Unsure if personnel availability is tailored to the population's needs		Need for data on nursing graduates; need for in-depth analysis of health personnel needs taking into account demographic and epidemiological evolutions and population health status
	Moderate use of electronic medical file compared to other countries	Relatively high total health expenditures		

Figure 26. Visual tool for a synthetic overview of the Belgian healthcare system's performance (please note that this was left uncoloured intentionally).

	Quality					Accessibility	Efficiency	Sustainability
	Effectiveness	Appropriateness	Safety	Patient-centeredness	Continuity			
Preventive care								
Curative care								
Long-term care								
End-of-life care								

The results presented in this report are generally in line with those reported by EHCI [27] and Itinera [81]. However, the ranking provided in the EHCI report should be interpreted with caution. The data used to measure the EHCI indicators are not transparent, and the use of different methods for different countries cannot be excluded. For some indicators (e.g. cancer therapy within 21 days, CT scan within 7 days, or % of diabetics with HbA1c levels >7%), measurability is even questionable. Above this, the inclusion of some indicators can also be questioned, e.g. direct access to specialists.

8.5 LIMITATIONS OF THE REPORT

The present report faced many limitations of which most were already discussed in the previous sections. These include:

- Due to the many gaps, the evaluation of the Belgian healthcare's performance presented in chapter 6 is preliminary. Gaps are identified related to the coverage of dimensions (patient-centeredness, continuity, equity), sub-dimensions (e.g. cultural, psychological and timely accessibility), healthcare domains (long-term and end-of-life care) and disease areas (elderly care, mental health). Furthermore, for some dimensions for which indicators were selected, the pilot study was faced with data unavailability (mortality, clinical data).

- By focusing the scope of the project on healthcare, other (non-medical) determinants of health were neglected. However, some of these determinants are strongly related to healthcare (e.g. smoking, weight, etc.) and can be influenced.

- The lack of patient-centeredness indicators is the result of the adopted selection process, but is also indicative of the paucity of information on patient-centeredness. The non-inclusion of patients in the stakeholders sample adds to this gap. In future reports, this aspect should be included explicitly.

8.6 POTENTIAL USE OF THE REPORT

The stakeholders' analysis revealed some intentions to use the performance report by the different health organisations and administrations in Belgium. Potential uses range from passive to more active actions, i.e. dissemination, internal discussion, comparison with other sources, the identification of research topics and the formulation of policy recommendations.

As stated in chapter 3, the ultimate goal of the performance system is a high-performing health system that contributes to the health of the Belgian population. This means that the information presented in the present and future reports should serve to improve the health system's performance where necessary. Concretely, the report can be used to formulate health objectives at the federal level, or at least to decide on a strategy for the formulation of health objectives. In future reports, the attainment of these objectives can be evaluated and targeted actions can be undertaken.

Clearly, the actual use of the report depends on several factors. A clear communication and dissemination strategy will be necessary to reach the intended users. To ensure that the report will be used to improve the health system's performance, the results will need to be discussed with the responsible policy makers, e.g. through a presentation of the report in the parliament. It would also be advisable to set up a working group evaluating the actual use of the report. Established health organisations such as the NIHDI and the FPS should play an active role in the communication, dissemination and utilisation of the report.

An added value of this project is the objectivity and global approach of the Belgian health system's performance. Although not all performance dimensions were covered by indicators, resulting in a fragmented evaluation, the results of individual indicators should not be interpreted in an isolated way, but in relation to other indicators and the broader context of the Belgian health system.

8.7   CONCLUSIONS

The present report shows that it is feasible to set up a performance measurement system in Belgium if certain preconditions are met. By doing this first exercise, it was shown that collaboration across health administrations and organisations is possible in an efficient way. However, existing gaps (in terms of indicators and available data) were highlighted. The results of the pilot test presented in this report should therefore be interpreted with caution.

9 APPENDIXES

APPENDIX 1: SEARCH STRATEGIES

Medline search:

1. Health Policy/

2. (health adj2 system).tw.

3. (healthcare adj2 system).tw.

4. "Outcome and Process Assessment (Health Care)"/

5. "Process Assessment (Health Care)"/

6. Quality Assurance, Health Care/

7. "Outcome Assessment (Health Care)"/

8. Quality Indicators, Health Care/

9. Health Status Indicators/

10. performance.ab,ti.

11. 4 or 5 or 6 or 7 or 8 or 9 or 10

12. 1 or 2 or 3

13. 11 and 12

14. limit 13 to (yr="2000 - 2008" and (dutch or english or french) and humans)

APPENDIX 2: OVERVIEW OF CONCEPTUAL FRAMEWORKS

AUSTRALIA

Health Status and Outcomes

How healthy are Australians? Is it the same for everyone?
Where is the most opportunity for improvement?

Health Conditions	Human Function	Life Expectancy and Wellbeing	Deaths
Prevalence of disease, disorder, injury or trauma or other health-related states.	Alterations to body, structure or function (impairment), activities (activity limitation) and participation (restrictions in participation).	Broad measures of physical, mental, and social wellbeing of individuals and other derived indicators such as Disability Adjusted Life Expectancy (DALE).	Age and/or condition specific mortality rates.

Determinants of Health

Are the factors determining good health changing for the better? Is it the same for everyone?
Where and for whom are these factors changing?

Environmental Factors	Socioeconomic Factors	Community Capacity	Health Behaviours	Person-related Factors
Physical, chemical and biological factors such as air, water, food and soil quality resulting from chemical pollution and waste disposal.	Socioeconomic factors such as education, employment, per capita expenditure on health, and average weekly earnings.	Characteristics of communities and families such as population density, age distribution, health literacy, housing, community support services and transport.	Attitudes, beliefs knowledge and behaviours e.g. patterns of eating, physical activity, excess alcohol consumption and smoking.	Genetic-related susceptibility to disease and other factors such as blood pressure, cholesterol levels and body weight.

Health System Performance

How well is the health system performing in delivering quality health actions
to improve the health of all Australians? Is it the same for everyone?

Effective	Appropriate	Efficient
Care, intervention or action achieves desired outcome.	Care/intervention/action provided is relevant to the client's needs and based on established standards.	Achieving desired results with most cost effective use of resources.
Responsive	**Accessible**	**Safe**
Service provides respect for persons and is client orientated. It includes respect for dignity, confidentiality, participation in choices, promptness, quality of amenities, access to social support networks, and choice of provider.	Ability of people to obtain health care at the right place and right time irrespective of income, physical location and cultural background.	The avoidance or reduction to acceptable limits of actual or potential harm from health care management or the environment in which health care is delivered.
Continuous	**Capable**	**Sustainable**
Ability to provide uninterrupted, coordinated care or service across programs, practitioners, organisations and levels over time.	An individual's or service's capacity to provide a health service based on skills and knowledge.	System or organisation's capacity to provide infrastructure such as workforce, facilities and equipment, and be innovative and respond to emerging needs (research, monitoring).

CANADA

HEALTH STATUS

How healthy are Canadians?

Health Conditions   Human Functions   Well-being   Deaths

NON-MEDICAL DETERMINANTS OF HEALTH

These are known to affect our health, and in some cases, when and how we use care

Health Behaviours   Living & Working Conditions   Personal Resources   Environmental Factors

HEALTH SYSTEM PERFORMANCE

How healthy is the health care system?

Acceptability   Accessibility   Appropriateness   Competence

Continuity   Effectiveness   Efficiency   Safety

COMMUNITY AND HEALTH SYSTEM CHARACTERISTICS

These provide useful contextual information but are not direct measures of health status or of the quality of care

Community   Health system   Resources

E Q U I T Y

THE NETHERLANDS

HEALTH
How healthy are the Dutch?

NON-HEALTHCARE DETERMINANTS OF HEALTH
Are the non-healthcare factors that also determine health as well as if/how health care is used changing favorably?

HEALTHCARE SYSTEM PERFORMANCE
How does the healthcare system perform? What is the level of care across the range of patient care needs? What does this performance cost?

	Dimensions of Healthcare Performance		
Healthcare Needs	Quality	Access	Costs
Staying healthy			
Getting better			
Living with illness or disability			
End-of-life care			

Efficiency
(value for money)

EQUITY

HEALTH SYSTEM DESIGN AND CONTEXT
What are the important design and contextual information that may be specific to the Dutch health system and which are necessary for interpreting the quality of health care?

NEW ZEALAND

Better health

The best possible improvement in New Zealanders' health status and quality of life over time, within the resources available.

Reduced inequalities

An improvement in the health status of those currently disadvantaged, particularly Māori, Pacific peoples and people with low socioeconomic status.

Better participation and independence

The health and disability support sector contributes constructively to having a society that fully values the lives of people with disabilities.

Trust and security

New Zealanders feel secure that they are protected by the system from substantial financial costs due to ill health, and trust it because it performs to high standards, reflects their needs and provides opportunities for community participation.

Healthy New Zealanders

Equity and access

New Zealanders in similar need of services have an equitable opportunity to access equivalent services and resources are allocated in a manner that reduces inequity of outcomes.

Quality

Health and disability support services are clinically sound, culturally competent and well co-ordinated and ongoing service quality improvement processes are in place.

Efficiency and value for money

The system operates efficiently and services deliver relatively large gains in health status for each unit of resource.

Effectiveness

The system as a whole and the services provided within the system are effective in contributing to the end outcome of healthy New Zealanders.

Intersectoral focus

Social, environmental, economic and cultural factors are influenced to reduce their negative impacts and increase their positive impacts on end outcomes for the health and disability system.

A fair and functional health system

UNITED STATES

	Components of Health Care Quality			
Consumers' Health Care Needs	Effectiveness	Safety	Timeliness	Patient centeredness
Staying healthy				
Getting better				
Living with illness or disability				
Coping with end of life				

WORLD HEALTH ORGANISATION

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APPENDIX 3: DETAILED SELECTION PROCESS OF PERFORMANCE INDICATORS

Table 54: Overview of first selection of performance indicators based on the Dutch and Canadian performance reports.

Number	Description	Source
CA001	Self-reported difficulty obtaining routine or ongoing health services	http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2006-fed-comp-indicat/2006-fed-comp-indicat_e.pdf
CA002	Self-reported difficulty obtaining health information or advice	http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2006-fed-comp-indicat/2006-fed-comp-indicat_e.pdf
CA003	Self-reported difficulty obtaining immediate care	http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2006-fed-comp-indicat/2006-fed-comp-indicat_e.pdf
CA004	Self-reported prescription drug spending as a percentage of income	http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2006-fed-comp-indicat/2006-fed-comp-indicat_e.pdf
CA005	Self-reported wait times for diagnostic services	http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2006-fed-comp-indicat/2006-fed-comp-indicat_e.pdf
CA006	Self-reported patient satisfaction with overall healthcare services	http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2006-fed-comp-indicat/2006-fed-comp-indicat_e.pdf
CA007	Self-reported patient satisfaction with community-based care	http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2006-fed-comp-indicat/2006-fed-comp-indicat_e.pdf
CA008	Self-reported patient satisfaction with telephone health line or tele-health services	http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2006-fed-comp-indicat/2006-fed-comp-indicat_e.pdf
CA009	Self-reported patient satisfaction with hospital care	http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2006-fed-comp-indicat/2006-fed-comp-indicat_e.pdf

Number	Description	Source
CA010	Self-reported patient satisfaction with physician care	http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/pubs/2006-fed-comp-indicat/2006-fed-comp-indicat_e.pdf
CA011	Patient satisfaction (and quality rating of services received)	http://secure.cihi.ca/indicators/en/defin32004.shtml
CA012	Proportion of the population age 65 and older who report that they received a dose of influenza vaccine in the past year	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA013	Proportion of women age 50-69 who report receiving screening mammograms within the last two years	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA014	Proportion of women age 18-69 who report having had a Pap test within the last three year	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA015	Proportion of children who, by their second birthday, have been fully immunized against diphtheria, pertussis, tetanus, Haemophilus influenzae type b (Hib), measles, mumps, and rubella	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA016	Regular medical doctor	http://secure.cihi.ca/indicators/june_2006/en/definitions06_e.shtml#hsp
CA017	Wait time for hip fracture surgery	http://secure.cihi.ca/indicators/2007/en/definition07_e.html
CA018	Proportion of women who have previously received a cesarean section who give birth via a vaginal delivery in an acute care hospital	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA019	Proportion of female breast cancer surgery inpatients in acute care hospitals who received breast conserving surgery	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA020	Proportion of women delivering babies in an acute care hospital who received cesarean sections	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA021	Proportion of smokers who quit smoking in the past two years	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA022	Proportion of live births with a birthweight less than 2500 grams	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA023	Number of cases of pertussis reported in a given year, expressed as a rate per 100 000 population	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA024	Number of cases of measles reported in a given year, expressed as a rate per 100 000 population	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA025	Number of new cases of tuberculosis reported in a given time period, expressed as a rate per 100 000 population	http://secure.cihi.ca/cihiweb/products/phi.pdf

Number	Description	Source
CA026	Number of new positive HIV cases in a given year, expressed as a rate per 100 000 population. Information is based on those who are tested for HIV	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA027	Number of new cases of chlamydia reported in a given year, expressed as a rate per 100 000 population	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA028	Age/sex standardized acute care hospitalization rates for pneumonia and influenza, per 100 000 population age 65 and older	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA029	Deaths due to Medically-Treatable Diseases: bacterial infections	http://secure.cihi.ca/indicators/en/defin3.shtml
CA030	Deaths due to Medically-Treatable Diseases: cervical cancer	http://secure.cihi.ca/indicators/en/defin3.shtml
CA031	Deaths due to Medically-Treatable Diseases: hypertensive disease	http://secure.cihi.ca/indicators/en/defin3.shtml
CA032	Deaths due to Medically-Treatable Diseases: pneumonia and unspecified bronchitis	http://secure.cihi.ca/indicators/en/defin3.shtml
CA033	30 day Acute Myocardial Infarction (AMI) in-hospital mortality rate	http://secure.cihi.ca/indicators/en/defin3.shtml
CA034	30 day Stroke in-hospital mortality rate	http://secure.cihi.ca/indicators/en/defin3.shtml
CA035	Acute Myocardial Infarction (AMI) readmission rate	http://secure.cihi.ca/indicators/en/defin3.shtml
CA036	Asthma readmission rate	http://secure.cihi.ca/indicators/en/defin3.shtml
CA037	Hysterectomy readmission rate	http://secure.cihi.ca/indicators/en/defin3.shtml
CA038	Pneumonia readmission rate	http://secure.cihi.ca/indicators/en/defin3.shtml
CA039	Prostatectomy readmission rate	http://secure.cihi.ca/indicators/en/defin3.shtml
CA040	Ambulatory Care Sensitive Conditions	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA041	Surgical Day Case Rates	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA042	Percentage of acute care inpatient hospitalizations classified as May Not Require Hospitalization	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA043	Percentage of inpatient days where a physician (or designated other) has indicated that a patient occupying an acute care hospital bed was well enough to have been cared for elsewhere	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA044	Expected Compared to Actual Stay	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA045	Hip fracture hospitalization	http://secure.cihi.ca/cihiweb/products/phi.pdf
CA046	In-hospital hip fracture	http://secure.cihi.ca/indicators/en/defin32004.shtml
NL001	Percentage of (adolescent) smokers	2006
NL002	Percentage of (adolescent) people who are overweight	2006

Number	Description	Source
NL003	Participation rates of population screening programmes: - cervical cancer screening - breast cancer screening - heel prick	2006
NL004	Vaccination rates (National Vaccination Programme (RVP), influenza vaccination, hepatitis B vaccination)	2006
NL005	Percentage of patients with diabetes with good glucose control	2006
NL006	Effectiveness of lifestyle advice in primary care	2006
NL007	Percentage of schools that offer effective lifestyle programmes	2006
NL008	Percentage of employers (companies) that have a workplace health promotion policy	2006
NL009	Health protection: consumer trust in food safety, emergency treatment of home and leisure accidents and an indicator for medical assistance in accidents and disasters (GHOR)	2006
NL010	Percentage of adolescents at high-risk that is identified by preventive child healthcare	2006
NL011	Percentage of underprivileged neighbourhoods with an intersectoral public health approach (no information available)	2006
NL012	Perinatal mortality	2006
NL013	Percentage of cases in which GPs do not prescribe medication for a specific syndrome, consistent with guidelines that advise against these medications	2006
NL014	Percentage of cases in which GPs prescribe medication for a specific syndrome consistent with guidelines	2006
NL015	Percentage of cases in which GPs prescribe according to guidelines	2006
NL016	Percentage of referrals by GPs to medical specialists	2006
NL017	Percentage of referrals by GPs to other primary care professionals	2006
NL018	In-hospital mortality for heart failure	2006
NL019	In-hospital mortality for pneumonia	2006
NL020	In-hospital mortality for bypass surgery	2006
NL021	Hospital Standardised Mortality Ratio	2006
NL022	30-day mortality following acute myocardial infarction	2006
NL023	30-day mortality following stroke	2006

Number	Description	Source
NL024	Asthma mortality rate per 100 000 population aged 5 39	2006
NL025	Breast cancer mortality rate per 100 000 women	2006
NL026	Colon cancer mortality rate per 100 000 population	2006
NL027	Cervical cancer mortality rate per 100 000 women	2006
NL028	Breast cancer 5-year survival rate	2006
NL029	Colon cancer 5-year survival rate	2006
NL030	Cervical cancer 5-year survival rate	2006
NL031	Percentage of (over) 65-year-old hip fracture patients with surgery initiated within 48 hours	2006
NL032	Number of diabetes-related major amputations per 10 000 diabetics aged 18 75	2006
NL033	Percentage of people with disabilities in the general population who indicate that medical aids solve their problems	2006
NL034	Percentage of people with somatic complaints who return to their home environment after a stay in a nursing home (as an indicator of the magnitude of the temporary stay function of nursing homes)	2006
NL035	Client experiences with home care, residential homes, nursing homes and care for the disabled	2006
NL036	Magnitude of potentially preventable healthcare problems (such as falls) among residential home and nursing home residents	2006
NL037	Percentages of patients with decubitus in residential homes, in nursing homes or with home care	2006
NL038	Judgements of the Health Care Inspectorate on nursing home care	2006
NL039	Percentages of home care or nursing home patients admitted to a hospital each year	2006
NL040	Number of psychogeriatric patients living in small-scale residential care facilities	2006
NL041	Results of prevention measures and the uptake by target groups	2006
NL042	Changes in mental and social functioning of patients	2006
NL043	Development in the number of suicides and suicide attempts	2006
NL044	Percentage of the target group reached by care professionals	2006
NL045	Development in removal rates from mental healthcare and substance abuse care	2006
NL046	General consumer trust: do Dutch people have confidence in the healthcare system irrespective of their actual use?	2006

Number	Description	Source
NL047	Consumer experiences: how do care consumers judge the care provided?	2006
NL048	Percentage of GPs and pharmacists who participate in Pharmacotherapeutic Consultations	2006
NL049	Pharmacovigilance in pharmacies	2006
NL050	Volume of high-risk surgery in hospitals	2006
NL051	Incidence of serious adverse effects of blood transfusion	2006
NL052	Prevalence of postoperative surgical site infections	2006
NL053	Prevalence of decubitus in hospitals	2006
NL054	Prevalence of decubitus in long-term care facilities	2006
NL055	Percentage of institutions that have been certified or accredited	2006
NL056	Percentage of institutions that have the necessary documents on quality policy	2006
NL057	Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes	2006
NL058	Percentage of institutions that use systems or subsystems for feedback from patients and clients	2006
NL059	Investments in research and development in the care sector; international comparison	2006
NL060	Number of biotechnology patents granted to the Netherlands	2006
NL061	Utilisation and speed of diffusion of minimal and non-invasive surgical techniques	2006
NL062	Use of process innovations, such as integrated care pathways and CVA integrated care	2006
NL063	Application of ICT in various areas of the healthcare sector	2006
NL064	Development in the rate of surgical day-treatments to the total number of surgical treatments	2006
NL065	New choices: personal care budget and health insurance services	2006
NL066	People's wishes with respect to choice: care provider, source of information and residential care	2006
NL067	Percentage of urgent ambulance rides that is on site within specific response times	2006
NL068	Number of urgent ambulance rides that exceed the 15-minute response time norm	2006
NL069	Number of people who are able to reach the nearest HED or central GP post by car within 30 minutes	2006
NL070	Number of urgent callers to central GP posts who get to speak a healthcare professional within one minute	2006

Number	Description	Source
NL071	Number of people waiting for a donor organ	2006
NL072	Percentage of patients who are satisfied with the speed with which they can see the GP, specialist or dentist	2006
NL073	Number of people waiting (length of waiting list)	2006
NL074	(Expected) time till treatment (waiting time)	2006
NL075	Number of people waiting longer than the so-called Treek norm	2006
NL076	Comparison of care utilization by people with a low or high level of education, corrected for health disparities	2006
NL077	Comparison of care utilization by Dutch versus immigrant populations, corrected for health disparities	2006
NL078	Care utilization in disadvantaged neighbourhoods of big cities and by marginal populations	2006
NL079	Satisfaction of asylum seekers with medical care	2006
NL080	Insurance status of the population, including being uninsured	2006
NL081	Healthcare costs per capita	2006
NL082	Amount of co-payments and out-of-pocket payments	2006
NL083	Tax deduction because of illness-related costs	2006
NL084	Additional illness-related costs for chronically ill people	2006
NL085	Use of financial compensatory measures by chronically ill people	2006
NL086	Percentage of family income spent on healthcare costs by high and low-income groups	2006
NL087	Share of total healthcare costs in the Netherlands that is paid by high and low-income groups (income solidarity in healthcare)	2006
NL088	Proximity of services, expressed in actual travelling time, or number of care locations in an urban area or region	2006
NL089	Number of outpatient and inpatient services per region per 10 000 inhabitants	2006
NL090	Number of vacancies in healthcare that are difficult to fill	2006
NL091	Personnel absenteeism rate	2006
NL092	Current unfulfilled demand	2006
NL093	Extent to which the current influx of personnel is matched to developments in care demands	2006

Number	Description	Source
NL094	Number of people who are not registered with a GP or dentist	2006
NL095	Number of physicians and nurses per 100 000 population	2006
NL096	Professional ratios: number of care providers relative to another type of care provider (e.g., number of dental hygienists to dentist)	2006
NL097	Medical-technical tasks carried out by general practice assistants	2006
NL098	Number of practice nurses in GP practices	2006
NL099	Numbers of qualified physician assistants and nurse practitioners working and in training	2006
NL100	Percentage of Dutch people who provide informal care	2006
NL101	*The number of referrals to physiotherapists (presently about 1 in every 50 GP contacts)*	2006
NL102	*The number of first contacts with physiotherapists without a referral of the GP*	2006
NL103	*The number of training places / basic specialists who completed their training*	2006
NL104	*The duration of training in years (from the beginning of the graduate training to the end of the postgraduate training) for specialists; currently measurable: time between the end of the graduate training and the start of the post-graduate training*	2006
NL105	*The number of institutes for higher vocational training in care participating in an educational region*	2006
NL106	Healthcare expenditures according to the Health Care Budgetary Framework (Ministry of Health)	2006
NL107	Healthcare expenditures according to the Health Accounts (Statistics Netherlands)	2006
NL108	Healthcare expenditures according to the System of Health Accounts (OECD)	2006
NL109	Expenditures on different sectors	2006
NL110	Expenditures for Health Care Budgetary Framework relevant care by funding source	2006
NL111	Share of healthcare costs in GDP	2006
NL112	Share of healthcare costs in the growth in GDP	2006
NL113	Price movements in healthcare	2006
NL114	Changes in volume of care	2006
NL116	Variation in insurance premiums (health insurance market)	2006
NL117	Market concentrations of care providers and health insurers (health insurance market/ care procurement market)	2006

Number	Description	Source
NL118	Access barriers to the healthcare market (all submarkets)	2006
NL119	Healthcare procurement by health insurers (care procurement market)	2006
NL120	Vertical integration (all submarkets)	2006
NL121	Mobility of insured between health insurers (health insurance market)	2006
NL122	Risk selection by insurers (health insurance market)	2006
NL123	Cost transfers (health insurance market)	2006
NL124	Development of production volume in six care sectors divided by the number of employees in fte and corrected for reduction of working hours	2006
NL125	Trend in productivity in hospitals compared to trend in productivity of the Dutch economy as a whole	2006
NL126	Number of hospital discharges by fte hospital employees	2006
NL127	Rate of return	2006
NL128	Solvency	2006
NL129	Liquidity	2006
NL130	Financial reserve	2006
NL131	Participation rate in the Guarantee Fund for the Health Care Sector	2006
NL134	Trends in lifestyle	2008
NL135	Annual check-ups at the dentist	2008
NL136	Coverage of preventive child healthcare	2008
NL137	Lifestyle counselling by the GP	2008
NL138	Infant mortality	2008
NL139	Health policy in schools	2008
NL140	Prescribing percentage in general practice according to the Dutch College of General Practitioners formulary	2008
NL141	Number of referrals to secondary care	2008
NL142	Opinion of general public on curative care	2008
NL143	Experienced coordination of medication use	2008
NL144	Number of people who die within 30 days of being admitted to hospital for an acute myocardial infarction, stroke or brain haemorrhage	2008
NL145	Mortality due to breast cancer, colon cancer or cervical cancer	2008

Number	Description	Source
NL146	Mortality due to asthma	2008
NL147	Number of hip fractures that are operated on within 48 hours	2008
NL148	Client judgements of residential homes and nursing homes	2008
NL149	Judgment of AWBZ-care applicants of the National Care Assessment Centre	2008
NL150	Quality of life of patients in residential homes and nursing homes	2008
NL151	Client judgements of care for the physically disabled	2008
NL152	Client judgements of home care	2008
NL153	Satisfaction of nurses and care workers with the quality of care	2008
NL154	Effectiveness of medical aids	2008
NL155	Preventable healthcare problems among residents in residential homes, nursing homes and care for the disabled (pressure sores, malnutrition, falls)	2008
NL156	Number of places in small-scale residential care facilities for people with dementia	2008
NL157	Judgement of the Dutch Health Care Inspectorate on the quality of long-term care	2008
NL158	Proportion of adults with a severe anxiety, mood or addiction disorder who receive care for this	2008
NL159	Proportion of adults with a severe anxiety, mood or addiction disorder under care who receive at least one follow-up contact	2008
NL160	Proportion of adults with a severe anxiety, mood or addiction disorder under care who receive a satisfactory form of care	2008
NL161	Proportion of secondary mental health treatments that are ended in joint consultation between the therapist and the client/patient	2008
NL162	Proportion of people who end up at the accident and emergency department after a suicide attempt and are seen by a psychiatrist there	2008
NL163	Patient experiences with Medication errors Medical errors Laboratory or diagnostic test errors	2008
NL165	Percentage of patients that sustained medical injury during hospitalization	2008
NL166	Prevalence of hospital-acquired pressure sores	2008
NL167	Prevalence of hospital-acquired infections	2008

Number	Description	Source
NL168	Incidence of transfusion-related adverse events	2008
NL169	Percentage of hospitals where information on medication prescribed in hospital and elsewhere is electronically accessible at hospital wards and elsewhere	2008
NL171	Prevalence of medication-related hospital admissions	2008
NL172	Percentage of Pharmacotherapeutic Consultations that function at levels 3 or 4	2008
NL173	International score for availability of minimal-invasive techniques	2008
NL174	Number of day surgery interventions as a proportion of all surgical interventions	2008
NL175	Use of home care technology and proportion of renal dialysis patients using home dialysis	2008
NL176	Use of telecare	2008
NL177	Supply of e-health in mental healthcare	2008
NL178	Evaluation of Breakthrough Projects	2008
NL179	ICT applications as process support: use of the Electronic Health Records, Electronic Medication Records and Electronic Locum File	2008
NL180	Number of patent applications by Dutch people together with foreigners, as a proportion of the total number of patent applications by Dutch people	2008
NL181	Number of patent applications by Dutch partnerships, as a proportion of the total number of Dutch patent applications	2008
NL182	Expenditure of a country's pharmaceutical industry on healthcare related Research & Development as a proportion of its gross domestic product	2008
NL183	Percentage of people who do not have health insurance	2008
NL184	Percentage of people who have confidence in the affordability of necessary healthcare	2008
NL185	Percentage of people who forego necessary healthcare	2008
NL186	Additional health-related expenses for people with chronic illnesses and disabilities	2008
NL187	Distribution of out of pocket payments across households	2008
NL188	Share of disposable income that is spent on healthcare by different income groups	2008
NL189	Average distance for every inhabitant of the Netherlands to the nearest specific care service	2008
NL190	Range of catchment profile by care service	2008
NL191	Trend of average distance and catchment profile for GPs and hospitals	2008

Number	Description	Source
NL192	Patients' experiences: was it a problem for you to travel for your care, examination or treatment?	2008
NL193	Percentage of people who had to travel more than 20 minutes to a hospital compared with other EU countries	2008
NL194	Number of emergency ambulance rides that exceed the 15-minute norm	2008
NL195	Number of people who can be reached by a mobile medical team within 30 minutes	2008
NL196	Number of people who can reach the nearest emergency services by car within 30 minutes	2008
NL197	Number of people who can reach the nearest general practice cooperative by car within 30 minutes	2008
NL198	Number of people who place an emergency call to general practice cooperatives and are helped by a care professional within one minute	2008
NL199	Percentage of people with a need for acute care who did not get the care they needed and wanted	2008
NL200	Percentage of care users who are of the opinion that waiting times in care are long or short	2008
NL201	Number of people who are waiting for healthcare by type (the length of the waiting list)	2008
NL204	Number of problematic patients who are waiting for long-term care	2008
NL205	Number of people who are waiting for a donor organ	2008
NL206	Differences in the use of care between people with a high educational level and those with a low educational level, whereby a correction for health differences is applied	2008
NL207	Differences in hospital admission and the use of mental healthcare and addiction services between migrants and natives	2008
NL208	Differences in mortality following hospital admission for a heart attack between migrants and natives	2008
NL209	Care needs of homeless people	2008
NL210	Quality of medical health services for asylum seekers	2008
NL211	Number of vacancies per 1000 jobs in healthcare	2008
NL212	Share of vacancies that are difficult to fill	2008
NL213	Percentage of nursing and care personnel that are leaving the sector (net turnover)	2008

Number	Description	Source
NL214	Percentage of work hours lost to absenteeism	2008
NL215	Number of people who have (had) problems finding a GP	2008
NL216	Percentage of care users who believe enough personnel is available during a stay in the hospital or nursing home	2008
NL217	Percentage of nurses and carers who believe that enough personnel is on duty to assure the patients' safety	2008
NL218	Unfilled demand for medical specialist care	2008
NL219	Number of doctors and nurses per 1000 inhabitants	2008
NL220	Qualification levels of care workers and nurses	2008
NL221	Number of people who experienced problems finding a GP	2008
NL222	Number of people who have a personal care budget	2008
NL223	Share of insured people who have switched health insurer	2008
NL224	Share of insured people who did not experience any limitations to their freedom to choose a health insurer	2008
NL225	Share of Dutch population that looked for information on quality with regards to hospitals and doctors	2008
NL229	Public health expenditure per working person according to the System of Health Accounts	2008
NL230	Health expenditure per healthcare sector according to the Health Care Budgetary Framework	2008
NL231	Health expenditure by source of funding	2008
NL232	Share of healthcare costs in gross domestic product	2008
NL233	Price and volume trends in health expenditure	2008
NL234	Profitability	2008
NL236	Reserve for acceptable costs	2008
NL237	Result	2008
NL239	Labour productivity in hospitals	2008
NL240	Labour productivity in care for the elderly	2008
NL241	Quality and labour productivity in residential homes	2008

Figure 27: Detailed overview of first formal scoring of selected indicators.

	Cat	Valid									Reliable									Relevant									Interpretable									Actionable								
		E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9
Quality																																														
Effectiveness																																															
CA012 Proportion of the population age 65 and older who report that they received a dose of influenza vaccine in the past year	Prev-vac	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	8	9	7	9	9	7	9	100%	9	9	5	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%
CA013 Proportion of women age 50-69 who report receiving screening mammograms within the last two years	Prev-scr	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	9	9	7	9	100%	9	9	5	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%
CA014 Proportion of women age 18-69 who report having had a Pap test within the last three year	Prev-scr	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	9	9	7	9	100%	9	9	5	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%
CA015 Proportion of children who, by their second birthday, have been fully immunized against diphtheria, pertussis, tetanus, Haemophilus influenzae type b (Hib), measles, mumps, and rubella	Prev-vac	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	9	9	7	9	100%	9	9	5	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%
CA021 Proportion of smokers who quit smoking in the past two years	Prev-hp	7	5	1	7	7	7	1	7	60%	7	5	9	7	4	7	4	9	60%	9	8	1	7	7	7	1	9	80%	9	5	1	7	7	7	1	9	60%	8	7	9	7	7	7	7	9	100%
CA022 Proportion of live births with a birthweight less than 2500 grams	CC-M&C	5	8	5	7	7	7	5	8	60%	7	9	5	7	7	7	5	9	80%	6	8	5	7	7	7	5	8	60%	6	5	5	7	7	6	5	7	40%	3	9	5	7	7	7	3	9	60%
CA023 Number of cases of pertussis reported in a given year, expressed as a rate per 100 000 population	Prev-vac	9	8	5	7	7	7	5	9	80%	9	5	5	7	7	7	5	9	60%	9	4	5	7	7	7	4	9	60%	9	8	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%
CA024 Number of cases of measles reported in a given year, expressed as a rate per 100 000 population	Prev-vac	9	8	5	7	7	7	5	9	80%	9	5	5	6	7	6	5	9	40%	9	4	5	7	7	7	4	9	60%	9	8	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%
CA025 Number of new cases of tuberculosis reported in a given time period, expressed as a rate per 100 000 population	Prev?	6	9	5	7	7	7	5	9	60%	9	5	5	7	7	7	5	9	60%	7	8	5	7	7	7	5	8	80%	9	8	5	7	7	7	5	9	80%	3	7	5	7	7	7	3	7	60%
CA026 Number of new positive HIV cases in a given year, expressed as a rate per 100 000 population. Information is based on those who are tested for HIV	Prev?	8	5	5	7	7	7	5	8	60%	9	9	5	7	7	7	5	9	80%	9	6	5	7	7	7	5	9	60%	9	6	5	7	7	7	5	9	60%	5	7	5	7	7	7	5	7	60%

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		E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9
CA027 Number of new cases of chlamydia reported in a given year, expressed as a rate per 100 000 population		8	9	5		7	7,5	5	9	75%	9	9	5		7	8	5	9	75%	8	4	5		7	6	4	8	50%	9	9	5		7	8	5	9	75%	5	9	5		7	6	5	9	50%
CA028 Age/sex standardized acute care hospitalization rates for pneumonia and influenza, per 100 000 population age 65 and older	Prev-vac	9	9	5	7	7	7	5	9	80%	9	7	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	7	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%
CA029 Deaths due to Medically-Treatable Diseases: bacterial infections		7	9	9	3	7	7	3	9	80%	7	9	9	7	7	7	7	9	100%	9	9	9	7	9	9	7	9	100%	5	9	6	7	5	6	5	9	40%	3	9	6	3	7	6	3	9	40%
CA030 Deaths due to Medically-Treatable Diseases: cervical cancer	CC-can	8	9	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	6	7	7	7	6	9	80%	9	9	6	7	7	7	6	9	80%	7	9	6	7	7	7	6	9	80%
CA031 Deaths due to Medically-Treatable Diseases: hypertensive disease	CC-CVD	5	9	9	7	7	7	5	9	80%	6	8	9	7	7	7	6	9	80%	7	9	9	7	9	9	7	9	100%	5	9	6	7	7	7	5	9	60%	7	9	6	7	7	7	6	9	80%
CA032 Deaths due to Medically-Treatable Diseases: pneumonia and unspecified bronchitis	CC-inf	5	9	9	3	7	7	3	9	60%	7	9	9	7	7	7	7	9	100%	9	9	9	7	9	9	7	9	100%	8	9	6	6	7	7	6	9	60%	7	9	6	6	7	7	6	9	60%
CA033 30 day Acute Myocardial Infarction (AMI) in-hospital mortality rate	CC-CVD	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	9	9	5	9	80%	9	9	5	7	7	7	5	9	80%	8	9	5	7	7	7	5	9	80%
CA034 30 day Stroke in-hospital mortality rate	CC-CVD	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	9	9	5	9	80%	9	9	5	7	7	7	5	9	80%	8	9	5	7	7	7	5	9	80%
CA035 Acute Myocardial Infarction (AMI) readmission rate		5	9	5	7	7	7	5	9	60%	9	9	5	7	7	7	5	9	80%	7	9	5	7	7	7	5	9	80%	5	9	5	7	6	6	5	9	40%	6	9	5	7	6	6	5	9	40%
CA036 Asthma readmission rate		5	9	5	7	7	7	5	9	60%	9	9	5	7	7	7	5	9	80%	7	9	5	7	7	7	5	9	80%	5	9	5	7	6	6	5	9	40%	6	9	5	7	6	6	5	9	40%
CA037 Hysterectomy readmission rate		5	9	5	7	7	7	5	9	60%	9	9	5	7	7	7	5	9	80%	7	9	5	7	7	7	5	9	80%	5	9	5	7	6	6	5	9	40%	6	9	5	7	6	6	5	9	40%
CA038 Pneumonia readmission rate		5	9	5	7	7	7	5	9	60%	9	9	5	7	7	7	5	9	80%	7	9	5	7	7	7	5	9	80%	5	9	5	7	6	6	5	9	40%	6	9	5	7	6	6	5	9	40%
CA039 Prostatectomy readmission rate		5	9	5	7	7	7	5	9	60%	9	9	5	7	7	7	5	9	80%	7	9	5	7	7	7	5	9	80%	5	9	5	7	6	6	5	9	40%	6	9	5	7	6	6	5	9	40%
CA040 Ambulatory Care Sensitive Conditions	CC-?	9	8	9	3	7	8	3	9	80%	9	5	9	3	7	7	3	9	60%	9	9	9	7	7	9	7	9	100%	9	7	9	6	4	7	4	9	60%	9	8	5	6	7	7	5	9	60%
CA045 Hip fracture hospitalization	Prev?	7	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	4	5	7	7	7	4	9	60%	9	7	5	7	7	7	5	9	80%	5	9	5	7	7	7	5	9	60%
NL001 Percentage of (adolescent) smokers	Prev-hp	7	7	1	7	7	7	1	7	80%	9	5	9	7	4	7	4	9	60%	9	6	1	7	7	7	1	9	60%	9	9	1	7	4	7	1	9	60%	8	8	9	7	7	8	7	9	100%

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NL002 Percentage of (adolescent) people who are overweight	Prev-hp	5	8	1	7	7	7	1	8	60%	9	8	9	7	4	8	4	9	80%	9	8	1	7	7	7	1	9	80%	9	9	1	7	7	7	1	9	80%	7	8	9	7	7	7	7	9	100%
NL003 Participation rates of population screening programmes: cervical cancer screening ; breast cancer screening ; heel prick	Prev-scr	9	8	9	7	7	8	7	9	100%	9	5	9	7	7	7	5	9	80%	9	8	9	7	9	9	7	9	100%	9	9	5	7	7	7	5	9	80%	9	8	9	7	7	8	7	9	100%
NL004 Vaccination rates (National Vaccination Programme (RVP), influenza vaccination, hepatitis B vaccination)	Prev-vac	9	8	9	7	7	8	7	9	100%	9	5	9	7	7	7	5	9	80%	9	8	9	7	9	9	7	9	100%	9	9	5	7	7	7	5	9	80%	9	8	9	7	7	8	7	9	100%
NL005 Percentage of patients with diabetes with good glucose control	CC-diab	6	9	9	7	7	7	6	9	80%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	7	9	5	7	7	7	5	9	80%	5	9	9	7	7	7	5	9	80%
NL006 Effectiveness of lifestyle advice in primary care		9	8	9		7	8,5	7	9	100%	7	5	5	4	4	5	4	7	20%	9	8	9	7	6	8	6	9	80%	5	9	9	7	7	7	5	9	80%	5	8	5	6	7	6	5	8	40%
NL007 Percentage of schools that offer effective lifestyle programmes	Prev-hp	9	8	9	7	6	8	6	9	80%	9	7	9	6	7	7	6	9	80%	9	4	9	7	4	7	4	9	60%	9	7	9	7	7	7	7	9	100%	9	8	9	7	7	8	7	9	100%
NL008 Percentage of employers (companies) that have a workplace health promotion policy		9	8	9	7	6	8	6	9	80%	9	7	9	6	7	7	6	9	80%	9	4	9	6	4	6	4	9	40%	9	7	9	7	7	7	7	9	100%	9	8	9	7	7	8	7	9	100%
NL009 Health protection: consumer trust in food safety, emergency treatment of home and leisure accidents and an indicator for medical assistance in accidents and disasters (GHOR)		9	8	1	7	7	7	1	9	80%	3	7	1	7	4	4	1	7	40%	9	4	1	7	7	7	1	9	60%	3	9	1	7	1	3	1	9	40%	5	8	1	7	7	7	1	8	60%
NL010 Percentage of adolescents at high-risk that is identified by preventive child health care		9	5	1	5	7	5	1	9	40%	7	6	1	5	7	6	1	7	40%	9	7	1	7	7	7	1	9	80%	9	6	1	6	5	6	1	9	20%	7	8	1	7	7	7	1	8	80%
NL011 Percentage of underprivileged neighbourhoods with an intersectoral public health approach (no information available)		9	5	9	5	7	7	5	9	60%	9	5	9	3	7	7	3	9	60%	1	5	9	5	7	5	1	9	40%	9	6	9	5	5	6	5	9	40%	1	4	9	4	6	4	1	9	20%
NL012 Perinatal mortality	CC-M&C	9	9	1	7	7	7	1	9	80%	9	9	9	7	7	9	7	9	100%	9	9	1	7	9	9	1	9	80%	9	9	1	7	7	7	1	9	80%	9	9	1	7	7	7	1	9	80%
NL016 Percentage of referrals by GPs to medical specialists	Generic	9	8	9	3	7	8	3	9	80%	9	7	9	3	7	7	3	9	80%	9	9	9	3	7	9	3	9	80%	9	8	9	3	7	8	3	9	80%	9	8	9	7	7	8	7	9	100%

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NL017 Percentage of referrals by GPs to other primary care professionals	Generic	9	8	9	3	7	8	3	9	80%	9	7	9	3	7	7	3	9	80%	9	7	9	3	7	7	3	9	80%	9	8	9	3	7	8	3	9	80%	9	8	9	7	7	8	7	9	100%
NL018 In-hospital mortality for heart failure	CC-CVD	9	8	5	7	7	7	5	9	80%	9	8	5	7	7	7	5	9	80%	9	8	5	7	9	8	5	9	80%	9	8	5	7	5	7	5	9	60%	7	8	5	7	7	7	5	8	80%
NL019 In-hospital mortality for pneumonia	CC-inf	9	8	5	7	7	7	5	9	80%	9	8	5	7	7	7	5	9	80%	9	8	5	7	9	8	5	9	80%	9	8	5	7	5	7	5	9	60%	7	8	5	7	7	7	5	8	80%
NL020 In-hospital mortality for bypass surgery	CC-CVD	9	8	5	7	7	7	5	9	80%	9	8	5	7	7	7	5	9	80%	9	8	5	7	9	8	5	9	80%	9	8	5	7	5	7	5	9	60%	7	8	5	7	7	7	5	8	80%
NL021 Hospital Standardised Mortality Ratio	CC-?	9	8	5	7	7	7	5	9	80%	9	8	5	7	7	7	5	9	80%	9	8	5	7	9	8	5	9	80%	9	8	5	7	7	7	5	9	80%	7	8	5	7	7	7	5	8	80%
NL022 30-day mortality following acute myocardial infarction		9	8	5	7	7	7	5	9	80%	9	8	5	7	7	7	5	9	80%	9	8	5	7	9	8	5	9	80%	9	8	5	7	7	7	5	9	80%	8	8	5	7	7	7	5	8	80%
NL023 30-day mortality following stroke		9	8	5	7	7	7	5	9	80%	9	8	5	7	7	7	5	9	80%	9	8	5	7	9	8	5	9	80%	9	7	5	7	7	7	5	9	80%	8	8	5	7	7	7	5	8	80%
NL024 Asthma mortality rate per 100 000 population aged 5-39		9	8	7	7	7	7	7	9	100%	9	8	9	7	7	8	7	9	100%	9	8	9	7	9	9	7	9	100%	9	9	7	7	7	7	7	9	100%		8	9	7	7	7,5	7	9	100%
NL025 Breast cancer mortality rate per 100 000 women	CC-can	9	8	7	7	7	7	7	9	100%	9	8	9	7	7	8	7	9	100%	9	8	9	7	9	9	7	9	100%	9	9	7	7	7	7	7	9	100%	7	8	9	7	7	7	7	9	100%
NL026 Colon cancer mortality rate per 100 000 population	CC-can	9	8	5	7	7	7	5	9	80%	9	8	9	7	7	8	7	9	100%	9	8	9	7	9	9	7	9	100%	9	9	5	7	7	7	5	9	80%	7	8	9	7	7	7	7	9	100%
NL027 Cervical cancer mortality rate per 100 000 women	CC-can	9	8	5	7	7	7	5	9	80%	9	8	9	7	7	8	7	9	100%	9	8	9	7	9	9	7	9	100%	9	9	5	7	7	7	5	9	80%	7	8	9	7	7	7	7	9	100%
NL028 Breast cancer 5-year survival rate	CC-can	9	8	5	7	7	7	5	9	80%	9	8	9	7	7	8	7	9	100%	9	8	9	7	9	9	7	9	100%	9	8	5	7	7	7	5	9	80%	7	8	9	7	7	7	7	9	100%
NL029 Colon cancer 5-year survival rate	CC-can	9	8	5	7	7	7	5	9	80%	9	8	9	7	7	8	7	9	100%	9	8	9	7	9	9	7	9	100%	9	8	5	7	7	7	5	9	80%	7	8	9	7	7	7	7	9	100%
NL030 Cervical cancer 5-year survival rate	CC-can	9	8	5	7	7	7	5	9	80%	9	8	9	7	7	8	7	9	100%	9	8	9	7	9	9	7	9	100%	9	8	5	7	7	7	5	9	80%	7	8	9	7	7	7	7	9	100%
NL031 Percentage of (over) 65-year-old hip fracture patients with surgery initiated within 48 hours		9	8	5	7	7	7	5	9	80%	9	8	5	7	7	7	5	9	80%	9	6	5	6	7	6	5	9	40%	9	5	5	6	7	6	5	9	40%	5	8	5	7	7	7	5	8	60%
NL032 Number of diabetes-related major amputations per 10 000 diabetics aged 18-75	CC-diab	9	8	5	7	7	7	5	9	80%	9	8	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	9	8	9	7	7	8	7	9	100%	7	8	9	7	7	7	7	9	100%
NL033 Percentage of people with disabilities in the general population who indicate that medical aids solve their problems		5	6	9	6	7	6	5	9	40%	5	6	9	6	6	6	5	9	20%	5	6	9	6	7	6	5	9	40%	9	5	9	5	7	7	5	9	60%	1	7	9	6	7	7	1	9	60%

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NL034 Percentage of people with somatic complaints who return to their home environment after a stay in a nursing home (as an indicator of the magnitude of the temporary stay function of nursing homes)	LTC-?	9	9	9	6	6	9	6	9	60%	9	7	9	6	7	7	6	9	80%	9	9	9	6	5	9	5	9	60%	9	7	9	6	6	7	6	9	60%	5	9	9	6	5	6	5	9	40%
NL038 Judgements of the Health Care Inspectorate on nursing home care		9	7	1	7	7	7	1	9	80%	9	7	1	7	7	7	1	9	80%	1	7	1	7	7	7	1	7	60%	9	6	1	6	7	6	1	9	40%	1	7	1	7	7	7	1	7	60%
NL039 Percentages of home care or nursing home patients admitted to a hospital each year		5	9	9	6	7	7	5	9	60%	9	9	9	5	7	9	5	9	80%	9	7	9	6	6	7	6	9	60%	5	6	9	6	7	6	5	9	40%	5	8	9	6	4	6	4	9	40%
NL040 Number of psychogeriatric patients living in small-scale residential care facilities	LTC-Men	9	7	9	6	7	7	6	9	80%	9	5	9	5	7	7	5	9	60%	7	8	9	6	7	7	6	9	80%	9	5	9	5	7	7	5	9	60%	9	7	9	7	7	7	7	9	100%
NL041 Results of prevention measures and the uptake by target groups	Prev-hp	9	7	7		7	7	7	9	100%	5	6	9		4	5,5	4	9	25%	9	7	9		7	8	7	9	100%	7	7	7		7	7	7	7	100%	9	7	9		7	8	7	9	100%
NL042 Changes in mental and social functioning of patients		7		1		7	7	1	7	67%	3		1		4	3	1	4	0%	7		1		7	7	1	7	67%	3		1		4	3	1	4	0%	7		1		7	7	1	7	67%
NL043 Development in the number of suicides and suicide attempts	CC-Men	9	8	1	7	7	7	1	9	80%	9	7	9	7	7	7	7	9	100%	9	9	1	7	8	8	1	9	80%	9	9	1	7	7	7	1	9	80%	9	7	9	7	7	7	7	9	100%
NL044 Percentage of the target group reached by care professionals	Prev-hp	9	8	7		7	7,5	7	9	100%	7	7	1		4	5,5	1	7	50%	9	9	1		7	8	1	9	75%	9	8	1		7	7,5	1	9	75%	9	9	7		7	8	7	9	100%
NL045 Development in removal rates from mental health care and substance abuse care		9	7	5		7	7	5	9	75%	9	6	5		7	6,5	5	9	50%	9	8	5		7	7,5	5	9	75%	9	6	5		5	5,5	5	9	25%	9	7	5		7	7	5	9	75%
NL134 Trends in lifestyle		9	6	1		7	6,5	1	9	50%	9	6	1		7	6,5	1	9	50%	9	5	1		7	6	1	9	50%	7	4	1		7	5,5	1	7	50%	9	7	1		7	7	1	9	75%
NL135 Annual check-ups at the dentist	Prev-RT	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	9	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%
NL136 Coverage of preventive child health care	Prev-hp	9	9	9		7	9	7	9	100%	9	7	9		7	8	7	9	100%	9	9	9		9	9	9	9	100%	9	9	9		7	9	7	9	100%	9	9	9		7	9	7	9	100%
NL137 Lifestyle counselling by the GP		9	9	9	7	7	9	7	9	100%	7	7	5	6	7	7	5	7	60%	9	9	9	7	7	9	7	9	100%	5	8	9	7	7	7	5	9	80%	5	9	5	7	7	7	5	9	60%
NL138 Infant mortality	CC-M&C	9	9	1	7	7	7	1	9	80%	9	7	9	7	7	7	7	9	100%	9	9	1	7	9	9	1	9	80%	9	7	1	7	7	7	1	9	80%	9	9	1	7	7	7	1	9	80%
NL139 Health policy in schools		9	7	9	7	7	7	7	9	100%	9	6	9	6	7	7	6	9	60%	9	5	9	7	4	7	4	9	60%	9	6	9	6	7	7	6	9	60%	9	9	9	7	7	9	7	9	100%
NL141 Number of referrals to secondary care	Generic	9	8	9	3	7	8	3	9	80%	9	7	9	3	7	7	3	9	80%	9	9	9	3	7	9	3	9	80%	9	8	9	3	7	8	3	9	80%	9	8	9	7	7	8	7	9	100%
NL142 Opinion of general public on curative care		9	6	9	6	7	7	6	9	60%	3	7	9	6	5	6	3	9	40%	9	6	9	6	7	7	6	9	60%	7	6	9	4	7	7	4	9	60%	5	8	9	4	7	7	4	9	60%

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		E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9
NL143 Experienced coordination of medication use	Generic	9	8	3	7	7	7	3	9	80%	9	7	3	7	7	7	3	9	80%	1	8	9	7	7	7	1	9	80%	9	6	3	6	4	6	3	9	20%	9	8	3	7	7	7	3	9	80%
NL144 Number of people who die within 30 days of being admitted to hospital for an acute myocardial infarction, stroke or brain haemorrhage		9	8	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	9	9	5	9	80%	9	5	5	7	7	7	5	9	60%	8	9	5	7	7	7	5	9	80%
NL145 Mortality due to breast cancer, colon cancer or cervical cancer	CC-can	9	7	7	7	7	7	7	9	100%	9	8	9	7	7	8	7	9	100%	9	8	9	7	9	9	7	9	100%	9	9	7	7	7	7	7	9	100%	7	8	9	7	7	7	7	9	100%
NL146 Mortality due to asthma		9	7	7	7	7	7	7	9	100%	9	8	9	7	7	8	7	9	100%	9	8	9	7	9	9	7	9	100%	9	9	7	7	7	7	7	9	100%		8	9	7	7	7,5	7	9	100%
NL147 Number of hip fractures that are operated on within 48 hours		9	8	5	7	7	7	5	9	80%	9	8	5	7	7	7	5	9	80%	9	6	5	6	7	6	5	9	40%	9	5	5	6	7	6	5	9	40%	5	8	5	7	7	7	5	8	60%
NL149 Judgment of AWBZ-care applicants of the National Care Assessment Centre		9		1			5	1	9	50%	3		1			2	1	3	0%	1		1			1	1	1	0%	5		1			3	1	5	0%	1		1			1	1	1	0%
NL153 Satisfaction of nurses and care workers with the quality of care	Generic	9	7	9	7	7	7	7	9	100%	3	6	9	6	5	6	3	9	20%	9	8	9	7	7	8	7	9	100%	7	5	9	6	7	7	5	9	60%	5	7	9	7	7	7	5	9	80%
NL154 Effectiveness of medical aids	LTC-?	9	7	9		7	8	7	9	100%	5	6	3	4	7	5	3	7	20%	9	8	9	7	7	8	7	9	100%	7	5	9	6	7	7	5	9	60%	7	7	9	7	7	7	7	9	100%
NL156 Number of places in small-scale residential care facilities for people with dementia		9	6	9	6	7	7	6	9	60%	9	9	9	6	7	9	6	9	80%	7	9	9	6	7	7	6	9	80%	9	8	9	5	7	8	5	9	80%	9	9	9	7	7	9	7	9	100%
NL157 Judgement of the Dutch Health Care Inspectorate on the quality of long-term care		9	7	1	7	7	7	1	9	80%	9	7	1	7	7	7	1	9	80%	1	7	1	7	7	7	1	7	60%	9	6	1	6	7	6	1	9	40%	1	7	1	7	7	7	1	7	60%
NL158 Proportion of adults with a severe anxiety, mood or addiction disorder who receive care for this	CC-Men	9	8	1	7	7	7	1	9	80%	9	6	1	6	7	6	1	9	40%	9	8	1	7	7	7	1	9	80%	9	7	1	7	7	7	1	9	80%	7	8	1	7	7	7	1	8	80%
NL159 Proportion of adults with a severe anxiety, mood or addiction disorder under care who receive at least one follow-up contact	CC-Men	9	8	1	7	7	7	1	9	80%	9	6	1	6	7	6	1	9	40%	9	9	1	7	7	7	1	9	80%	9	7	1	6	7	7	1	9	60%	7	8	1	7	7	7	1	8	80%
Appropriateness																																														
CA018 Proportion of women who have previously received a cesarean section who give birth via a vaginal delivery in an acute care hospital	CC-M&C	7	9	5	6	7	7	5	9	60%	9	8	5	6	7	7	5	9	60%	8	9	5		6	7	5	9	50%	9	9	5	6	7	7	5	9	60%	7	9	5	7	7	7	5	9	80%

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CA019 Proportion of female breast cancer surgery inpatients in acute care hospitals who received breast conserving surgery	CC-can	7	7	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%	8	2	9		6	7	2	9	50%	9	8	9	7	7	8	7	9	100%	7	9	9	7	7	7	7	9	100%
CA020 Proportion of women delivering babies in an acute care hospital who received cesarean sections	CC-M&C	7	7	5	7	7	7	5	7	80%	9	9	5	7	7	7	5	9	80%	8	9	5		7	7,5	5	9	75%	9	8	5	7	7	7	5	9	80%	7	9	5	7	5	7	5	9	60%
NL013 Percentage of cases in which GPs do not prescribe medication for a specific syndrome, consistent with guidelines that advise against these medications	Generic	9	9	9	7	7	9	7	9	100%	9	7	9	7	7	7	7	9	100%	9	8	9	7	7	8	7	9	100%	6	8	9	7	7	7	6	9	80%	8	9	9	7	7	8	7	9	100%
NL014 Percentage of cases in which GPs prescribe medication for a specific syndrome consistent with guidelines	Generic	9	9	9	7	7	9	7	9	100%	9	7	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%	6	9	9	7	7	7	6	9	80%	8	9	9	7	7	8	7	9	100%
NL015 Percentage of cases in which GPs prescribe according to guidelines	Generic	9	9	9	7	7	9	7	9	100%	9	7	9	7	7	7	7	9	100%	9	9	9	7	9	9	7	9	100%	6	8	9	7	7	7	6	9	80%	8	9	9	7	7	8	7	9	100%
NL050 Volume of high-risk surgery in hospitals		5	9	5		7	6	5	9	50%	7	9	5		7	7	5	9	75%	9	5	5		6	5,5	5	9	25%	7	5	5		5	5	5	7	25%	9	9	5		5	7	5	9	50%
NL057 Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes	CC-?	9	9	9	7	7	9	7	9	100%	9	6	9	6	7	7	6	9	60%	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%	6	9	9	7	7	7	6	9	80%
NL061 Utilisation and speed of diffusion of minimal and non-invasive surgical techniques	CC-?	9	8	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	7	8	9		7	7,5	7	9	100%	5	8	9	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%
NL140 Prescribing percentage in general practice according to the Dutch College of General Practitioners formulary	Generic	9	9	5		7	8	5	9	75%	9	7	5		7	7	5	9	75%	7	9	5		7	7	5	9	75%	9	8	5		7	7,5	5	9	75%	9	9	5		7	8	5	9	75%
NL160 Proportion of adults with a severe anxiety, mood or addiction disorder under care who receive a satisfactory form of care	CC-Men	9	8	1	7	7	7	1	9	80%	9	5	1	5	7	5	1	9	40%	9	9	1	7	7	7	1	9	80%	9	7	1	6	7	7	1	9	60%	7	8	1	7	7	7	1	8	80%

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NL161 Proportion of secondary mental health treatments that are ended in joint consultation between the therapist and the client/patient	CC-Men	9	7	9	7	4	7	4	9	80%	9	5	9	5	7	7	5	9	60%	9	8	9	7	4	8	4	9	80%	9	6	5	6	1	6	1	9	20%	7	8	6	7	1	7	1	8	60%
NL162 Proportion of people who end up at the accident and emergency department after a suicide attempt and are seen by a psychiatrist there	CC-Men	9	7	1	6	7	7	1	9	60%	9	9	9	6	7	9	6	9	80%	9	8	1	7	7	7	1	9	80%	9	8	1	6	7	7	1	9	60%	7	8	1	7	7	7	1	8	80%
NL173 International score for availability of minimal-invasive techniques	CC-?	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	7	8	9		7	7,5	7	9	100%	5	9	9	7	7	7	5	9	80%	9	9	9	7	8	9	7	9	100%
Safety																																														
CA046 In-hospital hip fracture	CC-?	7	9	9	7	7	7	7	9	100%	9	6	9	7	7	7	6	9	80%	9	9	9	7	7	9	7	9	100%	9	7	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%
NL036 Magnitude of potentially preventable health care problems (such as falls) among residential home and nursing home residents	LTC-?	9	8	9	7	7	8	7	9	100%	9	5	9	6	7	7	5	9	60%	9	6	9	7	5	7	5	9	60%	9	8	9	7	7	8	7	9	100%	5	7	9	7	7	7	5	9	80%
NL037 Percentages of patients with decubitus in residential homes, in nursing homes or with home care	LTC-?	9	9	9	7	7	9	7	9	100%	9	8	9	6	7	8	6	9	80%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	5	7	9	7	7	7	5	9	80%
NL048 Percentage of GPs and pharmacists who participate in Pharmacotherapeutic Consultations		5	6	9	7		6,5	5	9	50%	6	9	9	7		8	6	9	75%	9	5	9	6		7,5	5	9	50%	5	5	9	6		5,5	5	9	25%	9	9	5	7		8	5	9	75%
NL049 Pharmacovigilance in pharmacies	Generic	7	5	9	7	7	7	5	9	80%	9	8	9	7	7	8	7	9	100%	9	4	9	6	7	7	4	9	60%	7	8	9	7	7	7	7	9	100%	9	9	5	7	7	7	5	9	80%
NL051 Incidence of serious adverse effects of blood transfusion	CC-?	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	8	9	9	7	8	8	7	9	100%
NL052 Prevalence of postoperative surgical site infections	CC-?	9	9	5	7	7	7	5	9	80%	7	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	8	9	5	7	8	8	5	9	80%
NL053 Prevalence of decubitus in hospitals	CC-?	9	9	9	7	7	9	7	9	100%	7	6	9	6	7	7	6	9	60%	7	9	9	7	7	7	7	9	100%	5	9	6	7	7	7	5	9	60%	6	9	9	7	7	7	6	9	80%
NL054 Prevalence of decubitus in long-term care facilities	LTC-?	9	9	9	7	7	9	7	9	100%	9	6	9	6	7	7	6	9	60%	7	9	9	7	7	7	7	9	100%	9	6	6	7	7	7	6	9	60%	8	9	9	7	7	8	7	9	100%

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NL155 Preventable health care problems among residents in residential homes, nursing homes and care for the disabled (pressure sores, malnutrition, falls)		9	7	9	7	7	7	7	9	100%	9	5	9	6	7	7	5	9	60%	9	9	9	7	7	9	7	9	100%	9	5	9	7	7	7	5	9	80%	5	7	5	7	7	7	5	7	60%
NL163 Patient experiences with : Medication errors ; Medical errors ; Laboratory or diagnostic test errors	CC-?	9	5	9	7	7	7	5	9	80%	3	5	9	6	5	5	3	9	20%	9	9	9	7	7	9	7	9	100%	3	5	9	7	7	7	3	9	60%	5	9	9	7	7	7	5	9	80%
NL165 Percentage of patients that sustained medical injury during hospitalization	CC-?	7	9	9	7	7	7	7	9	100%	5	7	9	6	7	7	5	9	60%	7	9	9	7	7	7	7	9	100%	3	9	6	7	7	7	3	9	60%	7	9	9	7	7	7	7	9	100%
NL166 Prevalence of hospital-acquired pressure sores	CC-?	9	9	9		7	9	7	9	100%	3	6	9		7	6,5	3	9	50%	7	9	9		7	8	7	9	100%	9	9	6		7	8	6	9	75%	9	9	9		7	9	7	9	100%
NL167 Prevalence of hospital-acquired infections	CC-?	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	8	9	6	7	7	7	6	9	80%	9	9	9	7	8	9	7	9	100%
NL168 Incidence of transfusion-related adverse events		9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	8	9	9	7	7	8	7	9	100%
NL169 Percentage of hospitals where information on medication prescribed in hospital and elsewhere is electronically accessible at hospital wards and elsewhere		5	5	9	7	6	6	5	9	40%	9	9	9	7	7	9	7	9	100%	7	4	9	6	6	6	4	9	40%	9	5	9	6	7	7	5	9	60%	9	9	9	7	7	9	7	9	100%
NL171 Prevalence of medication-related hospital admissions		9	5	5	7	5	5	5	9	40%	7	5	5	6	7	6	5	7	40%	7	9	5	7	6	7	5	9	60%	9	8	5	7	6	7	5	9	60%	6	7	5	6	5	6	5	7	20%
NL172 Percentage of Pharmacotherapeutic Consultations that function at levels 3 or 4		9	8	5			8	5	9	67%	9	8	5			8	5	9	67%	1	9	5			5	1	9	33%	1	8	5			5	1	8	33%	1	9	5			5	1	9	33%
Patient-centeredness																																														
CA006 Self-reported patient satisfaction with overall health care services	Generic	9	6	9	6	7	7	6	9	60%	5	7	9	6	5	6	5	9	40%	9	8	9	6	8	8	6	9	80%	7	6	9	4	7	7	4	9	60%	7	7	9	4	7	7	4	9	80%
CA007 Self-reported patient satisfaction with community-based care	Generic	9	6	9	6	7	7	6	9	60%	5	7	9	6	5	6	5	9	40%	9	7	9	6	7	7	6	9	80%	7	5	9	4	7	7	4	9	60%	7	7	9	4	7	7	4	9	80%
CA008 Self-reported patient satisfaction with telephone health line or tele-health services	Generic	7	6	9		7	7	6	9	75%	5	5	9		5	5	5	9	25%	7	5	9		7	7	5	9	75%	7	4	9		7	7	4	9	75%	7	7	9		7	7	7	9	100%

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CA009 Self-reported patient satisfaction with hospital care	CC	9	6	9	6	7	7	6	9	60%	5	7	9	6	5	6	5	9	40%	9	6	9	7	7	7	6	9	80%	7	5	9	4	7	7	4	9	60%	7	7	9	4	7	7	4	9	80%
CA010 Self-reported patient satisfaction with physician care	Generic	9	6	9	6	7	7	6	9	60%	5	7	9	6	5	6	5	9	40%	9	7	9	6	7	7	6	9	80%	7	5	9	4	7	7	4	9	60%	7	7	9	4	7	7	4	9	80%
CA011 Patient satisfaction (and quality rating of services received)	Generic	9	6	9	6	7	7	6	9	60%	5	7	9	6	5	6	5	9	40%	9	8	9	7	8	8	7	9	100%	7	5	9	4	7	7	4	9	60%	7	7	9	4	7	7	4	9	80%
NL035 Client experiences with home care, residential homes, nursing homes and care for the disabled			9	8	9	7	8	7	9	100%	5	5	9	6	5	5	5	9	20%	9	6	9	7	7	7	6	9	80%	9	5	9	6	7	7	5	9	60%	7	7	9	7	7	7	7	9	100%
NL046 General consumer trust: do Dutch people have confidence in the health care system irrespective of their actual use?	Generic	9	6	9	6	7	7	6	9	60%	5	7	9	6	5	6	5	9	40%	9	7	9	6	8	8	6	9	80%	7	5	9	4	7	7	4	9	60%	7	7	9	4	7	7	4	9	80%
NL047 Consumer experiences: how do care consumers judge the care provided?	Generic	9	6	9	6	7	7	6	9	60%	5	7	9	6	5	6	5	9	40%	9	7	9	6	8	8	6	9	80%	7	6	9	4	7	7	4	9	60%	7	7	9	4	7	7	4	9	80%
NL058 Percentage of institutions that use systems or subsystems for feedback from patients and clients	Generic	5	8	9	7	7	7	5	9	80%	9	8	9	7	7	8	7	9	100%	7	6	9	7	7	7	6	9	80%	9	7	9	6	7	7	6	9	80%	9	9	9	6	7	9	6	9	80%
NL066 People's wishes with respect to choice: care provider, source of information and residential care	Generic	1	8	9	7		7,5	1	9	75%	3	7	3	7		5	3	7	50%	9	7	9	7		8	7	9	100%	9	8	3	7		7,5	3	9	75%	1	8	3	7		5	1	8	50%
NL148 Client judgements of residential homes and nursing homes	LTC-?	9	8	9	7	7	8	7	9	100%	3	5	9	6	5	5	3	9	20%	9	6	9	7	7	7	6	9	80%	7	5	9	6	7	7	5	9	60%	5	7	9	7	7	7	5	9	80%
NL150 Quality of life of patients in residential homes and nursing homes	LTC-?	9	7	9	7	7	7	7	9	100%	3	5	9	5	5	5	3	9	20%	9	8	9	7	7	8	7	9	100%	7	5	9	5	7	7	5	9	60%	5	7	9	7	7	7	5	9	80%
NL151 Client judgements of care for the physically disabled	LTC-?	9	7	9	7	7	7	7	9	100%	3	5	9	6	5	5	3	9	20%	9	7	9	7	7	7	7	9	100%	7	5	9	6	7	7	5	9	60%	5	7	9	7	7	7	5	9	80%
NL152 Client judgements of home care	LTC-?	9	7	9	7	7	7	7	9	100%	3	6	9	6	5	6	3	9	20%	9	8	9	7	7	8	7	9	100%	7	5	9	6	7	7	5	9	60%	5	7	9	7	7	7	5	9	80%
NL169 Percentage of hospitals where information on medication prescribed in hospital and elsewhere is electronically accessible at hospital wards and elsewhere	Generic	5	9	9	7	6	7	5	9	60%	9	9	9	7	7	9	7	9	100%	7	9	9	6	6	7	6	9	60%	9	9	9	6	7	9	6	9	80%	9	9	9	7	7	9	7	9	100%

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NL171 Prevalence of medication-related hospital admissions		9	9	5	7	5	7	5	9	60%	7	7	5	6	7	7	5	7	60%	7	9	5	7	6	7	5	9	60%	9	9	5	7	6	7	5	9	60%	6	9	5	6	5	6	5	9	20%
NL172 Percentage of Pharmacotherapeutic Consultations that function at levels 3 or 4		9	8	5			8	5	9	67%	9	8	5			8	5	9	67%	1	9	5			5	1	9	33%	1	8	5			5	1	8	33%	1	9	5			5	1	9	33%
Continuity																																														
NL101 The number of referrals to physiotherapists (presently about 1 in every 50 GP contacts)		5	9	1	6	7	6	1	9	40%	9	9	1	7	7	7	1	9	80%	9	4	1	4	8	4	1	9	40%	5	6	1	4	7	5	1	7	20%	7	9	1	7	7	7	1	9	80%
NL102 The number of first contacts with physiotherapists without a referral of the GP		5	9	1	7	7	7	1	9	60%	7	9	1	7	7	7	1	9	80%	7	4	1	4	8	4	1	8	40%	7	5	1	4	7	5	1	7	40%	9	9	1	7	8	8	1	9	80%
NL173 International score for availability of minimal-invasive techniques	CC-?	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	7	8	9	7	8	8	7	9	100%	5	9	9	7	7	7	5	9	80%	9	9	9	7	8	9	7	9	100%
NL175 Use of home care technology and proportion of renal dialysis patients using home dialysis	LTC-?	5	9	9	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%	8	9	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%
NL176 Use of telecare		5	8	9	7	7	7	5	9	80%	7	9	9	7	7	7	7	9	100%	5	4	9	4	7	5	4	9	40%	7	3	9	4	6	6	3	9	40%	7	8	9	7	7	7	7	9	100%
NL177 Supply of e-health in mental health care		5	8	9	7	7	7	5	9	80%	7	6	9	6	5	6	5	9	40%	5	6	9	6	6	6	5	9	20%	7	5	6	4	4	5	4	7	20%	7	7	9	7	6	7	6	9	80%
NL179 ICT applications as process support: use of the Electronic Health Records, Electronic Medication Records and Electronic Locum File	Generic	9	6	9	7	7	7	6	9	80%	9	6	9	7	7	7	6	9	80%	9	6	9	7	6	7	6	9	60%	9	5	9	6	6	6	5	9	40%	9	9	9	7	6	9	6	9	80%
Accessibility																																														
CA001 Self-reported difficulty obtaining routine or ongoing health services		9	7	9	7	7	7	7	9	100%	3	5	9	6	5	5	3	9	20%	9	7	9	7	7	7	7	9	100%	7	6	9	6	5	6	5	9	40%	5	7	9	7	7	7	5	9	80%
CA002 Self-reported difficulty obtaining health information or advice		9	7	9	7	7	7	7	9	100%	3	5	9	6	5	5	3	9	20%	9	7	9	7	7	7	7	9	100%	7	6	9	6	5	6	5	9	40%	5	7	9	7	7	7	5	9	80%
CA003 Self-reported difficulty obtaining immediate care		9	7	9	7	7	7	7	9	100%	3	5	9	6	5	5	3	9	20%	9	7	9	7	7	7	7	9	100%	7	6	9	6	5	6	5	9	40%	7	7	9	7	7	7	7	9	100%
CA004 Self-reported prescription drug spending as a percentage of income	Gen-cost	9	7	9	7	7	7	7	9	100%	3	5	9	6	5	5	3	9	20%	9	7	9	7	7	7	7	9	100%	7	6	9	6	7	7	6	9	60%	9	7	9	7	7	7	7	9	100%

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CA005 Self-reported wait times for diagnostic services	Gen-time	9	7	9	7	7	7	7	9	100%	3	5	9	6	5	5	3	9	20%	9	7	9	7	7	7	7	9	100%	7	6	9	6	7	7	6	9	60%	5	7	9	7	7	7	5	9	80%
CA016 Regular medical doctor	Generic	9	9	9	7	6	9	6	9	80%	7	9	9	7	7	7	7	9	100%	9	9	9	7	6	9	6	9	80%	9	9	9	6	5	9	5	9	60%	9	9	9	7	7	9	7	9	100%
CA017 Wait time for hip fracture surgery	CC-time	9	9	1	7	7	7	1	9	80%	9	9	1	7	7	7	1	9	80%	9	9	1	7	7	7	1	9	80%	9	9	1	7	7	7	1	9	80%	5	9	1	7	7	7	1	9	60%
NL065 New choices: personal care budget and health insurance services	Gen-cost	9	8	5	7		7,5	5	9	75%	9	7	5	7		7	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	7	8	5	7		7	5	8	75%
NL067 Percentage of urgent ambulance rides that is on site within specific response times	Gen-time	9	8	9	7	7	8	7	9	100%	9	6	9	6	7	7	6	9	60%	9	9	9	7	7	9	7	9	100%	9	9	9	7	6	9	6	9	80%	7	9	9	7	7	7	7	9	100%
NL068 Number of urgent ambulance rides that exceed the 15-minute response time norm	Gen-time	9	8	9	7	7	8	7	9	100%	9	6	9	6	7	7	6	9	60%	9	7	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%
NL069 Number of people who are able to reach the nearest HED or central GP post by car within 30 minutes	Gen-geo	9	7	7	7	7	7	7	9	100%	9	6	9	6	7	7	6	9	60%	9	7	9	7	7	7	7	9	100%	9	9	5	7	7	7	5	9	80%	9	9	1	7	7	7	1	9	80%
NL070 Number of urgent callers to central GP posts who get to speak a health care professional within one minute	Gen-time	9	7	9	6	7	7	6	9	80%	9	6	9	6	7	7	6	9	60%	9	4	9	4	7	7	4	9	60%	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%
NL071 Number of people waiting for a donor organ	CC-time	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	9	9	7	9	100%	9	9	7	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%
NL072 Percentage of patients who are satisfied with the speed with which they can see the GP, specialist or dentist	Gen-time	9	5	9	6	7	7	5	9	60%	5	9	9	6	5	6	5	9	40%	9	5	9	6	7	7	5	9	60%	7	9	9	6	7	7	6	9	80%	5	9	9	7	7	7	5	9	80%
NL073 Number of people waiting (length of waiting list)	Gen-time	9	5	9	6	7	7	5	9	60%	9	9	9	6	5	9	5	9	60%	9	5	9	6	7	7	5	9	60%	5	9	9	6	7	7	5	9	60%	5	9	9	7	6	7	5	9	60%
NL074 (Expected) time till treatment (waiting time)	Gen-time	9	9	9	7	7	9	7	9	100%	9	9	9	6	5	9	5	9	60%	9	9	9	7	7	9	7	9	100%	7	9	9	6	7	7	6	9	80%	5	9	9	7	6	7	5	9	60%
NL075 Number of people waiting longer than the so-called Treek norm	Gen-time	9	9	1	7	7	7	1	9	80%	9	9	9	7	5	9	5	9	80%	9	7	1	7	7	7	1	9	80%	5	9	7	7	7	7	5	9	80%	5	9	5	7	6	6	5	9	40%
NL076 Comparison of care utilization by people with a low or high level of education, corrected for health disparities	Gen-cost	9	7	1	7	7	7	1	9	80%	9	9	9	7	7	9	7	9	100%	9	9	1	7	7	7	1	9	80%	9	9	1	7	5	7	1	9	60%	9	9	5	7	7	7	5	9	80%

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NL077 Comparison of care utilization by Dutch versus immigrant populations, corrected for health disparities	Gen-cult	9	9	1	7	7	7	1	9	80%	9	9	9	7	7	9	7	9	100%	9	9	1	7	7	7	1	9	80%	9	9	1	7	5	7	1	9	60%	9	9	5	7	7	7	5	9	80%
NL078 Care utilization in disadvantaged neighbourhoods of big cities and by marginal populations	Gen-cost	9	9	1	7	7	7	1	9	80%	9	9	9	6	7	9	6	9	80%	9	9	1	7	7	7	1	9	80%	9	9	1	6	7	7	1	9	60%	9	9	5	7	7	7	5	9	80%
NL079 Satisfaction of asylum seekers with medical care	Gen-cult	9	9	9	7	7	9	7	9	100%	5	9	9	6	5	6	5	9	40%	9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	9	9	7	7	9	7	9	100%
NL080 Insurance status of the population, including being uninsured	Gen-cost	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	8	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	6	9	6	9	80%
NL081 Health care costs per capita	Gen-cost	9	9	1	7	7	7	1	9	80%	9	9	9	7	7	9	7	9	100%	9	9	1	7	8	8	1	9	80%	9	9	1	7	7	7	1	9	80%	9	9	1	7	6	7	1	9	60%
NL082 Amount of co-payments and out-of-pocket payments	Gen-cost	9	9	9	7		9	7	9	100%	9	9	9	7		9	7	9	100%	9	9	9	7		9	7	9	100%	9	9	9	7		9	7	9	100%	9	9	9	7		9	7	9	100%
NL083 Tax deduction because of illness-related costs	Gen-cost	5	9	9	7		8	5	9	75%	9	9	9	7		9	7	9	100%	5	9	9	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	9	7		9	7	9	100%
NL084 Additional illness-related costs for chronically ill people	LTC-cost	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	6	9	6	9	80%
NL085 Use of financial compensatory measures by chronically ill people	LTC-cost	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	6	9	6	9	80%
NL086 Percentage of family income spent on health care costs by high and low-income groups	Gen-cost	9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	6	9	6	9	80%
NL087 Share of total health care costs in the Netherlands that is paid by high and low-income groups (income solidarity in health care)	Gen-cost	9	9	1	7	7	7	1	9	80%	9	9	9	7	7	9	7	9	100%	9	9	1	7	7	7	1	9	80%	9	9	1	7	7	7	1	9	80%	9	9	1	7	6	7	1	9	60%
NL088 Proximity of services, expressed in actual travelling time, or number of care locations in an urban area or region	Gen-geo	9	8	9	7	7	8	7	9	100%	9	7	9	7	7	7	7	9	100%	9	7	9	7	8	8	7	9	100%	9	6	9	7	7	7	6	9	80%	9	9	9	7	7	9	7	9	100%
NL089 Number of outpatient and inpatient services per region per 10 000 inhabitants	Gen-geo	9	8	5	7	7	7	5	9	80%	9	9	5	6	7	7	5	9	60%	9	8	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%
NL090 Number of vacancies in health care that are difficult to fill	Gen-pers	9	8	9	7	7	8	7	9	100%	9	6	9	6	7	7	6	9	60%	9	8	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	6	9	9	7	6	7	6	9	60%

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NL091 Personnel absenteeism rate	Gen-pers	9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	8	9	7	6	8	6	9	80%	7	9	9	7	7	7	7	9	100%	7	9	9	7	6	7	6	9	80%
NL092 Current unfulfilled demand	Gen-pers	9	8	9	7	7	8	7	9	100%	9	6	9	6	7	7	6	9	60%	9	8	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	6	9	6	9	80%
NL093 Extent to which the current influx of personnel is matched to developments in care demands	Gen-pers	9	7	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%	9	8	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	6	9	6	9	80%
NL094 Number of people who are not registered with a GP or dentist	Generic	9	9	9	7	6	9	6	9	80%	7	9	9	7	7	7	7	9	100%	9	9	9	7	6	9	6	9	80%	9	9	9	6	5	9	5	9	60%	9	9	9	7	7	9	7	9	100%
NL095 Number of physicians and nurses per 100 000 population	Gen-pers	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	7	9	7	7	7	7	9	100%	9	9	5	7	7	7	5	9	80%	9	9	9	7	5	9	5	9	80%
NL096 Professional ratios: number of care providers relative to another type of care provider (e.g., number of dental hygienists to dentist)		9	7	9	6	5	7	5	9	60%	9	9	9	7	7	9	7	9	100%	9	6	9	6	4	6	4	9	40%	9	9	5	7	4	7	4	9	60%	9	9	9	7	5	9	5	9	80%
NL097 Medical-technical tasks carried out by general practice assistants	Gen-pers	9	9	5	6	7	7	5	9	60%	9	9	5	7	5	7	5	9	60%	9	9	5	6	7	7	5	9	60%	9	9	5	6	6	6	5	9	40%	9	9	5	7	7	7	5	9	80%
NL098 Number of practice nurses in GP practices	Gen-pers	9	9	5	6	7	7	5	9	60%	9	9	5	7	7	7	5	9	80%	9	9	5	6	7	7	5	9	60%	9	7	5	6	7	7	5	9	60%	9	9	5	7	6	7	5	9	60%
NL099 Numbers of qualified physician assistants and nurse practitioners working and in training	Gen-pers	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	7	5	7	7	7	5	9	80%	9	9	5	7	5	7	5	9	60%
NL100 Percentage of Dutch people who provide informal care		9	6	9	4	7	7	4	9	60%	5	9	9	6	5	6	5	9	40%	9	6	9	4	7	7	4	9	60%	3	4	9	3	7	4	3	9	40%	7	2	9	3	6	6	2	9	40%
NL106 Health care expenditures according to the Health Care Budgetary Framework (Ministry of Health)		9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%
NL107 Health care expenditures according to the Health Accounts (Statistics Netherlands)		9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%
NL108 Health care expenditures according to the System of Health Accounts (OECD)		9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	5	5	7	7	7	5	9	60%	9	9	5	7	6	7	5	9	60%

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NL109 Expenditures on different sectors		9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%
NL110 Expenditures for Health Care Budgetary Framework relevant care by funding source		9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%
NL113 Price movements in health care	Gen-cost	9	9	5		7	8	5	9	75%	9	9	5		7	8	5	9	75%	9	9	5		7	8	5	9	75%	9	9	5		7	8	5	9	75%	9	9	5	7	6	7	5	9	60%
NL114 Changes in volume of care	Gen-cost	9	9	9		7	9	7	9	100%	9	9	9		7	9	7	9	100%	9	9	9		7	9	7	9	100%	9	9	5		7	8	5	9	75%	9	9	9	7	6	9	6	9	80%
NL118 Access barriers to the health care market (all submarkets)	Generic	9	9	1	7	7	7	1	9	80%	7	9	1	7	7	7	1	9	80%	9	9	1	7	9	9	1	9	80%	7	9	1	6	7	7	1	9	60%	9	9	1	7	6	7	1	9	60%
NL119 Health care procurement by health insurers (care procurement market)	Gen-cost	9	9	1			9	1	9	67%	9	9	1			9	1	9	67%	9	9	1			9	1	9	67%	5	9	1			5	1	9	33%	9	9	1			9	1	9	67%
NL121 Mobility of insured between health insurers (health insurance market)	Gen-cost	7	9	5	7		7	5	9	75%	9	9	7	7		8	7	9	100%	7	9	1	7		7	1	9	75%	9	9	5	3		7	3	9	50%	7	9	1	7		7	1	9	75%
NL122 Risk selection by insurers (health insurance market)	Gen-cost	9	9	5	7		8	5	9	75%	9	9	7	7		8	7	9	100%	9	9	1	7		8	1	9	75%	9	9	5	7		8	5	9	75%	9	9	1	7		8	1	9	75%
NL124 Development of production volume in six care sectors divided by the number of employees in fte and corrected for reduction of working hours		9		1			5	1	9	50%	5		7			6	5	7	50%	9		1			5	1	9	50%	3		4			3,5	3	4	0%	5		1	7		5	1	7	33%
NL125 Trend in productivity in hospitals compared to trend in productivity of the Dutch economy as a whole		9	9	1	7	4	7	1	9	60%	5	9	7	6	7	7	5	9	60%	9	9	1	7	6	7	1	9	60%	3	9	3	6	7	6	3	9	40%	5	9	1	7	4	5	1	9	40%
NL126 Number of hospital discharges by fte hospital employees	Gen-pers	9	9	5	7	7	7	5	9	80%	9	9	9	6	7	9	6	9	80%	9	5	9	6	7	7	5	9	60%	9	9	5	6	6	6	5	9	40%	9	9	5	7	6	7	5	9	60%
NL175 Use of home care technology and proportion of renal dialysis patients using home dialysis	Generic	5	9	9	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%	8	9	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%
NL176 Use of telecare		5	8	9	7	7	7	5	9	80%	7	9	9	7	7	7	7	9	100%	5	4	9	4	7	5	4	9	40%	7	3	9	4	6	6	3	9	40%	7	8	9	7	7	7	7	9	100%

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		E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9
NL177 Supply of e-health in mental health care		5	8	9	7	7	7	5	9	80%	7	6	9	6	5	6	5	9	40%	5	6	9	6	6	6	5	9	20%	7	5	6	4	4	5	4	7	20%	7	7	9	7	6	7	6	9	80%
NL182 Expenditure of a country's pharmaceutical industry on health care related Research & Development as a proportion of its gross domestic product		9	9	5	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%	9	9	9	7	8	9	7	9	100%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%
NL183 Percentage of people who do not have health insurance		9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	8	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	6	9	6	9	80%
NL184 Percentage of people who have confidence in the affordability of necessary health care	Gen-cost	5	7	9	7	7	7	5	9	80%	3	6	9	6	7	6	3	9	40%	7	9	9	7	8	8	7	9	100%	3	7	9	7	7	7	3	9	80%	6	9	9	7	6	7	6	9	60%
NL185 Percentage of people who forego necessary health care	Generic	9	7	9	6	7	7	6	9	80%	9	9	3	6	7	7	3	9	60%	9	9	1	7	9	9	1	9	80%	9	9	5	7	7	7	5	9	80%	9	9	1	7	7	7	1	9	80%
NL186 Additional health-related expenses for people with chronic illnesses and disabilities		9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	6	9	6	9	80%
NL187 Distribution of out of pocket payments across households	Gen-cost	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%
NL188 Share of disposable income that is spent on health care by different income groups		9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	7	9	7	7	7	7	9	100%	9	9	6	6	7	7	6	9	60%	9	9	6	7	6	7	6	9	60%
NL189 Average distance for every inhabitant of the Netherlands to the nearest specific care service	Gen-geo	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%
NL190 Range of catchment profile by care service	Gen-geo	9	9	9	7		9	7	9	100%	9	9	9	6		9	6	9	75%	9	8	9	7		8,5	7	9	100%	9	6	5	7		6,5	5	9	50%	7	9	9	7		8	7	9	100%
NL191 Trend of average distance and catchment profile for GPs and hospitals	Gen-geo	9	9	9	7		9	7	9	100%	9	9	9	7		9	7	9	100%	9	9	9	7		9	7	9	100%	9	7	5	7		7	5	9	75%	7	9	9	7		8	7	9	100%
NL192 Patients' experiences: was it a problem for you to travel for your care, examination or treatment?	Gen-geo	9	9	9	7	7	9	7	9	100%	5	9	9	7	5	7	5	9	60%	9	9	9	7	7	9	7	9	100%	9	7	9	7	7	7	7	9	100%	7	9	9	7	6	7	6	9	80%
NL193 Percentage of people who had to travel more than 20 minutes to a hospital compared with other EU countries	Gen-geo	9	9	7	7	7	7	7	9	100%	9	7	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%	9	7	5	7	7	7	5	9	80%	7	9	1	7	7	7	1	9	80%

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		E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9
NL194 Number of emergency ambulance rides that exceed the 15-minute norm		9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	7	9	7	7	7	7	9	100%	9	8	9	7	7	8	7	9	100%	7	9	9	7	7	7	7	9	100%
NL195 Number of people who can be reached by a mobile medical team within 30 minutes	Gen-geo	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	6	9	7	7	7	6	9	80%	9	8	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%
NL196 Number of people who can reach the nearest emergency services by car within 30 minutes		9	9	7	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%	9	7	1	7	7	7	1	9	80%	9	8	5	7	7	7	5	9	80%	9	9	1	7	7	7	1	9	80%
NL197 Number of people who can reach the nearest general practice cooperative by car within 30 minutes		9	9	7	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%	9	4	9	7	7	7	4	9	80%	9	8	5	7	7	7	5	9	80%	9	9	1	7	7	7	1	9	80%
NL198 Number of people who place an emergency call to general practice cooperatives and are helped by a care professional within one minute	Gen-time	9	9	9	6	7	9	6	9	80%	9	9	9	6	7	9	6	9	80%	9	4	9	4	7	7	4	9	60%	9	8	9	7	7	8	7	9	100%	7	9	9	7	7	7	7	9	100%
NL199 Percentage of people with a need for acute care who did not get the care they needed and wanted	Generic	9	8	9	7	7	8	7	9	100%	9	7	9	7	7	7	7	9	100%	9	9	9	7	8	9	7	9	100%	7	8	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%
NL200 Percentage of care users who are of the opinion that waiting times in care are long or short		9	6	9	6	1	6	1	9	40%	5	5	9	6	5	5	5	9	20%	9	4	9	6	7	7	4	9	60%	5	4	9	6	7	6	4	9	40%	5	9	9	7	7	7	5	9	80%
NL201 Number of people who are waiting for health care by type (the length of the waiting list)		9	9	9	7	7	9	7	9	100%	9	9	9	7	5	9	5	9	80%	9	4	9	7	7	7	4	9	80%	5	9	9	7	7	7	5	9	80%	5	9	9	7	6	7	5	9	60%
NL204 Number of problematic patients who are waiting for long-term care	LTC-time	9	9	9	7	7	9	7	9	100%	9	9	9	7	5	9	5	9	80%	9	9	9	7	7	9	7	9	100%	5	9	9	7	7	7	5	9	80%	5	9	9	7	6	7	5	9	60%
NL205 Number of people who are waiting for a donor organ		9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%
NL206 Differences in the use of care between people with a high educational level and those with a low educational level, whereby a correction for health differences is applied	Gen-cost	9	9	1	7	7	7	1	9	80%	9	9	1	7	7	7	1	9	80%	9	9	1	7	5	7	1	9	60%	9	9	1	7	5	7	1	9	60%	9	9	1	7	7	7	1	9	80%

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NL207 Differences in hospital admission and the use of mental health care and addiction services between migrants and natives	CC-cult	9	9	7	7	7	7	7	9	100%	9	9	9	6	7	9	6	9	80%	9	9	1	7	5	7	1	9	60%	9	9	1	6	7	7	1	9	60%	9	9	5	7	7	7	5	9	80%
NL208 Differences in mortality following hospital admission for a heart attack between migrants and natives	CC-cult	9	9	1	6	7	7	1	9	60%	9	9	9	7	7	9	7	9	100%	9	9	1	6	9	9	1	9	60%	9	9	1	6	7	7	1	9	60%	7	9	5	7	7	7	5	9	80%
NL209 Care needs of homeless people	?	1	9	9	7	7	7	1	9	80%	5	9	9	6	5	6	5	9	40%	9	9	9	7	7	9	7	9	100%	9	9	9	6	5	9	5	9	60%	1	9	9	7	6	7	1	9	60%
NL210 Quality of medical health services for asylum seekers	Gen-cult	9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	9	9	7	7	9	7	9	100%
NL211 Number of vacancies per 1000 jobs in health care	Gen-pers	9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	9	9	7	7	9	7	9	100%	9	9	6	7	7	7	6	9	80%	9	9	9	7	6	9	6	9	80%
NL212 Share of vacancies that are difficult to fill	Gen-pers	9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	9	9	7	7	9	7	9	100%	9	9	6	7	7	7	6	9	80%	9	9	9	7	6	9	6	9	80%
NL213 Percentage of nursing and care personnel that are leaving the sector (net turnover)	Gen-pers	9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	9	9	7	7	9	7	9	100%	9	8	6	7	7	7	6	9	80%	9	9	9	7	6	9	6	9	80%
NL214 Percentage of work hours lost to absenteeism	Gen-pers	9	9	9	7	7	9	7	9	100%	9	7	9	6	7	7	6	9	80%	9	6	9	7	7	7	6	9	80%	7	9	6	7	7	7	6	9	80%	7	9	9	7	6	7	6	9	80%
NL215 Number of people who have (had) problems finding a GP	Gen-pers	9	8	9	7	7	8	7	9	100%	9	9	9	7	5	9	5	9	80%	9	9	9	7	8	9	7	9	100%	9	9	9	7	5	9	5	9	80%	9	9	9	7	6	9	6	9	80%
NL216 Percentage of care users who believe enough personnel is available during a stay in the hospital or nursing home	Gen-pers	9	9	9	7	7	9	7	9	100%	5	9	9	7	5	7	5	9	60%	9	8	9	7	7	8	7	9	100%	9	7	9	7	7	7	7	9	100%	9	9	9	7	6	9	6	9	80%
NL217 Percentage of nurses and carers who believe that enough personnel is on duty to assure the patients' safety	Gen-pers	9	7	9	7	7	7	7	9	100%	5	9	9	7	5	7	5	9	60%	9	6	9	7	7	7	6	9	80%	9	7	9	7	7	7	7	9	100%	9	9	9	7	6	9	6	9	80%
NL218 Unfilled demand for medical specialist care	Gen-pers	9	7	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%	9	7	9	7	7	7	7	9	100%	9	8	9	7	7	8	7	9	100%	9	9	9	7	6	9	6	9	80%
NL219 Number of doctors and nurses per 1000 inhabitants		9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	6	6	7	7	7	6	9	60%	9	9	9	7	5	9	5	9	80%
NL220 Qualification levels of care workers and nurses	Gen-pers	9	9	9	7	7	9	7	9	100%	5	9	9	7	7	7	5	9	80%	9	7	9	7	7	7	7	9	100%	9	8	9	7	7	8	7	9	100%	9	9	9	7	5	9	5	9	80%
NL221 Number of people who experienced problems finding a GP		9	8	9	7	7	8	7	9	100%	9	9	9	7	5	9	5	9	80%	9	9	9	7	8	9	7	9	100%	9	9	9	7	5	9	5	9	80%	9	9	9	7	6	9	6	9	80%

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		E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9
NL222 Number of people who have a personal care budget		9	8	5	6	7	7	5	9	60%	9	9	5	6	5	6	5	9	40%	1	4	5	5	7	5	1	7	20%	1	9	5	7	7	7	1	9	60%	1	9	5	7	7	7	1	9	60%
NL223 Share of insured people who have switched health insurer	Gen-cost	7	8	5	7	7	7	5	8	80%	9	9	5	7	7	7	5	9	80%	7	9	5	7	7	7	5	9	80%	9	3	5	3	7	5	3	9	40%	7	9	5	7	5	7	5	9	60%
NL224 Share of insured people who did not experience any limitations to their freedom to choose a health insurer	Gen-cost	9	8	5	7	7	7	5	9	80%	7	9	5	7	6	7	5	9	60%	9	9	5	7	8	8	5	9	80%	7	3	5	3	7	5	3	7	40%	9	9	5	7	7	7	5	9	80%
NL225 Share of population that looked for information on quality with regards to hospitals and doctors		5	8	9	7	5	7	5	9	60%	5	9	9	6	6	6	5	9	40%	9	9	9	7	5	9	5	9	80%	5	3	9	4	5	5	3	9	20%	7	9	9	7	1	7	1	9	80%
NL229 Public health expenditure per working person according to the System of Health Accounts		9	9	1	7	7	7	1	9	80%	9	9	9	7	7	9	7	9	100%	9	9	1	7	7	7	1	9	80%	9	9	1	7	7	7	1	9	80%	9	9	1	7	7	7	1	9	80%
NL230 Health expenditure per health care sector according to the Health Care Budgetary Framework		9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%
NL231 Health expenditure by source of funding		9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%
NL233 Price and volume trends in health expenditure	Gen-cost	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	9	7		9	7	9	100%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%
NL239 Labour productivity in hospitals		9	9	1	7	7	7	1	9	80%	5	9	4	6	7	6	4	9	40%	9	9	1	7	7	7	1	9	80%	3	9	1	6	7	6	1	9	40%	5	9	4	7	7	7	4	9	60%
NL240 Labour productivity in care for the elderly		9	9	1	7	7	7	1	9	80%	5	9	4	6	7	6	4	9	40%	9	9	1	7	7	7	1	9	80%	3	9	1	6	7	6	1	9	40%	5	9	4	7	7	7	4	9	60%
NL241 Quality and labour productivity in residential homes		9	9	9	7	7	9	7	9	100%	5	9	3	6	7	6	3	9	40%	9	9	9	7	7	9	7	9	100%	3	9	3	6	7	6	3	9	40%	5	9	5	7	7	7	5	9	60%
Efficiency																																														
CA041 Surgical Day Case Rates	CC	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	6	9	7	8	8	6	9	80%	7	9	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%
CA042 Percentage of acute care inpatient hospitalizations classified as May Not Require Hospitalization	CC	9	9	9	7	7	9	7	9	100%	7	6	9	6	7	7	6	9	60%	9	9	9	7	8	9	7	9	100%	7	9	9	7	7	7	7	9	100%	5	9	9	7	7	7	5	9	80%

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CA043 Percentage of inpatient days where a physician (or designated other) has indicated that a patient occupying an acute care hospital bed was well enough to have been cared for elsewhere	CC	9	9	9	7	7	9	7	9	100%	5	9	9	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%	7	6	9	6	7	7	6	9	60%	5	9	9	7	7	7	5	9	80%
CA044 Expected Compared to Actual Stay	Generic	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%	9	6	1	7	7	7	1	9	60%	9	9	7	7	7	7	7	9	100%	7	9	5	7	7	7	5	9	80%
NL061 Utilisation and speed of diffusion of minimal and non-invasive surgical techniques	CC	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	7	6	9	7	8	7	6	9	80%	5	9	9	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%
NL064 Development in the rate of surgical day-treatments to the total number of surgical treatments	CC	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	6	9	7	8	8	6	9	80%	7	9	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%
NL173 International score for availability of minimal-invasive techniques	CC	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	7	8	9	7	8	8	7	9	100%	5	9	9	7	7	7	5	9	80%	9	9	9	7	8	9	7	9	100%
NL174 Number of day surgery interventions as a proportion of all surgical interventions	CC	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	7	9	7	8	8	7	9	100%	7	9	9	7	7	7	7	9	100%	9	9	9	7	7	9	7	9	100%
NL175 Use of home care technology and proportion of renal dialysis patients using home dialysis	LTC	5	9	9	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%	8	9	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%
NL176 Use of telecare		5	8	9	7	7	7	5	9	80%	7	9	9	7	7	7	7	9	100%	5	4	9	4	7	5	4	9	40%	7	3	9	4	6	6	3	9	40%	7	8	9	7	7	7	7	9	100%
NL177 Supply of e-health in mental health care		5	8	9	7	7	7	5	9	80%	7	6	9	6	5	6	5	9	40%	5	6	9	6	6	6	5	9	20%	7	5	6	4	4	5	4	7	20%	7	7	9	7	6	7	6	9	80%
NL179 ICT applications as process support: use of the Electronic Health Records, Electronic Medication Records and Electronic Locum File	Generic	9	6	9	7	7	7	6	9	80%	9	6	9	7	7	7	6	9	80%	9	6	9	7	6	7	6	9	60%	9	5	9	6	6	6	5	9	40%	9	9	9	7	6	9	6	9	80%
NL229 Public health expenditure per working person according to the System of Health Accounts	Generic	9	9	1	7	7	7	1	9	80%	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	1	7	7	7	1	9	80%	9	9	9	7	7	9	7	9	100%

	Cat	Valid									Reliable									Relevant									Interpretable									Actionable								
		E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9
Sustainability																																														
NL055 Percentage of institutions that have been certified or accredited	Infra	5	8	1	7	7	7	1	8	60%	9	8	1	7	7	7	1	9	80%	7	4	1	7	8	7	1	8	60%	7	5	1	6	7	6	1	7	40%	9	7	1	7	4	7	1	9	60%
NL056 Percentage of institutions that have the necessary documents on quality policy	Infra	5	8	1	7	7	7	1	8	60%	9	8	1	7	7	7	1	9	80%	7	5	1	7	7	7	1	7	60%	7	5	1	6	7	6	1	7	40%	9	8	1	7	7	7	1	9	80%
NL057 Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes	Infra	9	9	9	7	7	9	7	9	100%	9	9	9	6	7	9	6	9	80%	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%	6	9	9	7	7	7	6	9	80%
NL058 Percentage of institutions that use systems or subsystems for feedback from patients and clients		5	9	9	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%	9	6	9	6	7	7	6	9	60%	9	9	9	6	7	9	6	9	80%
NL059 Investments in research and development in the care sector; international comparison	Innov	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	9	9	9	7	8	9	7	9	100%	9	5	9	7	7	7	5	9	80%	5	9	9	7	7	7	5	9	80%
NL060 Number of biotechnology patents granted to the Netherlands	Innov	9	9	9	7		9	7	9	100%	9	9	9	7		9	7	9	100%	9	9	9	7		9	7	9	100%	9	9	9	6		9	6	9	75%	5	9	9	7		8	5	9	75%
NL061 Utilisation and speed of diffusion of minimal and non-invasive surgical techniques	Innov	9	8	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	7	8	9	7	8	8	7	9	100%	5	8	9	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%
NL062 Use of process innovations, such as integrated care pathways and CVA integrated care	Innov	9	8	9	7	7	8	7	9	100%	3	9	9	7	7	7	3	9	80%	9	8	9	7	7	8	7	9	100%	3	7	9	7	7	7	3	9	80%	9	9	9	7	7	9	7	9	100%
NL063 Application of ICT in various areas of the health care sector	Innov	9	8	9	7	7	8	7	9	100%	9	9	9	7	7	9	7	9	100%	9	7	9	7	6	7	6	9	80%	9	7	9	6	6	7	6	9	60%	6	9	9	7	6	7	6	9	60%
NL101 The number of referrals to physiotherapists (presently about 1 in every 50 GP contacts)		5	9	1	6	7	6	1	9	40%	9	9	1	7	7	7	1	9	80%	9	5	1	4	8	5	1	9	40%	5	6	1	4	7	5	1	7	20%	7	9	1	7	7	7	1	9	80%
NL102 The number of first contacts with physiotherapists without a referral of the GP		5	9	1	7	7	7	1	9	60%	7	9	1	7	7	7	1	9	80%	7	4	1	4	8	4	1	8	40%	7	5	1	4	7	5	1	7	40%	9	9	1	7	8	8	1	9	80%
NL103 The number of training places / basic specialists who completed their training	Pers	5	7	5	7	7	7	5	7	60%	9	9	5	7	7	7	5	9	80%	7	9	5	7	7	7	5	9	80%	7	7	5	6	7	7	5	7	60%	9	9	5	7	7	7	5	9	80%

	Cat	Valid									Reliable									Relevant									Interpretable									Actionable								
		E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9
NL104 The duration of training in years (from the beginning of the graduate training to the end of the postgraduate training) for specialists; currently measurable: time between the end of the graduate training and the start of the post-graduate training		3	9	5	7	7	7	3	9	60%	9	9	5	7	7	7	5	9	80%	1	4	5	7	5	5	1	7	20%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%
NL105 The number of institutes for higher vocational training in care participating in an educational region		3	9	5	6	7	6	3	9	40%	9	9	5	7	7	7	5	9	80%	3	5	5	6	6	5	3	6	0%	9	5	5	6	7	6	5	9	40%	9	9	5	7	7	7	5	9	80%
NL106 Health care expenditures according to the Health Care Budgetary Framework (Ministry of Health)	Cost	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%
NL107 Health care expenditures according to the Health Accounts (Statistics Netherlands)	Cost	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%
NL108 Health care expenditures according to the System of Health Accounts (OECD)	Cost	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	5	5	7	7	7	5	9	60%	9	9	5	7	6	7	5	9	60%
NL109 Expenditures on different sectors	Cost	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%
NL110 Expenditures for Health Care Budgetary Framework relevant care by funding source	Cost	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%
NL111 Share of health care costs in GDP	Cost	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%	9	9	5	7	6	7	5	9	60%
NL112 Share of health care costs in the growth in GDP	Cost	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%	9	9	5	7	6	7	5	9	60%
NL113 Price movements in health care	Cost	9	9	5		7	8	5	9	75%	9	9	5		7	8	5	9	75%	9	9	5		7	8	5	9	75%	9	9	5		7	8	5	9	75%	9	9	5	7	6	7	5	9	60%
NL114 Changes in volume of care	?	9	9	9		7	9	7	9	100%	9	9	9		7	9	7	9	100%	9	9	9		7	9	7	9	100%	9	9	5		7	8	5	9	75%	9	9	9	7	6	9	6	9	80%
NL116 Variation in insurance premiums (health insurance market)	?	7	9	5	7	6	7	5	9	60%	9	9	5	7	7	7	5	9	80%	7	9	5	7	6	7	5	9	60%	9	9	5	7	5	7	5	9	60%	9	9	5	7	5	7	5	9	60%

	Cat	Valid									Reliable									Relevant									Interpretable									Actionable								
		E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9
NL117 Market concentrations of care providers and health insurers (health insurance market/ care procurement market)		9	9	5	7	6	7	5	9	60%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%	5	9	5	7	5	5	5	9	40%	5	9	5	7	5	5	5	9	40%
NL118 Access barriers to the health care market (all submarkets)	?	9	9	9	7	7	9	7	9	100%	7	9	9	7	7	7	7	9	100%	9	9	9	7	9	9	7	9	100%	7	9	9	6	7	7	6	9	80%	9	9	9	7	6	9	6	9	80%
NL119 Health care procurement by health insurers (care procurement market)	?	9	9	9			9	9	9	100%	9	9	9			9	9	9	100%	9	9	9			9	9	9	100%	5	9	9			9	5	9	67%	9	9	9			9	9	9	100%
NL120 Vertical integration (all submarkets)		9	9	5			9	5	9	67%	6	9	5			6	5	9	33%	9	9	5			9	5	9	67%	5	9	5			5	5	9	33%	7	9	5			7	5	9	67%
NL121 Mobility of insured between health insurers (health insurance market)	?	7	9	5	7		7	5	9	75%	9	9	7	7		8	7	9	100%	7	9	9	7		8	7	9	100%	9	9	5	3		7	3	9	50%	7	9	9	7		8	7	9	100%
NL122 Risk selection by insurers (health insurance market)	?	9	9	5	7		8	5	9	75%	9	9	7	7		8	7	9	100%	9	9	9	7		9	7	9	100%	9	9	5	7		8	5	9	75%	9	9	9	7		9	7	9	100%
NL123 Cost transfers (health insurance market)	Cost	9	9	5			9	5	9	67%	9	9	5			9	5	9	67%	9	9	5			9	5	9	67%	5	9	5			5	5	9	33%	9	9	5			9	5	9	67%
NL124 Development of production volume in six care sectors divided by the number of employees in fte and corrected for reduction of working hours		9		9			9	9	9	100%	5		7			6	5	7	50%	9		9			9	9	9	100%	3		4			3,5	3	4	0%	5		9	7		7	5	9	67%
NL125 Trend in productivity in hospitals compared to trend in productivity of the Dutch economy as a whole	Cost	9	9	9	7	4	9	4	9	80%	5	9	7	6	7	7	5	9	60%	9	9	9	7	6	9	6	9	80%	3	9	3	6	7	6	3	9	40%	5	9	9	7	4	7	4	9	60%
NL126 Number of hospital discharges by fte hospital employees	Pers	9	9	5	7	7	7	5	9	80%	9	9	9	6	7	9	6	9	80%	9	5	9	6	7	7	5	9	60%	9	9	5	6	6	6	5	9	40%	9	9	5	7	6	7	5	9	60%
NL127 Rate of return		9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	7		5			6	5	7	50%
NL128 Solvency		9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	7		5			6	5	7	50%
NL129 Liquidity		9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	7		5			6	5	7	50%
NL130 Financial reserve		9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	7		5			6	5	7	50%
NL131 Participation rate in the Guarantee Fund for the Health Care Sector		9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	3	9	5	7		6	3	9	50%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%
NL173 International score for availability of minimal-invasive techniques	Innov	9	9	9	7	7	9	7	9	100%	9	9	9	7	7	9	7	9	100%	7	8	9	7	8	8	7	9	100%	5	9	9	7	7	7	5	9	80%	9	9	9	7	8	9	7	9	100%
NL178 Evaluation of Breakthrough Projects		9	9	9			9	9	9	100%	9	9	9			9	9	9	100%	1	9	9			9	1	9	67%	9	8	7			8	7	9	100%	1	9	9			9	1	9	67%

	Cat	Valid									Reliable									Relevant									Interpretable									Actionable								
		E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	Med	Min	Max	%7-9
NL180 Number of patent applications by Dutch people together with foreigners, as a proportion of the total number of patent applications by Dutch people		5		9			7	5	9	50%	9		9			9	9	9	100%	5		9			7	5	9	50%	9		5			7	5	9	50%	7		5			6	5	7	50%
NL181 Number of patent applications by Dutch partnerships, as a proportion of the total number of Dutch patent applications		5		9			7	5	9	50%	9		9			9	9	9	100%	5		9			7	5	9	50%	9		5			7	5	9	50%	7		5			6	5	7	50%
NL182 Expenditure of a country's pharmaceutical industry on health care related Research & Development as a proportion of its gross domestic product	Innov	9	9	5	7	7	7	5	9	80%	9	9	9	7	7	9	7	9	100%	9	9	9	7	8	9	7	9	100%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%
NL230 Health expenditure per health care sector according to the Health Care Budgetary Framework	Cost	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%
NL231 Health expenditure by source of funding		9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%
NL232 Share of health care costs in gross domestic product		9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	7	7	5	9	80%	9	9	5	7	6	7	5	9	60%	9	9	5	7	6	7	5	9	60%
NL233 Price and volume trends in health expenditure		9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%	9	9	9	7		9	7	9	100%	9	9	5	7		8	5	9	75%	9	9	5	7		8	5	9	75%
NL234 Profitability		9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	7		5			6	5	7	50%
NL236 Reserve for acceptable costs		9		5	7		7	5	9	67%	9		5	7		7	5	9	67%	9		5	7		7	5	9	67%	9		5	7		7	5	9	67%	7		5	7		7	5	7	67%
NL237 Result		9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	9		5			7	5	9	50%	7		5			6	5	7	50%
NL239 Labour productivity in hospitals		9	9	1	7	7	7	1	9	80%	5	9	4	6	7	6	4	9	40%	9	9	1	7	7	7	1	9	80%	3	9	1	6	7	6	1	9	40%	5	9	4	7	7	7	4	9	60%
NL240 Labour productivity in care for the elderly		9	9	1	7	7	7	1	9	80%	5	9	4	6	7	6	4	9	40%	9	9	1	7	7	7	1	9	80%	3	9	1	6	7	6	1	9	40%	5	9	4	7	7	7	4	9	60%
NL241 Quality and labour productivity in residential homes		9	9	9	7	7	9	7	9	100%	5	9	3	6	7	6	3	9	40%	9	9	9	7	7	9	7	9	100%	3	9	3	6	7	6	3	9	40%	5	9	5	7	7	7	5	9	60%

Figure x: Detailed overview of second formal scoring process.

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9										
Quality																																
Effectiveness																																
NL032 Number of diabetes related major amputations per 10 000 diabetics aged 18-75	CC-diab	1	7	5	9	67%	7,5	7	9	100%	8	7	9	100%	7,5	7	9	100%	7	7	9	100%	IN	IN	IN	IN	IN	IN	IN	7	0	7
CA013 Proportion of women age 50-69 who report receiving screening mammograms within the last two years	Prev-scr	1	8	6	9	83%	8	7	9	100%	9	7	9	100%	7	5	9	83%	8	7	9	100%	IN	IN	IN	IN	IN	IN		6	0	6
NL029 Colon cancer 5-year survival rate	CC-can	1	7	5	9	67%	7,5	7	9	100%	8,5	7	9	100%	7	5	9	83%	7	7	9	100%	IN	IN	IN	IN	IN	IN		6	0	6
CA012 Proportion of the population age 65 and older who report that they received a dose of influenza vaccine in the past year	Prev-vac	1	8	6	9	83%	8	7	9	100%	8,5	7	9	100%	7	5	9	83%	8	7	9	100%		IN		IN	IN	IN	IN	5	0	5
CA015 Proportion of children who, by their second birthday, have been fully immunized against diphtheria, pertussis, tetanus, Haemophilus influenzae type b (Hib), measles, mumps, and rubella	Prev-vac	1	8	7	9	100%	8	5	9	83%	9	6	9	83%	7	5	9	67%	8	4	9	83%	IN	IN		IN	IN	IN		5	0	5
CA014 Proportion of women age 18-69 who report having had a Pap test within the last three year	Prev-scr	1	8	6	9	83%	8	7	9	100%	9	7	9	100%	7	5	9	83%	8	7	9	100%	IN	IN		IN	IN	IN		5	0	5
NL012 Perinatal mortality	CC-M&C	1	7,5	1	9	83%	8,5	7	9	100%	8,5	1	9	83%	7,5	1	9	83%	7,5	1	9	83%		IN	IN	IN	IN	IN	IN	5	0	5
NL138 Infant mortality	CC-M&C	1	7	1	9	67%	7	6	9	83%	8	1	9	83%	7	1	9	83%	7	1	9	83%		IN	IN	IN	IN	IN	IN	5	0	5
NL028 Breast cancer 5-year survival rate	CC-can	1	7	5	9	67%	7,5	7	9	100%	8,5	7	9	100%	7	5	9	83%	7	7	9	100%		IN	IN	IN	IN	IN		5	0	5
NL030 Cervical cancer 5-year survival rate	CC-can	1	7	5	9	67%	7,5	7	9	100%	8,5	7	9	100%	7	5	9	83%	7	7	9	100%		IN	IN	IN	IN	IN		5	0	5
CA028 Age/sex standardized acute care hospitalization rates for pneumonia and influenza, per 100 000 population age 65 and older	Prev-vac	1	7	3	9	67%	7	5	9	83%	7	5	9	83%	7	5	9	67%	7	5	9	67%		IN	IN	IN	IN			4	0	4
NL135 Annual check-ups at the dentist	Prev-RT	1	8	7	9	100%	8	7	9	100%	9	7	9	100%	8	7	9	100%	8	7	9	100%	IN		IN	IN			IN	4	0	4

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				IN/OUT							#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	E6	E7			
NL094 Number of people who are not registered with a GP or dentist	Generic	3	8	3	9	67%	7	7	9	100%	8	6	9	83%	8	5	9	67%	8	5	9	83%	OUT	IN	IN		IN	IN	IN	5	1	3,5
NL025 Breast cancer mortality rate per 100 000 women	CC-can	1	7	3	9	83%	7,5	7	9	100%	8,5	7	9	100%	7	7	9	100%	7	7	9	100%	OUT	IN	IN	IN	IN	IN		5	1	3,5
NL026 Colon cancer mortality rate per 100 000 population	CC-can	1	7	3	9	67%	7,5	7	9	100%	8,5	7	9	100%	7	5	9	83%	7	7	9	100%	OUT	IN	IN	IN	IN	IN		5	1	3,5
NL027 Cervical cancer mortality rate per 100 000 women	CC-can	1	7	3	9	67%	7,5	7	9	100%	8,5	7	9	100%	7	5	9	83%	7	7	9	100%	OUT	IN	IN	IN	IN	IN		5	1	3,5
CA023 Number of cases of pertussis reported in a given year, expressed as a rate per 100 000 population	Prev-vac	1	7	3	9	67%	7	5	9	67%	7	4	9	67%	7	5	9	67%	7	5	9	67%			IN		IN	IN		3	0	3
CA022 Proportion of live births with a birthweight less than 2500 grams	CC-M&C	1	7	5	8	67%	7	5	9	83%	7	5	8	67%	6,5	5	7	50%	7	3	9	67%			IN	IN		IN		3	0	3
CA033 30 day Acute Myocardial Infarction (AMI) in-hospital mortality rate	CC-CVD	1	7	5	9	67%	7	5	9	83%	8	5	9	83%	7	5	9	83%	7	5	9	83%			IN	IN			IN	3	0	3
NL021 Hospital Standardised Mortality Ratio	CC	1	7	5	9	83%	7	5	9	83%	7,5	5	9	83%	7	5	9	83%	7	5	8	83%			IN		IN	IN		3	0	3
NL001 Percentage of (adolescent) smokers	Prev-hp	1	7	1	7	67%	7	4	9	67%	7	1	9	67%	6,5	1	9	50%	8	7	9	100%		IN	IN	IN	IN		OUT	4	1	2,5
CA032 Deaths due to Medically-Treatable Diseases: pneumonia and unspecified bronchitis	CC-inf	1	6,5	3	9	50%	7	7	9	100%	9	7	9	100%	7	6	9	67%	7	6	9	67%	OUT	IN	IN	IN		IN		4	1	2,5
NL005 Percentage of patients with diabetes with good glucose control	CC-diab	1	7	6	9	83%	8	7	9	100%	8	7	9	100%	7	5	9	83%	7	5	9	83%	OUT		IN	IN	IN		IN	4	1	2,5
NL003 Participation rates of population screening programmes: cervical cancer screening ; breast cancer screening ; heel prick	Prev-scr	1	7,5	5	9	83%	7	5	9	83%	8,5	7	9	100%	7	5	9	83%	7,5	7	9	100%	OUT	IN	IN	OUT	IN	IN	IN	5	2	2
CA024 Number of cases of measles reported in a given year, expressed as a rate per 100 000 population	Prev-vac	1	7	3	9	67%	6,5	5	9	50%	7	4	9	67%	7	5	9	67%	7	5	9	67%			IN		IN			2	0	2
CA031 Deaths due to Medically-Treatable Diseases: hypertensive disease	CC-CVD	1	7	5	9	67%	7	6	9	83%	8	7	9	100%	7	5	9	67%	7	6	9	83%	OUT	IN	IN	IN				3	1	1,5
CA034 30 day Stroke in-hospital mortality rate	CC-CVD	1	7	5	9	67%	7	5	9	83%	8	5	9	83%	7	5	9	83%	7	5	9	83%			IN					1	0	1

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9										
NL043 Development in the number of suicides and suicide attempts	CC-Men	1	7	1	9	67%	7	7	9	100%	7,5	1	9	67%	7	1	9	67%	7	7	9	100%			IN			IN	OUT	2	1	0,5
NL019 In-hospital mortality for pneumonia	CC-inf	1	7	5	9	83%	7	5	9	83%	7,5	5	9	83%	7	5	9	67%	7	5	8	83%	OUT		IN		IN			2	1	0,5
CA021 Proportion of smokers who quit smoking in the past two years	Prev-hp	1	6	1	7	50%	7	4	9	67%	7	1	9	83%	6	1	9	50%	7	5	9	83%	OUT		IN	IN		IN	OUT	3	2	0
NL057 Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes	Generic	6	8,5	7	9	100%	8	6	9	83%	8	5	9	83%	7	7	9	100%	7	6	9	83%	OUT	IN	IN			IN	OUT	3	2	0
CA030 Deaths due to Medically-Treatable Diseases: cervical cancer	CC-can	1	7,5	6	9	83%	8	7	9	100%	9	7	9	100%	7	6	9	83%	7	6	9	83%			IN	IN	OUT	IN	OUT	3	2	0
NL145 Mortality due to breast cancer, colon cancer or cervical cancer	CC-can	1	7	4	9	83%	7,5	7	9	100%	8,5	7	9	100%	7	7	9	100%	7	7	9	100%	OUT	IN	IN	OUT	OUT	IN	IN	4	3	-0,5
NL018 In-hospital mortality for heart failure	CC-CVD	1	7	5	9	83%	7	5	9	83%	7,5	5	9	83%	7	5	9	67%	7	5	8	83%	OUT		IN					1	1	-0,5
NL020 In-hospital mortality for bypass surgery	CC-CVD	1	7	5	9	83%	7	5	9	83%	7,5	5	9	83%	7	5	9	67%	7	5	8	83%	OUT		IN					1	1	-0,5
NL002 Percentage of (adolescent) people who are overweight	Prev-hp	1	6	1	8	50%	7,5	4	9	83%	7	1	9	83%	7	1	9	67%	7,5	7	9	100%			IN	OUT	IN		OUT	2	2	-1
NL062 Use of process innovations, such as integrated care pathways and CVA integrated care	Generic	5	7,5	5	9	83%	7	3	9	67%	7,5	4	9	83%	7	3	9	67%	8	7	9	100%	OUT	IN			OUT	IN		2	2	-1
CA016 Regular medical doctor	Generic	3	8	6	9	83%	7	5	9	83%	8	5	9	67%	7,5	5	9	50%	8	5	9	83%		IN	OUT		OUT	IN		2	2	-1
NL016 Percentage of referrals by GPs to medical specialists	Generic	4	7,5	3	9	83%	7	3	9	83%	8	3	9	67%	7,5	3	9	83%	7,5	7	9	100%	OUT		IN		IN	OUT		2	2	-1
NL004 Vaccination rates (National Vaccination Programme (RVP), influenza vaccination, hepatitis B vaccination)	Prev-vac	1	7,5	5	9	83%	7	5	9	83%	8,5	7	9	100%	7	5	9	83%	7,5	7	9	100%	OUT							0	1	-1,5
CA025 Number of new cases of tuberculosis reported in a given time period, expressed as a rate per 100 000 population	Prev-?	1	6,5	3	9	50%	7	5	9	67%	7	5	8	83%	7	5	9	67%	6	3	7	50%	OUT		IN				OUT	1	2	-2

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				IN/OUT							#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	E6	E7			
CA028 Number of new positive HIV cases in a given year, expressed as a rate per 100 000 population. Information is based on those who are tested for HIV	Prev-?	1	6	3	8	50%	7	5	9	83%	7	5	9	67%	6,5	5	9	50%	6	5	7	50%	OUT		IN			OUT	OUT	1	3	-3,5
NL153 Satisfaction of nurses and care workers with the quality of care	Generic	2	8	7	9	100%	6	3	9	33%	8,5	7	9	100%	7	5	9	67%	7	5	9	83%	OUT	IN	OUT			OUT		1	3	-3,5
CA045 Hip fracture hospitalization	CC	1	7	1	9	67%	7	5	9	67%	7	4	9	67%	7	5	9	67%	6,5	5	9	50%	OUT		IN		OUT	OUT		1	3	-3,5
NL154 Effectiveness of medical aids	LTC	1	7	3	9	80%	4,5	3	7	17%	7,5	3	9	83%	6,5	3	9	50%	7	3	9	83%	OUT	IN	OUT		OUT	OUT		1	4	-5
NL041 Results of prevention measures and the uptake by target groups	Prev-hp	1	7	3	9	80%	5	4	9	20%	7	3	9	80%	7	5	7	80%	7	5	9	80%	OUT	IN	OUT	OUT	OUT	OUT		1	5	-6,5
NL044 Percentage of the target group reached by care professionals	Prev-hp	2	7	7	9	100%	7	1	7	60%	7	1	9	80%	8	1	9	80%	7	6	9	80%	OUT	OUT	OUT	OUT	OUT	OUT		0	6	-9
Appropriateness																																
NL015 Percentage of cases in which GPs prescribe according to guidelines	Generic	1	8	7	9	100%	7	7	9	100%	9	3	9	83%	7	6	9	83%	7,5	7	9	100%		IN	IN	IN		IN		4	0	4
NL061 Utilisation and speed of diffusion of minimal and non-invasive surgical techniques	CC	3	7,5	7	9	100%	8	7	9	100%	7	7	9	100%	7	5	9	67%	8	6	9	83%	IN	IN	IN	IN				4	0	4
NL057 Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes	CC	6	8,5	7	9	100%	7	6	9	67%	8	5	9	83%	7	7	9	100%	7	6	9	83%		IN			IN	IN	IN	4	0	4
CA020 Proportion of women delivering babies in an acute care hospital who received cesarean sections	CC-M&C	1	7	5	7	83%	7	5	9	83%	7	5	9	80%	7	5	9	67%	6,5	5	9	50%		IN		IN		IN		3	0	3
NL175 Use of home care technology and proportion of renal dialysis patients using home dialysis	LTC	3	7	3	9	67%	8	3	9	83%	7,5	3	9	83%	8	3	9	83%	7	3	9	83%		IN		IN	IN	OUT	IN	4	1	2,5

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9										
NL013 Percentage of cases in which GPs do not prescribe medication for a specific syndrome, consistent with guidelines that advise against these medications	Generic	1	8	7	9	100%	7	7	9	100%	7,5	3	9	83%	7	6	9	83%	7,5	7	9	100%	OUT	IN			IN	IN	IN	4	1	2,5
NL014 Percentage of cases in which GPs prescribe medication for a specific syndrome consistent with guidelines	Generic	1	8	7	9	100%	7	7	9	100%	8	3	9	83%	7	6	9	83%	7,5	7	9	100%	OUT	IN			IN	IN	IN	4	1	2,5
NL016 Percentage of referrals by GPs to medical specialists	Generic	4	7,5	3	9	83%	7	3	9	83%	8	3	9	67%	7,5	3	9	83%	7,5	7	9	100%		IN	IN	IN	IN	OUT		4	1	2,5
NL173 International score for availability of minimal-invasive techniques	CC	3	8	7	9	100%	8	7	9	100%	7	7	9	100%	7	5	9	67%	8,5	6	9	83%	OUT	IN			IN		IN	3	1	1,5
NL199 Percentage of people with a need for acute care who did not get the care they needed and wanted	Generic	3	7,5	4	9	83%	7	3	9	83%	8,5	4	9	83%	7	4	9	83%	8	3	9	83%	OUT	IN		IN	IN	OUT	IN	4	2	1
NL169 Percentage of hospitals where information on medication prescribed in hospital and elsewhere is electronically accessible at hospital wards and elsewhere	Generic	3	8	5	9	67%	9	7	9	100%	8	6	9	67%	9	6	9	83%	8	5	9	83%		IN				OUT	IN	2	1	0,5
CA043 Percentage of inpatient days where a physician (or designated other) has indicated that a patient occupying an acute care hospital bed was well enough to have been cared for elsewhere	CC	2	9	7	9	100%	7	5	9	80%	9	7	9	100%	7	6	9	60%	7	5	9	80%		IN	IN		OUT	OUT	IN	3	2	0
NL162 Proportion of people who end up at the accident and emergency department after a suicide attempt and are seen by a psychiatrist there	CC-Men	1	7	1	9	67%	8	5	9	67%	7	1	9	83%	7	1	9	67%	7	1	9	83%								0	0	0

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				IN/OUT							#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	E6	E7			
NL159 Proportion of adults with a severe anxiety, mood or addiction disorder under care who receive at least one follow-up contact	CC-Men	2	7	1	9	83%	6	1	9	33%	7	1	9	83%	7	1	9	67%	7	1	8	83%	OUT		IN					1	1	-0.5
CA040 Ambulatory Care Sensitive Conditions	CC	3	8.5	3	9	83%	7	3	9	67%	8	7	9	100%	7	4	9	67%	7	5	9	67%	IN	IN	OUT			OUT		2	2	-1
NL161 Proportion of secondary mental health treatments that are ended in joint consultation between the therapist and the client/patient	CC-Men	1	7	4	9	83%	6	5	9	50%	7.5	4	9	83%	6	1	9	33%	7	1	8	67%	OUT							0	1	-1.5
NL158 Proportion of adults with a severe anxiety, mood or addiction disorder who receive care for this	CC-Men	2	7	1	9	83%	6	1	9	33%	7	1	9	83%	7	1	9	83%	7	1	8	83%	OUT	OUT		IN				1	2	-2
CA042 Percentage of acute care inpatient hospitalizations classified as May Not Require Hospitalization	CC	2	8	5	9	83%	6.5	5	9	50%	8.5	4	9	83%	7	4	9	83%	7	4	9	67%	OUT	IN	IN			OUT	OUT	2	3	-2.5
NL140 Prescribing percentage in general practice according to the Dutch College of General Practitioners formulary	Generic	1	7	5	9	80%	7	5	9	80%	7	5	9	80%	7	5	9	80%	7	5	9	80%	OUT					OUT	OUT	0	3	-4.5
NL143 Experienced coordination of medication use	Generic	3	7	3	9	67%	7	3	9	67%	7	1	9	67%	5	3	9	17%	7	3	9	67%	OUT		OUT		OUT	OUT		0	4	-6
NL160 Proportion of adults with a severe anxiety, mood or addiction disorder under care who receive a satisfactory form of care	CC-Men	1	7	1	9	83%	6	1	9	33%	7	1	9	83%	7	1	9	67%	7	1	8	83%	OUT	OUT		OUT	OUT	OUT		0	5	-7.5
Safety																																
NL051 Incidence of serious adverse effects of blood transfusion	CC	1	9	7	9	100%	8	7	9	100%	9	7	9	100%	9	7	9	100%	8.5	7	9	100%	IN	IN	IN	IN	IN	IN	IN	7	0	7
NL167 Prevalence of hospital-acquired infections	CC	1	9	7	9	100%	9	7	9	100%	9	7	9	100%	7.5	6	9	83%	9	7	9	100%	IN	IN	IN	IN		IN	IN	6	0	6
NL054 Prevalence of decubitus in long-term care facilities	LTC	1	9	7	9	100%	8	6	9	67%	8	7	9	100%	7	6	9	67%	8.5	7	9	100%		IN	IN		IN	IN	IN	5	0	5
NL053 Prevalence of decubitus in hospitals	CC	1	9	7	9	100%	7	6	9	67%	8	7	9	100%	7	5	9	67%	8	6	9	83%		IN	IN	IN		IN		4	0	4

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9										
NL052 Prevalence of postoperative surgical site infections	CC	1	8	5	9	83%	7	5	9	83%	8	5	9	83%	8	5	9	83%	8	5	9	83%		IN	IN	IN		IN		4	0	4
NL057 Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes	Generic	6	8,5	7	9	100%	8	6	9	83%	8	5	9	83%	7	7	9	100%	7	6	9	83%		IN		IN	IN			3	0	3
CA046 In-hospital hip fracture	CC	1	8	7	9	100%	8	6	9	83%	9	7	9	100%	8	7	9	100%	9	7	9	100%	OUT	IN	IN	IN		IN		4	1	2,5
NL165 Percentage of patients that sustained medical injury during hospitalization	CC	1	8	7	9	100%	7	5	9	67%	8	7	9	100%	7	3	9	67%	7	4	9	83%	OUT	IN	IN		IN		IN	4	1	2,5
NL037 Percentages of patients with decubitus in residential homes, in nursing homes or with home care	LTC	1	8	7	9	100%	7,5	6	9	83%	8	7	9	100%	8	7	9	100%	7	5	9	83%		IN		IN				2	0	2
NL036 Magnitude of potentially preventable health care problems (such as falls) among residential home and nursing home residents	LTC	1	7,5	3	9	83%	6,5	5	9	50%	7	5	9	67%	7,5	7	9	100%	7	5	9	83%		IN	IN					2	0	2
NL062 Use of process innovations, such as integrated care pathways and CVA integrated care	Generic	5	7,5	5	9	83%	7	3	9	67%	7,5	4	9	83%	7	3	9	67%	8	7	9	100%		IN	OUT	IN			IN	3	1	1,5
NL163 Patient experiences with : Medication errors ; Medical errors ; Laboratory or diagnostic test errors	CC	1	8	5	9	83%	5	3	9	17%	9	7	9	100%	7	3	9	67%	7,5	5	9	83%	OUT	IN	IN				IN	3	1	1,5
NL169 Percentage of hospitals where information on medication prescribed in hospital and elsewhere is electronically accessible at hospital wards and elsewhere	Generic	3	8	5	9	67%	9	7	9	100%	8	6	9	67%	9	6	9	83%	8	5	9	83%		IN	OUT				IN	2	1	0,5
NL166 Prevalence of hospital-acquired pressure sores	CC	1	9	6	9	80%	6	3	9	40%	7	6	9	80%	7	5	9	60%	8	7	9	100%	OUT	IN	IN					2	1	0,5
NL214 Percentage of work hours lost to absenteeism	Saf-pers	3	8	4	9	83%	7	3	9	67%	7	5	9	67%	7	3	9	67%	7	3	9	67%		IN	OUT		OUT			1	2	-2
NL091 Personnel absenteeism rate	Saf-pers	3	8	5	9	83%	8	4	9	67%	7,5	5	9	67%	7	4	9	83%	7	5	9	67%		OUT			OUT	IN		1	2	-2

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				IN/OUT							#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	E6	E7			
NL217 Percentage of nurses and carers who believe that enough personnel is on duty to assure the patients' safety	Generic	3	7	3	9	83%	6	3	9	50%	7	4	9	67%	7	2	9	83%	8	3	9	67%	OUT		OUT					0	2	-3
NL143 Experienced coordination of medication use	Generic	3	7	3	9	67%	7	3	9	67%	7	1	9	67%	5	3	9	17%	7	3	9	67%	OUT		OUT		OUT			0	3	-4,5
Patient-centeredness																																
NL072 Percentage of patients who are satisfied with the speed with which they can see the GP, specialist or dentist	Generic	2	8	5	9	67%	7,5	5	9	50%	8	5	9	67%	7	5	9	67%	7	5	9	67%	OUT	IN	IN	IN	IN	IN	IN	6	1	4,5
NL199 Percentage of people with a need for acute care who did not get the care they needed and wanted	Generic	3	7,5	4	9	83%	7	3	9	83%	8,5	4	9	83%	7	4	9	83%	8	3	9	83%	OUT	IN	IN	IN			IN	4	1	2,5
NL150 Quality of life of patients in residential homes and nursing homes	LTC	1	8	7	9	100%	5	3	9	33%	8,5	7	9	100%	7	5	9	67%	7	5	9	83%	OUT			IN	IN	IN		3	1	1,5
CA011 Patient satisfaction (and quality rating of services received)	Generic	1	7	6	9	67%	5,5	5	9	33%	8	7	9	100%	6	4	9	50%	7	4	9	83%	OUT	IN		IN		IN		3	1	1,5
CA009 Self-reported patient satisfaction with hospital care	CC	1	7	6	9	67%	5,5	5	9	33%	7	5	9	67%	6	4	9	50%	7	4	9	83%	OUT	IN	IN			IN		3	1	1,5
CA007 Self-reported patient satisfaction with community-based care	Generic	1	7	6	9	67%	5,5	5	9	33%	7	6	9	83%	6	4	9	50%	7	4	9	83%	OUT	IN				IN		2	1	0,5
CA010 Self-reported patient satisfaction with physician care	Generic	1	7	6	9	67%	5,5	5	9	33%	7	6	9	83%	6	4	9	50%	7	4	9	67%	OUT	IN				IN		2	1	0,5
NL058 Percentage of institutions that use systems or subsystems for feedback from patients and clients	Generic	1	7	5	9	83%	7,5	6	9	83%	7	5	9	67%	7	6	9	67%	8	5	9	67%	OUT	IN		IN		OUT	IN	3	2	0
CA008 Self-reported patient satisfaction with overall health care services	Generic	1	7	6	9	67%	5,5	5	9	33%	8	6	9	83%	6,5	4	9	50%	7	4	9	83%	OUT	IN						1	1	-0,5
NL047 Consumer experiences: how do care consumers judge the care provided?	Generic	1	7	6	9	67%	5,5	5	9	33%	7,5	6	9	83%	6,5	4	9	50%	7	4	9	83%	OUT	IN						1	1	-0,5

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				IN/OUT							#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	E6	E7			
NL218 Percentage of care users who believe enough personnel is available during a stay in the hospital or nursing home	Generic	1	8	3	9	83%	6	3	9	50%	7,5	4	9	83%	7	2	9	83%	8	3	9	67%	OUT	IN	OUT					1	2	-2
NL066 People's wishes with respect to choice: care provider, source of information and residential care	Generic	1	7	1	9	60%	5	3	7	40%	7	5	9	80%	7	3	9	60%	4	1	8	40%	OUT		IN		OUT			1	2	-2
NL152 Client judgements of home care	LTC	1	8	7	9	100%	6	3	9	33%	8,5	7	9	100%	7	5	9	67%	7	5	9	83%	OUT	IN	OUT		IN	OUT		2	3	-2,5
NL148 Client judgements of residential homes and nursing homes	LTC	1	7,5	7	9	100%	5,5	3	9	33%	7	6	9	83%	7	5	9	67%	7	5	9	83%	OUT		OUT					0	2	-3
NL151 Client judgements of care for the physically disabled	LTC	1	8	7	9	100%	5,5	3	9	33%	8	7	9	100%	7	5	9	67%	7	5	9	83%	OUT	IN	OUT			OUT		1	3	-3,5
CA008 Self-reported patient satisfaction with telephone health line or tele-health services	Generic	1	7	6	9	80%	5	5	9	20%	7	5	9	80%	7	4	9	60%	7	7	9	100%	OUT	IN	OUT		OUT	OUT		1	4	-5
NL046 General consumer trust: do Dutch people have confidence in the health care system irrespective of their actual use?	Generic	1	7	6	9	67%	5,5	3	9	33%	7,5	4	9	67%	6	4	9	50%	7	4	9	83%	OUT	IN		OUT	OUT	OUT		1	4	-5
NL079 Satisfaction of asylum seekers with medical care	Generic	2	8	7	9	100%	5,5	4	9	33%	8	3	9	83%	8	3	9	67%	8	4	9	83%	OUT	IN	OUT	OUT	OUT	OUT	IN	2	5	-5,5
Continuity																																
NL094 Number of people who are not registered with a GP or dentist	Generic	3	8	3	9	67%	7	7	9	100%	8	6	9	83%	8	5	9	67%	8	5	9	83%		IN	IN		IN		IN	4	0	4
CA005 Self-reported wait times for diagnostic services	Generic	3	7	7	9	100%	5,5	3	9	17%	7,5	7	9	100%	6,5	4	9	50%	7	5	9	67%		IN	IN	IN	OUT	IN		4	1	2,5
CA017 Wait time for hip fracture surgery	CC	2	7	1	9	83%	7	1	9	67%	7	1	9	67%	7	1	9	67%	6	1	9	50%	OUT		IN	IN		IN	IN	4	1	2,5
NL074 (Expected) time till treatment (waiting time)	Generic	2	9	7	9	100%	9	5	9	67%	8,5	7	9	100%	7,5	6	9	83%	7,5	5	9	67%			IN				IN	2	0	2
NL016 Percentage of referrals by GPs to medical specialists	Generic	4	7,5	3	9	83%	7	3	9	83%	8	3	9	67%	7,5	3	9	83%	7,5	7	9	100%	OUT			IN	IN	IN		3	1	1,5

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9										
NL017 Percentage of referrals by GPs to other primary care professionals	Generic	1	7,5	3	9	83%	7	3	9	83%	7	3	9	67%	7,5	3	9	83%	7,5	7	9	100%	OUT	IN		IN		IN		3	1	1,5
CA040 Ambulatory Care Sensitive Conditions	CC	3	8,5	3	9	83%	7	3	9	67%	8	7	9	100%	7	4	9	67%	7	5	9	67%	IN		OUT	IN		OUT	IN	3	2	0
CA016 Regular medical doctor	Generic	3	8	6	9	83%	7	5	9	83%	8	5	9	67%	7,5	5	9	50%	8	5	9	83%		IN	OUT		OUT	IN		2	2	-1
NL054 Percentage of people with somatic complaints who return to their home environment after a stay in a nursing home (as an indicator of the magnitude of the temporary stay function of nursing homes)	LTC	2	8	6	9	67%	7	6	9	83%	8	5	9	67%	7	6	9	67%	6,5	5	9	50%		IN		OUT		OUT		1	2	-2
NL159 Proportion of adults with a severe anxiety, mood or addiction disorder under care who receive at least one follow-up contact	CC-Men	2	7	1	9	83%	6	1	9	33%	7	1	9	83%	7	1	9	67%	7	1	8	83%	OUT		IN		OUT			1	2	-2
NL057 Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes	Generic	6	8,5	7	9	100%	8	6	9	83%	8	5	9	83%	7	7	9	100%	7	6	9	83%	OUT	IN	OUT		IN	OUT		2	3	-2,5
NL062 Use of process innovations, such as integrated care pathways and CVA integrated care	Generic	6	7,5	5	9	83%	7	3	9	67%	7,5	4	9	83%	7	3	9	67%	8	7	9	100%	OUT	IN	OUT			OUT	IN	2	3	-2,5
NL143 Experienced coordination of medication use	Generic	3	7	3	9	67%	7	3	9	67%	7	1	9	67%	5	3	9	17%	7	3	9	67%	OUT				OUT	OUT		0	3	-4,5
Accessibility																																
NL095 Number of physicians and nurses per 100 000 population	Gen-pers	1	8	7	9	100%	8	7	9	100%	7	6	9	83%	7	5	9	67%	8	5	9	83%	IN	IN	IN	IN	IN		IN	6	0	6
NL080 Insurance status of the population, including being uninsured	Gen-cost	1	9	7	9	100%	9	7	9	100%	9	7	9	100%	9	7	9	100%	9	6	9	83%	IN	IN	IN	IN	IN	IN		6	0	6
NL071 Number of people waiting for a donor organ	CC-time	1	9	7	9	100%	9	7	9	100%	9	7	9	100%	7	5	9	83%	8	6	9	83%	IN	IN	IN	IN	IN	IN		6	0	6
NL082 Amount of co-payments and out-of-pocket payments	Gen-cost	1	9	7	9	100%	9	7	9	100%	9	7	9	100%	9	7	9	100%	9	7	9	100%	IN	IN	IN		IN	IN		5	0	5

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9										
NL136 Coverage of preventive child health care	Prev-hp	1	9	3	9	80%	7	7	9	100%	9	3	9	80%	9	6	9	80%	9	6	9	80%			IN	IN	IN		IN	4	0	4
NL084 Additional illness-related costs for chronically ill people	LTC-cost	1	8	7	9	100%	8	7	9	100%	8	7	9	100%	9	7	9	100%	9	6	9	83%	IN	IN	IN		IN			4	0	4
NL072 Percentage of patients who are satisfied with the speed with which they can see the GP, specialist or dentist	Gen-time	2	8	5	9	67%	7,5	5	9	50%	8	5	9	67%	7	5	9	67%	7	5	9	67%		IN		IN	IN		IN	4	0	4
NL085 Use of financial compensatory measures by chronically ill people	LTC-cost	1	8	7	9	100%	8	7	9	100%	8	7	9	100%	9	7	9	100%	9	6	9	83%		IN	IN				IN	3	0	3
NL089 Number of outpatient and inpatient services per region per 10 000 inhabitants	Gen-geo	1	7	5	9	83%	7	5	9	67%	7	5	9	83%	7	5	9	83%	7	5	9	83%			IN	IN	IN			3	0	3
NL175 Use of home care technology and proportion of renal dialysis patients using home dialysis	Generic	3	7	3	9	67%	8	3	9	83%	7,5	3	9	83%	8	3	9	83%	7	3	9	83%	OUT	IN		IN	IN		IN	4	1	2,5
NL204 Number of problematic patients who are waiting for long-term care	LTC-time	1	8	4	9	83%	8	3	9	67%	8	4	9	83%	7	4	9	67%	6,5	3	9	50%		IN	IN					2	0	2
NL074 (Expected) time till treatment (waiting time)	Gen-time	2	9	7	9	100%	9	5	9	67%	8,5	7	9	100%	7,5	6	9	83%	7,5	5	9	67%		IN					IN	2	0	2
NL211 Number of vacancies per 1000 jobs in health care	Gen-pers	2	8	5	9	83%	8	4	9	67%	8	4	9	83%	7	3	9	67%	8	3	9	67%		IN		IN				2	0	2
NL220 Qualification levels of care workers and nurses	Gen-pers	2	8	4	9	83%	7	3	9	67%	7	4	9	83%	7,5	3	9	83%	8	5	9	67%		IN	IN					2	0	2
NL086 Percentage of family income spent on health care costs by high and low-income groups	Gen-cost	1	8	6	9	83%	8	5	9	67%	8	7	9	100%	8	5	9	83%	8	5	9	67%		IN	IN					2	0	2
NL233 Price and volume trends in health expenditure	Gen-cost	3	9	5	9	80%	9	5	9	80%	9	7	9	100%	9	5	9	80%	9	5	9	80%		IN					IN	2	0	2
NL076 Comparison of care utilization by people with a low or high level of education, corrected for health disparities	Gen-cost	1	7	1	9	83%	8	7	9	100%	8	1	9	83%	7,5	1	9	67%	8	5	9	83%					IN		IN	2	0	2
NL187 Distribution of out of pocket payments across households	Gen-cost	1	9	5	9	80%	9	5	9	80%	9	5	9	80%	9	5	9	80%	9	5	9	80%		IN					IN	2	0	2
NL081 Health care costs per capita	Gen-cost	1	7	1	9	67%	8	4	9	83%	7,5	1	9	67%	7	1	9	67%	6,5	1	9	50%		IN		IN				2	0	2

	Cat	#Dim	Valid Med	Valid Min	Valid Max	Valid %7-9	Reliable Med	Reliable Min	Reliable Max	Reliable %7-9	Relevant Med	Relevant Min	Relevant Max	Relevant %7-9	Interpretable Med	Interpretable Min	Interpretable Max	Interpretable %7-9	Actionable Med	Actionable Min	Actionable Max	Actionable %7-9	E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
CA041 Surgical Day Case Rates	CC	3	8	5	9	83%	8	5	9	83%	7,5	4	9	67%	7	4	9	83%	8	4	9	83%		IN			IN			2	0	2
CA005 Self-reported wait times for diagnostic services	Gen-time	3	7	7	9	100%	5,5	3	9	17%	7,5	7	9	100%	6,5	4	9	50%	7	5	9	67%		IN	IN	IN	OUT			3	1	1,5
NL068 Number of urgent ambulance rides that exceed the 15-minute response time norm	Gen-time	1	7,5	3	9	83%	6,5	4	9	50%	7	4	9	83%	8	4	9	83%	7	3	9	83%		IN	OUT		IN		IN	3	1	1,5
NL199 Percentage of people with a need for acute care who did not get the care they needed and wanted	Generic	3	7,5	4	9	83%	7	3	9	83%	8,5	4	9	83%	7	4	9	83%	8	3	9	83%	OUT	IN		IN	IN			3	1	1,5
CA017 Wait time for hip fracture surgery	CC-time	2	7	1	9	83%	7	1	9	67%	7	1	9	67%	7	1	9	67%	6	1	9	50%	OUT		IN	IN		IN		3	1	1,5
NL206 Differences in the use of care between people with a high educational level and those with a low educational level, whereby a correction for health differences is applied	Gen-cost	1	8	1	9	83%	8	1	9	83%	8	1	9	67%	8	1	9	67%	8	1	9	83%		OUT	IN	IN	OUT	IN	IN	4	2	1
NL213 Percentage of nursing and care personnel that are leaving the sector (net turnover)	Gen-pers	2	8	5	9	83%	8	4	9	67%	8	4	9	83%	7	2	9	67%	8	3	9	67%		IN						1	0	1
NL215 Number of people who have (had) problems finding a GP	Gen-pers	2	7,5	7	9	100%	8	5	9	67%	8,5	6	9	83%	8	5	9	67%	8	5	9	67%		IN						1	0	1
NL099 Numbers of qualified physician assistants and nurse practitioners working and in training	Gen-pers	2	7	5	9	83%	7	5	9	67%	7	5	9	83%	7	5	9	83%	7,5	5	9	67%			IN					1	0	1
NL087 Share of total health care costs in the Netherlands that is paid by high and low-income groups (income solidarity in health care)	Gen-cost	1	7	1	9	83%	8	7	9	100%	7	1	9	83%	8	1	9	83%	6,5	1	9	50%			IN					1	0	1
NL040 Number of psychogeriatric patients living in small-scale residential care facilities	LTC-Men	1	7	5	9	67%	6	5	9	50%	7	6	9	67%	6	5	9	50%	7	5	9	83%	OUT	IN					IN	2	1	0,5
NL067 Percentage of urgent ambulance rides that is on site within specific response times	Gen-time	1	7,5	3	9	83%	6,5	4	9	50%	8	4	9	83%	8	4	9	67%	7	3	9	83%		IN	OUT	IN				2	1	0,5

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9										
NL189 Average distance for every inhabitant of the Netherlands to the nearest specific care service	Gen-geo	1	8	4	9	83%	8	3	9	83%	8	3	9	83%	8	3	9	83%	7	3	9	83%		IN	OUT			IN		2	1	0,5
NL185 Percentage of people who forego necessary health care	Generic	1	7	5	9	67%	6,5	3	9	50%	8	1	9	83%	7	5	9	83%	7	1	9	83%	OUT		IN		IN			2	1	0,5
NL122 Risk selection by insurers (health insurance market)	Gen-cost	2	7	4	9	60%	7	4	9	80%	9	1	9	80%	7	5	9	80%	9	1	9	80%	OUT		IN			IN		2	1	0,5
NL064 Development in the rate of surgical day-treatments to the total number of surgical treatments	CC	3	8	3	9	83%	8	5	9	83%	7,5	3	9	67%	7	3	9	83%	8	5	9	83%		IN			OUT	IN		2	1	0,5
NL113 Price movements in health care	Gen-cost	3	7	5	9	60%	7	5	9	80%	7	5	9	80%	8	5	9	80%	7,5	5	9	67%								0	0	0
NL093 Extent to which the current influx of personnel is matched to developments in care demands	Gen-pers	2	7	5	9	83%	8	4	9	83%	7,5	3	9	83%	8	3	9	83%	8	3	9	67%		IN			OUT			1	1	-0,5
NL091 Personnel absenteeism rate	Gen-pers	3	8	5	9	83%	8	4	9	67%	7,5	5	9	67%	7	4	9	83%	7	5	9	67%			OUT			IN		1	1	-0,5
NL214 Percentage of work hours lost to absenteeism	Gen-pers	3	8	4	9	83%	7	3	9	67%	7	5	9	67%	7	3	9	67%	7	3	9	67%		IN	OUT					1	1	-0,5
NL069 Number of people who are able to reach the nearest HED or central GP post by car within 30 minutes	Gen-geo	1	7	7	9	100%	7	6	9	67%	8	7	9	100%	8	5	9	83%	8	1	9	83%		IN	OUT					1	1	-0,5
NL088 Proximity of services, expressed in actual travelling time, or number of care locations in an urban area or region	Gen-geo	1	7,5	6	9	83%	7	5	9	83%	7,5	5	9	83%	7	5	9	67%	8	4	9	83%		IN	OUT					1	1	-0,5
NL192 Patients' experiences: was it a problem for you to travel for your care, examination or treatment?	Gen-geo	1	8	3	9	83%	6	2	9	50%	8	3	9	83%	7	3	9	83%	7	3	9	67%	OUT	IN						1	1	-0,5
NL190 Range of catchment profile by care service	Gen-geo	1	9	3	9	80%	9	2	9	60%	8	3	9	80%	6	3	9	80%	7	3	9	80%	OUT	IN						1	1	-0,5
NL191 Trend of average distance and catchment profile for GPs and hospitals	Gen-geo	1	9	3	9	80%	9	2	9	80%	9	3	9	80%	7	3	9	60%	7	3	9	80%	OUT	IN						1	1	-0,5

	Cat	#Dim	Valid Med	Min	Max	%7-9	Reliable Med	Min	Max	%7-9	Relevant Med	Min	Max	%7-9	Interpretable Med	Min	Max	%7-9	Actionable Med	Min	Max	%7-9	E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
NL078 Care utilization in disadvantaged neighbourhoods of big cities and by marginal populations	Gen-cost	1	8	1	9	83%	8	8	9	83%	8	1	9	83%	7.5	1	9	67%	8	5	9	83%	OUT		IN					1	1	-0.5
NL065 New choices: personal care budget and health insurance services	Gen-cost	1	7	5	9	80%	7	5	9	60%	7	5	9	80%	7	5	9	60%	7	3	8	60%	OUT		IN					1	1	-0.5
NL174 Number of day surgery interventions as a proportion of all surgical interventions	CC	3	8	3	9	83%	8	5	9	83%	7.5	3	9	83%	7	3	9	83%	8	5	9	83%		IN		OUT				1	1	-0.5
NL092 Current unfulfilled demand	Gen-pers	2	7.5	5	9	83%	6.5	4	9	50%	7.5	5	9	83%	8	3	9	83%	8	3	9	67%		IN	OUT			OUT	IN	2	2	-1
NL153 Percentage of people who had to travel more than 20 minutes to a hospital compared with other EU countries	Gen-geo	1	7	3	9	83%	7	2	9	83%	8	3	9	83%	7	3	9	67%	7	1	9	67%	OUT		OUT	IN			IN	2	2	-1
NL077 Comparison of care utilization by Dutch versus immigrant populations, corrected for health disparities	Gen-cult	1	8	1	9	83%	8	7	9	100%	8	1	9	83%	7.5	1	9	67%	8	5	9	83%			OUT		IN	OUT	IN	2	2	-1
CA004 Self-reported prescription drug spending as a percentage of income	Gen-cost	1	7	7	9	100%	5.5	3	9	17%	7.5	7	9	100%	6.5	4	9	50%	7	5	9	83%	OUT		IN	IN	OUT			2	2	-1
NL098 Number of practice nurses in GP practices	Gen-pers	2	7	5	9	67%	7	5	9	67%	7.5	5	9	67%	7	5	9	67%	7.5	5	9	67%	OUT							0	1	-1.5
NL195 Number of people who can be reached by a mobile medical team within 30 minutes	Gen-geo	1	8	3	9	83%	8	2	9	83%	7	3	9	67%	7.5	3	9	83%	8	3	9	83%		OUT						0	1	-1.5
NL118 Access barriers to the health care market (all submarkets)	Generic	2	8	1	9	83%	7	1	9	83%	8	1	9	83%	7	1	9	67%	7.5	1	9	67%	OUT							0	1	-1.5
NL121 Mobility of insured between health insurers (health insurance market)	Gen-cost	2	7	5	9	80%	7	7	9	100%	7	1	9	80%	8	3	9	60%	7	1	9	80%	OUT							0	1	-1.5
NL119 Health care procurement by health insurers (care procurement market)	Gen-cost	2	8	1	9	75%	8	1	9	75%	8	1	9	75%	6.5	1	9	50%	8.5	1	9	75%	OUT							0	1	-1.5
NL223 Share of insured people who have switched health insurer	Gen-cost	1	7	4	8	67%	7	4	9	67%	7	3	9	67%	4	2	9	33%	6	3	9	50%	OUT							0	1	-1.5

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9										
NL224 Share of insured people who did not experience any limitations to their freedom to choose a health insurer	Gen-cost	1	7	4	9	67%	6,5	4	9	50%	7,5	3	9	67%	4	2	7	33%	7	3	9	67%	OUT							0	1	-1,5
NL044 Percentage of the target group reached by care professionals	Prev-hp	2	7	7	9	100%	7	1	7	50%	7	1	9	80%	8	1	9	80%	7	6	9	80%		OUT	IN	OUT				1	2	-2
NL070 Number of urgent callers to central GP posts who get to speak a health care professional within one minute	Gen-time	1	8	6	9	83%	7	6	9	67%	8	4	9	67%	9	7	9	100%	8	7	9	100%			IN		OUT		OUT	1	2	-2
NL218 Unfilled demand for medical specialist care	Gen-pers	2	7	2	9	83%	8	2	9	83%	7	7	9	100%	7,5	2	9	83%	8	2	9	67%		IN	OUT		OUT			1	2	-2
NL184 Percentage of people who have confidence in the affordability of necessary health care	Gen-cost	1	7	3	9	67%	8	3	9	33%	7,5	7	9	100%	7	3	9	67%	6,5	5	9	50%	OUT	IN			OUT			1	2	-2
NL153 Proportion of adults with a severe anxiety, mood or addiction disorder who receive care for this	CC-Men	2	7	1	9	83%	8	1	9	33%	7	1	9	83%	7	1	9	83%	7	1	8	83%	OUT	OUT	IN					1	2	-2
NL210 Quality of medical health services for asylum seekers	Gen-cult	1	8	7	9	100%	8	5	9	67%	8	6	9	83%	8	4	9	67%	8	4	9	83%	OUT	IN	OUT	OUT		IN		2	3	-2,5
NL217 Percentage of nurses and carers who believe that enough personnel is on duty to assure the patients' safety	Gen-pers	3	7	3	9	83%	8	3	9	50%	7	4	9	67%	7	2	9	83%	8	3	9	67%	OUT		OUT					0	2	-3
NL097 Medical-technical tasks carried out by general practice assistants	Gen-pers	3	7	5	9	67%	6,5	5	9	50%	7,5	5	9	67%	6,5	5	9	50%	7,5	5	9	83%	OUT				OUT			0	2	-3
NL209 Care needs of homeless people	Generic	1	7	1	9	83%	5,5	5	9	33%	8	6	9	83%	7,5	4	9	50%	6,5	1	9	50%	OUT	IN		OUT	OUT			1	3	-3,5
NL079 Satisfaction of asylum seekers with medical care	Gen-cult	2	8	7	9	100%	5,5	4	9	33%	8	3	9	83%	8	3	9	67%	8	4	9	83%	OUT	IN	OUT	OUT				1	3	-3,5
NL090 Number of vacancies in health care that are difficult to fill	Gen-pers	2	7,5	5	9	83%	6,5	4	9	50%	7,5	5	9	83%	8	3	9	83%	6,5	3	9	50%	OUT	IN	OUT		OUT	OUT		1	4	-5
Efficiency																																
CA041 Surgical Day Case Rates	CC	3	8	5	9	83%	8	5	9	83%	7,5	4	9	67%	7	4	9	83%	8	4	9	83%	IN	IN		IN	IN			4	0	4

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				IN/OUT							#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	E6	E7			
NL094 Number of people who are not registered with a GP or dentist	Generic	3	8	3	9	67%	7	7	9	100%	8	6	9	83%	8	5	9	67%	8	5	9	83%		IN			IN		IN	3	0	3
NL108 Health care expenditures according to the System of Health Accounts (OECD)	Cost	2	8	5	9	83%	7	5	9	83%	8	5	9	83%	7	5	9	67%	7,5	5	9	67%				IN	IN		IN	3	0	3
NL173 International score for availability of minimal-invasive techniques	CC	3	8	7	9	100%	8	7	9	100%	7,5	7	9	100%	7	5	9	67%	8,5	6	9	83%		IN			IN		IN	3	0	3
NL061 Utilisation and speed of diffusion of minimal and non-invasive surgical techniques	CC	3	8	7	9	100%	8	7	9	100%	7	6	9	83%	7	5	9	67%	8	6	9	83%		IN		IN			IN	3	0	3
NL175 Use of home care technology and proportion of renal dialysis patients using home dialysis	LTC	3	7	3	9	67%	8	3	9	83%	7,5	3	9	83%	8	3	9	83%	7	3	9	83%	OUT	IN		IN	IN		IN	4	1	2,5
NL057 Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes	Generic	6	8,5	7	9	100%	8	6	9	83%	8	5	9	83%	7	7	9	100%	7	6	9	83%		IN			IN			2	0	2
NL169 Percentage of hospitals where information on medication prescribed in hospital and elsewhere is electronically accessible at hospital wards and elsewhere	Generic	3	8	5	9	67%	9	7	9	100%	8	6	9	67%	9	6	9	83%	8	5	9	83%		IN					IN	2	0	2
NL034 Percentage of people with somatic complaints who return to their home environment after a stay in a nursing home (as an indicator of the magnitude of the temporary stay function of nursing homes)	LTC	2	8	6	9	67%	7	6	9	83%	8	5	9	67%	7	6	9	67%	6,5	5	9	50%		IN						1	0	1
NL016 Percentage of referrals by GPs to medical specialists	Generic	4	7,5	3	9	83%	7	3	9	83%	8	3	9	67%	7,5	3	9	83%	7,5	7	9	100%				IN				1	0	1
NL233 Price and volume trends in health expenditure	Gen-cost	3	9	5	9	80%	9	5	9	80%	9	7	9	100%	9	5	9	80%	9	5	9	80%							IN	1	0	1

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				IN/OUT							#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	E6	E7			
NL106 Health care expenditures according to the Health Care Budgetary Framework (Ministry of Health)	Cost	2	8	5	9	83%	7	5	9	83%	8	5	9	83%	7,5	5	9	83%	7,5	5	9	67%			IN					1	0	1
NL110 Expenditures for Health Care Budgetary Framework relevant care by funding source	Cost	2	7	5	9	83%	7	5	9	83%	8	5	9	83%	7,5	5	9	83%	7,5	5	9	67%			IN					1	0	1
NL062 Use of process innovations, such as integrated care pathways and CVA integrated care	Generic	5	7,5	5	9	83%	7	3	9	67%	7,5	4	9	83%	7	3	9	67%	8	7	9	100%	OUT	IN					IN	2	1	0,5
NL064 Development in the rate of surgical day-treatments to the total number of surgical treatments	CC	3	8	3	9	83%	8	5	9	83%	7,5	3	9	67%	7	3	9	83%	8	5	9	83%		IN			OUT		IN	2	1	0,5
NL229 Public health expenditure per working person according to the System of Health Accounts	Generic	1	7	1	9	67%	8	5	9	83%	8	3	9	83%	7	1	9	67%	8	4	9	83%								0	0	0
NL113 Price movements in health care	Gen-cost	3	7	5	9	60%	7	5	9	80%	7	5	9	80%	8	5	9	80%	7,5	5	9	67%								0	0	0
NL107 Health care expenditures according to the Health Accounts (Statistics Netherlands)	Cost	2	8	5	9	83%	7	5	9	83%	8	5	9	83%	7,5	5	9	83%	7,5	5	9	67%								0	0	0
NL109 Expenditures on different sectors	Cost	2	7	5	9	83%	7	5	9	83%	8	5	9	83%	7,5	5	9	83%	7,5	5	9	67%								0	0	0
CA018 Regular medical doctor	Generic	3	8	6	9	83%	7	5	9	83%	8	5	9	67%	7,5	5	9	50%	8	5	9	83%		IN		OUT				1	1	-0,5
CA040 Ambulatory Care Sensitive Conditions	CC	3	8,5	3	9	83%	7	3	9	67%	8	7	9	100%	7	4	9	67%	7	5	9	67%			OUT			IN		1	1	-0,5
NL174 Number of day surgery interventions as a proportion of all surgical interventions	CC	3	8	3	9	83%	8	5	9	83%	7,5	3	9	83%	7	3	9	83%	8	5	9	83%		IN			OUT			1	1	-0,5
NL097 Medical-technical tasks carried out by general practice assistants	Gen-pers	3	7	5	9	67%	6,5	5	9	50%	7,5	5	9	67%	6,5	5	9	50%	7,5	5	9	83%	OUT							0	1	-1,5
NL098 Number of practice nurses in GP practices	Gen-pers	2	7	5	9	67%	7	5	9	67%	7,5	5	9	67%	7	5	9	67%	7,5	5	9	67%	OUT							0	1	-1,5
CA042 Percentage of acute care inpatient hospitalizations classified as May Not Require Hospitalization	CC	2	8	5	9	83%	6,5	5	9	50%	8,5	4	9	83%	7	4	9	83%	7	4	9	67%	OUT	IN			OUT			1	2	-2

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9										
CA043 Percentage of inpatient days where a physician (or designated other) has indicated that a patient occupying an acute care hospital bed was well enough to have been cared for elsewhere	CC	2	8	5	9	83%	7	5	9	67%	8	4	9	83%	6,5	4	9	50%	7	4	9	67%	OUT	IN			OUT			1	2	-2
NL125 Trend in productivity in hospitals compared to trend in productivity of the Dutch economy as a whole	Cost	2	8	1	9	67%	6,5	1	9	50%	8	1	9	67%	4,5	1	9	33%	6	1	9	50%	OUT			OUT	OUT	OUT		0	4	-6
Sustainability																																
NL108 Health care expenditures according to the System of Health Accounts (OECD)	Cost	2	8	5	9	83%	7	5	9	83%	8	5	9	83%	7	5	9	67%	7,5	5	9	67%			IN		IN		IN	3	0	3
NL062 Use of process innovations, such as integrated care pathways and CVA integrated care	Innov	5	7,5	5	9	83%	7	3	9	67%	7,5	4	9	83%	7	3	9	67%	8	7	9	100%	OUT	IN		IN		IN	IN	4	1	2,5
NL182 Expenditure of a country's pharmaceutical industry on health care related Research & Development as a proportion of its gross domestic product	Innov	1	7	1	9	67%	8	5	9	83%	8,5	1	9	83%	7	1	9	67%	7	1	9	67%			IN				IN	2	0	2
NL060 Number of biotechnology patents granted to the Netherlands	Innov	1	9	5	9	80%	9	4	9	80%	9	4	9	80%	9	4	9	60%	7	5	9	80%			IN				IN	2	0	2
NL063 Application of ICT in various areas of the health care sector	Innov	1	7,5	5	9	83%	8	4	9	83%	7	4	9	67%	6,5	4	9	50%	7	6	9	67%			IN				IN	2	0	2
NL220 Qualification levels of care workers and nurses	Gen-pers	2	8	4	9	83%	7	3	9	67%	7	4	9	83%	7,5	3	9	83%	8	5	9	67%			IN	IN				2	0	2
NL211 Number of vacancies per 1000 jobs in health care	Gen-pers	2	8	5	9	83%	8	4	9	67%	8	4	9	83%	7	3	9	67%	8	3	9	67%			IN	IN				2	0	2
NL093 Extent to which the current influx of personnel is matched to developments in care demands	Gen-pers	2	7	5	9	83%	8	4	9	83%	7,5	5	9	83%	8	3	9	83%	8	3	9	67%			IN				IN	2	0	2
NL233 Price and volume trends in health expenditure	Gen-cost	3	9	5	9	80%	9	5	9	80%	9	7	9	100%	9	5	9	80%	9	5	9	80%	IN						IN	2	0	2
CA041 Surgical Day Case Rates	CC	3	8	5	9	83%	8	5	9	83%	7,5	4	9	67%	7	4	9	83%	8	4	9	83%			IN		IN			2	0	2

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				E1	E2	E3	E4	E5	E6	E7	#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9										
NL059 Investments in research and development in the care sector; international comparison	Innov	1	8	7	9	100%	8	5	9	83%	8,5	7	9	100%	7	5	9	67%	7	3	9	67%		IN	OUT	IN			IN	3	1	1,5
NL153 Satisfaction of nurses and care workers with the quality of care	Generic	2	8	7	9	100%	6	3	9	33%	8,5	7	9	100%	7	5	9	67%	7	5	9	83%	OUT	IN	IN	IN				3	1	1,5
NL064 Development in the rate of surgical day-treatments to the total number of surgical treatments	CC	3	8	3	9	83%	8	5	9	83%	7,5	3	9	67%	7	3	9	83%	8	5	9	83%		IN		IN	OUT		IN	3	1	1,5
NL106 Health care expenditures according to the Health Care Budgetary Framework (Ministry of Health)	Cost	2	8	5	9	83%	7	5	9	83%	8	5	9	83%	7,5	5	9	83%	7,5	5	9	67%			IN					1	0	1
NL107 Health care expenditures according to the Health Accounts (Statistics Netherlands)	Cost	2	8	5	9	83%	7	5	9	83%	8	5	9	83%	7,5	5	9	83%	7,5	5	9	67%			IN					1	0	1
NL109 Expenditures on different sectors	Cost	2	7	5	9	83%	7	5	9	83%	8	5	9	83%	7,5	5	9	83%	7,5	5	9	67%			IN					1	0	1
NL110 Expenditures for Health Care Budgetary Framework relevant care by funding source	Cost	2	7	5	9	83%	7	5	9	83%	8	5	9	83%	7,5	5	9	83%	7,5	5	9	67%			IN					1	0	1
NL111 Share of health care costs in GDP	Cost	1	7	5	9	67%	7	5	9	67%	7	5	9	83%	7	5	9	67%	6,5	5	9	50%			IN					1	0	1
NL112 Share of health care costs in the growth in GDP	Cost	1	7	5	9	67%	7	5	9	67%	7	5	9	83%	7	5	9	67%	6,5	5	9	50%			IN					1	0	1
NL114 Changes in volume of care	?	1	9	4	9	80%	9	7	9	100%	9	7	9	100%	8	5	9	80%	8,5	6	9	83%		IN						1	0	1
NL173 International score for availability of minimal-invasive techniques	Innov	3	8	7	9	100%	8	7	9	100%	7,5	7	9	100%	7	5	9	67%	8,5	6	9	83%		IN	OUT		IN			2	1	0,5
NL090 Number of vacancies in health care that are difficult to fill	Gen-pers	2	7,5	5	9	83%	6,5	4	9	50%	7,5	5	9	83%	8	3	9	83%	6,5	3	9	50%	OUT	IN	IN					2	1	0,5
NL091 Personnel absenteeism rate	Gen-pers	3	8	5	9	83%	8	4	9	67%	7,5	5	9	67%	7	4	9	83%	7	5	9	67%			OUT	IN			IN	2	1	0,5

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				IN/OUT							#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	E6	E7			Score
NL057 Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes	Generic	6	8,5	7	9	100%	8	6	9	83%	8	5	9	83%	7	7	9	100%	7	6	9	83%	OUT	IN			IN			2	1	0,5
NL061 Utilisation and speed of diffusion of minimal and non-invasive surgical techniques	Innov	3	7,5	7	9	100%	8	7	9	100%	7,5	7	9	100%	7	5	9	67%	8	6	9	83%		IN	OUT	IN	OUT		IN	3	2	0
NL218 Unfilled demand for medical specialist care	Gen-pers	2	7	2	9	83%	8	2	9	83%	7	7	9	100%	7,5	2	9	83%	8	2	9	67%		IN	OUT					1	1	-0,5
NL093 Numbers of qualified physician assistants and nurse practitioners working and in training	Gen-pers	2	7	5	9	83%	7	5	9	67%	7	5	9	83%	7	5	9	83%	7,5	5	9	67%			OUT	IN				1	1	-0,5
NL213 Percentage of nursing and care personnel that are leaving the sector (net turnover)	Gen-pers	2	8	5	9	83%	8	4	9	67%	8	4	9	83%	7	2	9	67%	8	3	9	67%		IN	OUT					1	1	-0,5
NL215 Number of people who have (had) problems finding a GP	Gen-pers	2	7,5	7	9	100%	8	5	9	67%	8,5	6	9	83%	8	5	9	67%	8	5	9	67%		IN	OUT					1	1	-0,5
NL092 Current unfulfilled demand	Gen-pers	2	7,5	5	9	83%	6,5	4	9	50%	7,5	5	9	83%	8	3	9	83%	8	3	9	67%	OUT	IN						1	1	-0,5
NL214 Percentage of work hours lost to absenteeism	Gen-pers	3	8	4	9	83%	7	3	9	67%	7	5	9	67%	7	3	9	67%	7	3	9	67%		IN	OUT					1	1	-0,5
NL174 Number of day surgery interventions as a proportion of all surgical interventions	CC	3	8	3	9	83%	8	5	9	83%	7,5	3	9	83%	7	3	9	83%	8	5	9	83%		IN		OUT				1	1	-0,5
NL118 Access barriers to the health care market (all submarkets)	?	2	9	7	9	100%	7	7	9	100%	9	7	9	100%	7,5	6	9	83%	8,5	6	9	83%	OUT				IN			1	1	-0,5
NL122 Risk selection by insurers (health insurance market)	?	2	7	4	9	60%	7	4	9	80%	9	7	9	100%	7	5	9	80%	9	7	9	100%	OUT				IN			1	1	-0,5
NL097 Medical-technical tasks carried out by general practice assistants	Gen-pers	3	7	5	9	67%	6,5	5	9	50%	7,5	5	9	67%	6,5	5	9	50%	7,5	5	9	83%	OUT							0	1	-1,5
NL113 Price movements in health care	Cost	3	7	5	9	60%	7	5	9	80%	7	5	9	80%	8	5	9	80%	7,5	5	9	67%		OUT						0	1	-1,5
NL119 Health care procurement by health insurers (care procurement market)	?	2	9	7	9	100%	9	7	9	100%	9	9	9	100%	8,5	5	9	75%	9	8	9	100%	OUT							0	1	-1,5

	Cat	#Dim	Valid				Reliable				Relevant				Interpretable				Actionable				IN/OUT							#IN	#OUT	Score
			Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	Med	Min	Max	%7-9	E1	E2	E3	E4	E5	E6	E7			
NL121 Mobility of insured between health insurers (health insurance market)	?	2	7	5	9	80%	7	7	9	100%	9	7	9	100%	8	3	9	60%	8	7	9	100%	OUT							0	1	-1.5
CA005 Self-reported wait times for diagnostic services	Gen-time	3	7	7	9	100%	5.5	3	9	17%	7.5	7	9	100%	6.5	4	9	50%	7	5	9	67%	OUT	IN	OUT		OUT	IN		2	3	-2.5
NL103 The number of training places / basic specialists who completed their training	Pers	1	6	5	7	50%	7	4	9	67%	7	4	9	67%	6.5	3	7	50%	7	4	9	67%	OUT		OUT					0	2	-3
NL217 Percentage of nurses and carers who believe that enough personnel is on duty to assure the patients' safety	Gen-pers	3	7	3	9	83%	6	3	9	50%	7	4	9	67%	7	2	9	83%	8	3	9	67%	OUT		OUT					0	2	-3
NL125 Trend in productivity in hospitals compared to trend in productivity of the Dutch economy as a whole	Cost	2	6	1	9	67%	6.5	1	9	50%	6	1	9	67%	4.5	1	9	33%	6	1	9	50%	OUT		OUT		OUT			0	3	-4.5
NL118 Variation in insurance premiums (health insurance market)	?	1	7	5	9	67%	7	5	9	67%	7	5	9	67%	6.5	5	9	50%	6	5	9	50%	OUT			OUT	OUT			0	3	-4.5

APPENDIX 4: TECHNICAL DETAILS PER INDICATOR

DESCRIPTION OF MCD AND PERMANENT SAMPLE (IMA) AND METHODOLOGY FOR DATA ANALYSIS

Data description

Databases that were available at the finest detail level are briefly described here, more information on all relevant databases can be found in supplement 2.

MCD

The Minimal Clinical Data (MCD) is a national administrative and clinical database recorded at the hospital level and collected every 6 months by the Federal Public Service of Health and Environment. The MCD registration is mandatory for each outpatient or inpatient stay in every non-psychiatric hospital in Belgium since 1991. This administrative clinical database contains administrative information on the patient (year of birth, sex, domicile zip code) or on his/her stay (length of stay, year and month of admission and discharge, bed type occupation). The clinical information recorded includes the diagnoses as well as the diagnostic and therapeutic procedures coded in ICD-9-CM (International Classification of Disease, 9th revision). Based on the codes recorded per stay, Ministry runs the APR-DRG version 15th grouper program to assign an APR-DRG (All-Patient Refined Diagnosis Related Group) to every stay in the database.

For the present study, all MCD records of the year 2004 and 2005 were used.

IMA data

The Intermutualistic Agency (IMA) gathers the population and health expenditures data of the whole population from all sickness funds. Population data include demographics (year of birth, gender, decease date), data on the insurance status and on the professional status. Healthcare expenditure data include detailed information such as quantities, date of administration and amounts paid by the patient or reimbursed by the national health insurance for drugs, implants, diagnostic and therapeutic procedures covered by the national health insurance.

From the whole population, a representative random sample of about 300 000 individuals (population data and healthcare expenditures) is constituted by IMA dating from 2002. This permanent sample represents 1/40 of the population below 65 years and 1/20 of the population aged 65 or more.

For the present study, the permanent sample was available from 2002 to 2007.

Data analysis

Anonymity was guaranteed by the data manager and the medical supervisor[9]. The patient identification, in the MCD as the permanent sample data, was recoded as soon as data were received. The hospital identification in the MCD was also recoded. Data analysis was performed on recoded data only.

Flags resulting from control programs run on MCD data by the FPS Health, Food Chain Safety and Environment were used as data cleaning. Stays controlled as correct for patient age, patient sex, dates and length of stay were analyzed, which represent 99.87% of the transmitted crude data. Further exclusions specific to each indicator are explained in this appendix.

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[9] Belgian Privacy Law stipulates that any processing of individual healthcare data (recoded or not) has to be done under the supervision and responsibility of an acknowledged healthcare professional, with additional recommendation (by the corresponding Sectoral Committee of the Privacy Commission) that such professional should have an medical degree.

Confidence intervals and statistical significance were not calculated on MCD as they represent the whole set of Belgian stays in non-psychiatric hospitals. On permanent sample data, the exact 95% confidence limits for binomial proportion were calculated.

For the calculation of indicators with data from the IMA permanent sample, each indicator – except QA2 – was calculated on the simple sampling (1/40 of the population all age included). In the case of indicator QA2 (proportion of women aged <50 or >69 who report receiving mammogram within the last two years), the results for the age bracket 72-79 years was calculated on the double sampling (1/20 of the population), while the results for the age bracket 42-49 was calculated on the simple sampling.

Possible trends over years or across levels of an ordinal variable such as the class of age were tested using a Cochran-Armitage test for trend. The null hypothesis is no trend. When the test statistic is greater than 0, a small right-sided p-value supports the hypothesis of an increase of the binomial proportions with the levels of the ordinal variable. When the statistic is lower than 0, a small left-side p-value supports a decrease of the proportion when the levels of the variable increase. For difference between nominal subgroups such as invalidity status for QE1 (cervical cancer screening), the test was a Chi-square test of independence with a null hypothesis of no difference. The level of statistical significance was set at 5%.

For hysterectomies (QA6), we used a Breslow-Day test for homogeneity of the odds ratios for each available socio-economic variable to verify if it was possible to calculate a common odds ratio across all age groups. Whenever the test was significant (in case of heterogeneity), odds ratios were presented per age group. For the variable with more than 2 possible values, the Breslow-Day test being unavailable, we used the Cochran-Mantel-Haenszel test(CMH). In this case the null hypothesis is that there is no association between the socioeconomic variable and the hysterectomy rate in any of the age group.

Analysis was performed using SAS version 9.

QE1: PROPORTION OF WOMEN AGE 50-69 HAVING RECEIVED A SCREENING MAMMOGRAM WITHIN THE LAST TWO YEARS

Definition

Description

Proportion of women age 50-69 having received a screening mammogram within the last two years.

Source

- CIHI (Canada)[10]
- Other international organisations: OECD[11], ECHI short list[12]

Numerator

Number of Belgian women aged 50-69 in a given year who are still alive at the end of the year, having received a screening mammogram within the past two years (see Figure 28).

NIHDI billing codes: 450192-450203 (screening mammogram within the screening programme). In this report, the term *mammotest* will be used to refer to this type of mammogram.

Importantly, in the IMA database only the year of birth is available and not the exact date of birth. Therefore, it is impossible for an individual woman to verify if she received a mammotest within the 2 years prior to her 52nd – 69th birthday. It is only possible to verify if a woman received a mammotest in the year of her 52nd – 69th birthday (T) and the year before (T-1). To allow all women in the sample to have a full 2-year period covered, an analysis including T-2 is necessary (i.e. the number of women with at least one mammotest in the year of her 52nd – 69th birthday or the 2 preceding years). However, this approach may induce an overestimation of good-quality care.

Given these restraints, the indicator will only be calculated for women aged 52-69.

Denominator

Total number of Belgian women aged 50-69 in a given year who are still alive at the end of the year (see Figure 28).

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[10] Canadian Institute for Health Information. National Consensus Conference on Population Health Indicators. Final Report. CIHI 1999.

[11] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[12] http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

Figure 28: Flowchart of indicator QE1.
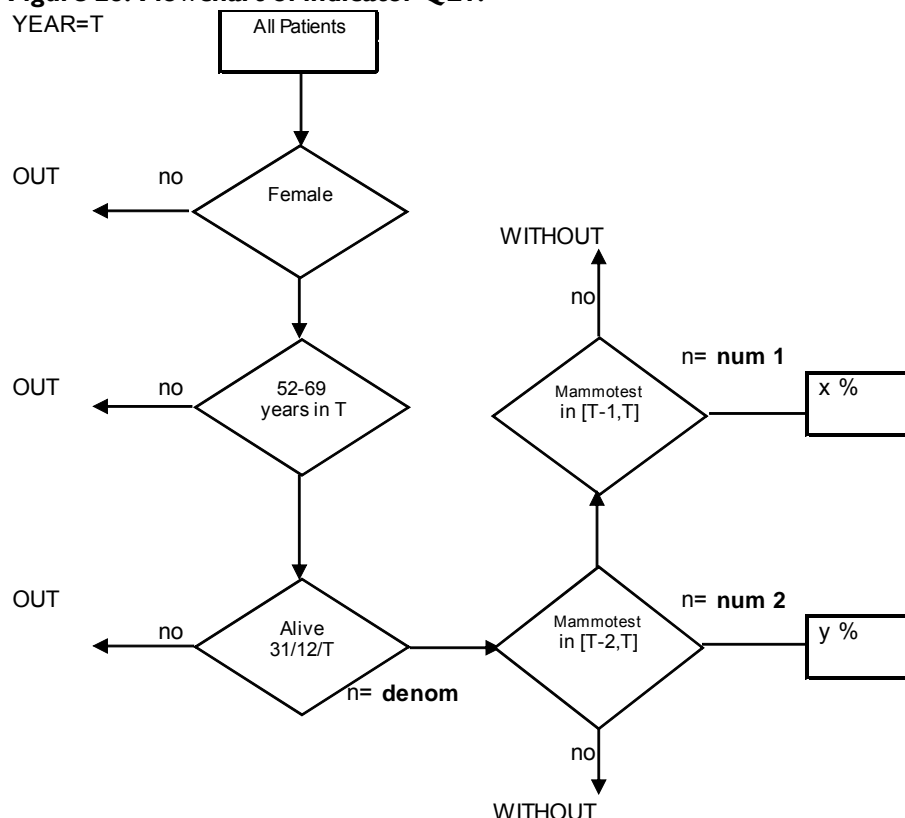
Harmonisation of definition with international organisations

The OECD calculates the number of women aged 52-69 reporting having received a bilateral mammography within the past year. This was adapted according to the screening programme in Belgium, and only taking into account the mammotests (i.e. screening mammograms only performed within the programme). Mammograms (i.e. screening tests performed outside the programme) are taken into account in indicator QE1.1.

Rationale and indicator characteristics

In 2005, 9 486 new cases of breast cancer were registered in Belgium (males: 81; females: 9 405). Overall, breast cancer represented the second most frequent cancer after prostate cancer. Breast cancer is the leading cause of death by cancer in females (20.6% of all cancer deaths) (source: Belgian Cancer Registry, http://www.coldfusionwebhostings.be/PSK/Upload/GENERAL//Brochures/KIB2004-2005/CancerInc_book.pdf).

Screening and treatment of breast cancer should lead to improved survival rates. Several treatment strategies have been linked with improved survival[13]. Since 2001 in Flanders and 2002 in Brussels and Wallonia, a national breast cancer screening programme exists for women aged 50-69 using the mammotest. This is clearly to be distinguished from the opportunistic screening using mammogram (i.e. outside the programme). Indicator QE1 measures the rate of eligible women undergoing mammotest (i.e. screening coverage), while indicator QE1.1 measures the rate of eligible women undergoing mammotest or other mammogram (i.e. total coverage of mammogram). Together, these indicators measure the *effectiveness* of the breast cancer screening programme in Belgium.

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13   Christiaens M-R, Vlayen J, Gailly J, et al. Scientific support of the College of Oncology: a national clinical practice guideline for breast cancer. Good Clinical Practice (GCP). Brussel: Federaal Kenniscentrum voor de Gezondheidszorg (KCE); 2007. KCE reports 63A (D2007/10.273/35).

Data source(s)

Source database(s)

IMA (see Supplement 2 for periodicity and data quality). For the present report the permanent sample 2002-2007 was used. The results were obtained on the simple sampling (without over-representation of the 65+ patients).

Comparability

The OECD warns for a limited comparability, since some countries use patient surveys, while other countries use administrative data.

Results

Table 55 gives the percentage of women having had a mammotest during the 2 or 3 years period. The rate increased annually until 29.7% (95%CI 29.1-30.2%) or 33.7% (95%CI 33.1-34.2%) according to the chosen period in 2007. This increase statistically significant (p<0.0001). The rate calculated on a 2-year basis is similar to the result calculated by the Intermutualistic Agency in its recent report on the screening mammotest[14].

Table 55: Mammotest rate in Belgium, 2004 – 2007.

Year T	Mammotest rate calculated on	
	2 years (T-1, T)	3 years (T-2, T-1, T)
2004	24.6%	29.6%
2005	25.5%	31.5%
2006	27.9%	32.6%
2007	29.7%	33.7%

Table 56 shows that the mammotest rate only slightly increases with age. The age group to which a woman belongs cannot be associated with the participation to the screening program, since there is no significant trend across age (2 years: Z test for trend = -0.8471, 2-sided p = 0.397; 3 years: Z = -1.4, 2-sided p = 0.162).

Table 56: Mammotest rate according to age category for the year 2007.

	Mammotest rate calculated on	
Age group	2 years (T-1, T)	3 years (T-2, T-1, T)
52-54	29.4%	33.0%
55-59	29.5%	33.5%
60-64	29.7%	34.0%
65-69	30.1%	34.1%

There are a number of socioeconomic variables available in the IMA dataset that can be used as proxy variables for the social class. More details on these variables are provided in the technical note of indicator QA6. Table 57 to Table 61 present the percentage of women aged 52-69 years in 2007 undergoing a screening mammotest stratified for a selection of socioeconomic variables available in the dataset, and only taking into account a period of 3 years. A chi-square test of independence was run to test the association between each socioeconomic variable and the percentage of women (α=0.05).

As seen in Table 57, the mammotest rate was lower in women entitled to preferential reimbursement for major risks. Women belonging to the general regime and those belonging to the self-employed regime did not show differences. The mammotest rate in the group of pensioners, widows, persons with disabilities and orphans was not clearly different from the rest of the women. However, the mammotest rate was lower in women disabled for more than one year or handicapped compared to the other groups.

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14   Fabri V, Remacle A. Programme du Dépistage du Cancer du sein, comparaison des trois premiers tours 2001-2002, 2003-2004 et 2005-2006. Vol. 6. IMA 2009.

Women covered for major and minor risks in the compulsory system presented a better coverage than those not covered for minor risks or those covered for minor risks by a voluntary supplementary insurance (Table 57).

Table 57: Mammotest rate by social categories in Belgium, 2007.

Categorization based on variable PP0030 and PP0035	Mammotest coverage		Chi-square test of independence	
	Rate	95% CI	Value	p
Preferential reimbursement (major risks)				
0 (no)	34.9	34.3 35.5	74.8930	<.0001
1 (yes)	28.6	27.4 29.8		
Major risk category				
General regime	33.8	33.2 34.4	1.4814	0.2236
Self-employed	32.5	30.6 34.5		
Pensioners, widows, persons with disabilities and orphans (PWDO)				
PWDO	34.2	33.4 35.0	3.1369	0.0765
Others	33.2	32.4 34.0		
Major invalidity				
Major invalidity	29.2	27.2 31.2	19.6030	<.0001
No major invalidity	34.0	33.4 34.6		
Minor risk category				
Minor risk non covered	14.8	10.3 20.4	36.6455	<.0001
Minor risk covered	33.9	33.4 34.5		
Freely insured	31.7	29.3 34.1		

Another proxy variable for social class is PP1003 which allows a distinction between the private sector, the public sector and the self-employed (Table 58). The difference between these categories was not statistically significant.

Table 58: Mammotest rate by social situation in Belgium, 2002 – 2007.

Categorization based on variable PP1003	Mammotest coverage			Chi-square test of independence	
	Rate	95% CI		Value	p
Private sector	33.8	33.1	34.5	5.1172	0.0774
Public sector	34.8	33.5	36.2		
Self-employed	32.0	29.9	34.2		

According to the employment situation, partial time unemployed presented the highest mammotest coverage, followed by early retired women (note that older women had a higher coverage as seen previously in Table 56). The lowest rate was unexpectedly found in not unemployed women (Table 59).

Table 59: Mammotest rate by employment situation in Belgium, 2007.

Categorization based on variable PP1004	Mammotest coverage			Chi-square test of independence	
	Rate	95% CI		Value	p
Not unemployed	33.2	32.6	33.8	25.4694	<.0001
Fulltime unemployed	36.0	34.3	37.8		
Partial time unemployed	41.5	35.5	47.7		
Early retired	39.6	35.4	43.9		

There was no statistically significant difference according to the ceilings of the maximum billing system (Table 60).

Table 60: Mammotest rate by MAB ceilings in Belgium, 2007.

Categorization based on variable PP3004	Mammotest coverage		Chi-square test of independence	
	Rate	95% CI	Value	p
Persons entitled to reimbursement based on €450 or €650 ceiling	32.8	30.9 34.7	1.4345	0.4881
Persons entitled to reimbursement based on higher ceilings	32.4	28.9 36.1		
Others	33.8	33.2 34.4		

The mammotest rate was clearly lower in women entitled to income guarantee for the elderly, subsistence level income (leefloon; revenu d'intégration) or support from the public municipal welfare centres (OCMW, CPAS) (Table 61).

Table 61: Mammotest rate in women aged 52-69, 2007.

Categorization based on variable PP3010 and 3013	Mammotest coverage		Chi-square test of independence	
	Rate	95% CI	Value	p
Entitlement to income guarantee for elderly, subsistence level income or support from OCMW/ CPAS	23.7	20.7 26.9	33.9197	<.0001
Others	33.9	33.4 34.5		

In conclusion, the socioeconomic variables that have shown a clear association with the mammotest rate are:

- Entitlement to a preferential reimbursement as studied above,
- Major invalidity,
- Minor risk category,
- Employment situation, (with the lowest rate in unexpectedly not unemployed women)
- Entitlement to income guarantee for elderly, subsistence level income or support from OCMW/ CPAS

Figure 29 shows that the mammotest rate is clearly higher in Flanders than in the two other regions.

Figure 29: Mammotest rate 2004-2007 in Belgium per region, 2004-2007
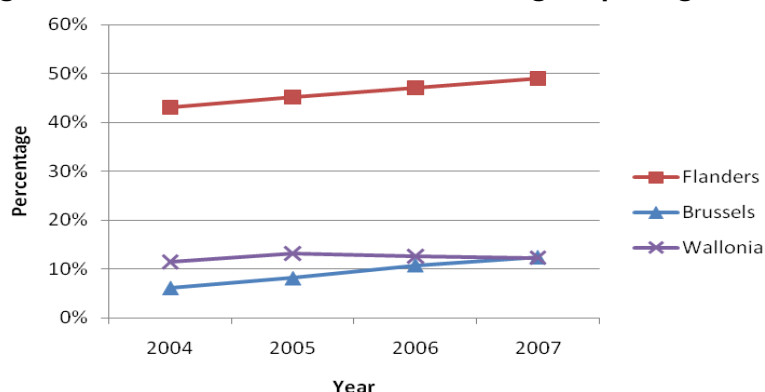
Comparison with other countries is provided in the results section of QE1.1.

Related performance indicators

QE1.1: Mammography in women aged 50-69.

QE14: Breast cancer 5-year survival rate.

QA2: Breast cancer screening with mammography in women aged <50 or >71.

QE1.1: PROPORTION OF WOMEN AGE 50-69 HAVING RECEIVED A MAMMOGRAM WITHIN THE LAST TWO YEARS

Definition

Description

Proportion of women age 50-69 having received a mammogram within the last two years.

Source

See indicator QE1.

Numerator

Number of Belgian women aged 50-69 in a given year who are still alive at the end of the year, having received a mammogram within the past two years (see Figure 30).

NIHDI billing codes: 450192-450203 (screening mammogram within the screening programme), 450096-450100 (other mammography), 461090-461101 (other mammography). Where the screening mammogram is referred to as *mammotest*, the two other types of mammogram are referred to as *other mammogram* in this report. Importantly, it is impossible to distinguish opportunistic mammograms (i.e. mammogram used for opportunistic screening outside the screening programme) and diagnostic mammograms (i.e. mammogram used for diagnostic reasons, e.g. in women with symptoms or at high risk).

Importantly, in the IMA database only the year of birth is available and not the exact date of birth (see QE1). Therefore, the same restraints as in QE1 are applicable here. The indicator will therefore be calculated only for women aged 52-69.

Denominator

Total number of Belgian women aged 50-69 in a given year who are still alive at the end of the year (see Figure 30).

Figure 30: Flowchart of indicator QEI. I
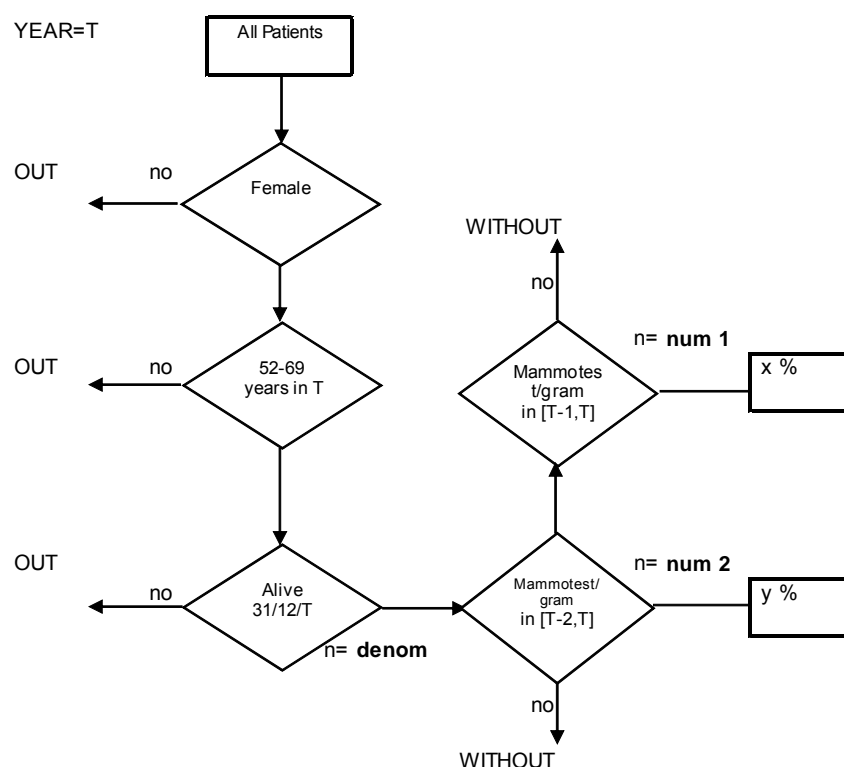
Harmonisation of definition with international organisations

See QEI.

Rationale and indicator characteristics

See QEI.

Data source(s)

Source database(s)

IMA (see Supplement 2 for periodicity and data quality). For the present report the permanent sample 2002-2007 was used. The results were obtained on the simple sampling (without over-representation of the 65+ patients).

Comparability

The OECD warns for a limited comparability, since some countries use patient surveys, while other countries use administrative data. For Belgium, the OECD data are based on the IMA reports[15].

Results

Similar to indicator QEI, the total mammogram coverage (mammotest + other mammogram) increased between 2004 and 2007 (p-value of test for trend was <0.0001 for both 2-year and 3-year calculation). While 9 114 women (33.7%) had a mammotest during the last three years in 2007, there were 9 185 additional women (33.9%) who had at least one other mammogram in that same period, resulting in a total mammogram coverage of 67.6% (Table 62). Calculated on a 2-year basis, the percentage of mammotests (with or without other mammogram) is 29.7% and the percentage of women with other mammogram but without mammotest is 30.7%, or a total mammogram coverage of 60.4%.

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[15]   Fabri V, Remacle A. Programme du Dépistage du Cancer du sein, comparaison des trois premiers tours 2001-2002, 2003-2004 et 2005-2006. Vol. 6. IMA 2009.

Table 62: Total mammogram coverage in women aged 52-69, 2004 – 2007.

Year T	Mammotest/gram rate calculated on	
	2 years (T-1, T)	3 years (T-2, T-1, T)
2004	55.3%	64.4%
2005	56.0%	65.3%
2006	59.0%	66.3%
2007	60.4%	67.6%

Table 63 shows that the percentage of the total mammogram coverage (mammotest or other mammogram) decreases with age, which is due to a drop in the rate of other mammograms with age (p-value of test for trend <0.0001 for both calculations).

Table 63: Total mammogram coverage according to age category in 2007.

Age group	Mammotest/gram rate calculated on	
	2 years (T-1, T)	3 years (T-2, T-1, T)
52-54	62.5%	70.1%
55-59	61.7%	69.1%
60-64	60.9%	67.8%
65-69	56.2%	63.1%

There are a number of socioeconomic variables available in the IMA dataset that can be used as proxy variables for the social class. More details on these variables are provided in the technical note of indicator QA6. Table 63 to Table 67 present the percentage of women aged 52-69 years in 2007 undergoing mammogram stratified for a selection of socioeconomic variables, and only taking into account a period of 3 years. A chi-square test of independence was run to test the association between each socioeconomic variable and the percentage of women (α=0.05).

As seen in Table 63, the total mammogram coverage was lower in women entitled to preferential reimbursement for major risks. Women belonging to the general regime and those belonging to the self-employed regime did not show rate differences. The total mammogram coverage in the group of pensioners, widows, persons with disabilities and orphans was lower than in other women. The coverage was also lower in women disabled for more than one year or handicapped against the rest of the women. Women who are covered for minor risks by a voluntary, supplementary insurance presented the highest coverage, followed by women who are covered for major and minor risks in the compulsory system and women who are not covered for their minor risks (who had the lowest coverage) (Table 63).

Table 64: Total mammogram coverage by social categories in Belgium, 2007.

Categorization based on variable PP0030 and PP0035	Total mammogram coverage			Chi-square test of independence	
	Rate	95% CI		Value	p
Preferential reimbursement (major risks)					
0 (no)	70.1	69.5	70.7	332.1448	<.0001
1 (yes)	57.0	55.7	58.4		
Major risk category					
General regime	67.6	67.1	68.2	0.2487	0.6180
Self-employed	67.1	65.2	69.1		
Pensioners, widows, persons with disabilities and orphans (PWDO)					
PWDO	65.4	64.6	66.2	60.9798	<.0001
Others	69.8	69.0	70.6		
Major invalidity					
Major invalidity	61.6	59.5	63.8	35.0984	<.0001
No major invalidity	68.1	67.5	68.7		
Minor risk category					
Minor risk non covered	40.7	33.9	47.7	75.1706	<.0001

Minor risk covered	67.6	67.1	68.2		
Freely insured	70.6	68.2	72.9		

Another proxy variable for social class is PP1003 which allows a distinction between the private sector, the public sector and the self-employed (Table 65). Women from the public sector had a higher coverage than the two other sectors.

Table 65: Total mammogram coverage by social situation in Belgium, 2002 – 2007.

Categorization based on variable PP1003	Total mammogram coverage			Chi-square test of independence	
	Rate	95% CI		Value	p
Private sector	66.5	65.8	67.1	109.8473	<.0001
Public sector	74.2	73.0	75.4		
Self-employed	67.5	65.4	69.6		

The total mammogram coverage in early retired women was higher than for other women (Table 66). The coverage was higher when partially unemployment, and again, as seen for the mammotest rate (indicator QE1), not unemployed women presented the lowest coverage.

Table 66: Total mammogram coverage by employment situation in Belgium, 2007.

Categorization based on variable PP1004	Total mammogram coverage			Chi-square test of independence	
	Rate	95% CI		Value	p
Not unemployed	67.1	66.5	67.7	48.9057	<.0001
Fulltime unemployed	68.4	66.6	70.1		
Partial time unemployed	73.6	67.8	78.8		
Early retired	80.8	77.1	84.0		

There was no statistically significant difference between the categories of women according to the ceilings of the maximum billing system (Table 67).

Table 67: Total mammogram coverage by MAB ceilings in Belgium, 2007.

Categorization based on variable PP3004	Total mammogram coverage			Chi-square test of independence	
	Rate	95% CI		Value	p
Persons entitled to reimbursement based on €450 or €650 ceiling	67.0	65.1	68.9	5.6805	0.0584
Persons entitled to reimbursement based on higher ceilings	71.7	68.2	75.1		

The total mammogram coverage was clearly lower in women entitled to income guarantee for the elderly, subsistence level income (leefloon; revenu d'intégration) or support from the public municipal welfare centres (OCMW, CPAS) (Table 68).

Table 68: Total mammogram coverage in women aged 52-69, 2007.

Categorization based on variable PP3010 and 3013	Total mammogram coverage			Chi-square test of independence	
	Rate	95% CI		Value	p
Entitlement to income guarantee for elderly,	49.5	45.8	53.1	115.0432	<.0001

subsistence level income or support from OCMW/ CPAS					
Others	68.1	67.5	68.7		

In conclusion, the variables that have shown a clear association with the total mammogram coverage are:

- Entitlement to a preferential reimbursement as studied above,
- Belonging to the group pensioners, widows, persons with disabilities and orphans
- Major invalidity,
- Minor risk category,
- Sector (public sector had a higher coverage than private sector or self-employment)
- Employment situation, (with the lowest rate in unexpectedly not unemployed women as for the mammotest rate)
- Entitlement to income guarantee for elderly, subsistence level income or support from OCMW/ CPAS

Figure 30 presents the total mammogram coverage by region. Flanders has the highest coverage, but the difference seen in Figure 29 (mammotest only rate per region) is much less pronounced. This can be explained by a higher rate of other mammograms in the Brussels Capital Region and Walloon Region.

Figure 30: Mammogram rate 2004-2007 in Belgium per region, 2004-2007
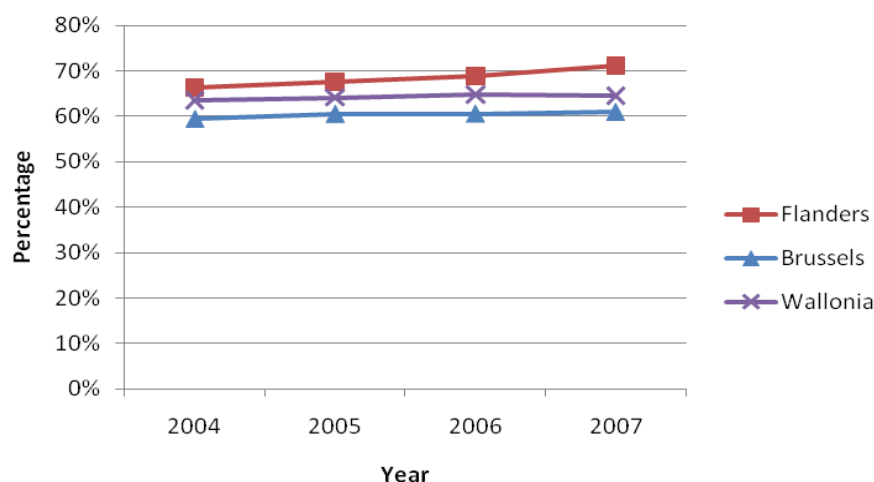
In comparison to other European countries, the total coverage in Belgium is rather low, with the Netherlands and UK having clearly better coverages (Figure 31).

Figure 31: Breast screening coverage in selected OECD countries, 2000 – 2006.
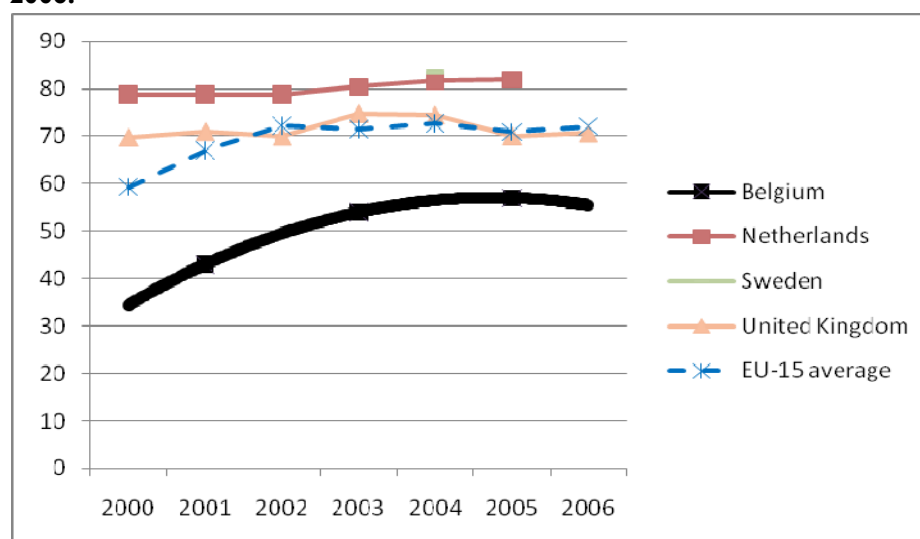
Related performance indicators

QE1: Breast cancer screening with mammotest in women aged 50-69.

QE14: Breast cancer 5-year survival rate.

QA2: Breast cancer screening with mammography in women aged <50 or >71.

QE2: CERVICAL CANCER SCREENING

Definition

Description

Proportion of women aged 25-64 having received a Pap test within the last three years.

Source

- CIHI (Canada)[16]
- Other international organisations: OECD[17], ECHI short list[18]

Numerator

Number of Belgian women aged 25-64 in a given year who are still alive at the end of the year having received cervical cancer screening within the past three years (see Figure 32).

NIHDI billing codes: 114030-114041, 149612-149623 and 588350-588361.

Women were included in the numerator if they had a PAP smear (114030-114041 or 149612-149623) and/or a cytopathological examination of a PAP smear (588350-588361).

Importantly, in the IMA database only the year of birth is available and not the exact date of birth. Therefore, it is impossible for an individual woman to verify if she received screening within the 3 years prior to her 28th – 64th birthday. It is only possible to verify if a woman received screening in the year of her 28th – 64th birthday (T), one year (T-1) and two years before (T-2). To allow all women in the sample to have a full 3-year period covered, an analysis including T-3 is necessary (i.e. the number of women with at least one screening test in the year of her 28th – 64th birthday or the 3 preceding years). However, this approach may induce an overestimation of good-quality care.

Given these restraints, the indicator will only be calculated for women aged 28-64.

Denominator

Total number of Belgian women aged 25-64 in a given year who are still alive at the end of the year.

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[16]　Canadian Institute for Health Information. National Consensus Conference on Population Health Indicators. Final Report. CIHI 1999.

[17]　OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[18]　http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

Figure 32: Flowchart of indicator QE2.
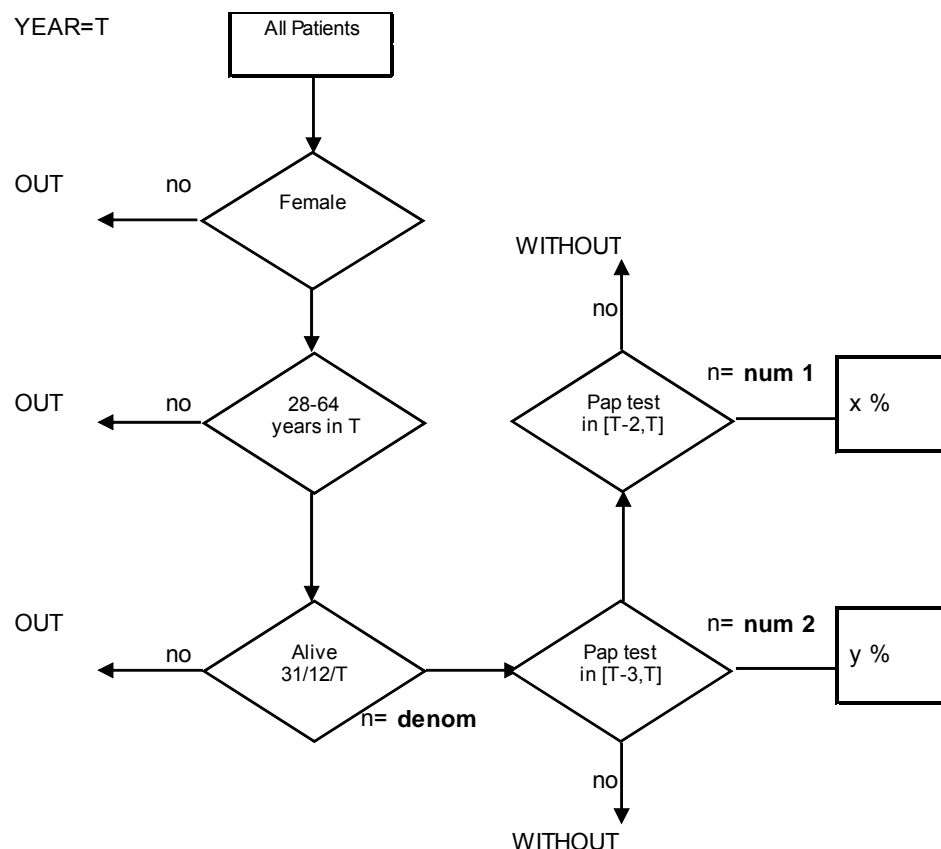
Harmonisation of definition with international organisations

The OECD calculates the number of women age 20-69 reporting cervical cancer screening within the past 3 years or the number of women age 20-69 screened for cervical cancer through an organised programme. However, since in Belgium cervical cancer screening is recommended in women age 25-64 every three years, this age category was also selected for the calculation of the indicator.

Rationale and indicator characteristics

In 2005, 651 new cases of cervical cancer were registered in Belgium (source: Belgian Cancer Registry, http://www.coldfusionwebhostings.be/PSK/Upload/GENERAL//Brochures/KIB2004-2005/CancerInc_book.pdf).

Cervical cancer screening is essentially opportunistic in Belgium. Screening initiatives were set up in the Flemish provinces, but efforts to start a central cervical cancer screening programme have failed so far. The 3-year cervical cancer screening coverage in women 25-64 years old was found to be only 59% in the period 1996 – 2000[19]. However, many of these women were found to be over-screened (i.e. more frequently than every 3 years).

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[19] Hulstaert F, Arbyn M, Huybrechts M, Vinck I, Puddu M, Ramaekers D. Cervical Cancer Screening and Human Papillomavirus (HPV) Testing. Health Technology
Assessment (HTA). Brussels: Federaal Kenniscentrum voor de gezondheidszorg (KCE); 2006. KCE reports 38A (D/2006/10.273/35).

Data source(s)

Source database(s)

IMA (see Supplement 2 for periodicity and data quality). For the present report the permanent sample 2002-2007 was used.

Comparability

The OECD warns for a limited comparability, since some countries use patient surveys, while other countries use administrative data. Also, the age categories covered are not the same in all OECD countries.

Results

The majority of women had both a PAP smear and a cytopathological examination billed, but some women had only the PAP smear billed and not the cytopathological examination or vice-versa. In 2007 for example, 53.8% of the women aged 28-64 years had both type of codes billed, another 8.1% had only a cytopathological examination and 0.8% had only a PAP smear billed during the last three years.

About two thirds of the women aged 28-64 years had at least one PAP smear during the last three years in the period 2005 – 2007 (Table 69). The rate slightly increased between 2005 and 2007 (test for trend one-sided $p = 0.0017$ for 3 years and one-sided $p = 0.0122$ for 4 years).

Table 69: Cervical cancer screening coverage in Belgium, 2005 – 2007.

Year	PAP smear test rate calculated on	
	3 years (T-2, T-1, T)	4 years (T-2, T-1, T)
2005	61.9%	67.3%
2006	62.1%	67.2%
2007	62.7%	67.9%

The rate clearly decreases with age (test for trend $p<0.0001$ for 3 years and 4 years) (Table 70). While in 2007 more than 70% of women aged 28-39 had a PAP smear during the last three years, the rate decreases to less than 50% in the age group 60-64.

Table 70: Cervical cancer screening coverage according to age (2007).

	PAP smear test rate calculated on	
Age group	3 years (T-2, T-1, T)	4 years (T-3, T-2, T-1, T)
28-29	72.8%	77.7%
30-34	74.9%	80.2%
35-39	71.6%	77.3%
40-44	68.5%	73.9%
45-49	64.1%	69.1%
50-54	57.9%	63.1%
55-59	50.3%	55.2%
60-64	43.7%	48.2%

There are a number of socioeconomic variables available in the IMA dataset that can be used as proxy variables for social class. More details on those variables are given in the technical note of indicator QA6. Table 71 to Table 79 present the percentage of women aged 28-64 years in 2007 undergoing a PAP test stratified for a selection of socioeconomic variables, and only taking into account a period of 4 years.

It was investigated if the preferential reimbursement status influenced the cervical cancer screening coverage controlling for age (age groups of 10 years). The Breslow-Day test for homogeneity of the odds ratios between the age groups was statistically significant ($p<0.0001$). Odds ratios were not homogeneous. As seen in Table 71, the cervical cancer screening coverage was lower in women entitled to preferential reimbursement for major risks in each stratum.

Table 71: Percentage of women screened for cervical cancer according to entitlement to preferential reimbursement, per age group, 2007.

Age group	Preferential reimbursement		Odds Ratio		
	No	Yes	OR	95% CI	
28-35	80.45%	65.36%	0.46	0.39	0.54
35-44	76.75%	61.98%	0.49	0.44	0.55
45-54	67.70%	54.60%	0.57	0.52	0.63
55-64	53.94%	42.75%	0.64	0.59	0.69

Percentage is calculated on the number of subjects in the Preferential Reimbursement category and the age group.

The next variable considered was the major risk category. The Breslow-Day test for homogeneity of the odds ratios between the age groups was not statistically significant (p=0.971). The common odds ratio of PAP test for self-employed versus general regime was 1.09 (95%CI 1.03-1.60), which is borderline statistically significant. However, the odds ratio did not reach statistical significance in any of the age groups (Table 72).

Table 72: Percentage of women screened for cervical cancer according to self-employed regime versus general regime, per age group, 2007.

Age group	General regime	Self-employed	Odds Ratio		
			OR	95% CI	
28-35	79.37%	80.63%	1.08	0.91	1.30
35-44	75.43%	77.34%	1.11	0.99	1.25
45-54	66.05%	67.62%	1.07	0.97	1.19
55-64	51.72%	54.14%	1.10	0.98	1.24

It was also investigated if the group of pensioners, widows, persons with disabilities and orphans had different PAP test rates controlling for age. The Breslow-Day test for homogeneity of the odds ratios between the age groups was statistically significant (p<0.0001); the odds ratios were thus heterogeneous. Odds ratios per age group are presented in Table 73. The PAP test rate in the group of pensioners, widows, persons with disabilities and orphans was lower than in other women.

Table 73: Percentage of women screened for cervical cancer according to PWDO status, per age group, 2007.

Age group	PWDO status		Odds Ratio		
	No	Yes	OR	95% CI	
28-35	80.03%	64.75%	0.46	0.37	0.56
35-44	76.27%	65.96%	0.60	0.53	0.69
45-54	67.58%	57.34%	0.64	0.59	0.70
55-64	55.17%	47.63%	0.74	0.69	0.79

Percentage is calculated on the number of subjects in the PWDO status and the age group.

The next categorisation studied was the major invalidity. Odds ratio were heterogeneous across age groups (Breslow-Day test p<0.0001). The PAP test rate was clearly lower in women disabled for more than one year or handicapped compared to other categories (Table 74).

Table 74: Percentage of women screened for cervical cancer according to major invalidity, per age group, 2007.

Age group	Major invalidity		Odds Ratio		
	No	Yes	OR	95% CI	
28-35	80.00%	57.25%	0.33	0.26	0.43
35-44	76.22%	62.58%	0.52	0.45	0.60
45-54	66.98%	57.19%	0.66	0.59	0.73
55-64	52.41%	46.88%	0.80	0.72	0.90

Percentage is calculated on the number of subjects in the major invalidity status and the age group

The coverage for minor risks was also studied. There was a statistically significant difference in PAP test rate between the different risks groups (CMH test p<0.0001).Table 75 shows that women who are covered for minor risks by a voluntary, supplementary insurance presented the highest coverage, followed by women who are covered for major and minor risks in the compulsory system and women who are not covered for their minor risks (who had the lowest coverage) .

Table 75: Percentage of women screened for cervical cancer according to the minor risks coverage, per age group, 2007.

Age group	Minor risks not covered	Minor risks covered	Freely insured
28-35	77.69%	79.38%	81.48%
35-44	60.38%	75.44%	80.48%
45-54	54.95%	66.04%	69.67%
55-64	27.87%	51.76%	57.89%

Percentage is calculated on the number of subjects in the minor risks coverage and the age group

Another proxy variable for social class is PP1003 which allows a distinction between the private sector, the public sector and the self-employed. The CMH test for association was statistically significant (p<0.0001) indicating an association between sector of employment and cervical cancer screening. Results per age group are presented in (1418 missings). Women in the public sector had a higher coverage than the two other sectors, private sector showing the lowest rate (Table 76).

Table 76: Percentage of women screened for cervical cancer according to the sector, per age group, 2007.

Age group	Private sector	Public sector	Self-employed
28-35	79.42%	87.92%	80.76%
35-44	75.05%	81.50%	77.81%
45-54	65.00%	72.01%	67.83%
55-64	50.55%	57.99%	54.74%

Percentage is calculated on the number of subjects in the sector category and the age group

There was a statistically significant difference in PAP test rate between the different groups of unemployment (CMH test p<0.0001).Results are presented per age group in Table 77. In the two youngest groups the partial-time unemployed showed a lower coverage. In the 45-54 group, full-time and partial-time unemployed women had a lower coverage. Conversely in the oldest group, the lower coverage was observed in the not unemployed, followed by the full-time unemployed.

Table 77: Percentage of women screened for cervical cancer according to the unemployment, per age group, 2007.

Age group	Not unemployed	Full-time unemployed	Partial time unemployed	Early retired
28-35	79.48%	80.15%	75.00%	N=0
35-44	76.36%	71.91%	71.16%	N=0
45-54	67.13%	59.88%	62.50%	66.67%
55-64	51.46%	52.41%	55.48%	60.12%

Percentage is calculated on the number of subjects in the unemployment category and the age group

There was no association between the MAB category and the cervical cancer screening (CMH test p=0.390). Table 78 shows the results per age group.

Table 78: Percentage of women screened for cervical cancer screening according to MAB ceilings, per age group, 2007.

Age group	Others	Persons entitled to reimbursement based on €450 or €650 ceiling	Persons entitled to reimbursement based on higher ceilings
28-35	79.43%	80.77%	75.47%
35-44	75.57%	75.11%	79.27%
45-54	66.18%	64.16%	71.72%
55-64	51.98%	51.34%	51.21%

Percentage is calculated on the number of subjects in the MAB ceilings category and the age group

The PAP test rate was clearly lower in women entitled to income guarantee for the elderly, subsistence level income (leefloon; revenu d'intégration) or support from the public municipal welfare centres (OCMW, CPAS). The Breslow-Day test for homogeneity of the odds ratios of cervical cancer screening for women entitled to RGCPAS versus other women between the age groups was not statistically significant (p=0.561). The common odds ratio was 0.592 (95%CI 0.53-0.66). Odds ratios calculated per age group are given in Table 79.

Table 79: Percentage of women screened for cervical cancer according to entitlement to income guarantee for the elderly, subsistence level income or support from the public municipal welfare centres, per age group, 2007.

Age group	Entitlement to RGCPAS		Odds Ratio		
	No	Yes	OR	95%	CI
28-35	79.73%	68.46%	0.55	0.43	0.72
35-44	75.88%	63.26%	0.55	0.45	0.67
45-54	66.35%	56.80%	0.67	0.53	0.84
55-64	52.18%	39.63%	0.60	0.48	0.76

Percentage is calculated on the number of subjects in the RGCPAS entitlement category and the age group

In conclusion, there were differences between groups after adjusting for age for seven out of nine proxy variables. The groups associated with a lower cervical cancer screening coverage were women entitled to a preferential reimbursement, women who are pensioners, widows, persons with disabilities or orphans, women disabled for more than one year or handicapped, women without minor risks coverage, women employed in the private sector and the group of women entitled to income guarantee for elderly, subsistence level income or support from OCMW/ CPAS. Globally, the association between cervical cancer screening and unemployment was statistically significant, but differed according to the group of age.

Figure 33 presents the evolution of the cervical cancer screening rate across the 3 regions for the period 2005-2007, based on a 4 year calculation basis. Brussels and Wallonia have similar rates being slightly higher than the rate in Flanders.

Figure 33: Cervical cancer screening rate in women aged 28-64 per region, 2005-2007 (based on a 4 year basis).
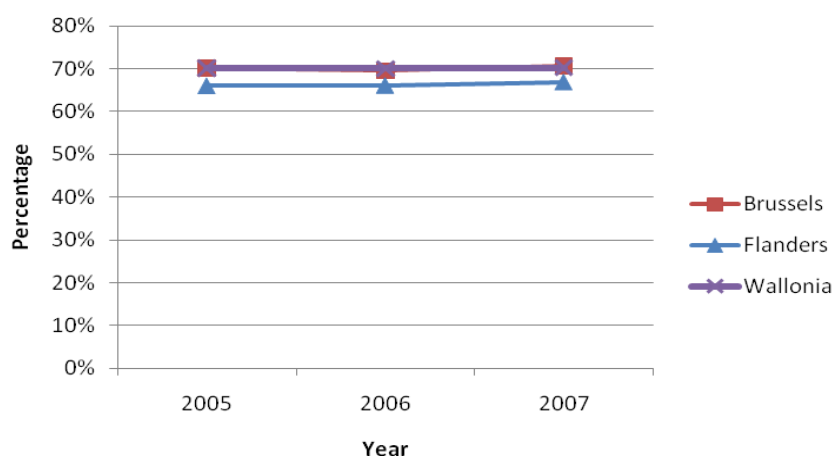
Compared to other OECD countries, the cervical cancer screening coverage is moderate to low (Figure 34). Both the UK and the US have a coverage around or above 80%.

Figure 34: Cervical cancer screening coverage in selected OECD countries, 2000 – 2007.
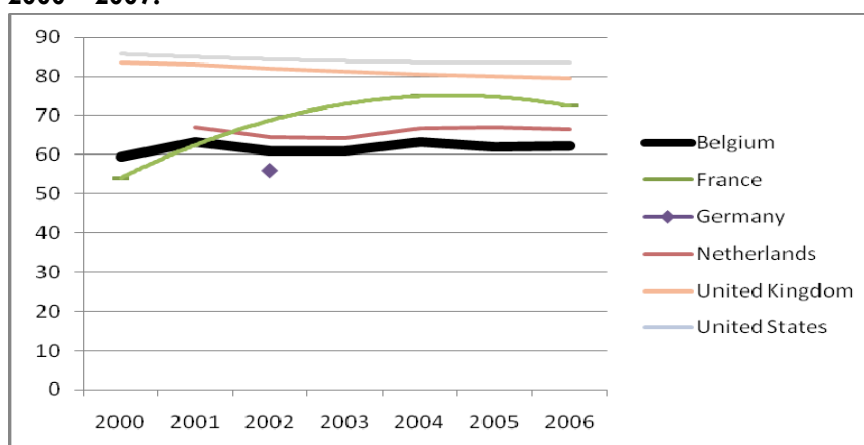
Related performance indicators

QE15: Cervical cancer 5-year survival rate.

QE3: COLORECTAL CANCER SCREENING

Definition

Description

Proportion of individuals age 50 and older having received a FOBT within the last two years.

Source

- ECHI (long list)[20]

Numerator

Number of Belgian citizens age 50 and older having received a Faecal Occult Blood Test within the last two years.

Denominator

Total mid-year Belgian population age 50 and older.

Harmonisation of definition with international organisations

Not applicable.

Rationale and indicator characteristics

A recent HTA report showed that colorectal cancer screening with guiac FOBT, followed by colonoscopy if positive FOBT, is cost-effective in persons aged 50 years and older [21]. Based on this report, the French community started a pilot screening programme in 2009. In the Flemish region, several smaller-scale pilot projects were started.

This indicator measures the *effectiveness* of preventive care.

Data source(s)

Source database(s)

No data available.

Comparability

Not applicable.

Results

None.

Related performance indicators

QE12: Colon cancer 5-year survival rate.

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20   http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

21   De Laet C, Neyt M, Vinck I, Lona M, Cleemput I, Van De Sande S. Health Technology Assessment. Screening for Colorectal Cancer : current evidence and budget impact for Belgium. Health Technology Assessment (HTA). Brussel: Federaal Kenniscentrum voor de Gezondheidszorg (KCE); 2006. KCE reports 45 A (D/2006/10.273/57)

QE4: INFLUENZA VACCINATION OF AT RISK POPULATION

Definition

Description

Proportion of the at risk population that received a dose of influenza vaccine in the past year.

Source

- CIHI (Canada)[22]
- International organisations/initiatives: OECD[23], ECHI long list[24]

Numerator

Number of Belgian people aged 65 and older who received a dose of influenza vaccine in the past year.

Pharmanet: ATC codes J07BB01 and J07BB02.

Denominator

Total mid-year Belgian population age 65 and older.

Harmonisation of definition with international organisations

In view of the inability to measure certain risk groups as defined by the Superior Health Council (group 2, 3 and 5 and partially group 1; see below), it was decided to use a proxy indicator, only measuring the proportion of persons 65 years and older receiving a dose of influenza vaccine. This is in line with the OECD definition.

Rationale and indicator characteristics

According to the Superior Health Council, the following risk groups need vaccination against influenza[25]:

- group 1:
  - all persons 65 years and older
  - all persons who are admitted to an institution
  - all patients from six months and older who suffer from (also if stabilized) an underlying chronically disorder of the lungs, heart, liver, kidneys, metabolic diseases or immunity disorders (naturally or induced)
  - children between 6 and 18 months who undergo a long-term aspirin therapy
- group 2: all persons that work in the healthcare sector and who are in direct contact with persons of group 1
- group 3: pregnant women who are in the second or third trimester of their pregnancy on the moment of the vaccination
- group 4: all persons between 50 and 64 years, even if they do not suffer from a risk disorder, because there is a chance of one out of three that they show at least one complication risk, especially persons who smoke, drink excessively and who are obese

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[22] Canadian Institute for Health Information. National Consensus Conference on Population Health Indicators. Final Report. CIHI 1999.

[23] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[24] http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

[25] Superior Health Council. Publication n° 8354.

- group 5: profession breeders of poultry and pigs as well as their family members who live with them and persons who come by their profession in daily contact with living poultry and pigs

The fifth group only needs vaccination in case of contemporary circulation of avian flu and human flu. Several systematic reviews are available supporting the recommendations of the Superior Health Council[2627].

This indicator measures the *effectiveness* of preventive care, and should be interpreted together with indicator QE6.

Data source(s)

Source database(s)

- Pharmanet (numerator): see Supplement 2 for periodicity and data quality.
- FPS Economy - Directorate-General Statistics and Economic Information, Demographics division[28] (denominator)

Comparability

Most results presented by the OECD come from national population-based surveys, as is the case for Belgium. The results presented in this report are based on administrative and demographic data, making a comparison difficult.

Results

The Pharmanet data are separated for outpatient and inpatient vaccination. For the outpatient data, detailed results per age are available, making an exact calculation of the indicator possible. On the contrary, for the inpatient data, results are only available for pre-specified age groups (i.e. 56-69, 70-79 and 80+). Therefore, aggregation into one result is not possible (Table 80). However, it is possible to calculate a range, with the lower limit only including the inpatient data on patients aged 70+ and the upper limit including the inpatient data on patients aged 56+. Using this strategy, the coverage ranged between 62.38% and 62.44% in 2004, between 61.32% and 61.37% in 2005, and between 63.26% and 63.32% in 2006. Clearly, the portion of inpatient vaccinations is low (less than 0.5%). Overall, an increasing number of outpatient influenza vaccinations was administered between 2004 and 2008 (table x).

Table 80: Absolute numbers of influenza vaccinations.

	Outpatient	Inpatient	
Year	65+	56+	70+
2004	1 044 192		
2005	1 121 262	5 328	4 167
2006	1 106 261	4 302	3 363
2007	1 144 084	5 057	4 012
2008	1 161 361		

In comparison to other countries, the Belgian result is moderate, approaching the EU-15 average (Figure 35).

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[26]   Goossen GM, Kremer LC, van de Wetering MD. Influenza vaccination in children being treated with chemotherapy for cancer. Cochrane Database Syst Rev. 2009 Apr 15;(2):CD006484.

[27]   Rivetti D, Jefferson T, Thomas R, et al. Vaccines for preventing influenza in the elderly. Cochrane Database Syst Rev. 2006 Jul 19;3:CD004876.

[28]   http://www.statbel.fgov.be/figures/d21_nl.asp

Figure 35: Evolution of proportion of influenza vaccinations in persons aged 65+ in selected OECD countries between 1995 and 2006.
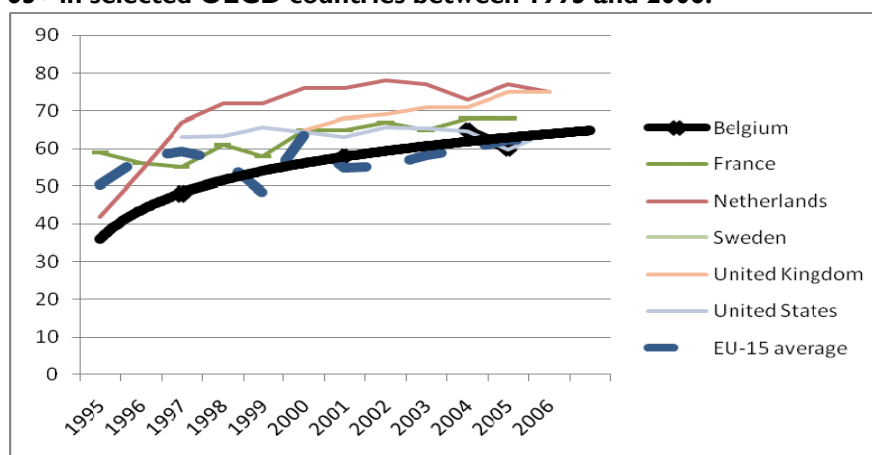
Related performance indicators

QE6: Hospitalisation rates for a. pneumonia and b. influenza per 100 000 population at risk.

QE5: VACCINATION COVERAGE CHILDREN

Definition

Description

Proportion of children who have been fully immunized according to the vaccination schedule recommended in Belgium against:

a. Diphtheria

b. Pertussis

c. Tetanus

d. Haemophilius influenzae type b (Hib)

e. Measles

f. Mumps

g. Rubella

h. Meningococcus C

i. Poliomyelitis

j. Hepatitis B

Source

- CIHI[29]
- International organisations: OECD[30], ECHI short list[31], WHO[32]

Numerator

Number of Belgian children who reached their

1. first birthday and are fully immunized against

k. Diphteria

l. Pertussis

m. Tetanus

n. Haemophilius influenzae type b (HiB)

o. Poliomyelitis

p. Hepatitis B

2. second birthday and are fully immunized against

q. Measles

r. Mumps

s. Rubella

t. Meningococcus C

at the end of the given calendar year.

For diphteria, pertussis and tetanus (DPT), the third dose is taken into account (DPT3). This is also the case for Haemophilius influenzae type b (HiB), poliomyelitis and

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[29]   Canadian Institute for Health Information. National Consensus Conference on Population Health Indicators. Final Report. CIHI 1999.

[30]   OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[31]   http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

[32]   WHO European Health For All Database. http://www.euro.who.int/hfadb, accessed August 21st 2009.

Hepatitis B. For measles, mumps and rubella (MBR), the first dose is taken into account (MBR1).

Denominator

Total number of Belgian children who reached their

1. first birthday

2. second birthday

at the end of the given calendar year.

Harmonisation of definition with international organisations

The definition is fully harmonised with the definitions used by other international sources.

Rationale and indicator characteristics

The implementation of this schedule should protect children optimally against the targeted infections[33].

Data source(s)

Source database(s)

Scientific Institute of Public Health.

Periodicity

Yearly.

Data quality

From 1999 onwards, the data are based on the weighted average of the 3 regional cluster sample surveys that are conducted regularly. This weighted average is updated every year based on the most recent surveys and assuming constant rates since the last survey. This assumption represents the worst case scenario and possibly underestimates the true coverage figures. The most recent data available for Flanders are from 2008. For Wallonia and Brussels the most recent data are from 2006.

Comparability

The data are comparable to international data. Only for meningococcus C, there are no comparable data in ECHI, OECD and/or the WHO dataset.

Results

An increase of the vaccination coverage was found, with coverage rates in 2008 for DPT3 of 98.7%, for HiB 98.0, and for MBR1 93.4% (Table 81). Compared to other countries, Belgium reaches a high coverage, especially for DTP and HiB (Figure 36, Figure 37, Figure 38, Figure 39, Figure 40).

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[33]   Hoge Gezondheidsraad. Basisvaccinatieschema aanbevolen door de Hoge Gezondheidsraad - mei 2009. 8559. 2009. Brussels: FOD Volksgezondheid Leefmilieu en Veiligheid van de Voedselketen.

Table 81: Vaccination coverage (in %) of the Belgian population (source: IPH).

	2002	2003	2004	2005	2006	2007	2008
Diphteria	95	95	95	97	98.5	98.5	98.7
Pertussis	95	95	95	97	98.5	98.5	98.7
Tetanus	95	95	95	97	98.5	98.5	98.7
Haemophilius influenzae type b	86.2	90	94.8	95	97.5	97.5	98.0
Measles	82.2	82.2	82.2	88	91.9	91.9	93.4
Mumps	82.2	82.2	82.2	88	91.9	91.9	93.4
Rubella	82.2	82.2	82.2	88	91.9	91.9	93.4
Meningococcus C					93.3	93.3	94.1
Poliomyelitis	95.7	95.7	95.7	97	98.7	98.7	98.8
Hepatitis B	60.0	65	65	77	94.4	94.4	97.5

Figure 36: Percentage of infants vaccinated against diphtheria, pertussis, tetanus (DPT) (source: IPH).
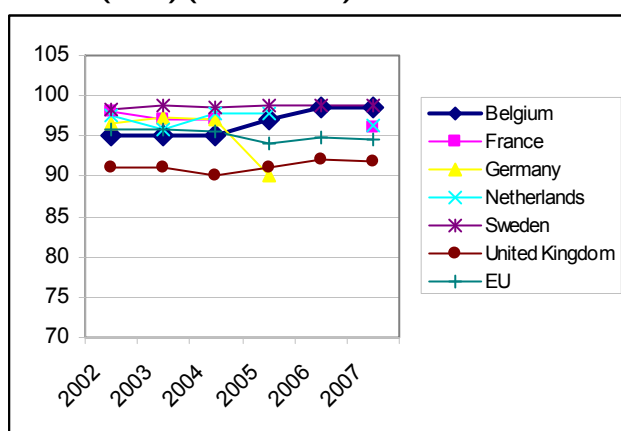
Figure 37: Percentage of infants vaccinated against Haemophilius influenzae type b (source: IPH).
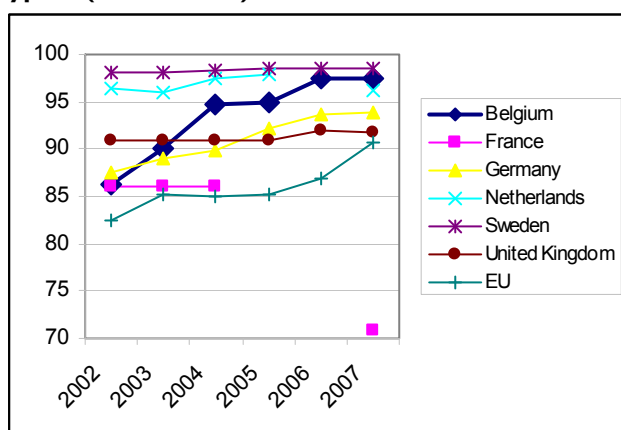
Figure 38: Percentage of infants vaccinated against measles (source: IPH).
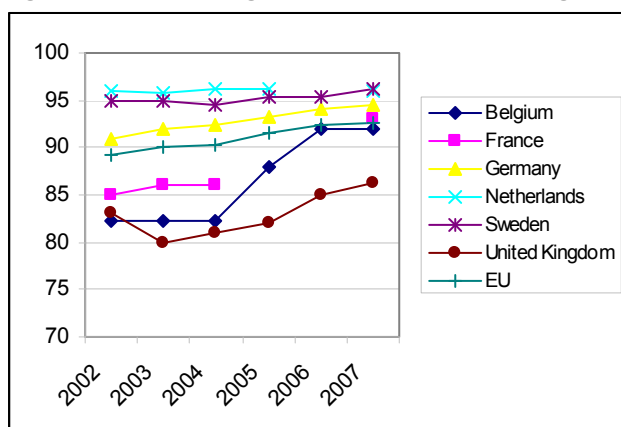
Figure 39: Percentage of infants vaccinated against mumps (source: IPH).
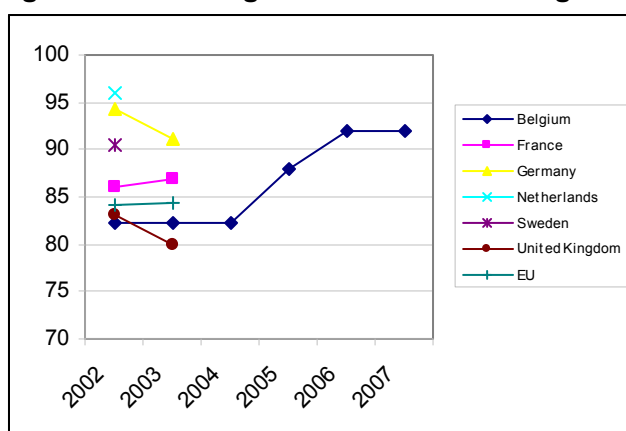
Figure 40: Percentage of infants vaccinated against rubella (source: IPH).
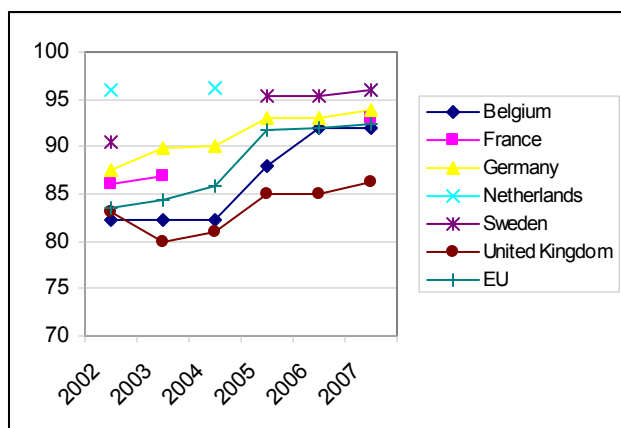
Related performance indicators

A4: Coverage of preventive child healthcare in high-risk groups.

QE6: ACUTE CARE HOSPITALIZATION RATES FOR PNEUMONIA AND INFLUENZA

Definition

Description

Age/sex standardized acute care hospitalization rates for:

    a. pneumonia

    b. influenza

per 100 000 population at risk.

Indicator source

- CIHI (Canada) [34]
- International organisations: OECD[35]

Numerator

Total acute care hospitalization rates for pneumonia and influenza for Belgian population aged 65 and older.

MCD: ICD-9-CM codes 480.xx, 481.xx, 482.xx, 483.xx, 485.xx, 486.xx (pneumonia) and 487.xx (influenza). Results are not presented by pathogen, because of the inaccurate coding.

Exclusion: one-day hospitalization, long stays (definition of long stays: see footnote of QS3).

Denominator

Total mid-year Belgian population aged 65 and older x 100 000.

Harmonisation of definition with international organisations

As for indicator QE4, it was decided to focus on the 65+ population. This makes comparison with other OECD countries difficult, since the OECD measures the number of discharges for acute upper respiratory infections and influenza per 100 000 population and for pneumonia per 100 000 population.

Rationale and indicator characteristics

According to the Superior Health Council, 4 risk groups need vaccination against influenza (see indicator QE4)[36]. A fifth group of profession breeders of poultry and pigs only needs vaccination in case of contemporary circulation of avian flu and human flu. Several systematic reviews are available supporting the recommendations of the Superior Health Council[37][38].

For the prevention of pneumococcal disease, the Superior Health Council recommends vaccination of the following groups[39]:

- Persons with a high risk of severe invasive pneumococcal infections, such as persons with functional asplenia and after splenectomy

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[34] Canadian Institute for Health Information. National Consensus Conference on Population Health Indicators. Final Report. CIHI 1999.

[35] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[36] Superior Health Council. Publication n° 8354.

[37] Goossen GM, Kremer LC, van de Wetering MD. Influenza vaccination in children being treated with chemotherapy for cancer. Cochrane Database Syst Rev. 2009 Apr 15;(2):CD006484.

[38] Rivetti D, Jefferson T, Thomas R, et al. Vaccines for preventing influenza in the elderly. Cochrane Database Syst Rev. 2006 Jul 19;3:CD004876.

[39] Superior Health Council. Publication n° 8205.

- Persons aged 65 years and older
- Persons aged 50 years and older with:
  - o Chronic bronchopulmonary diseases
  - o Congestive heart disease
  - o Alcohol abuse (with or without liver cirrhosis)
- HIV-infected patients

Pneumococcal vaccination can also be considered in patients with specific characteristics, such as organ transplants, lymphoma, etc.

This indicator measures the *effectiveness* of preventive care, and should be interpreted together with indicator QE4.

Data source(s)

Source database(s)

- MCD (numerator): see Supplement 2 for periodicity and data quality.
- FPS Economy - Directorate-General Statistics and Economic Information, Demographics division[40] (denominator).

Comparability

As stated above, the OECD uses a different definition, making comparison difficult.

Results

Pneumonia

There were 17 038 acute care inpatient stays of patients aged 65 years or more, admitted for pneumonia in Belgium in 2004. Given a mid-year Belgian population of 1 789 810 aged 65 years or more in 2004, the global rate was thus 952 admissions / 100 000 inhabitants. In 2005, the rate amounted to 1 035 admissions / 100 000 inhabitants.

The 2005 rate was also computed per sex and per age, as presented in Table 82. The number of admissions per 100 000 inhabitants was higher in the male population than in the female population and increased with age in both groups.

Table 82: Admission rate for pneumonia for the year 2005

	Male			Female		
	N stays	Mid-year population 2005	Rate (/ 100 000 inhabitants)	N stays	Mid-year population 2005	Rate (/ 100 000 inhabitants)
65-69	1 375	231 710	593	753	259 199	291
70-74	1 986	209 165	949	1 113	258 033	431
75-79	2 377	159 436	1 491	1 649	229 965	717
80-84	2 522	102 567	2 459	2 177	181 534	1 199
85-89	1 166	32 425	3 596	1 401	75 634	1 852
90+	788	13 940	5 653	1 366	50 653	2 697
Total	**10 214**	**749 242**	**1 363**	**8 459**	**1 055 017**	**802**

Note that the numerator can include nosocomial infections too (transferred from another hospital). Moreover, community-acquired pneumonia covers different pathogens and coding is not homogeneous[41] [42]. Finally, the admission practices can vary from one hospital to another, some hospitals admitting only more severe cases.

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40   http://www.statbel.fgov.be/figures/d21_nl.asp
41   Guevara RE, Butler JC, Marston BJ, Plouffe JF, File TM, Jr., Breiman RF. Accuracy of ICD-9-CM codes in detecting community-acquired pneumococcal pneumonia for incidence and vaccine efficacy studies. Am J Epidemiol 1999, 149: 282-289.
42   Van de Garde EM, Oosterheert JJ, Bonten M, Kaplan RC, Leufkens HG. International classification of disease codes showed modest sensitivity for detecting community-acquired pneumonia. J Clin Epidemiol 2007, 60: 834-838.

Influenza

There were 181 inpatient stays of patients aged 65 years or more admitted for influenza in acute care in Belgium in 2004. The hospitalization rate for influenza for this category was 10.11 / 100 000 in habitants. In 2005, the rate reached 18.35 /100 000 inhabitants (331 cases). Considering the small number of cases, the results were only broken down by gender for 2005. The rate was 20.29 admissions / 100 000 men of 65 years or more versus 16.97 admissions / 100 000 women of 65 years or more. Again men were relatively more affected than women.

Related performance indicators

QE4: Influenza vaccination of at risk population.

QE7: PERCENTAGE OF DAILY SMOKERS

Definition

Description

Proportion of the population aged 15 years and older that smokes on a daily basis.

Source

- RIVM (the Netherlands)[43]
- International organisations: OECD[44], ECHI short list[45], WHO[46]

Numerator

Total number of people aged 15 years and older that smokes on a daily basis.

Smoking includes the consumption of cigarettes, cigars and pipes.

Denominator

Total population aged 15 years and older.

Harmonisation of definition with international organisations

The used definition is the same definition used by other international sources.

Rationale and indicator characteristics

Tobacco use is considered to be the single most preventable cause of morbidity and mortality in the world today[47]. Urgent action is necessary, otherwise the number of people killed by tobacco each year will double over the next few decades. Therefore, this is considered an important indicator of health promotion.

Data source(s)

Source database(s)

Belgian Health Interview Survey (HIS):

- 1997 and 2001: TA.01: Do you smoke? Yes, every day; Yes, from time to time; No.
- 2004:
  - TA.01: Have you ever smoked at least 100 cigarettes, or the equivalent amount of tobacco, in your lifetime? Only when the answer of the respondents on this question is 'yes', they can answer the question whether they smoke daily at the moment.
  - TA.02: Do you smoke at the moment? Yes, every day; Yes, from time to time; No.
- (2008: TA.05: Do you smoke at all nowadays? Yes, daily; Yes, occasionally; Not at all.)

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43   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

44   OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

45   http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

46   WHO European Health For All Database. http://www.euro.who.int/hfadb, accessed August 21st 2009.

47   WHO Report on the Global Tobacco Epidemic, 2008 - The MPOWER package.

Periodicity

> The Belgian Health Interview Survey is foreseen to be collected every 4 years. It was already executed in 1997, 2001, 2004 and 2008. However, the data of 2008 are not yet available.

Data quality

> The quality of the Belgian HIS data is ensured by the Quality Control Board (which guides all phases of fieldwork), and by special software that is used to construct the sample[48].

Comparability

> In many countries data about smoking are available from National Health Interview Surveys. However, these HIS are not collected in the same year in every country. This makes comparability therefore difficult.

Results

> There is a small decrease in the total percentage of daily smokers between 1997 and 2004 (83). There are more male than female daily smokers, but were the percentage of female daily smokers is stable, the percentage of male daily smokers clearly decreases.

Table 83: Percentage daily smokers in the 15+ population (source: HIS).

Year	Total	Women	Men
1997	25.5	19.7	31.2
2001	24.1	19.9	28.6
2004	23.7	19.7	28

According to the educational level, the lowest percentage of daily smokers is found in the group with superior education (Figure 41).

Figure 41: Percentage daily smokers in the 15+ population: by educational level (source: HIS).
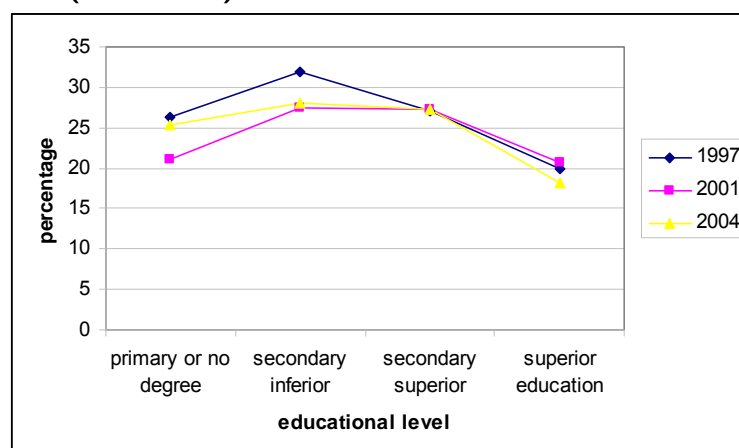
There are also less daily smokers as the income level increases (Figure 42). This difference was the most pronounced in 1997 and 2004.

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48   Van de Sande S, De Wachter D, Swartenbroeckx N, Peers J et al. Inventaris van databanken gezondheidszorg - Supplement. KCE Reports vol.30 Suppl. Brussel: Federaal Kenniscentrum voor de gezondheidszorg (KCE) ; Mei 2006. Ref. D/2006/10.273/16.

Figure 42: Percentage daily smokers in the 15+ population: by income level (source: HIS).
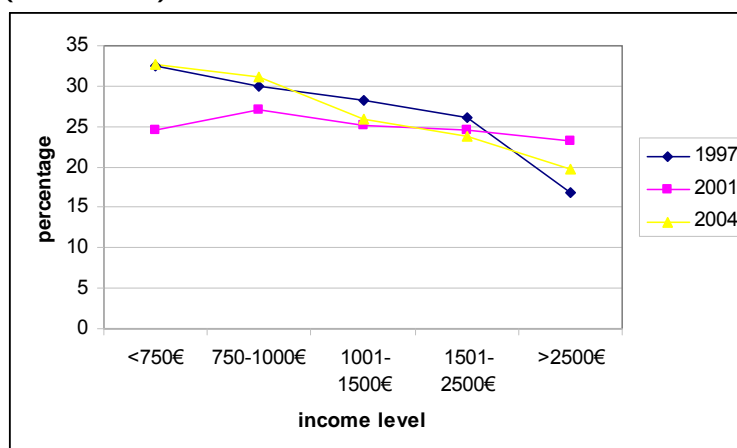
In the older age groups, there are less daily smokers than in the younger age groups (Figure 43).

Figure 43: Percentage daily smokers in the 15+ population: by age group (source: HIS).
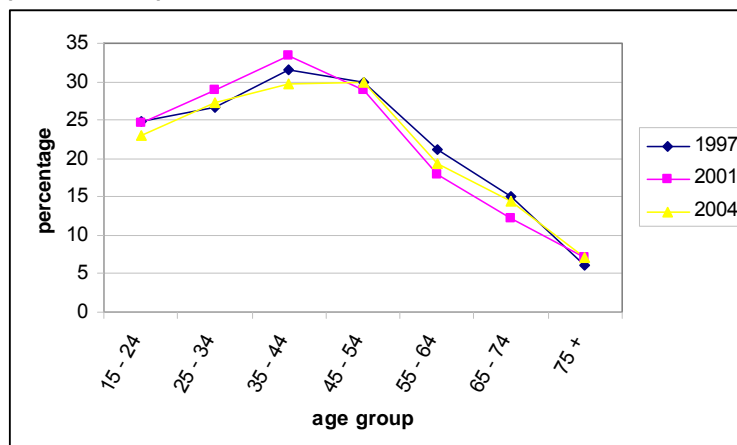
Related performance indicators

QE7.1: Consumption of fruit and vegetables

QE7.2: Alcohol consumption

QE7.3: Consumption of salt

QE 7.1: CONSUMPTION OF FRUIT AND VEGETABLES

Definition

Description

Proportion of population aged 15 years and older who report consuming at least 300 grams of vegetables (350 grams raw vegetables), and 250 grams of fruit on a daily basis.

Source

- International organisations: OECD[49], ECHI short list[50]

Numerator

Total number of people aged 15 years and older at the end of the given calendar year, who report consuming at least 300 gram of vegetables (or 350 gram raw vegetables), and 250 grams of fruit on a daily basis.

Denominator

Total number of people aged 15 years and older at the end of the given calendar year.

Harmonisation of definition with international organisations

The definition used for the present report is different from the recommendation of WHO stating that one should consume 400 grams of fruit and vegetables on a daily basis.

Rationale and indicator characteristics

Fruit and vegetables are part of a healthy diet, and if consumed on a daily basis in sufficient amounts can help to prevent certain diseases, such as cardiovascular diseases and certain cancers[51]. It is therefore considered an important indicator of health promotion.

Data source(s)

Source database(s)

1. Belgian Health Interview Survey (HIS):
   - 2001: NU.09: How often do you eat or drink one of the following products? 05: fruit (like fresh fruit or fresh orange juice, can- and deepfreeze fruit, dried fruit); 24 prepared or raw vegetables (be careful: no dried pulse)? Every day; 5-6 times per week; 2-4 times per week; once a week; 1-3 times per month; almost never-never; don't know; no answer.
   - 2004:
     - NH.04: How often do you eat prepared or raw vegetables (dried pulse not included)? Every day; 5-6 times per week; 2-4 times per week; once a week; 1-3 times per month; almost never-never; don't know; no answer.
     - (NH.05: On such a day, how many prepared or raw vegetables do you eat on average? Less than 200 grams; about 200 grams; more than 200 grams; don't know; no answer.)
     - NH.06: How many times do you eat fresh fruit? Every day; 5-6 times per week; 2-4 times per week; once a week; 1-3 times per month; almost never-never; don't know; no answer.

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[49] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[50] http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

[51] Fruit and vegetables for health: Report of a Joint FAO/WHO Workshop, 1-3 September, 2004, Kobe, Japan.

- o (NH.07: On such a day, how many pieces of fruit do you eat on average? Less than 2 pieces; about 2 pieces; more than 2 pieces; don't know; no answer.)
- (2008:
  - o NH.01: How many times do you eat fruit? 2 or more times per day; once a day; 4-6 times per week; 1-3 times per week; less than once a week; never; don't know; no answer.
  - o NH02: On such a day, how many pieces of fruit do you eat on average? Less than 2 pieces; about 2 pieces; more than 2 pieces; don't know; no answer.
  - o NH.03: How often do you eat vegetables or salads (excluded juice and potatoes)? 2 or more times per day; once a day; 4-6 times per week; 1-3 times per week; less than once a week; never; don't know; no answer.
  - o NH.04: On such a day, how many pieces of vegetables and salads do you eat on average? Less than 2 pieces; about 2 pieces; more than 2 pieces; don't know; no answer.)

The Belgian Health Interview Survey considers minimum daily consumption of fruit or vegetables as recommended.

2. National food consumption survey

Importantly, although according to the definition used for the present report the consumption of fruit <u>and</u> vegetables is calculated, the available data only give an idea about the consumption of fruit and vegetables separately. The data of the Belgian Health Interview Survey calculate the percentage of people reporting the daily consumption of at least one portion of fruit or vegetable. The data of the National Food Consumption Survey provide the percentage of people consuming fruit or vegetables on a daily basis, and the percentage of people consuming vegetables or fruit as recommended.

The data of the National Food Consumption Survey are in line with the definition used for the present project. The data of the HIS can be considered a proxy. In the HIS, the studied population is not limited to people older than 15 years. The 'recommended' amount of fruit and vegetables differs from the recommendations used in the indicator definition (vegetables: at least 200 grams, raw or cooked; fruit: at least two portions a day). There are also data about the consumption of fruit and vegetables in 1997, but these are not used here.

Periodicity

HIS data are available for the years 1997, 2001 and 2004. In the HIS of 2008 this topic was also included, but these data are not yet available.

As to the National food consumption survey, data are only available for 2004 at present.

Data quality

The quality of the Belgian HIS data is ensured by the Quality Control Board (which guides all phases of fieldwork), and by special software that is used to construct the sample[52].

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52   Van de Sande S, De Wachter D, Swartenbroeckx N, Peers J et al. Inventaris van databanken gezondheidszorg - Supplement. KCE Reports vol.30 Suppl. Brussel: Federaal Kenniscentrum voor de gezondheidszorg (KCE); Mei 2006. Ref. D/2006/10.273/16.

Comparability

Health Interview Surveys in other countries also include questions about the frequency and the amount of fruit and vegetables people consume. However, the remark on the different periods of data collection is also applicable here.

Results

Looking at the recommendations (see definition), only 0.1% of the population consumes enough vegetables and 8% enough portions of fruit (Table 84). According to the National food consumption survey, 38% of the population consumes some vegetables and 47% fruits on a daily basis.

Table 84: Percentage of the population that consumes 1) every day, and 2) the recommended number of fruit and vegetables (source: National food consumption survey).

	vegetables	fruit
Daily	37.7%	47.3%
Recommended	0.1%	7.6%

Women consume more vegetables and fruit on a daily basis than men (Table 85). No big differences are found according to educational level (Figure 44) or income level (Figure 45).

Table 85: Percentage of the population that consumed at least as much as recommended (source: HIS).

	2001		2004	
	vegetables	fruit	vegetables	fruit
Male	77%	56%	83%	54%
Female	82%	66%	86%	63%
Total	79%	61%	85%	59%

Figure 44: Percentage of the population that consumed at least as much as recommended: by educational level (source: HIS).
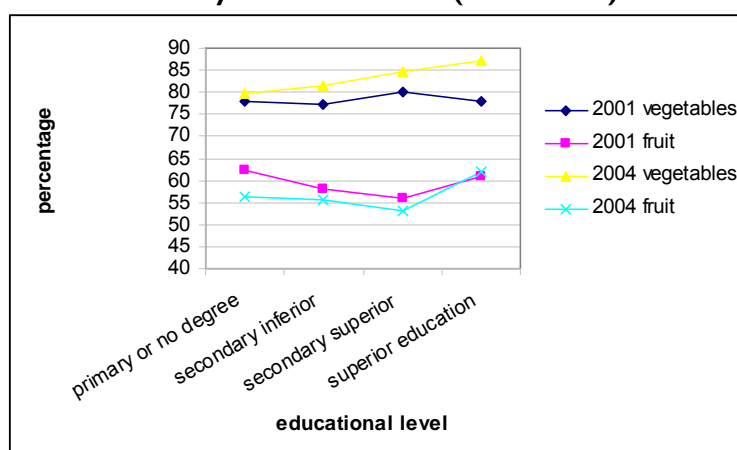
Figure 45: Percentage of the population that consumed at least as much as recommended: by income level (source: HIS).
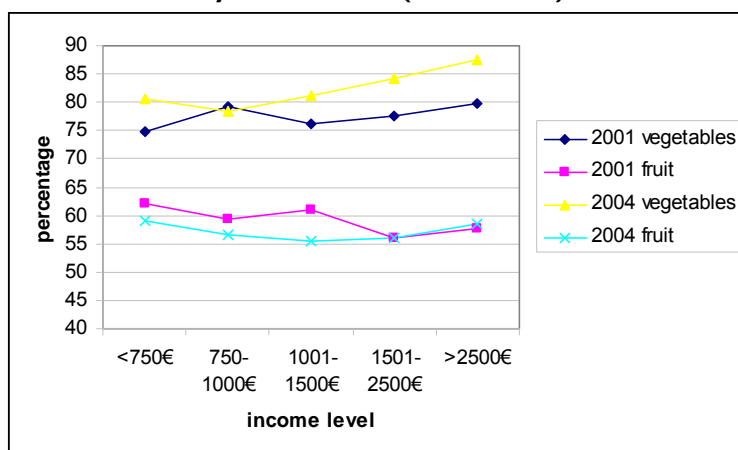
Related performance indicators

QE7.3: Consumption of salt

QE7.2: ALCOHOL CONSUMPTION (PROBLEMATIC DRINKERS)

Definition

Description

Proportion of the population aged 15 years and older who are problematic drinkers.

Source

- International organisations: OECD[53], ECHI short list[54]

Numerator

Total number of 1) men and 2) women aged 15 years and older at the end of the given calendar year who consume more than 1) 21 and 2) 14 drinks per week.

Hazardous or problematic drinking is defined as a consumption of more than 21 alcoholic drinks per week for men, and more than 14 alcoholic drinks per week for women. To calculate the percentage of female hazardous drinkers, the sum is made of the percentage of women consuming between 15 and 21 alcoholic drinks per week, and the percentage of women consuming at least 22 drinks per week. For the percentage of male problematic drinkers, the percentage of men consuming at least 22 drinks per week is used.

Denominator

Total number of people aged 15 years and older at the end of the given calendar year.

Harmonisation of definition with international organisations

The used definition for this report only differs with the definition used by ECHI in that ECHI considers 2 drinks per day for women, and 3-4 drinks per day for men as 'hazardous alcohol consumption'. This corresponds to 14 drinks per week for women and 21-28 drinks per week for men (instead of maximum 21 drinks per week according to the definition used here).

Rationale and indicator characteristics

A substantial part of health, social and economic burden is caused by public health problems attributable to hazardous alcohol consumption[55]. Reducing this burden is a priority area for international public health which can be obtained through the implementation of proven alcohol strategies. Therefore, this is considered an important indicator of health promotion.

Data source(s)

Source database(s)

Belgian Health Interview Survey (HIS):

- 1997:
  - AL.06: How many glasses do you drink on average during the days of the week (Monday till Thursday)? 1; 2; 3; 4 or 5; 6; 7-10; more than 10.
  - AL.10: How many glasses do you drink on average during the days of the weekend (Friday till Sunday)? 1; 2; 3; 4 or 5; 6; 7-10; more than 10.
- 2001:
  - AL.06: How many glasses do you drink on average during the days of the week (Monday till Thursday)? 11 or more; 7-10; 6; 4 or 5; 3; 2; 1.

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[53] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[54] http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

[55] WHO Expert Committee on Problems Related to Alcohol Consumption, Second Report.

- o AL.09: How many glasses do you drink on average during the days of the weekend (Friday till Sunday)? 11 or more; 7-10; 6; 4 or 5; 3; 2; 1.
- 2004:
  - o AL.06: How many glasses do you drink on average during the days of the week (Monday till Thursday)? 11 or more; 7-10; 6; 4 or 5; 3; 2; 1.
  - o AL.09: How many glasses do you drink on average during the days of the weekend (Friday till Sunday)? 11 or more; 7-10; 6; 4 or 5; 3; 2; 1.
- (2008: AL.02. How many drinks containing alcohol do you have each day in a typical week? Start with Monday and take one day at a time. Indicate the number of glasses per alcoholic beverage and per day.)

Periodicity

The Belgian Health Interview Survey was executed in 1997, 2001, 2004 and 2008. The data of 2008 are however not yet available.

Data quality

The quality of the Belgian HIS-data is ensured by the Quality Control Board (which guides all phases of fieldwork), and by special software that is used to construct the sample[56].

Comparability

According to ECHI, data from other countries are also coming from health interview surveys, and therefore will be comparable to each other. However, again the remark on different periods of data collection apply here.

Results

More men than women are problematic drinkers (Table 86). In the HIS of 2001 and 2004, more highly educated people (Figure 46) and people with higher incomes (Figure 47) were found to be problematic drinkers. Especially middle-aged people are problematic drinkers (Figure 48).

Table 86: Percentage problematic drinkers (source: HIS).

	Women	Men	Total
1997	3.8	10.1	13.9
2001	6.5	12.2	18.7
2004	5.5	12.7	18.2

Figure 46: Percentage problematic drinkers: by educational level (source: HIS).
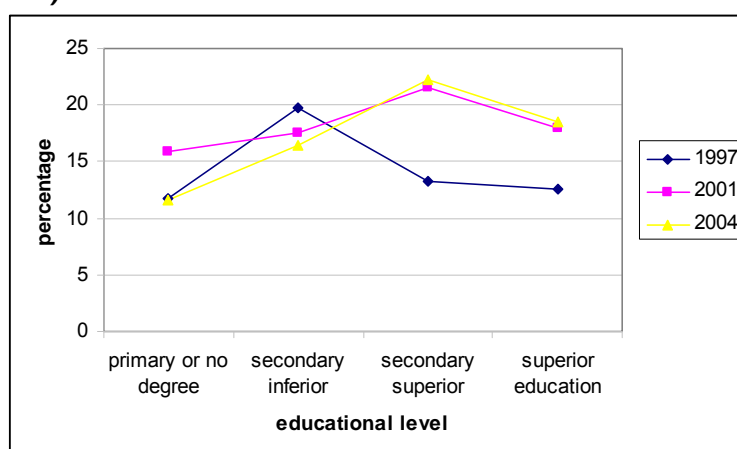
56   Van de Sande S, De Wachter D, Swartenbroeckx N, Peers J et al. Inventaris van databanken gezondheidszorg - Supplement. KCE Reports vol.30 Suppl. Brussel: Federaal Kenniscentrum voor de gezondheidszorg (KCE) ; Mei 2006. Ref. D/2006/10.273/16

Figure 47: Percentage problematic drinkers: by income level (source: HIS).
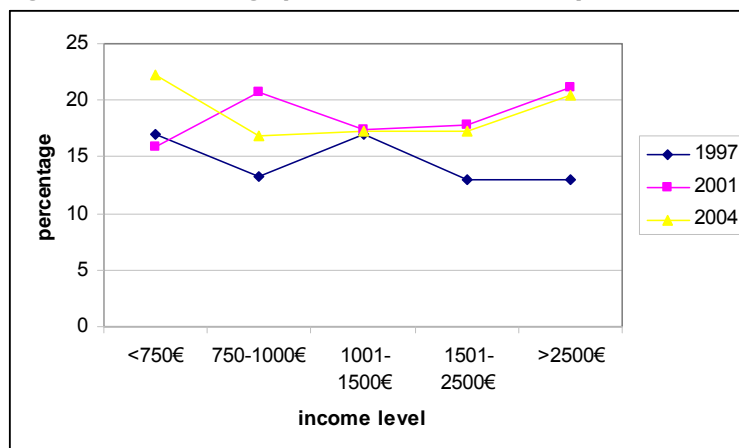
Figure 48: Percentage problematic drinkers: by age group (source: HIS).
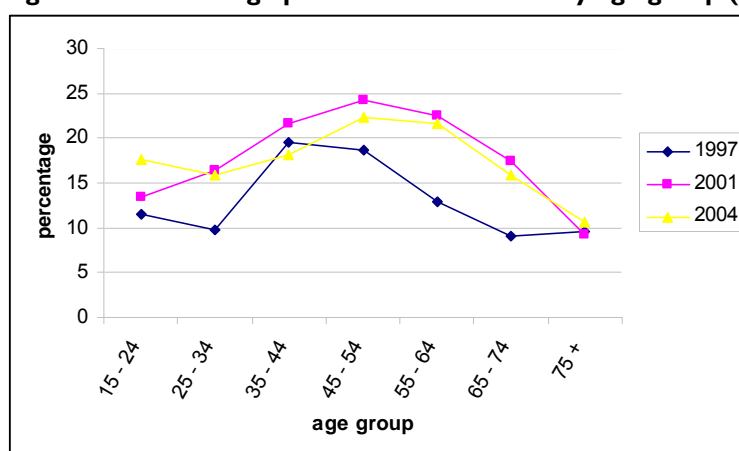
Related performance indicators

QE7: Percentage of adolescent smokers

QE7.1: Consumption of fruit and vegetables

QE7.3: Consumption of salt

QE7.3: SALT CONSUMPTION

Definition

Description

Proportion of population aged 18 years and older whose daily intake of sodium is less or equal to 3.5 grams.

Source

-

Numerator

Total number of people aged 18 years and older whose daily intake of sodium is less or equal to 3.5 grams.

Denominator

Total number of people aged 18 years and older.

Harmonisation of definition with international organisations

The definition is based on the recommendations of the Belgian Superior Health Council[57]. The World Health Organisation recommends that the consumption of sodium should be reduced to 2 grams per day[58].

Rationale and indicator characteristics

Sodium intake is directly associated with blood pressure, and high blood pressure is a major risk factor for coronary heart disease and stroke (ischaemic and haemorrhagic). Further more, high consumption of sodium has been linked to gastric cancer, osteoporosis, cataract, kidney stones and diabetes[59].

Therefore, inappropriate sodium intake is considered to be a relevant indicator of health promotion.

Data source(s)

Source database(s)

Vandevijvere, S., Van Oyen, H. Sodium intake in the Belgian population. Research limitations and policy implications. Arch Public Health 2008; 66: 1987-195.

Periodicity

This study was available in 2008, and will not be continuous.

Data quality

The study itself indicates some limitations:

- The consumption of table salt and salt added during recipe preparations were strongly underestimated and consequently not taken into account.
- Food composition data often come from the industry. The sodium contents of some food may be underestimated due to the fact that sodium concentrations higher than the maximum permitted levels will not be reported.
- Consumption data for children and adolescents younger than 15 years are lacking in this survey.

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[57] Hoge Gezondheidsraad. Voedingsaanbevelingen voor België. Herziening November 2006. 7145-2. 2006. Brussels: FOD Volksgezondheid, leefmilieu en Veiligheid van de Voedselketen.

[58] Diet, nutrition and the prevention of chronic diseases. Report of a Joint WHO/FAO Expert consultation. 2003. Geneva: World Health Organisation.

[59] Vandevijvere, S., Van Oyen, H. Sodium intake in the Belgian population. Research limitations and policy implications. Arch Public Health 2008; 66: 1987-195.

Comparability

Not applicable.

Results

More than 80% of the Belgian population meets the recommendation of the Belgian Superior Health Committee (BSHC) (Table 87). Men consume more sodium than women. Only 65% of men met the recommendation of the BSHC, compared to 92% of women. About one fourth of the total population consumes less than 2 grams per day.

Table 87: Sodium intake in the Belgian population: compliance according to WHO or BSHC recommendation (source: Vandevijvere et al.)

	Grams (CI)	WHO	BSHC
Mean	2.7 (1.0)	23.3%	81.2%
Women	3.3 (1.2)	40.8%	91.5%
Men	2.3 (0.9)	10.2%	65.1%

Related performance indicators

QE7.1: Consumption of fruit and vegetables

QE8: BREAST FEEDING

Definition

Description

Proportion of infants reaching their first birthday in a given calendar year who were exclusively breastfed until 6 months of age.

Source

- International organisations: ECHI (long list)[60], WHO[61]

Numerator

Total number of infants reaching their first birthday in a given calendar year who were exclusively breastfed until 6 months of age.

Denominator

Total number of infants reaching their first birthday in a given calendar year.

Harmonisation of definition with international organisations

The definition is harmonized with international organisations.

Rationale and indicator characteristics

WHO strongly recommends exclusive breastfeeding during the first six months of life[62]. Breast milk is the ideal food for newborns and infants, providing them with all the nutrients needed for a healthy development. Breast milk is safe and contains antibodies that help protect infants against common childhood illnesses, such as diarrhoea and pneumonia, the two primary causes of child mortality worldwide. Breastfeeding also benefits mothers. As for the mother, breastfeeding reduces the risk of breast and ovarian cancer, helps women return to their pre-pregnancy weight faster, and lowers rates of obesity.

Besides the immediate benefits for children, breastfeeding contributes to a lifetime of good health. Adults who were breastfed as babies often have lower blood pressure and lower cholesterol, as well as lower rates of overweight, obesity and type 2 diabetes.

For all reasons mentioned above, this indicator is considered a relevant indicator of health promotion.

Data source(s)

Source database(s)

- Flemish Community: Kind en Gezin (Kind in Vlaanderen)
- Walloon Community: Office de la Naissance et de l'Enfance: « Bilans de Santé » de la Banque de Données Médico-Sociales (BDMS)

Periodicity

Kind en Gezin each year produces a report "Kind in Vlaanderen", in which the percentage of children receiving breastfeeding on day 6 and on month 3 is provided. For the moment, the percentage of children that receiving breastfeeding on month 6 is not registered.

ONE also provides annual data on the percentage of children receiving breastfeeding on 1, 12, 17 and 24 weeks.

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60   http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.
61   WHO European Health For All Database. http://www.euro.who.int/hfadb, accessed August 21st 2009.
62   WHO, 10 Facts on Breastfeeding, July 2009.

Data quality

Kind en Gezin: no quality plan at the moment, but there is already some attention paid to the quality of the data[63].

ONE follows several steps to assure the quality. A first quality control (detection of missing and wrong codes) is done by the Subregional Committees. Secondly, the duplicates and deviations are eliminated. Furthermore, every year the general characteristics of the population are compared with those of the French Community. There is also a verification between several fiches of the BDMS to control the coherence of the data.

Comparability

Kind en Gezin has no data about breastfeeding at six months, ONE has data at 24 weeks. Since we cannot compare data of both organisations due to the different timeframes used, data will only be presented on the percentage of children that is breastfed at day six (K&G) or seven (ONE) and at three months (K&G) or 12 weeks (ONE).

Results

According to ONE, the percentage of children breastfed at 24 weeks increased to 15% in 2007 (Figure 49).

Figure 49: Percentage of children exclusively breastfed at 24 weeks (source: ONE).
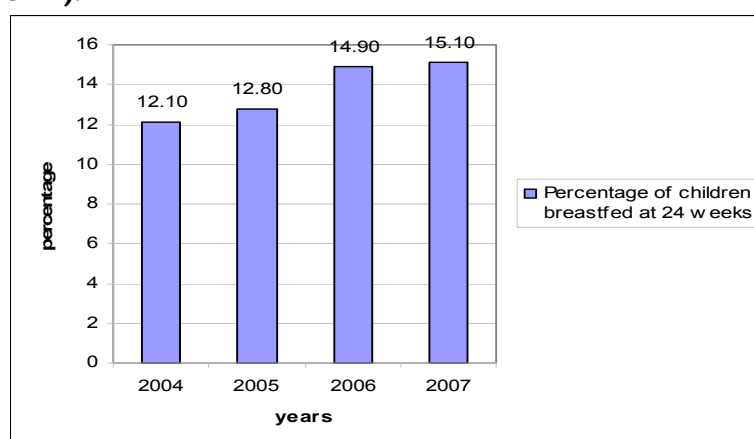
Comparing the percentage of children breastfed at day 6 or 7 between the 2 communities, the percentages of the French Community are higher than those of the Flemish Community (72% vs. 65% in 2007) (Figure 50). At the age of three months, the differences between the Flemish Community and the French Community have almost disappeared (Figure 51). At the age of three months, about one third of the children is exclusively breastfed.

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[63]   Van de Sande S, De Wachter D, Swartenbroeckx N, Peers J et al. Inventaris van databanken gezondheidszorg - Supplement. KCE Reports vol.30 Suppl.. Brussel : Federaal Kenniscentrum voor de gezondheidszorg (KCE) ; Mei 2006. Ref. D/2006/10.273/16.

Figure 50: Percentage of children exclusively breastfed at six days / one week (source: K&G, ONE).
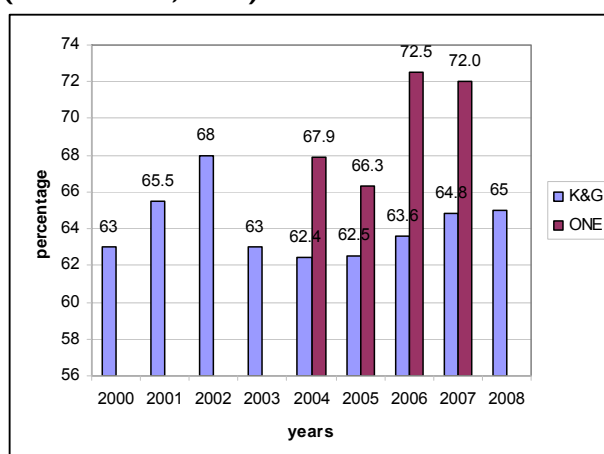
Figure 51: Percentage of children exclusively breastfed at three months / 12 weeks, among all children (source: K&G, ONE).
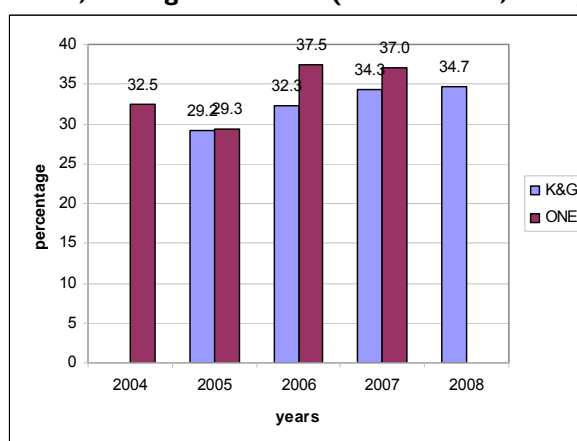
Across the Flemish provinces, there is a difference in the percentage of children that started breastfeeding after birth and still was exclusively breastfed at three months (Figure 52). West Flanders has a lower percentage than the rest of the provinces (58% in 2008).

Figure 52: Percentage of children exclusively breastfed at three months among all children that started breastfeeding after birth: by province, Flemish Community (source: K&G).
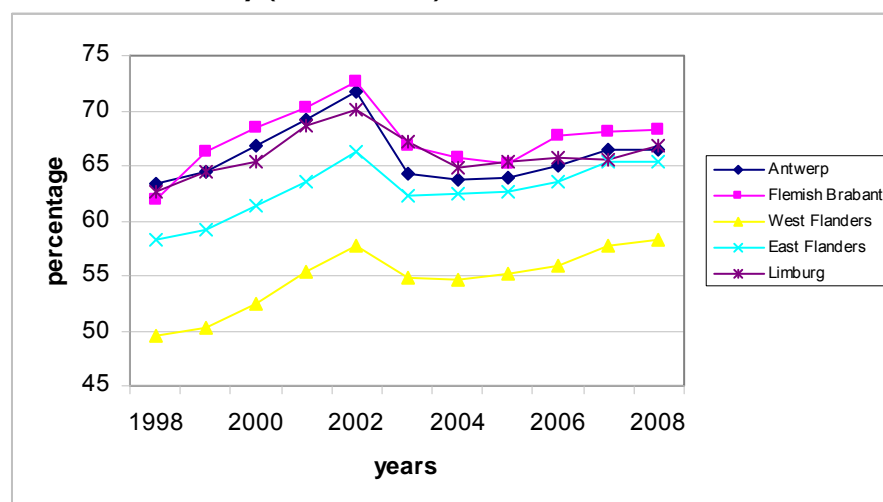
Looking at the differences between immigrant and native people and between the privileged and underprivileged, immigrant parents more often choose for breastfeeding (Figure 53). Within the group of immigrant people, there is no difference between under- and privileged people. Within the group of native Belgians there is however a difference: privileged people more often choose for exclusively breastfeeding at the age of six days (63%) than underprivileged people (39%).

Figure 53: Percentage children exclusively breastfed at six days: by origin and socio-economic status family, Flemish Community (source: K&G).
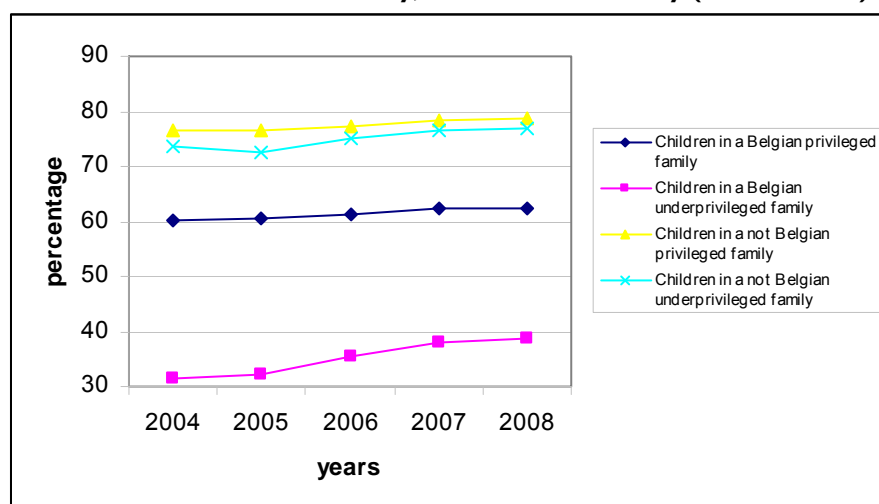
The age of the mother is another important determinant (Figure 54). Mothers younger than 20 years less often give exclusively breastfeeding when their child is six days old (52%), while mothers between 25 and 35 years have the highest percentage (66%).

Figure 54: Percentage children exclusively breastfed at six days: by age of the mother, Flemish Community (source: K&G).
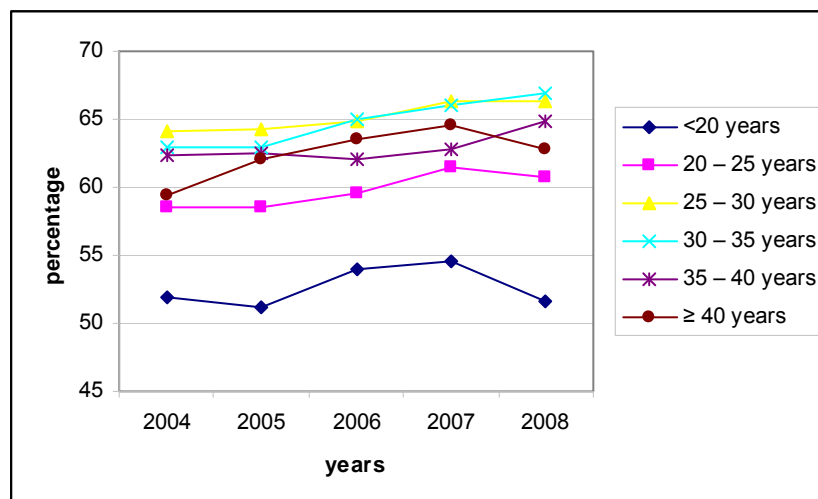
The last determinant that was examined in the data of Kind en Gezin is the educational level of the mother (Figure 55). Mothers with a degree of secondary education less often give their children exclusively breastfeeding at the age of six days (53%) than mothers with a university degree (79%) or with no or a lower education (77%).

Figure 55: Percentage children exclusively breastfed at six days: by educational level mother, Flemish Community (source: K&G).
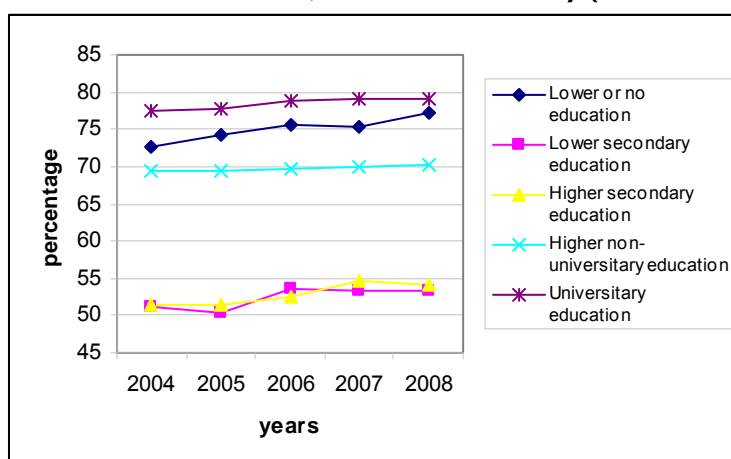
ONE also examined the educational level of mothers (Figure 56). Children of mothers with a superior education are more often exclusively breastfed for a longer time than children of mothers with a lower educational degree.

Figure 56: Percentage children exclusively breastfed at 12 weeks: by educational level mother, French Community, 2006 - 2007 (source: ONE).
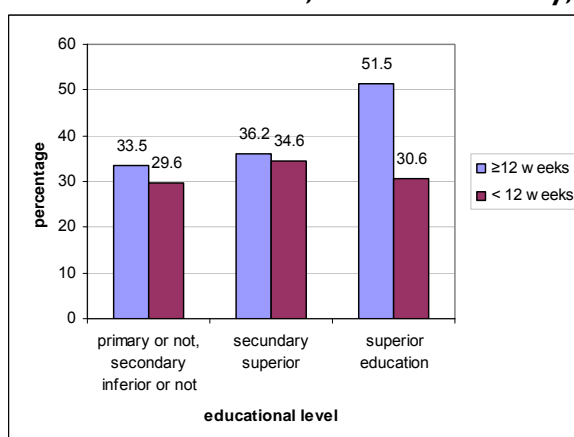
Looking at the household income (Figure 57), children living in a family with no fixed or a replacement income are less often exclusively breastfed. Children of mothers who are employed are more frequently exclusively breastfed than children of mothers without a job (Figure 58). As to the duration of this exclusive breastfeeding, there is no difference between employed and unemployed mothers.

Figure 57: Percentage children exclusively breastfed at 12 weeks: by income level family, French Community, 2006 – 2007 (source: ONE).
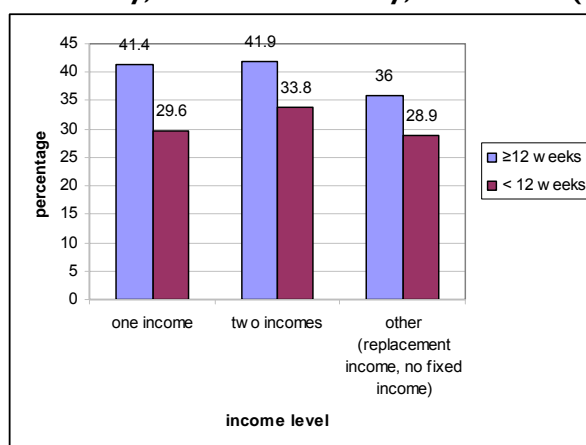
Figure 58: Percentage children exclusively breastfed at 12 weeks: by employment status mother, French Community, 2006 – 2007 (source: ONE).
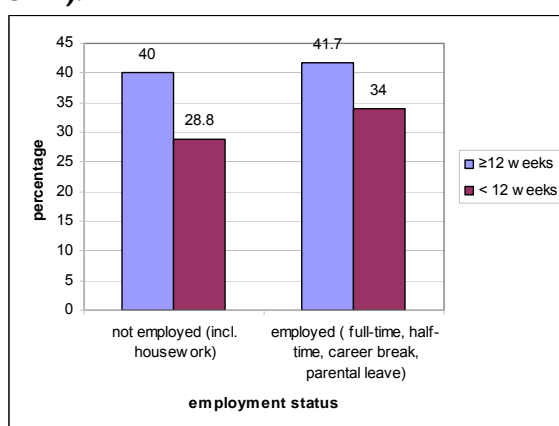
Related performance indicators

QE5: Vaccination coverage of children

A4: coverage of preventive child healthcare in high-risk groups.

QE9: ANNUAL CHECK-UPS AT THE DENTIST

Definition

Description

Annual check-ups at the dentist.

Indicator source

- RIVM (the Netherlands)[64]

Numerator

Total number of Belgian children below 18 years that visit a dentist for an annual check-up (Figure 59).

Figure 59. Flowchart of indicator QE9.
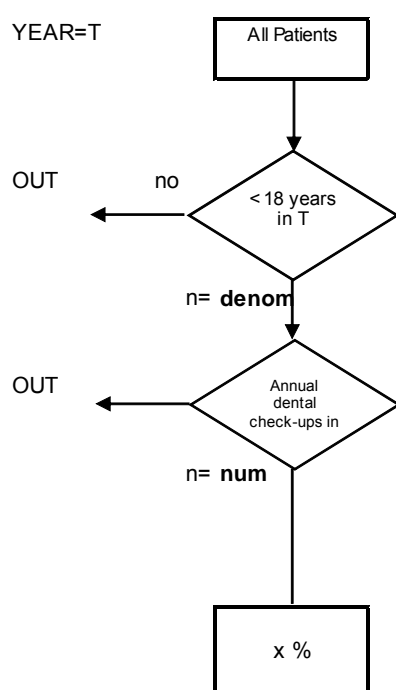
NIHDI billing codes: 301556-301560, 301571-301582, 371556-371560 and 371571-371582. These different billing codes concerned the intellectual acts of the preventive mouth care in children and were used in the period between 1998 – 2009 (see Figure 60).

Figure 60: Overview of used billing codes for preventive mouth care in children aged <18y for the period 2002 – 2009.

O	I		Creation of code	2002	2003	2004	2005	2006	2007	2008	2009
							Sept 1st			July 1st	May 1st
301556	301560	1st half	1/03/1998				12-18y			15-18y	Deleted
301571	301582	2nd half	1/03/1998				12-18y			15-18y	Deleted
371556	371560	1st half	1/09/2005					<12y		<15y	<18y
371571	371582	2nd half	1/09/2005					<12y		<15y	<18y

Denominator

Belgian insured population below 18 years.

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64   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care
      Performance Report 2008. RIVM 2008.

Harmonisation of definition with international organisations

> This indicator was selected from the indicator set of the RIVM. The RIVM defined the indicator as the proportion of the total Dutch population going to the dentist for a regular check-up, with subanalyses according to age. For the present project, the scope was limited to children below 18 years and to intellectual acts.

> No other international organisations/projects were identified measuring this indicator.

Rationale and indicator characteristics

> Several studies showed a relationship between a population's level of socio-economic development and dental caries[65][66]. This indicator gives an idea about the *effectiveness* of preventive measures for dental health.

Data source(s)

> IMA (see Supplement 2 for periodicity and data quality). For the present report the permanent sample 2002-2007 was used.

Results

> Figure 61 shows the evolution of the percentage of children having at least one dental check-up for the period 2002 – 2007. The percentage rose from 15.6% (95%CI 15.3-15.9%) in 2002 to 22.0% (95%CI 21.7-22.4%) in 2007. The trend was found to be statistically significant (p<0.0001).

Figure 61: Percentage of children aged <18y who underwent at least one annual dental check-up, 2002 – 2007.
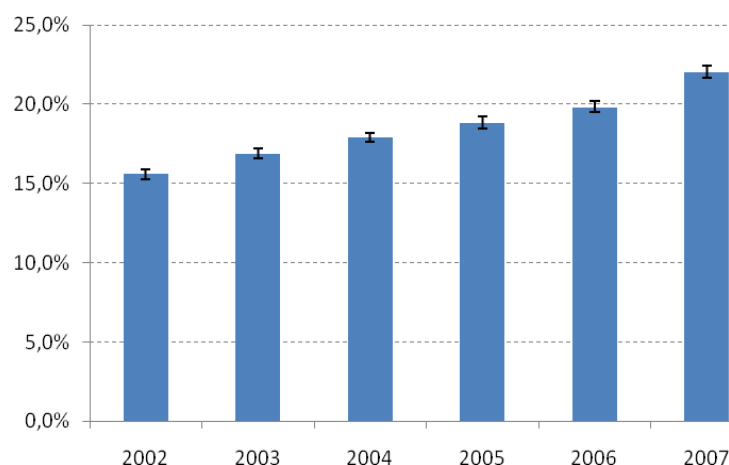
> Figure 62 shows an analysis per gender and age for the year 2007. The percentage annual dental check-ups is at its highest in children aged 8 years and decreases afterwards. Note that only the year of birth is available from the data. The last percentage may thus be underestimated for the children who have their 17th birthday at the end of the year. In global, the gender difference was not pronounced (21.8% in boys vs. 22.3% in girls).

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[65]   Downer MC, Drugan CS, Blinkhorn AS. Correlates of dental caries in 12-year-old children in Europe: a cross-sectional analysis. Community Dent Health. 2008;25(2):70-8.

[66]   Armfield JM. Socioeconomic inequalities in child oral health: a comparison of discrete and composite area-based measures. J Public Health Dent. 2007 Spring;67(2):119-25.

Figure 62: Percentage of children aged <18y who underwent at least one dental check-up, per age and gender for 2007.
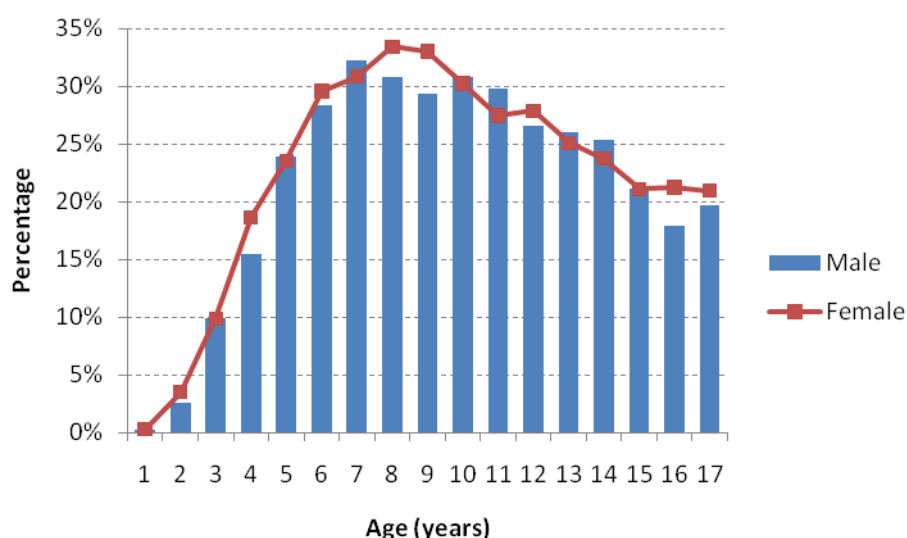
There are a number of socioeconomic variables available in the IMA dataset that can be used as proxy variables for the social class of the household of the children. For more information on the content of each variable, see KCE report 80 on the maximum billing system[67] and the technical note of indicator QA6. Table 88 to Table 90 present the percentage of children who had at least 1 annual check-up stratified for a selection of socioeconomic variables. A chi-square test of independence was run to test the association between each socioeconomic variable and the percentage of children with at least 1 annual check-up (=0.05).

Table 88 shows the percentage according to different categorizations of the variable PP0030. PP0030 (code gerechtigde/code titulaire) gives the insurance status for major risks (e.g. hospitalization) of sickness funds enrolees. The variable takes the same value for all the members of the same "sickness fund household" depending of the possible entitlement of the head to preferential treatment. The third digit of variable PP0030 allows a distinction between sickness fund household entitled to preferential reimbursement for major risks and those who are not. Households entitled to preferential reimbursement pay reduced co-payments (Table 88). PP0030 also allows to differentiate between households with a head belonging to the general regime (first digit of PP0030 = 1) or the self-employed regime (first digit of PP0030 = 4). Before 2008, self-employed persons were only covered by the compulsory health insurance system for major risks. Sickness funds and private insurers offer supplementary insurance for minor risks. About 75% of self-employed takes out this supplementary insurance against minor risk (Table 88). The percentage of children with a dental check-up is significantly lower in self-employed households.

The next categorization groups pensioners, widows, persons with disabilities and orphans (second digit). The group PWDO includes children whose households are entitled or not preferential reimbursement. The percentage of children with a dental check-up is lower in the group PWDO (Table 88).

The second digit of PP0030 equal to 2 means that the person who is the head of the household has been disabled for more than one year or is handicapped. The coverage for dental check-up was found to be lower in these households (Table 88).

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[67]   E Schokkaert, J Guillaume, A Lecluyse, H Avalosse, K Cornelis, D De Graeve, S Devriese, J Vanoverloop, C Van de Voorde, Effects of the Maximum Billing system on health care consumption and financial access to health care, KCE Report 80

The combination of PP0030 (insurance status for major risks) and PP0035 (insurance status for minor risks) allows children to be distinguished according to the risk coverage of their household: covered for major and minor risks in the compulsory system, covered for minor risks by a voluntary, supplementary insurance or not covered for their minor risks. The percentage of children with a dental check-up was lower when minor risks were not covered (Table 88).

Table 88: Percentage of children aged <18y with at least 1 check-up in 2007 by social situation in Belgium.

Categorization based on IMA variable PP0030 and PP0035	Percentage of children with at least 1 check-up in 2007		Chi-square test of independence	
	Rate (%)	95%CI	Value	p
Preferential reimbursement (major risks)				
0 (no)	22.9	22.5 23.3	203.92	<.0001
1 (yes)	14	13.1 15		
Major risk category				
General regime	23.1	22.7 23.5	412.65	<.0001
Self-employed	9.0	8.1 10.0		
Pensioners, widows, persons with disabilities and orphans (PWDO)				
PWDO	18.2	16.9 19.7	26.91	<.0001
Others	22.3	21.9 22.7		
Major invalidity				
Major invalidity	16.2	14.5 18.1	34.17	<.0001
No major invalidity	22.2	21.9 22.6		
Minor risk category				
Minor risk non covered	3.2	1.5 5.7	511.15	<.0001
Minor risk covered	23.1	22.7 23.5		
Freely insured	6.3	5.5 7.3		

Another proxy variable for social class is PP1003 which allows a distinction between the private sector, the public sector and the self-employed. Again, the percentage of children with at least 1 annual dental check-up was lower in the household of the self-employed (Table 89).

Table 89: Percentage of children aged <18y with at least 1 check-up in 2007 in Belgium

Categorization based on variable PP1003	Number of children with at least 1 check-up in 2007		Chi-square test of independence	
	Rate	95% CI	Value	p
Private sector	22.6	22.2 23.0	587.72	<.0001
Public sector	30.6	29.3 31.9		
Self-employed	8.5	7.6 9.5		

The next proxy variable to classify children according to their social class is derived from the maximum billing system (MAB). When certain income conditions are met, households whose total annual co-payments exceed a ceiling may benefit from reimbursement of co-payments. The system is articulated around different ceilings. The first ceilings are fixed at €450 and €650 for people with a low or modest income. A low or modest income with high co-payments (above the ceiling) can represent a proxy of a vulnerable population group. The first category has a lower dental check-up percentage (Table 90).

Table 90: Percentage of children aged <18y with at least 1 check-up in 2007 by MAB ceilings in 2007.

Categorization based on variable PP3004	Number of children with at least 1 check-up in 2007			Chi-square test of independence	
	Rate	95% CI		Value	p
Persons entitled to reimbursement based on €450 or €650 ceiling	15.7	14.2	17.3	53.82	<.0001
Persons entitled to reimbursement based on higher ceilings	23.0	19.6	26.7		
Others	22.3	21.9	22.7		

As a conclusion, children from weak or vulnerable socioeconomic categories have a lower probability to have an annual dental check-up than children from more privileged categories.

Figure 63 shows that the coverage in Flanders is better than the two other regions of Belgium.

Figure 63: Percentage of children aged <18y who underwent at least one annual dental check-up per region, 2002 – 2007.
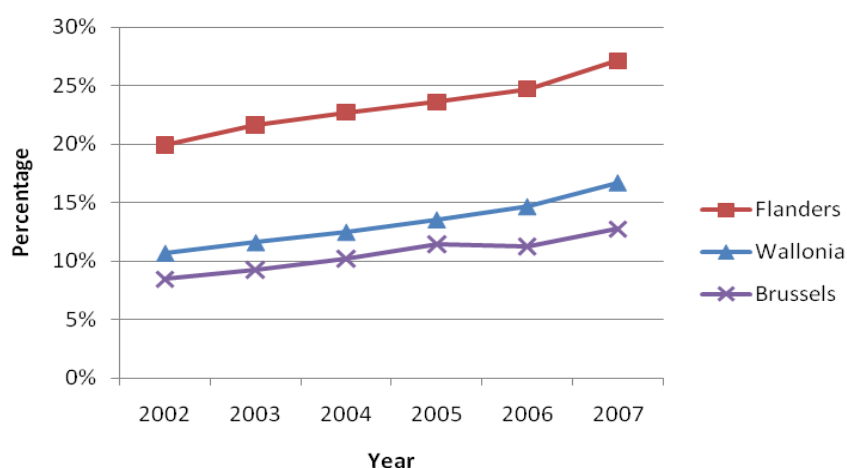
In the Netherlands, the percentage of annual dental visits was 55.1% for children aged 0-12 years in 2007, for young people aged 12-18 years it was 64.7%.

Related performance indicators

QE10: Decayed, missing, filled teeth at age 12.

QE10: DECAYED, MISSING, FILLED TEETH AT AGE 12

Definition

Description

Average number of decayed, missing, filled teeth in children at age 12.

Source

- OECD[68]
- Other international organisations: WHO[69]

Numerator

Number of decayed, missing and filled teeth in Belgian children aged 12.

Denominator

Mid-year number of Belgian children aged 12.

Harmonisation of definition with international organisations

The OECD definition was adopted.

Rationale and indicator characteristics

The DMFT-index is generally used as an indicator of the dental health status of a population, particularly among children. It gives an idea about the *effectiveness* of preventive measures for dental health.

Several studies showed a relationship between a population's level of socio-economic development and dental caries[70][71].

Data source(s)

Source database(s)

No national data are available. The OECD calculated the indicator for Belgium based on surveys of a sample of 12-years old children (until 2001).

However, at present a survey is ongoing about the mouth health of the Belgian population (parallel to Health Interview Survey 2008). Results are expected by June 2011.

Comparability

At present, in some countries data are collected by the WHO Oral Health Programme and corresponding WHO Collaborating Centre in Malmo, Sweden (www.whocollab.od.mah.se). Data have been obtained from standard surveys assisted by the WHO, or from published literature using comparable methods and are working estimates rather than being fully representative. Therefore, the international comparability is limited.

Results

In 2001, the average number of decayed, missing and filled teeth at age 12 was 1.1 in Belgium[72]. More recent data are not available.

Related performance indicators

QE9: Annual check-ups at the dentist.

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[68]   OECD   Health   Data   2009.
http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[69]   WHO European Health For All Database. http://www.euro.who.int/hfadb, accessed August 21st 2009.

[70]   Downer MC, Drugan CS, Blinkhorn AS. Correlates of dental caries in 12-year-old children in Europe: a cross-sectional analysis. Community Dent Health. 2008;25(2):70-8.

[71]   Armfield JM. Socioeconomic inequalities in child oral health: a comparison of discrete and composite area-based measures. J Public Health Dent. 2007 Spring;67(2):119-25.

[72]   OECD   Health   Data   2009.
http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

QE11: CARDIOVASCULAR SCREENING

Definition

Description

Cardiovascular screening in individuals age 45-75.

Source

-

Numerator

Number of Belgian people age 45-75 who report having undergone

a) a blood pressure test

b) a cholesterol test

Denominator

Total Belgian mid-year population aged 45-75.

Harmonisation of definition with international organisations

Not applicable.

Rationale and indicator characteristics

Cardiovascular disease is the most important cause of death in Western countries, although mortality from both ischemic heart disease and cerebrovascular disease has continuously been decreasing in most West European countries over the last decades. According to a recent study, there is a clear north–east to south–west gradient in mortality from cardiovascular disease and ischemic heart disease in Europe[73]. However, the study was based on data from 2000, and no data were available for Belgium.

According to the SCORE model, Belgium is considered to be a low-risk country for the development of cardiovascular disease [74]. To calculate one's risk of dying from cardiovascular disease within 10 years, the following factors are taken into account: age, sex, smoking behaviour, blood pressure and total cholesterol level. A risk of 5% or more is considered to be high.

This indicator measures the *effectiveness* of preventive care.

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[73]   Müller-Nordhorn J, Binting S, Roll S, Willich SN. An update on regional variation in cardiovascular mortality within Europe. Eur Heart J 2008;29:1316-1326.

[74]   De Backer G, Ambrosioni E, Borch-Johnson K, Brotons C, Cifkova R, Dallongeville J, Ebrahim S, Faergeman O, Graham I, Mancia G, Manger Cats V, Orth-Gomér K, Perk J, Pyörälä K, Rodicio JL, Sans S, Sansoy V, Sechtem U, Silber S, Thomson T, Wood D. European guidelines on cardiovascular disease prevention in clinical practice. Third Joint Task Force of European and Other Societies on Cardiovascular Disease Prevention in Clinical Practice. Eur Heart J 2003;24:1601–1610.

Data source(s)

Source database(s)

At present no organised screening for cardiovascular disease is available in Belgium. However, in the near future a nomenclature code will be created for cardiovascular screening in individuals aged 45-75 year, making a calculation of the numerator possible.

Demographic data (denominator) are available from the FPS Economy - Directorate-General Statistics and Economic Information, Demographics division (http://www.statbel.fgov.be/figures/d21_nl.asp).

Comparability

No comparable indicator was identified.

Results

Not available.

Related performance indicators

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QE12: COLON CANCER 5-YEAR SURVIVAL RATE

Definition

Description

Colon cancer 5-year survival rate.

Source

- RIVM (the Netherlands)[75]
- International initiatives: ECHI long list[76], HCQI[77]

Numerator

Number of individuals diagnosed with colon cancer that survive 5 years after diagnosis.

Denominator

All individuals diagnosed with colon cancer in a given year.

ICD10 codes: C18 & C19

Harmonisation of definition with international organisations

The HCQI definition was adopted.

Rationale and indicator characteristics

In 2005, 5 447 new cases of colon cancer were registered in Belgium (males: 2 888; females: 2 559). Overall, colon cancer represented the fourth most frequent cancer after prostate cancer, breast cancer and lung cancer. In males, colon cancer was the third most frequent cancer (after prostate and lung cancer), in females it was the second most frequent cancer (after breast cancer). In 2004, colorectal cancer was the second most important cause of death by cancer in both sexes (2 841 cases) (source: Belgian Cancer Registry, http://www.coldfusionwebhostings.be/PSK/Upload/GENERAL//Brochures/KIB2004-2005/CancerInc_book.pdf).

Screening and treatment of colon cancer should lead to improved survival rates. Several treatment strategies have been linked with improved survival[78].

When comparing data on cancer survival over time or between countries, possible lead-time bias should be taken into account. When cancer is diagnosed earlier, but there is no effect on treatability and prognosis, the prolonged survival that is detected is not a true quality effect.

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75   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

76   http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

77   Mattke S, Kelley E, Scherer P, Hurst J, Lapetra MLG and the HCQI Expert Group Members. Health Care Quality Indicators Project. Initial indicators report. OECD Health Working Papers 2006, n° 22.

78   KCE reports vol. 29 S1: National Clinical Practice Guidelines of the College of Oncology: clinical practice guideline for colorectal cancer.

Data source(s)

Source database(s)

Belgian Cancer Registry: see Supplement 2 for periodicity and data quality.

At present, no 5-year survival data are available for Belgium. By spring 2010, 1- and 3-year survival data are expected for 2004-2005 (Liesbet Van Eycken, personal communication).

Comparability

Thanks to the work of EUROCARE, the methods used by cancer registries internationally are more standardised[79].

Results

In the period 2000-2001, global 5-year survival (actuarial method: life table method) for colorectal cancer was 46% in men and 47% in women in Flanders[80]. Relative 5-year survival (observed survival divided by the expected survival in a group of people with the same gender and age structure from the general population) was 57% in males and females. More recent data are not available at present.

Related performance indicators

QE3: Colorectal cancer screening.

QE14: Breast cancer 5-year survival rate.

QE15: Cervical cancer 5-year survival rate.

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[79]   Mattke S, Kelley E, Scherer P, Hurst J, Lapetra MLG and the HCQI Expert Group Members. Health Care Quality Indicators Project. Initial indicators report. OECD Health Working Papers 2006, n° 22.

[80]   Van Eycken E, De Wever N. Cancer incidence and survival in Flanders, 2000-2001. Flemish Cancer Registry Network, VLK, Brussels, 2006.

QE13: INFANT MORTALITY

Definition

Description

Infant mortality.

Source

- RIVM (the Netherlands)[81]
- International organisations/initiatives: OECD[82], WHO[83], ECHI short list[84]

Numerator

Number of children dying in their first year of life (day 0-364), expressed per 1 000 live births.

Denominator

Total live births in Belgium at or after 22 completed weeks of gestation.

Harmonisation of definition with international organisations

This indicator was identified in the indicator set of the RIVM, but is also measured by several international organisations/initiatives, such as OECD, WHO and ECHI. The used definition for this report is closely related to that of the OECD and WHO, although births before 22 completed weeks of gestation are not considered.

Rationale and indicator characteristics

This is a long-established indicator, not only of child health, but also of the well-being of a society. This indicator reflects the level of mortality, health status and healthcare of a population, and the *effectiveness* of preventive care and the attention paid to maternal and child health[85].

This indicator is also measured by the Flemish Community and Brussels-Capital Health and Social Observatory (see Data source(s)).

Data source(s)

Source database(s)

- Flemish Community: http://www.zorg-en-gezondheid.be/topPage.aspx?id=4828
- Brussels-Capital Health and Social Observatory: http://www.observatbru.be/documents/indicateurs/perinatalite.xml?lang=nl
- French Community: Observatoire Wallon de la Santé

See Supplement 2 for periodicity and data quality.

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[81] Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[82] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[83] http://www.who.int/whosis/en/, accessed August 20th 2009.

[84] http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

[85] Reidpath DD, Allotey P. Infant mortality rate as an indicator of population health. J Epidemiol Community Health. 2003 May;57(5):344-6.

Comparability

Some of the international variation in infant and neonatal mortality rates may be due to variations among countries in registering practices of premature infants (whether they are reported as live births or not). In several countries, such as in the United States, Canada and the Nordic countries, very premature babies (with relatively low odds of survival) are registered as live births, which increases mortality rates compared with other countries that do not register them as live births.

Results

No recent national data are available for Belgium in the absence of data from the Walloon Region between 2000 and 2006 (V. Tellier, personal communication). Table 91 gives the evolution of the infant mortality in the Flemish and Brussels Capital Region between 1998 and 2006. Overall, a decline can be noticed. In comparison to other countries both regions perform well, following the EU-15 average (Figure 64).

For this indicator, many civilised countries already reached the lower limit. The remaining infant mortality for these countries is in large part composed of mortality due to congenital diseases. Part of this mortality can be and is already being avoided by therapeutic abortions.

Table 91: Evolution of the infant mortality in the Flemish and Brussels Capital Region, 1998 – 2006.

Year	Flanders	Brussels
1998	5.1	5.7
1999	4.8	5.2
2000	4.7	5.2
2001	4.5	4.6
2002	4.3	5.1
2003	4.3	5.8
2004	3.9	4.5
2005	3.9	3.3
2006	4.2	3.7

Figure 64: Evolution of infant mortality in selected OECD countries, 1995 – 2006.
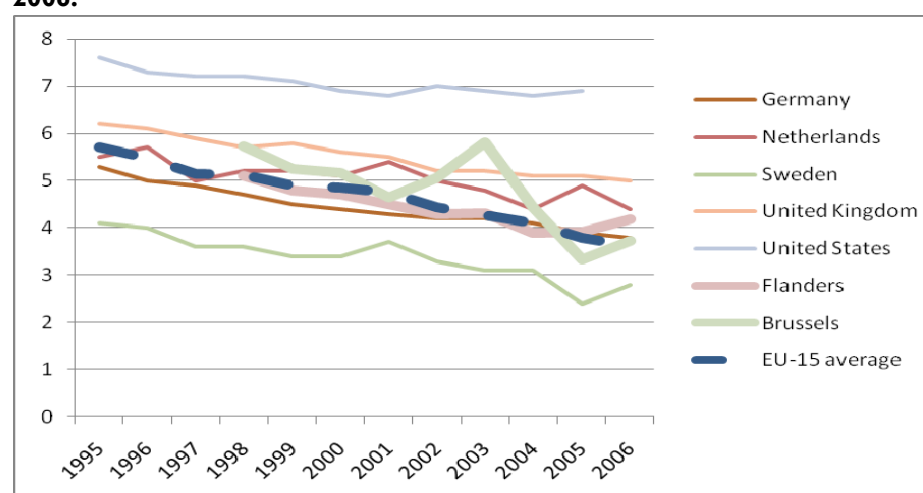
Related performance indicators

Secondary indicator: Premature mortality.

QE13.1: PREMATURE MORTALITY

Definition

Description

Premature mortality.

Source

- OECD[86]

Harmonisation of definition with international organisations

The OECD uses the Potential Years of Life Lost (PYLL) as a summary measure of premature mortality. The calculation of PYLL involves summing up deaths occurring at each age and multiplying this with the number of remaining years to live up to a selected age limit.

Rationale and indicator characteristics

Premature mortality is a measure of unfulfilled life expectancy. Because deaths of younger people are often preventable, the premature mortality rate is a measure that gives more weight to the death of younger people than to older people. Infant mortality is therefore an important contributor to the premature mortality.

Data source(s)

Source database(s)

- OECD Health Data.

Comparability

This indicator is comparable across OECD countries.

Results

No national data are available for Belgium. However, data on PYLL are available for the Flemish Region (http://www.zorg-en-gezondheid.be/topPage.aspx?id=2836).

Related performance indicators

QE13: Infant mortality.

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[86]   OECD   Health   Data   2009.
http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

QE14: BREAST CANCER 5-YEAR SURVIVAL RATE

Definition

Description

Breast cancer 5-year survival rate.

Source

- RIVM (the Netherlands)[87]
- International initiatives: HCQI[88]

Numerator

Number of women diagnosed with breast cancer that survive 5 years after diagnosis.

Denominator

All women diagnosed with breast cancer in a given year.

ICD10 code: C50.

Harmonisation of definition with international organisations

The HCQI definition was adopted.

Rationale and indicator characteristics

In 2005, 9 486 new cases of breast cancer were registered in Belgium (males: 81; females: 9 405). Overall, breast cancer represented the second most frequent cancer after prostate cancer. Breast cancer is the leading cause of death by cancer in females (20.6% of all cancer deaths) (source: Belgian Cancer Registry, http://www.coldfusionwebhostings.be/PSK/Upload/GENERAL//Brochures/KIB2004-2005/CancerInc_book.pdf).

Screening and treatment of breast cancer should lead to improved survival rates. Several treatment strategies have been linked with improved survival[89].

When comparing data on cancer survival over time or between countries, possible lead-time bias should be taken into account. When cancer is diagnosed earlier, but there is no effect on treatability and prognosis, the prolonged survival that is detected is not a true quality effect.

Data source(s)

Source database(s)

Belgian Cancer Registry: see Supplement 2 for periodicity and data quality.

At present, no 5-year survival data are available for Belgium. Spring 2010, 1- and 3-year survival data are expected for 2004-2005 (Liesbet Van Eycken, personal communication).

Comparability

Thanks to the work of EUROCARE, the methods used by cancer registries internationally are more standardised[90].

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[87] Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[88] Mattke S, Kelley E, Scherer P, Hurst J, Lapetra MLG and the HCQI Expert Group Members. Health Care Quality Indicators Project. Initial indicators report. OECD Health Working Papers 2006, n° 22.

[89] Christiaens M-R, Vlayen J, Gailly J, et al. Scientific support of the College of Oncology: a national clinical practice guideline for breast cancer. Good Clinical Practice (GCP). Brussel: Federaal Kenniscentrum voor de Gezondheidszorg (KCE); 2007. KCE reports 63A (D2007/10.273/35).

[90] Mattke S, Kelley E, Scherer P, Hurst J, Lapetra MLG and the HCQI Expert Group Members. Health Care Quality Indicators Project. Initial indicators report. OECD Health Working Papers 2006, n° 22.

Results

Global 5-year survival (actuarial method: life table method) was 75% in Flanders for the period 2000-2001[91]. Relative 5-year survival (observed survival divided by the expected survival in a group of people with the same gender and age structure from the general population) in women was 82%. More recent data are not available at present.

Related performance indicators

QE1: Breast cancer screening.

QE12: Colon cancer 5-year survival rate.

QE15: Cervical cancer 5-year survival rate.

QA2: Proportion of women age <50 or >69 who report receiving screening mammograms within the last two years.

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[91]   Van Eycken E, De Wever N. Cancer incidence and survival in Flanders, 2000-2001. Flemish Cancer Registry Network, VLK, Brussels, 2006.

QE15: CERVICAL CANCER 5-YEAR SURVIVAL RATE

Definition

Description

Cervical cancer 5-year survival rate.

Source

- RIVM (the Netherlands)[92]
- International initiatives: HCQI[93]

Numerator

Number of women diagnosed with cervical cancer that survive 5 years after diagnosis.

Denominator

All women diagnosed with cervical cancer in a given year.
ICD10 code: C53.

Harmonisation of definition with international organisations

The HCQI definition was adopted.

Rationale and indicator characteristics

In 2005, 651 new cases of cervical cancer were registered in Belgium (source: Belgian Cancer Registry, http://www.coldfusionwebhostings.be/PSK/Upload/GENERAL//Brochures/KIB2004-2005/CancerInc_book.pdf).

Screening, preventive measures (e.g. HPV vaccination) and treatment of cervical cancer should lead to improved survival rates. Several treatment strategies have been linked with improved survival[94] [95].

When comparing data on cancer survival over time or between countries, possible lead-time bias should be taken into account. When cancer is diagnosed earlier, but there is no effect on treatability and prognosis, the prolonged survival that is detected is not a true quality effect.

[92] Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[93] Mattke S, Kelley E, Scherer P, Hurst J, Lapetra MLG and the HCQI Expert Group Members. Health Care Quality Indicators Project. Initial indicators report. OECD Health Working Papers 2006, n° 22.

[94] Chemoradiotherapy for Cervical Cancer Meta-Analysis Collaboration. Reducing uncertainties about the effects of chemoradiotherapy for cervical cancer: a systematic review and meta-analysis of individual patient data from 18 randomized trials. J Clin Oncol. 2008;26(35):5802-12.

[95] Neoadjuvant Chemotherapy for Cervical Cancer Meta-Analysis Collaboration (NACCCMA) Collaboration. Neoadjuvant chemotherapy for locally advanced cervix cancer. Cochrane Database Syst Rev. 2004;(2):CD001774.

Data source(s)

Source database(s)

Belgian Cancer Registry: see Supplement 2 for periodicity and data quality.

At present, no 5-year survival data are available for Belgium. Spring 2010, 1- and 3-year survival data are expected for 2004-2005 (Liesbet Van Eycken, personal communication).

Comparability

Thanks to the work of EUROCARE, the methods used by cancer registries internationally are more standardised[96].

Results

Global 5-year survival (actuarial method: life table method) was 68% in Flanders for the period 2000-2001[97]. Relative 5-year survival (observed survival divided by the expected survival in a group of people with the same gender and age structure from the general population) in women was 65%. More recent data are not available at present.

Related performance indicators

QE2: Cervical cancer screening.

QE12: Colon cancer 5-year survival rate.

QE14: Breast cancer 5-year survival rate.

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96   Mattke S, Kelley E, Scherer P, Hurst J, Lapetra MLG and the HCQI Expert Group Members. Health Care Quality Indicators Project. Initial indicators report. OECD Health Working Papers 2006, n° 22.

97   Van Eycken E, De Wever N. Cancer incidence and survival in Flanders, 2000-2001. Flemish Cancer Registry Network, VLK, Brussels, 2006.

QE16A: IN-HOSPITAL MORTALITY AFTER HIP FRACTURE

Definition

Description

In-hospital mortality after hip fracture.

Source

- FPS Health, Food Chain Safety and Environment (multidimensional feedback to hospitals)[98]
- International organisations: AHRQ[99]

Numerator

All persons admitted for a hip fracture (primary diagnosis) and dying during admission.

Denominator

All persons admitted for a hip fracture (primary diagnosis).

MCD: ICD9-CM 820 (fracture of neck of femur).

Exclusion of:

- <18y
- MDC 14
- MDC 15
- Transfer to other acute hospital
- Surgical day cases or long-term stays
- Polytrauma
- Hospitals admitting <80 persons with a hip fracture

Harmonisation of definition with international organisations

The definition used by the FPS was adopted for this report and is very similar to that used by the AHRQ. An important difference is the exclusion of periprosthetic fractures by the AHRQ.

Rationale and indicator characteristics

Hip fractures are frequent causes of disability in elderly and are associated with an important mortality risk. Several interventions are known to positively influence outcomes after hip fracture, such as deep venous thrombosis prophylaxis, antibiotic prophylaxis, adequate nutrition, etc[100]. A recent meta-analysis showed that operative delay beyond 48 hours negatively impacted mortality[101].

Because in-hospital mortality after hip fracture gives information about outcomes and indirectly about the technical quality of care, it is an indicator of *effectiveness*.

Data source(s)

Source database(s)

MCD: see Supplement 2 for periodicity and data quality.

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[98]   FPS Health, Food Chain Safety and Environment. Multidimensional feedback to the hospitals. April 2008.

[99]   Agency for Healthcare Research and Quality. Guide to Inpatient Quality Indicators: Quality of Care in Hospitals – Volume, Mortality, and Utilization. Version 3.1 (March 12, 2007).

[100]   Beaupre LA, Jones CA, Saunders LD, Johnston DW, Buckingham J, Majumdar SR. Best practices for elderly hip fracture patients. A systematic overview of the evidence. J Gen Intern Med. 2005;20(11):1019-25.

[101]   Shiga T, Wajima Z, Ohe Y. Is operative delay associated with increased mortality of hip fracture patients? Systematic review, meta-analysis, and meta-regression. Can J Anaesth. 2008;55(3):146-54.

Comparability

The results can be compared with those of the AHRQ, taking into account the difference in exclusion criteria (see above).

Results

Overall, the fatality rate after hip fracture remained almost stable between 2004 and 2007, both in men and women (Table 92). Importantly, the fatality rate was twice as high in men as in women for all studied age categories. In both sexes, the fatality rate increased with age (Table 93).

The AHRQ reported a much lower mortality rate of 3.01% for 2004[102]. Males were also found to have a higher mortality than females (4.27% vs. 2.50%).

Table 92: In-hospital mortality after hip fracture by sex, 2004-2007.

	Men			Women			Total		
Year	Rate	Fatalities	Cases	Rate	Fatalities	Cases	Rate	Fatalities	Cases
2004	12,2%	325	2672	6,5%	587	9065	7,8%	912	11737
2005	12,6%	353	2807	6,2%	559	9020	7,7%	912	11827
2006	11,9%	343	2877	6,0%	540	9053	7,4%	883	11930
2007	12,2%	349	2865	6,0%	545	9067	7,5%	894	11932

Table 93: In-hospital mortality after hip fracture by age, 2004-2007.

	Men			Women			Total		
Age	Rate	Fatalities	Cases	Rate	Fatalities	Cases	Rate	Fatalities	Cases
65-69	4,6%	43	938	2,4%	37	1557	3,2%	80	2495
70-74	6,3%	87	1371	2,9%	89	3113	3,9%	176	4484
75-79	9,7%	224	2299	3,9%	248	6395	5,4%	472	8694
80+	15,4%	1016	6613	7,4%	1857	25140	9,0%	2873	31753

Related performance indicators

QE16b: In-hospital mortality for community-acquired pneumonia.

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[102]   Agency for Healthcare Research and Quality. Inpatient Quality Indicators. Comparative data for provider indicators. Version 3.1 (March 12, 2007).

QE16B: IN-HOSPITAL MORTALITY FOR COMMUNITY-ACQUIRED PNEUMONIA

Definition

Description

In-hospital mortality for community-acquired pneumonia.

Source

- FPS Health, Food Chain Safety and Environment (multidimensional feedback to hospitals)[103]
- International organisations: AHRQ[104]

Numerator

All persons admitted for a community-acquired pneumonia (primary diagnosis) and dying during admission.

Denominator

All persons admitted for a community-acquired pneumonia (primary diagnosis).

MCD: ICD9-CM pneumonia diagnosis codes :

00322	salmonella pneumonia	4831	chlamydia pneumonia oct96-
0212	pulmonary tularemia	4838	oth spec org pneumonia
0391	pulmonary actinomycosis	4841	pneum w cytomeg incl dis
0521	varicella pneumonitis	4843	pneumonia in whoop cough
0551	postmeasles pneumonia	4845	pneumonia in anthrax
0730	ornithosis pneumonia	4846	pneum in aspergillosis
1124	candidiasis of lung	4847	pneum in oth sys mycoses
1140	primary coccidioidomycos	4848	pneum in infect dis nec
1144	chronic pulmoncoccidioidomycosis	485	broncopneumonia org nos
1145	unspec pulmon coccidioidomycosis	486	pneumonia, organism nos
11505	histoplasm caps pneumon	48230	strep pneumonia unspec
11515	histoplasm dub pneumonia	48231	grp a strep pneumonia
11595	histoplasmosis pneumonia	48232	grp b strep pneumonia
1304	toxoplasma pneumonitis	48239	oth strep pneumonia
1363	pneumocystosis	48240	staph pneumonia unsp oct98-
4800	adenoviral pneumonia	48241	staph aureus pneumon oct98-
4801	resp syncyt viral pneum	48249	staph pneumon oth oct98-
4802	parinfluenza viral pneum	48281	anaerobic pneumonia
4803	pneumonia due to sars oct03-	48282	e coli pneumonia
4808	viral pneumonia nec	48283	oth gram neg pneumonia
4809	viral pneumonia nos	48284	legionnaires dx oct97-
481	pneumococcal pneumonia	48289	bact pneumonia nec
4820	k. pneumoniae pneumonia	5070	food/vomit pneumonitis
4821	pseudomonal pneumonia	5100	empyema with fistula
4822	h.influenzae pneumonia	5109	empyema w/o fistula
4824	staphylococcal pneumonia	5110	pleurisy w/o effus or tb
4829	bacterial pneumonia nos	5130	abscess of lung
4830	mycoplasma pneumonia		

Exclusion of:

- <18y
- MDC 14

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[103]   FPS Health, Food Chain Safety and Environment. Multidimensional feedback to the hospitals. April 2008.
[104]   Agency for Healthcare Research and Quality. Guide to Inpatient Quality Indicators: Quality of Care in Hospitals – Volume, Mortality, and Utilization. Version 3.1 (March 12, 2007).

- MDC 15
- Transfer to other acute hospital
- Patients with missing discharge data
- Hospitals admitting <80 persons with CAP

Harmonisation of definition with international organisations

The definition used by the FPS was adopted for this report and is very similar to that used by the AHRQ.

Rationale and indicator characteristics

CAP is a frequent cause of hospitalisation and carries a high risk of mortality in elderly. Several factors influence clinical outcomes of CAP, including patient characteristics[105], pathogen characteristics[106], and treatment modalities[107].

Because in-hospital mortality for CAP gives information about outcomes and indirectly about the technical quality of care, it is an indicator of *effectiveness*.

Data source(s)

Source database(s)

MCD: see Supplement 2 for periodicity and data quality.

Comparability

The results can be compared with those of the AHRQ.

Results

Overall, the fatality rate for CAP slightly declined between 2004 and 2007, both in men and women (Table 94).The fatality rate was higher for men than for women for all studied age categories. In both sexes, the fatality rate increased with age (Table 95). Persons aged 80+ have a nearly 25% chance of dying when admitted for a CAP.

The AHRQ reported a much lower mortality rate of 5.49% for 2004[108]. Males were also found to have a higher mortality than females (5.78% vs. 5.23%).

Table 94: In-hospital mortality for CAP by sex, 2004-2007.

	Men			Women			Total		
Year	**Rate**	**Fatalities**	**Cases**	**Rate**	**Fatalities**	**Cases**	**Rate**	**Fatalities**	**Cases**
2004	15,9%	2497	15745	14,3%	1760	12268	15,2%	4257	28013
2005	14,5%	2471	17079	13,3%	1848	13913	13,9%	4319	30992
2006	15,1%	2400	15846	13,7%	1684	12332	14,5%	4084	28178
2007	14,4%	2494	17364	12,7%	1685	13276	13,6%	4179	30640

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[105] Fine MJ, Smith MA, Carson CA, Mutha SS, Sankey SS, Weissfeld LA, Kapoor WN. Prognosis and outcomes of patients with community-acquired pneumonia. A meta-analysis. JAMA. 1996;275(2):134-41.

[106] Tleyjeh IM, Tlaygeh HM, Hejal R, Montori VM, Baddour LM. The impact of penicillin resistance on short-term mortality in hospitalized adults with pneumococcal pneumonia: a systematic review and meta-analysis. Clin Infect Dis. 2006;42(6):788-97.

[107] Siempos II, Vardakas KZ, Kopterides P, Falagas ME. Adjunctive therapies for community-acquired pneumonia: a systematic review. J Antimicrob Chemother. 2008 Oct;62(4):661-8.

[108] Agency for Healthcare Research and Quality. Inpatient Quality Indicators. Comparative data for provider indicators. Version 3.1 (March 12, 2007).

Table 95: In-hospital mortality for CAP by age, 2004-2007.

Age	Men			Women			Total		
	Rate	Fatalities	Cases	Rate	Fatalities	Cases	Rate	Fatalities	Cases
18-39	1,4%	77	5412	1,1%	55	5108	1,3%	132	10520
40-64	7,1%	1078	15191	4,5%	462	10341	6,0%	1540	25532
65-79	14,8%	3622	24475	11,5%	1623	14093	13,6%	5245	38568
80+	24,3%	5085	20956	21,7%	4837	22247	23,0%	9922	43203

Related performance indicators

QE16a: In-hospital mortality after hip fracture.

QE17: DIABETES-RELATED MAJOR AMPUTATIONS

Definition

Description

Number of diabetes-related major amputations per 10 000 diabetics aged 18-75.

Indicator source

- RIVM (the Netherlands)[109]
- International organisations: HCQI[110], AHRQ[111]

Numerator

Proportion of diabetes-related major amputations x 10 000.

MCD: ICD-9-CM codes:

Procedure codes for lower-extremity amputation
8410 Lower Limb Amputat Nos
8411 Toe Amputation
8412 Amputation Through Foot
8413 Disarticulation Of Ankle
8414 Amputat Through Malleoli
8415 Below Knee Amputat Nec
8416 Disarticulation Of Knee
8417 Above Knee Amputation
8418 Disarticulation Of Hip
8419 Hindquarter Amputation
Diagnosis Codes For Diabetes:
25000 Dmii Wo Cmp Nt St Uncntr
25001 Dmi Wo Cmp Nt St Uncntrl
25002 Dmii Wo Cmp Uncntrld
25003 Dmi Wo Cmp Uncntrld
25010 Dmii Keto Nt St Uncntrld
25011 Dmi Keto Nt St Uncntrld
25012 Dmii Ketoacd Uncontrold
25013 Dmi Ketoacd Uncontrold
25020 Dmii Hprsm Nt St Uncntrl
25021 Dmi Hprsm Nt St Uncntrld
25022 Dmii Hprosmlr Uncontrold
25023 Dmi Hprosmlr Uncontrold
25030 Dmii O Cm Nt St Uncntrld
25031 Dmi O Cm Nt St Uncntrl
25032 Dmii Oth Coma Uncontrold
25033 Dmi Oth Coma Uncontrold
25040 Dmii Renl Nt St Uncntrld
25041 Dmi Renl Nt St Uncntrld
25042 Dmii Renal Uncntrld
25043 Dmi Renal Uncntrld
25050 Dmii Ophth Nt St Uncntrl
25051 Dmi Ophth Nt St Uncntrld
25052 Dmii Ophth Uncntrld
25053 Dmi Ophth Uncntrld

[109] Westert GP, Verkleij H. Dutch Health Care Performance Report 2006. RIVM 2006.

[110] Mattke S, Kelley E, Scherer P, Hurst J, Lapetra MLG and the HCQI Expert Group Members. Health Care Quality Indicators Project. Initial indicators report. OECD Health Working Papers 2006, n° 22.

[111] Agency for Healthcare Research and Quality. National Healthcare Quality Report 2008. AHRQ Publication No. 09-0001.

25060 Dmii Neuro Nt St Uncntrl
25061 Dmi Neuro Nt St Uncntrld
25062 Dmii Neuro Uncntrld
25063 Dmi Neuro Uncntrld
25070 Dmii Circ Nt St Uncntrld
25071 Dmi Circ Nt St Uncntrld
25072 Dmii Circ Uncntrld
25073 Dmi Circ Uncntrld
25080 Dmii Oth Nt St Uncntrld
25081 Dmi Oth Nt St Uncntrld
25082 Dmii Oth Uncntrld
25083 Dmi Oth Uncntrld
25090 Dmii Unspf Nt St Uncntrl
25091 Dmi Unspf Nt St Uncntrld
25092 Dmii Unspf Uncntrld
25093 Dmi Unspf Uncntrld

Exclusion of cases:

- transferring from another institution
- MDC 14 (pregnancy, childbirth, and puerperium)
- MDC 15 (newborn and other neonates)
- with trauma diagnosis code in any field

Exclusion of trauma diagnosis codes:

8950 Amputation Toe
8951 Amputation Toe-Complicat
8960 Amputation Foot, Unilat
8961 Amput Foot, Unilat-Compl
8962 Amputation Foot, Bilat
8963 Amputat Foot, Bilat-Comp
8970 Amput Below Knee, Unilat
8971 Amputat Bk, Unilat-Compl
8972 Amput Above Knee, Unilat
8973 Amput Abv Kn, Unil-Compl
8974 Amputat Leg, Unilat Nos
8975 Amput Leg, Unil Nos-Comp
8976 Amputation Leg, Bilat
8977 Amputat Leg, Bilat-Compl

Denominator

All individuals aged 18-75 with a diagnosis of diabetes.

Harmonisation of definition with international organisations

The denominator of the original indicator is not measurable, since no exact epidemiological data are available for Belgium. For the OECD, the FPS provides data for the following indicator: Diabetes lower extremity amputation rate (numerator: All non-maternal discharges [age 15+] with procedure code for lower extremity amputation in any field and diagnosis code of diabetes in any field; denominator: Total Belgian population aged 15+). This definition was adopted for the present report as a proxy of the original indicator.

Rationale and indicator characteristics

According to the Health Interview Survey[112], the self-reported prevalence of diabetes in Belgium rose from 2.3% in 1997 to 3.5% in 2004. Many diabetic patients are faced with microvascular and macrovascular complications, sometimes necessitating amputation. Adequate glycaemic control[113] and treatment of other cardiovascular risk factors[114] is known to prevent diabetic complications.

The rate of diabetes-related major amputations gives information on a hard outcome of diabetic care, and is therefore an indicator of *effectiveness*.

Data source(s)

Source database(s)

MCD: see Supplement 2 for periodicity and data quality.

Comparability

Both the AHRQ and the HCQI use the prevalent diabetic population as denominator, which makes comparison with our results difficult at present.

Results

For 2006, the FPS calculated the diabetes lower extremity amputation rate to be 21.32 per 100 000 Belgian population (95%CI 20.41-22.23), with more men than women undergoing amputations (33.56 [31.79-35.32] vs. 11.63 [10.75-12.52]).

In the Netherlands, the RIVM reported 35 diabetes-related major amputations per 10 000 diabetics aged 18-75[115].

Related performance indicators

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[112] Belgian Health Interview Survey – Interactive analysis. http://www.iph.fgov.be/EPIDEMIO/hisia/index.htm. Accessed August 19th 2009.
[113] Stettler C, Allemann S, Jüni P, Cull CA, Holman RR, Egger M, Krähenbühl S, Diem P. Glycemic control and macrovascular disease in types 1 and 2 diabetes mellitus: Meta-analysis of randomized trials. Am Heart J. 2006 Jul;152(1):27-38.
[114] Saha SA, Molnar J, Arora RR. Tissue angiotensin-converting enzyme inhibitors for the prevention of cardiovascular disease in patients with diabetes mellitus without left ventricular systolic dysfunction or clinical evidence of heart failure: a pooled meta-analysis of randomized placebo-controlled clinical trials. Diabetes Obes Metab. 2008 Jan;10(1):41-52.
[115] Westert GP, Verkleij H. Dutch Health Care Performance Report 2006. RIVM 2006.

QA1: PRESCRIPTION ACCORDING TO GUIDELINES

Definition

Description

Percentage of cases in which GPs prescribe according to guidelines.

Source

- RIVM (the Netherlands)[116]

Numerator

1. Number of women with uncomplicated urinary tract infection (UTI) that are treated with trimethoprim or nitrofurantoin for 3 days

2. Number of individuals with acute otitis media (AOM) that are not treated with antibiotics

3. Number of individuals with uncomplicated hypertension that are treated with diuretics or betablocking agents

Denominator

1. All women with uncomplicated UTI

2. All individuals with AOM

3. All individuals with uncomplicated hypertension

Harmonisation of definition with international organisations

Not applicable.

Rationale and indicator characteristics

Clinical practice guidelines are intended to reduce variability in care and to enhance the *appropriateness* of medical acts. However, the implementation of guidelines remains a difficult problem.

The prescription of antibiotics receives a lot of attention in view of the increasing antibiotic resistance related to inappropriate antibiotic use[117]. For this indicator, 2 recommendations – based on good evidence – were selected from recently updated guidelines[118]. For women with uncomplicated UTI, treatment with trimethoprim or nitrofurantoin for 3 days is recommended. For patients with AOM, treatment with antibiotics is not recommended.

A third recommendation is related to the prescription of antihypertensive agents. According to the guidelines of Domus Medica – which were validated by the Belgian Centre for Evidence-Based Medicine (CEBAM), but are currently undergoing a revision – first-line treatment of uncomplicated hypertension consists of diuretics (thiazides) or betablocking agents[119].

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[116] Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[117] Catry B, Hendrickx E, Preal R, Mertens R. Multicentrische studie. Verband tussen antibioticaconsumptie en microbiële resistentie bij de individuele patiënt. IMA – BAPCOC – WIV, November 2008.

[118] Dirven K, De Sutter A, Van Royen P, Mambourg F, Van Den Bruel A. Guidelines update. Good Clinical Practice (GCP). Brussel: Federaal Kenniscentrum voor de gezondheidszorg (KCE); 2006. KCE reports 43A (D/2006/10.273/48).

[119] De Cort P, Philips H, Govaerts F, Van Royen P. Hypertensie. http://www.domusmedica.be/kwaliteit/aanbevelingen/overzicht/hypertensie-horizontaalmenu-384.html, accessed August 26th 2009.

Data source(s)

Source database(s)

Information on prescriptions can be retrieved from Pharmanet. However, these data do not contain clinical information, rendering the measurement of this indicator not feasible at present.

Comparability

Not applicable.

Results

None.

Related performance indicators

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QA2: PROPORTION OF WOMEN AGE < 50 OR >71 RECEIVING MAMMOGRAMS WITHIN THE LAST TWO YEARS

Definition

Description

Proportion of women age <50 or >71 receiving mammograms within the last two years.

Source

-

Numerator

Number of Belgian women aged 40-49 or 72-79 in a given year who are still alive at the end of the year, having received a mammogram within the past two years (see Figure 65).

NIHDI billing codes: 450096-450100, 461090-461101. It should be noted that it is impossible to distinguish opportunistic mammograms (i.e. mammogram used for opportunistic screening outside the screening programme) and diagnostic mammograms (i.e. mammogram used for diagnostic reasons, e.g. in women with symptoms or at high risk).

Importantly, in the IMA database only the year of birth is available and not the exact date of birth. Therefore, it is impossible for an individual woman to verify if she received a mammography within the 2 years prior to her 40th – 49th or 72nd – 79th birthday. It is only possible to verify if a woman received a mammography in the year of her 40th – 49th or 72nd – 79th birthday (T) and the year before (T-1). To allow all women in the sample to have a full 2-year period covered, an analysis including T-2 is necessary (i.e. the number of women with at least one mammography in the year of her 40th – 49th or 72nd – 79th birthday or the 2 preceding years). However, this approach may induce an overestimation of good-quality care.

Denominator

Total number of Belgian women aged 40-49 or 72-79 in a given year who are still alive at the end of the year.

Figure 65: Flowchart of indicator QA2.
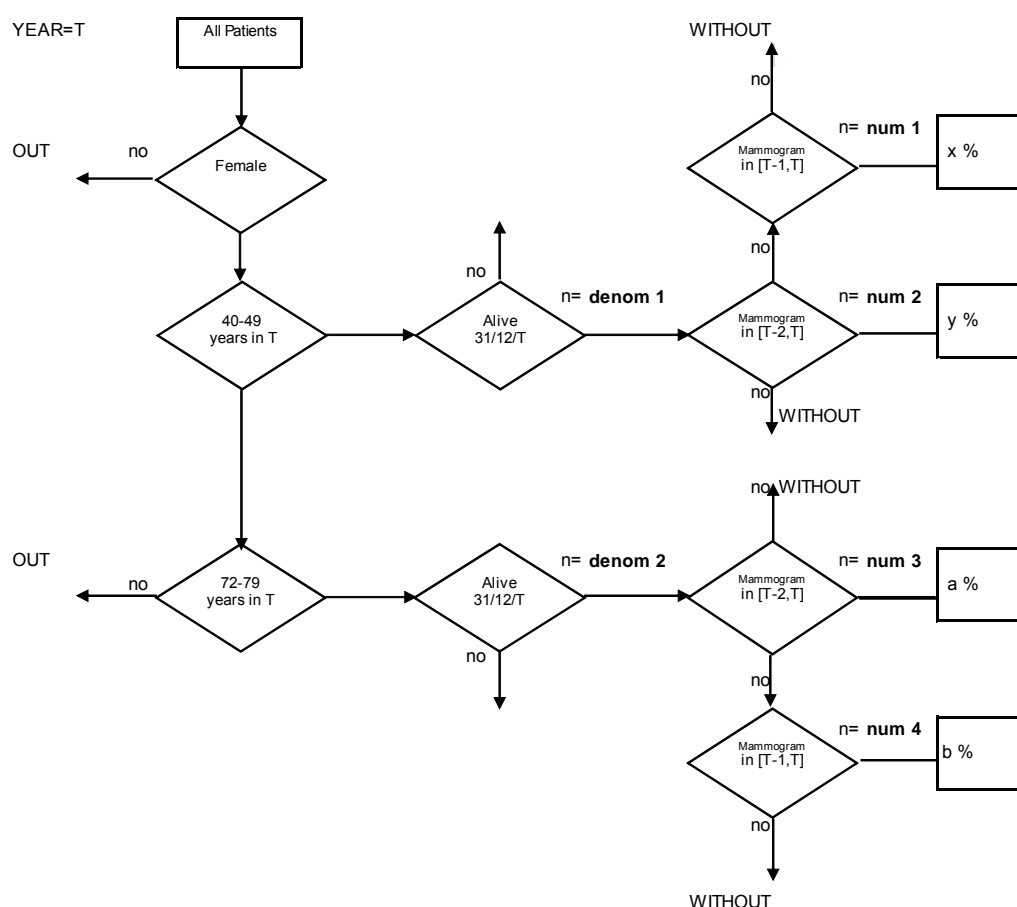
Harmonisation of definition with international organisations

> Not applicable.

Rationale and indicator characteristics

> Since 2001 in Flanders and 2002 in Brussels and Wallonia, a national breast cancer screening programme exists for women aged 50-69 using the mammotest. The extension of the scope of this programme to younger (40-49) and older age categories (70-79) remains controversial[120][121][122]. The present indicator measures in how far breast cancer screening is really limited to the age group 50-69, and thus how many women falling outside this age category undergo opportunistic and thus *inappropriate* screening.

Data source(s)

Source database(s)

> IMA (see Supplement 2 for periodicity and data quality). For the present report the permanent sample 2002-2007 was used. The over-sampling was not corrected for the older age group.

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[120] Armstrong K, Moye E, Williams S, Berlin JA, Reynolds EE. Screening mammography in women 40 to 49 years of age: a systematic review for the American College of Physicians. Ann Intern Med. 2007 Apr 3;146(7):516-26.

[121] Galit W, Green MS, Lital KB. Routine screening mammography in women older than 74 years: a review of the available data. Maturitas. 2007 Jun 20;57(2):109-19.

[122] Gøtzsche PC, Nielsen M. Screening for breast cancer with mammography. Cochrane Database Syst Rev. 2006 Oct 18;(4):CD001877.

Comparability

Not applicable.

Results

Table 96 gives the percentage of women aged 40-49 or 72-79 having had a mammogram during the previous 2 or 3 years. Opportunistic screening seems to be common practice in women aged 40-49, with about one third having had a mammogram. Beyond the age of 72 years, opportunistic screening becomes less common. However, for both age categories, the rate increased between 2004 and 2007 (p-value of test for trend <0.0001 in both age categories and whatever the period analyzed). Again, opportunistic screening mammograms cannot be distinguished from diagnostic mammograms.

Table 96: Mammogram rate in women aged 40-49 or 72-79, 2004 – 2007.

Age	Year	Mammogram rate calculated on	
		2 years (T-1, T)	**3 years (T-2, T-1, T)**
40-49	2004	32.0%	38.5%
40-49	2005	33.6%	39.4%
40-49	2006	34.4%	40.4%
40-49	2007	34.7%	41.3%
72-79	2004	15.6%	20.0%
72-79	2005	16.3%	20.7%
72-79	2006	17.3%	21.9%
72-79	2007	18.4%	23.1%

There are a number of socioeconomic variables available in the IMA dataset that can be used as proxy variables for the social class. More details on these variables are provided in the technical note of indicator QA6. The percentage of women aged 40-49 and 72-79 years in 2007 undergoing a mammogram was stratified for a selection of socioeconomic variables, and only taking into account a period of 3 years. A chi-square test of independence was run to test the association between each socio-economic variable and the percentage of women (=0.05).

For the group aged 40-49 years, all proxy variables showed an association with the mammogram rate (p<0.05). The groups that were associated with clearly lower mammogram rates were women entitled to a preferential reimbursement (31.9% [95%CI 29.7-34.2%) vs. 42.2% [41.5-43%]); women from the general regime (41% [40.3-41.8%] vs. 43.9% [41.7-46.1%] for the self-employed women); women who are pensioners, widows, persons with disabilities or orphans (PWDO) (37.4% [35.1-39.7%] vs. 41.7% [41.0-42.5%]); women disabled for more than one year or handicapped (38.3% [35.5-41.1%] vs. 41.5% [40.8-42.2%]); women without minor risks coverage (34.4% [28.6-40.6%] vs. 41.1% [40.3-41.8%] for women with minor risks coverage and 45.7% [43.2-48.2%] for the freely insured); and (especially partially) unemployed women (partially 31.7% [28.5-35.1%], full-time 35% [32.9-37.1%], not unemployed 42.6% [41.8-43.3%]). The rate for women from the private sector amounted to 40% (39.2-40.8%) vs. 44% (41.8-46.2%) for the self-employed sector and 49.7% (47.6-51.8%) for the public sector. Finally, a lower rate was also observed in the small group of women entitled to income guarantee for elderly, subsistence level income or support from OCMW/CPAS (23.1% [18.9-27.7%] vs. 41.7% [41-42.4%]).

The results by maximum billing system are more difficult to interpret. The rate was found to be the lowest for women outside the system (41.2% [40.5-41.9%]) followed by women entitled to reimbursement based on €450 or €650 ceilings (41.6% [38-45.2%]). The highest rate was observed in women entitled to reimbursement based on higher ceilings (51% [44.5-57.5%]).

For the group aged 72-79, some statistically significant associations were similar to those observed in younger women, such as a lower rate for women entitled to preferential reimbursement or disabled for more than one year or handicapped, or entitled to income guarantee for elderly, subsistence level income or support from OCMW/CPAS.

The relationship between maximum billing system and mammogram rate followed the same pattern as for the younger age group. However, the older group was smaller and some differences across other classifications did not reach statistical significance (e.g. PWDO status or coverage of the minor risks). Some results were opposed or at least different to what was observed in the younger women group. Self-employed women had a lower rate than women from the general regime (18.6% [15.9-21.5%] vs. 23.5% [22.6-24.4%]). The rate in women from the self-employed sector amounted to 16.9% (13-21.4%) vs. 22.4% (21.4-23.4%) for the private sector and 28.9% (26.7-31.3%) for the public sector.

Figure 66 and Figure 67 show the evolution of the mammogram rates in both age categories per region (based on a 3-year calculation). The rates in Flanders are lower than in the two other regions.

Figure 66: Mammogram rate in women aged 40-49 per region, 2004-2007 (based on 3 years).
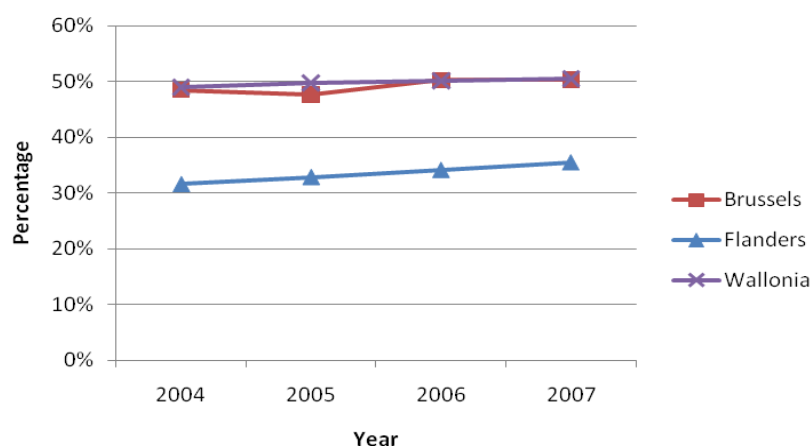
Figure 67: Mammogram rate in women aged 72-79 per region, 2004-2007 (based on 3 years).
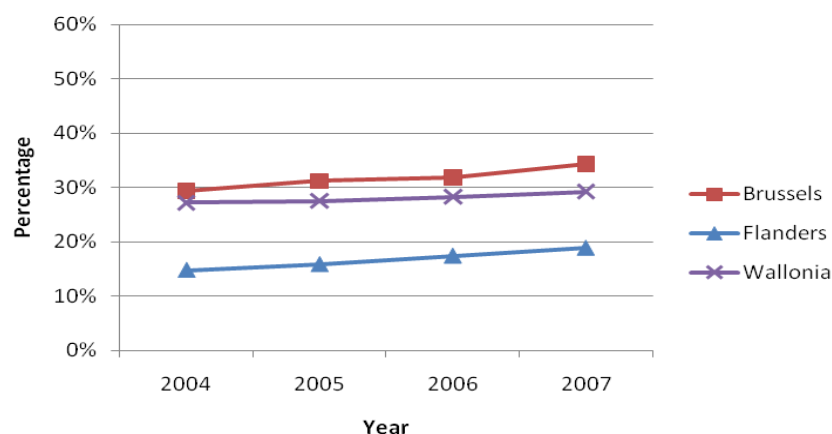
Related performance indicators

QE1: Breast cancer screening with mammotest in women aged 50-69.

QE1.1: Breast cancer screening with mammography in women aged 50-69.

QE14: Breast cancer 5-year survival rate.

QA3A: UTILISATION OF MINIMAL AND NON-INVASIVE SURGICAL TECHNIQUES

Definition

Description

Utilisation of minimal and non-invasive surgical techniques.

Source

- RIVM (the Netherlands)[123]
- Other international organisations/initiatives: AHRQ[124], OECD[125]

Numerator

1. Number of laparoscopic cholecystectomies: ICD-9-CM code 51.23

2. Number of PTCAs: ICD-9-CM codes 00.66, 36.01, 36.02 and 36.05

The ICD-9-CM procedure codes for stenting (36.06, 36.07) were not selected, as they should be simultaneously coded together with the 36.01, 36.02, 36.05 PTCA codes.

Denominator

1. All cholecystectomies (laparoscopic + open): ICD-9-CM codes 51.23 and 51.22

2. All cardiac revascularisation procedures (CABG + percutaneous): ICD-9-CM codes 36.1x, 00.66, 36.01, 36.02 and 36.05

Several codes can be recorded simultaneously for one CABG procedure. For example, codes 36.11, 36.12, 36.13 and 36.14 indicate the number of vessels involved, while 36.15, 36.16 and 36.17 respectively indicate a single internal mammary, a double internal mammary and an abdominal bypass. Therefore, if several codes were coded on the same day, they were counted only as one procedure.

Harmonisation of definition with international organisations

The RIVM uses a score that is calculated by dividing the availability or the use of minimal-invasive techniques (keyhole operations [proportion of the total number of gall bladder operations], radiation therapy, and for diagnostic purposes the MRI scan, CT scan and mammogram unit) in a country by the availability or use of these techniques in all OECD countries. For the present report, it was decided to focus on 2 minimal-invasive surgical techniques that are also measured as such by the OECD.

Rationale and indicator characteristics

The use of minimal-invasive techniques is a means for reducing postoperative complications, length-of-stay and costs[126][127]. It is therefore an indicator of *efficiency*. However, these techniques are not considered *appropriate* for all patients and careful patient selection is necessary. The use of these newer minimal-invasive techniques is also considered to be an indication of innovation (*sustainability*).

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[123] Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[124] Agency for Healthcare Research and Quality. Guide to Inpatient Quality Indicators: Quality of Care in Hospitals – Volume, Mortality, and Utilization. Version 3.1 (March 12, 2007).

[125] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[126] Modi P, Hassan A, Chitwood WR Jr. Minimally invasive mitral valve surgery: a systematic review and meta-analysis. Eur J Cardiothorac Surg. 2008;34(5):943-52.

[127] Keus F. de Jong JA. Gooszen HG. van Laarhoven CJ. Laparoscopic versus open cholecystectomy for patients with symptomatic cholecystolithiasis. Cochrane Database of Systematic Reviews. (4):CD006231, 2006.

Data source(s)

Source database(s)

MCD: see Supplement 2 for periodicity and data quality.

Comparability

The use of laparoscopic cholecystectomy and PTCA is also measured by the OECD, and is therefore comparable.

Results

Amongst 22 229 cholecystectomies performed in 2004, 19 024 (85.6%) were laparoscopic. In 2005, the rate of laparoscopic cholecystectomies rose to 86.7% of all cholecystectomies. Between 2000 and 2005, the trend was slightly upwards in Belgium (Figure 68). The results are in line with those of other countries. In contrast, the UK less than 40% of the cholecystectomies are laparoscopic.

Figure 68: Evolution of the rate of laparoscopic cholecystectomies in selected OECD countries, 2000 – 2005.
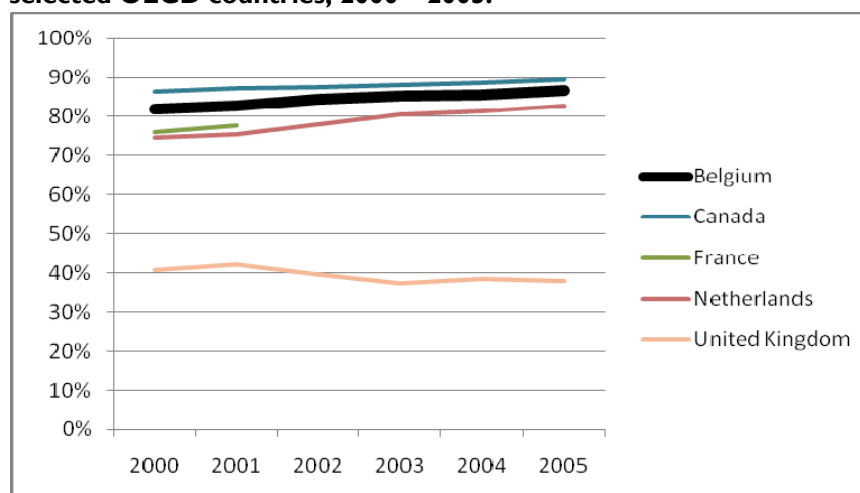
In 2004, 9 491 CABGs and 25 799 (73.1% of total) PTCAs were performed. In 2005, the percentage of PTCAs rose to 74.6% (n = 25 775). As for the rate of laparoscopic cholecystectomies, the percentage of PTCAs is gradually increasing (Figure 69), not only in Belgium but also in other OECD countries.

Figure 69: Evolution of the rate of PTCAs in selected OECD countries, 2000 – 2005.
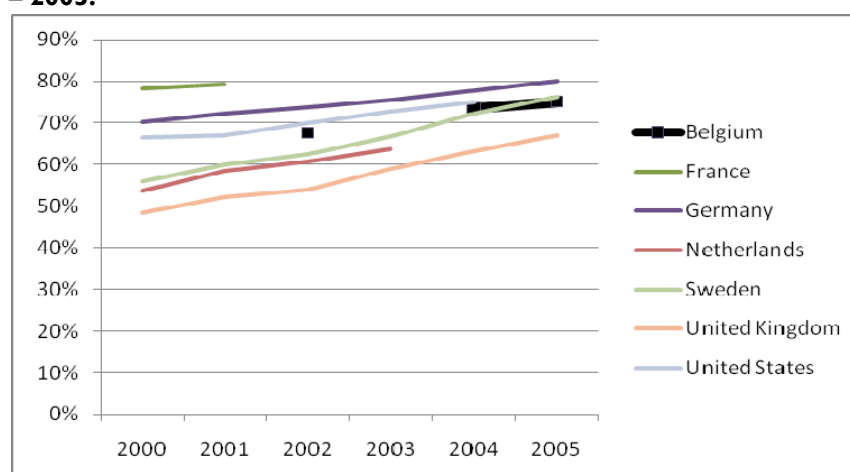
Related performance indicators

QA3b: Speed of diffusion of minimal and non-invasive surgical techniques.

QA3B: SPEED OF DIFFUSION OF MINIMAL AND NON-INVASIVE SURGICAL TECHNIQUES

Definition

Description

Speed of diffusion of minimal and non-invasive surgical techniques.

Source

- RIVM (the Netherlands)[128]

Numerator

Same as indicator QA3a, but analysed as a trend and per centre.

Denominator

Same as indicator QA3a, but analysed as a trend and per centre.

Harmonisation of definition with international organisations

See indicator QA3a.

Rationale and indicator characteristics

See indicator QA3a.

Data source(s)

Source database(s)

MCD: see Supplement 2 for periodicity and data quality.

Comparability

See indicator QA3a.

Results

The percentage of cholecystectomies that are laparoscopic varied between 41% and 100% in 2004 and between 50% and 100% in 2005 across the Belgian hospitals (Figure 70). The number of hospitals having ≥90% laparoscopic cholecystectomies amounted to 53 in 2004 (46.1% of all hospitals). In 2005, 52.6% of the hospitals (n=61) had a percentage of ≥90%.

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[128]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

Figure 70: Percentage of laparoscopic cholecystectomies analysed per centre (MCD 2004-2005).
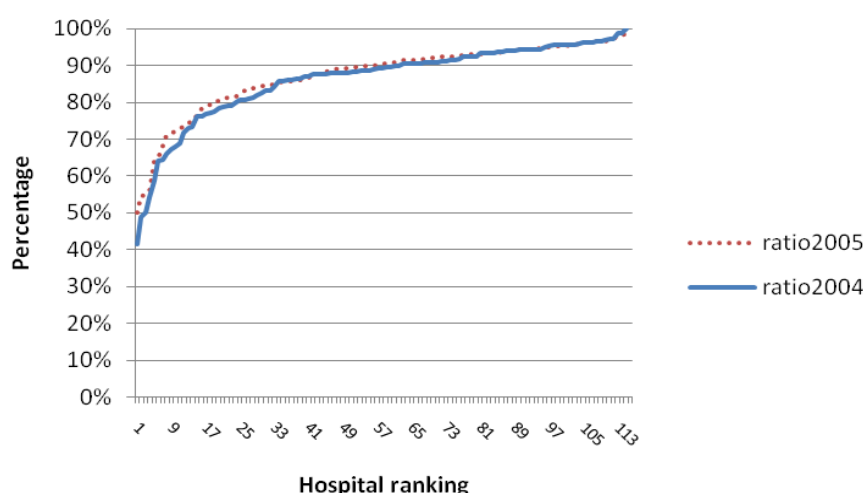
The percentage of PTCAs amongst all cardiac revascularisations (PTCAs + CABGs) was only calculated for hospitals belonging to the B3 cardiac care program[129], which are allowed to perform PTCAs and cardiac surgery (n=26 at the end of 2005). About 91% of all PTCAs and 96% of all CABGs are performed in B3 hospitals (the remaining procedures are performed in a B3 cardiac surgical facility on patients admitted in another hospital, but transferred to the B3 facility for the procedure and returning to their initial hospital to recover). In 2004, the percentage of PTCAs varied between 60% and 84%, and was ≥80% in only two hospitals (Figure 71). In 2005, five hospitals reached the 80% threshold (range 61-88%).

Figure 71: Percentage of PTCAs in PTCAs+CABGs per B3 hospitals (MCD 2004-2005)
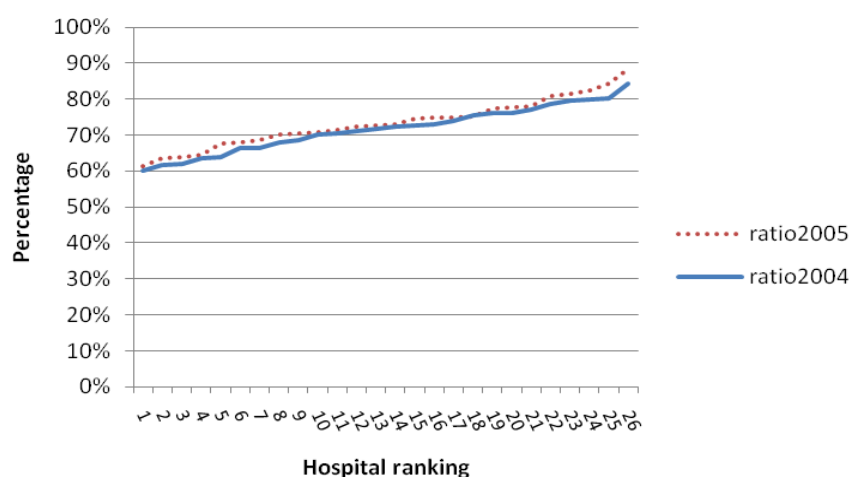
Related performance indicators

QA3a: Utilisation of minimal and non-invasive surgical techniques.

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[129]   Variations des pratiques médicales hospitalières en cas d'infarctus aigu du myocarde en Belgique, Van Brabandt H, Ramaekers D, Bonneux L, Camberlin C, Vrijens F, Parmentier Y, KCE 2005.

QA4: PERCENTAGE OF INSTITUTIONS THAT USE SPECIAL PROTOCOLS OR GUIDELINES OUTLINING PROCEDURES FOR HIGH RISK OR COMPLEX PROCESSES

Definition

Description

Percentage of institutions that use special protocols or guidelines outlining procedures for high risk or complex processes.

Source

- RIVM (the Netherlands)[130]

Numerator

Number of acute hospitals that use special protocols or guidelines outlining procedures for high risk or complex processes.

Denominator

All acute hospitals.

Harmonisation of definition with international organisations

Not applicable.

Rationale and indicator characteristics

Many institutions use protocols, guidelines or clinical pathways to standardise mainly well-defined care processes[131]. Common examples are the care processes for prosthetic joint replacement, inguinal hernia repair, etc. However, the impact of the use of these instruments on patient outcomes still needs to be established in good-quality studies. Application of clinical pathways should therefore include specific in- and exclusion criteria.

Data source(s)

Source database(s)

FPS Health, Food Chain Safety and Environment: Yearly hospital statistics, http://www.health.fgov.be/hospitalstatistics.

Annual survey without validation process. Data are available before 2008, but 2008 is the first year for which more than half of the hospital sites gave a valid answer. Information is only available by hospital site (n=205 in 2008) and cannot be gathered by hospital entity.

Comparability

Only data from the Netherlands are available.

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[130]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care
         Performance Report 2008. RIVM 2008.
[131]   Devriese S, Lambert ML, Eyssen M, Van De Sande S, Poelmans J, Van Brabandt H, Sermeus W, Vlayen J, Ramaekers D. Defining hospital physicians' renumeration prospectively on clinical pathways and guidelines: easier said than done. Brussel: Federaal Kenniscentrum voor de Gezondheidszorg (KCE); 2005. KCE Reports vol. 18A. Ref. D/2005/10.273/19

Results

Figure 72 gives the percentage of hospital sites that have less than 25%, between 25% and 75%, or more than 75% of the patients with a specific condition entering a clinical pathway. The number of patients is an estimation given by each site. Without taking into account invalid answers (left grey section), almost half of the Belgian hospital sites had patients who entered a cerebral vascular accident clinical pathway (57/115) in 2008. For total knee prosthesis, the rate was 64% (80/160), for total hip prosthesis 66%, for diabetes 51%, for transurethral prostatectomy and breast cancer 46%, for inguinal hernia 44% and for other clinical pathways 73%.

Figure 72: Percentage of acute hospital sites with patients entering a clinical pathway (2008).
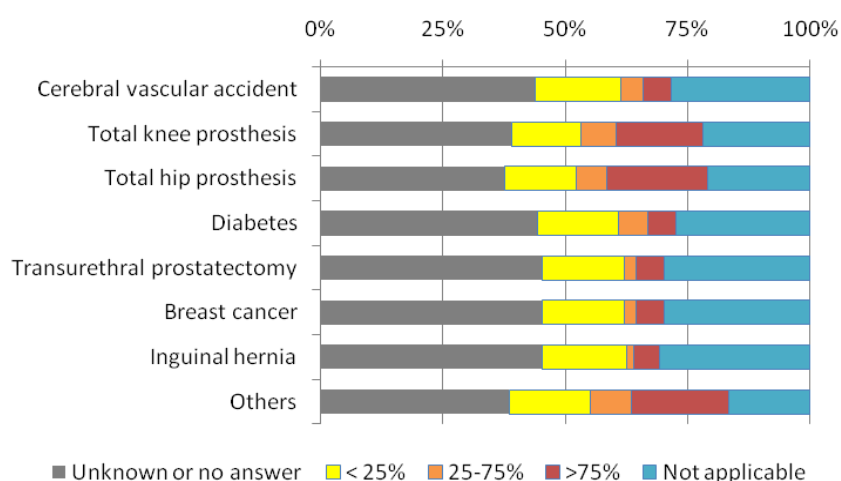
Related performance indicators

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QA5: CAESAREAN SECTION RATE

Definition

Description

Caesarean sections per 1 000 live births.

Source

- OECD[132]
- Other international organisations: AHRQ[133], WHO[134]

Numerator

Number of caesarean sections x 1 000.

ICD9-CM codes:

74.0 Classical caesarean section

74.1 Low cervical caesarean section

74.2 Extraperitoneal caesarean section

74.4 Caesarean section of other specified type

74.99 Other caesarean section of unspecified type

Denominator

All live births.

Harmonisation of definition with international organisations

The definition used by the OECD and WHO was adopted. The AHRQ uses all deliveries as denominator, with exclusion of patients with abnormal presentation, preterm, fetal death, multiple gestation diagnosis codes, and breech procedure codes.

Rationale and indicator characteristics

A study of the FPS Health, Food Chain Safety and Environment showed a steady increase of the proportion of caesarean sections of about 2% every 6 months, with important differences in practice across the Belgian hospitals[135]. Non-medical factors of the proportion of caesarean sections were found to be day of admission and the geographical region. In women with a low-risk delivery, the proportion of caesarean sections increased with age.

The caesarean section rate is an indicator of *appropriateness*, in that the indication for a caesarean delivery largely depends on patients' clinical characteristics. It is known that individual physician practice patterns account for a significant portion of the variation in the caesarean section rate[136][137][138].

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132   OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

133   Agency for Healthcare Research and Quality. Guide to Inpatient Quality Indicators: Quality of Care in Hospitals – Volume, Mortality, and Utilization. Version 3.1 (March 12, 2007).

134   WHO European Health For All Database. http://www.euro.who.int/hfadb, accessed August 21st 2009.

135   FPS Health, Food Chain Safety and Environment. Multidimensional feedback to the hospitals. April 2008.

136   Goyert GL, Bottoms SF, Treadwell MC, Nehra PC. The physician factor in cesarean birth rates. N Engl J Med. 1989;320(11):706-9.

137   Coco AS, Gates TJ, Gallagher ME, Horst MA. Association of attending physician specialty with the cesarean delivery rate in the same patient population. Fam Med. 2000;32(9):639-44.

138   Poma PA. Effects of obstetrician characteristics on cesarean delivery rates. A community hospital experience. Am J Obstet Gynecol. 1999;180(6):1364-72.

A recent meta-analysis showed that the number of caesarean sections can be safely reduced by interventions (e.g. multifaceted strategies, audit and detailed feedback) that involve health workers in analyzing and modifying their practice[139].

Data source(s)

Source database(s)

- MCD (numerator): see Supplement 2 for periodicity and data quality.
- FPS Economy - Directorate-General Statistics and Economic Information, Demographics division (denominator): http://statbel.fgov.be/figures/d22_nl.asp#2

Comparability

Not all countries use the same definition for a live birth. Comparison is therefore difficult.

Results

As in other OECD countries, the number of caesareans per 1 000 live births is increasing in Belgium (Table 97). Nevertheless, Belgium stays well below the EU-15 average (Figure 73). Only the Netherlands, Finland and Sweden have a lower number (data not shown).

Table 97: Evolution of the number of caesarean sections (CS) in Belgium between 1998 and 2004.

Year	CS/1 000 live births	Absolute number of inpatient CS
1998	144.4	16 496
1999	159.2	18 173
2000	158.0	18 149
2001	174.0	19 864
2002	181.9	20 235
2003	187.7	21 045
2004	187.8	21 710
2005	192.9	22 759
2006	198.6	24 105

Figure 73: Evolution of the number of caesarean sections per 1 000 live births in selected OECD countries between 1995 and 2006 (source: OECD).
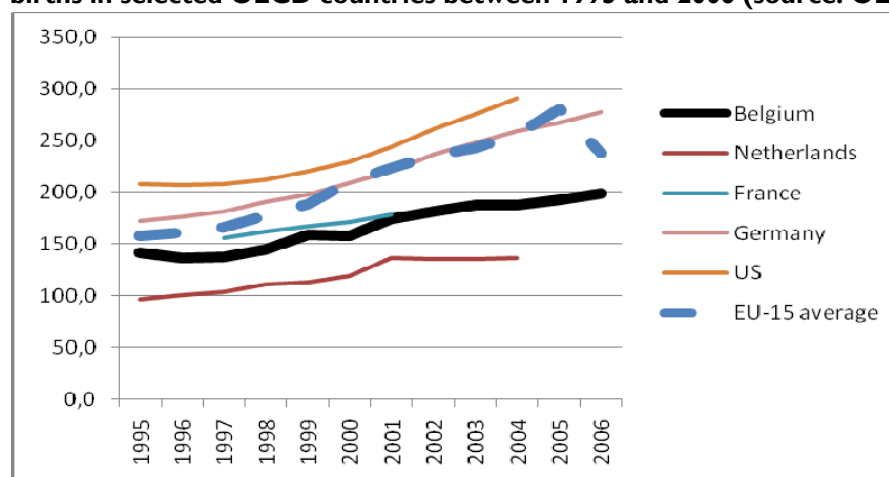
Related performance indicators

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[139] Chaillet N, Dumont A. Evidence-based strategies for reducing cesarean section rates: a meta-analysis. Birth. 2007 Mar;34(1):53-64.

QA6: HYSTERECTOMY BY SOCIAL CLASS

Definition

Description

Hysterectomy by social class.

Source

-

Numerator

Number of Belgian women having had a vaginal hysterectomy.

NIHDI billing codes:

431270-431281	Total abdominal hysterectomy
431314-431325	Total vaginal hysterectomy
431336-431340	Radical hysterectomy (Wertheim)
431351-431362	Total hysterectomy & pelvic lymphadenectomy
431491-431502	Cervix amputation (Sturmdorf)
432154-432165	Removal of residual cervix

Subtotal hysterectomies are not considered in the present report.

Denominator

Number of Belgian women.

Harmonisation of definition with international organisations

Not applicable.

Rationale and indicator characteristics

A report of the Christian Sickness Funds published in 1999 showed important regional differences in the incidence of hysterectomies in Belgium[140]. Female labourers were found to have a higher risk for hysterectomy than employees, as were females with the lowest incomes. These differences raised an important question about the correct indication and thus *appropriateness* of hysterectomy. It was therefore considered a relevant indicator by some experts consulted during the indicator selection process for the present project.

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[140]   Diels J, Cluyse L, Gaussin C, Mertens R. Hysterectomy in Belgium (in Dutch). De thematische dossiers van de CM, Nr. 1, Oktober 1999.

Data source(s)

Source database(s)

IMA (see Supplement 2 for periodicity and data quality). For the present report the permanent sample 2002-2007 was used. The indicator was calculated on the simple sampling (1/40 of the population all age included).

Comparability

The OECD only provides the rate of vaginal hysterectomies per 100 000 women.

Results

The global rate of hysterectomies per 1 000 adult women per year (18+) is presented in Table 98. A clearly decreasing trend was found between 2002 and 2007 (test for trend: 2-sided p=0.0006).

Table 98: Number of hysterectomies / 1 000 adult women in Belgium, 2002 – 2007.

Year	Rate	95% CI	
2002	3.67	3.32	4.06
2003	3.14	2.81	3.49
2004	3.40	3.06	3.76
2005	3.25	2.92	3.61
2006	2.99	2.68	3.33
2007	2.80	2.49	3.13

Figure 74 presents the data for 2007 detailed by age group. In 2007, the rate in women aged 25-64 was 3.06 (95%CI 2.67-3.50). The highest rate was found in women aged 45-49 (6.82, 95%CI 5.29-8.66). This first peak is followed by a smaller peak in the group aged 70-74 (4.16, 95%CI 2.72-6.09). Confidence intervals are larger than for the global rates due to the categorization in age groups.

Figure 74: Number of hysterectomies / 1 000 Belgian adult women in 2007, per age group.
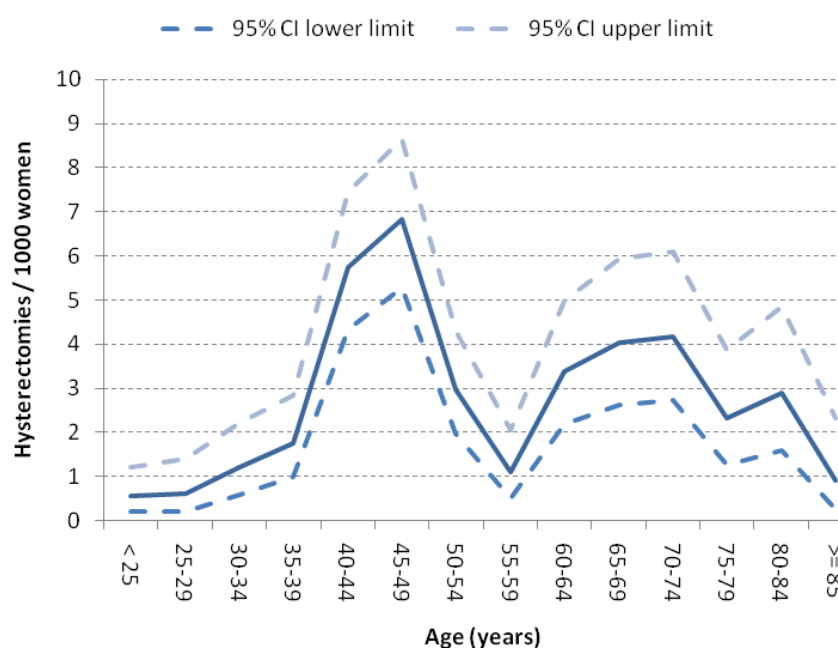
There are a number of socio-economic variables available in the IMA dataset that may be used as proxy variables for the social class of women. For more information on the content of each variable, see KCE report 80 on the maximum billing system[141]. To evaluate a possible association of these variables with the rate of hysterectomy, the data for the 6 selected years were pooled in order to increase the power of the analysis. This resulted in a dataset of 646 059 women-years without oversampling (corresponding to 807 547 women-years including the oversampling of women of 65 years or more). PP0030 (code gerechtigde/code titulaire) gives the insurance status for major risks (e.g. hospitalization) of sickness funds enrolees. The third digit of variable PP0030 allows a distinction between women entitled to preferential reimbursement for major risks and those who are not. Persons entitled to preferential reimbursement pay reduced co-payments. Originally, the system of preferential reimbursement was restricted to patients with a specific social status (pensioners, widow(er)s, persons with disabilities and orphans), for which the gross taxable income of the family did not exceed a yearly-adapted limit. In 1997 and 1998, the benefit of the preferential tariff system was extended to the following groups (still conditional on the income limit):

- (Controlled) long term unemployed, aged 50 and older with at east one year of full employment;
- Persons entitled to one of the following allowances:
  o Integration allowance for handicapped personsIncome replacement allowance for handicapped persons
  o Allowance for assistance for the elderly
  o Income guarantee for the elderly (gewaarborgd inkomen voor bejaarden of inkomensgarantie voor ouderen – revenu garanti auxpersonnes âgées ou la garantie de revenus pour personnes âgées)
  o Subsistence level income (leefloon; revenu d'intégration)
  o Support from the public municipal welfare centres (OCMW, CPAS).

In 2007, the system was further extended with the introduction of the Omnio-status which guarantees preferential reimbursement to all household members below a certain income level. Preferential reimbursement does not include women entitled to the Omnio-status.

It was investigated if the preferential reimbursement status influenced the hysterectomy rate controlling for age. In order to avoid small samples, age groups of 10 years were used. The Breslow-Day test for homogeneity of the odds ratios between the age groups was not statistically significant at a 5% level (p=0.067). Nevertheless, as it was borderline, odds ratios were calculated per age group. Table 99 presents the odds ratios of hysterectomy in women with preferential reimbursement versus other women. There was no association between preferential reimbursement and hysterectomy whatever the age group (as each confidence interval includes 1).

Table 99: Percentage of hysterectomies according to preferential reimbursement, per age group, 2002-2007.

Age group	Preferential reimbursement		Odds Ratio		
	No	**Yes**	**OR**	**95% CI**	
Below 35	0.08%	0.13%	1.76	0.95	3.02
35-44	0.48%	0.60%	1.26	0.90	1.71
45-54	0.57%	0.47%	0.81	0.61	1.07
55-64	0.36%	0.32%	0.89	0.65	1.19
65-74	0.36%	0.36%	0.98	0.75	1.27
Above 75	0.21%	0.18%	0.85	0.62	1.16

Percentage is calculated on the number of subjects in the Preferential Reimbursement category and the age group.

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[141]   E Schokkaert, J Guillaume, A Lecluyse, H Avalosse, K Cornelis, D De Graeve, S Devriese, J Vanoverloop, C Van de Voorde, Effects of the Maximum Billing system on health care consumption and financial access to health care, KCE Report 80

PP0030 also allows to differentiate between persons belonging to the general regime (first digit of PP0030 = 1) and the self-employed regime (first digit of PP0030 = 4). Before 2008, self-employed persons were only covered by the compulsory health insurance system for major risks [142] . Sickness funds and private insurers offer supplementary insurance for minor risks. About 75% of self-employed takes out this supplementary insurance against minor risks[143]. The Breslow-Day test for homogeneity of the odds ratios of hysterectomy for self-employed versus general regime between the age groups was statistically significant (p=0.026). The null hypothesis of homogeneity was rejected and the odds ratio were calculated per age group. As shown in Table 100, the odds ratio was statistically significant (borderline) in the group aged between 55 and 64 years, where the rate of hysterectomies was higher in the self-employed (4.9 versus 3.4 hysterectomies per 1 000 women-years).

On the contrary, in the second group with statistical significance, the group aged between 35 and 44 years, the rate was higher in women from the general regime (5 versus 3.4 hysterectomies per 1 000 women-years).

Table 100: Percentage of hysterectomies according to self-employed versus general regime, per age group, 2002-2007.

Age group	General regime	Self-employed	Odds Ratio		
			OR	95% CI	
Below 35	0.08%	0.08%	0.94	0.42	1.85
35-44	0.50%	0.34%	0.68	0.48	0.94
45-54	0.56%	0.58%	1.03	0.78	1.34
55-64	0.34%	0.49%	1.46	1.02	2.04
65-74	0.35%	0.46%	1.30	0.85	1.92
Above 75	0.19%	0.24%	1.26	0.72	2.06

Percentage is calculated on the number of subjects in the major risk category and the age group.

The next categorization groups pensioners, widows, persons with disabilities and orphans (second digit). The group PWDO includes women with and without entitlement to preferential reimbursement. The Breslow-Day test for homogeneity of the odds ratios between the age groups was not statistically significant (p=0.195). The common odds ratio of hysterectomy for pensioners, widows, persons with disabilities and orphans versus other women was 1.03 (95% CI: 0.90, 1.18). There was no global association between hysterectomy and PWDO status. The results per age group are presented in Table 101. The odds ratio was only statistically significant (borderline) in the group aged between 35 and 44 years (rate = 6.8 / 1 000 women years in the PWDO group against 4.7 / 1 000 women years in the PWDO group).

Table 101: Percentage of hysterectomies according to PWDO status, per age group, 2002-2007.

Age group	PWDO status		Odds Ratio		
	No	Yes	OR	95% CI	
Below 35	0.08%	0.06%	0.76	0.20	1.99
35-44	0.47%	0.68%	1.44	1.04	1.96
45-54	0.56%	0.57%	1.02	0.80	1.28
55-64	0.36%	0.34%	0.93	0.74	1.17
65-74	0.46%	0.36%	0.78	0.48	1.37
Above 75	0.14%	0.19%	1.35	0.52	5.02

Percentage is calculated on the number of subjects in the PWDO status and the age group.

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[142]   Some categories of self-employed were also covered for their minor risks by the compulsory health insurance system, e.g. handicapped self-employed or self-employed at charge of someone of the general regime if they fulfil certain income conditions.

[143]   E Schokkaert, J Guillaume, A Lecluyse, H Avalosse, K Cornelis, D De Graeve, S Devriese, J Vanoverloop, C Van de Voorde, Effects of the Maximum Billing system on health care consumption and financial access to health care, KCE Report 80

The second digit of PP0030 equal to 2 means that the person has been disabled for more than one year[144] or is handicapped. The Breslow-Day test for homogeneity of the odds ratios between the age groups was not statistically significant (p=0.257). The common odds ratio of hysterectomy for disability or handicap versus other women was 1.15 (95%CI 0.96-1.39). There was no global association between hysterectomy and major invalidity. As the odds ratio was close to 1, the results per age group are presented in Table 102: Percentage of hysterectomies according to major invalidity, per age group, 2002-2007.

. The odds ratio was statistically significant in the group aged 35-44 years, where the rate was 7.4 / 1 000 women-years in the major invalidity category against 4.7 hysterectomies / 1 000 women-years in the other category.

Table 102: Percentage of hysterectomies according to major invalidity, per age group, 2002-2007.

Age group	Major invalidity		Odds Ratio		
	No	Yes	OR	95% CI	
Below 35	0.08%	0.05%	0.65	0.08	2.38
35-44	0.47%	0.74%	1.56	1.08	2.19
45-54	0.56%	0.65%	1.17	0.87	1.54
55-64	0.35%	0.34%	0.97	0.62	1.45
65-74	0.37%	0.16%	0.43	0.05	1.59
Above 75	0.19%	0.21%	1.07	0.22	3.18

Percentage is calculated on the number of subjects in the major invalidity status and the age group

The combination of PP0030 (insurance status for major risks) and PP0035 (insurance status for minor risks) allows women to be distinguished into those who are covered for major and minor risks in the compulsory system, those who are covered for minor risks by a voluntary, supplementary insurance and those who are not covered for their minor risks. There was no statistically significant difference in hysterectomy rate between the different risks groups (CMH test p=0.230). The results per age group are presented in Table 103.

Table 103: Percentage of hysterectomies according to the minor risks coverage, per age group, 2002-2007.

Age group	Minor risks not covered	Minor risks covered	Freely insured
Below 35	0%	0.08%	0.08%
35-44	0.53%	0.50%	0.32%
45-54	0.17%	0.56%	0.61%
55-64	0.38%	0.34%	0.51%
65-74	0.17%	0.36%	0.56%
Above 75	0%	0.19%	0.37%

Percentage is calculated on the number of subjects in the minor risks coverage and the age group

Another proxy variable for social class is PP1003 which allows a distinction between the private sector, the public sector and the self-employed. Unfortunately, there were 28 906 missing values for this variable. There was no statistically significant difference in hysterectomy rate between the different sectors (CMH test p=0.131). Results per age group are presented in Table 103.

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144 Being disabled is always related to work ability.

Table 104: Percentage of hysterectomies according to the sector (private sector, public sector, self-employed), per age group, 2002-2007.

Age group	Private sector	Public sector	Self-employed
Below 35	0.09%	0.01%	0.08%
35-44	0.52%	0.36%	0.32%
45-54	0.57%	0.56%	0.57%
55-64	0.33%	0.38%	0.50%
65-74	0.36%	0.27%	0.27%
Above 75	0.19%	0.19%	0.19%

Percentage is calculated on the number of subjects in the sector category and the age group

The database also allows to differentiate between women who are (partially or completely) unemployed or not. There was no statistically significant difference in hysterectomy rate between the different groups (CMH test p=0.375). Results are presented per age group in Table 105.

Table 105: Percentage of hysterectomies according to the unemployment, per age group, 2002-2007.

Age group	Not unemployed	Full-time unemployed	Partial time unemployed	Early retired
Below 35	0.06%	0.16%	0.19%	N=0
35-44	0.46%	0.58%	0.73%	N=0
45-54	0.58%	0.45%	0.41%	N=0
55-64	0.37%	0.23%	0.33%	0.37%
65-74	0.36%	1.12%	N=0	N=0
Above 75	0.19%	0.25%	N=0	N=0

Percentage is calculated on the number of subjects in the unemployment category and the age group

The next proxy variable to classify women according to social class is derived from the maximum billing system (MAB). When certain income conditions are met, households whose total annual co-payments exceed a ceiling may benefit from reimbursement of co-payments. The system is articulated around different ceilings. The first ceilings are fixed at €450 and €650 for people with a low or modest income. A low or modest income with high co-payments (above the ceiling) can represent a proxy of a vulnerable population group. There was an association between the MAB category and the rate of hysterectomy (CMH test p<0.0001). Table 106 shows that women whose households exceed the MAB ceilings have more hysterectomies than other women (percentages in women from households for which income exceed €650 must be taken cautiously considering the small numbers).

Table 106: Percentage of hysterectomies by MAB ceilings, per age group, 2002-2007.

Age group	Others	Persons entitled to reimbursement based on €450 or €650 ceiling	Persons entitled to reimbursement based on higher ceilings
Below 35	0.07%	0.22%	0.13%
35-44	0.45%	1.08%	1.69%
45-54	0.53%	1.05%	0.91%
55-64	0.31%	0.74%	0.29%
65-74	0.28%	0.68%	0.61%
Above 75	0.15%	0.33%	0.45%

Percentage is calculated on the number of subjects in the MAB ceilings category and the age group

A last proxy variable for social class (RGCPAS) is entitlement to income guarantee for the elderly, subsistence level income (leefloon; revenu d'intégration) or support from the public municipal welfare centres (OCMW, CPAS). This variable is derived from two variables in the dataset, PP3010 and PP3013. The Breslow-Day test for homogeneity of the odds ratios of hysterectomy for women entitled to RGCPAS versus other women between the age groups was statistically significant (p=0.014). The null hypothesis of homogeneity was rejected and the odds ratio were calculated per age group, as given in Table 106.

Table 107: Percentage of hysterectomies according to income guarantee for the elderly, subsistence level income or support from the public municipal welfare centres versus no entitlement, per age group, 2002-2007

Age group	Entitlement to RGCPAS		Odds Ratio		
	No	Yes	OR	95% CI	
Below 35	0.08%	0.18%	2.29	0.97	4.66
35-44	0.48%	0.52%	1.08	0.56	1.91
45-54	0.57%	0.34%	0.59	0.22	1.30
55-64	0.36%	0.11%	0.32	0.04	1.15
65-74	0.35%	0.49%	1.38	0.84	2.16
Above 75	0.20%	0.12%	0.63	0.27	1.27

Percentage is calculated on the number of subjects in the RGCPAS entitlement category and the age group

In conclusion, the MAB ceilings category was the only socioeconomic proxy that showed different hysterectomy rates across strata.

Finally, Figure 75 shows that the lowest rate of hysterectomies can be found in Brussels and the highest rate in Flanders.

Figure 75: Number of hysterectomies / 1 000 women-years per region, 2002 – 2007.
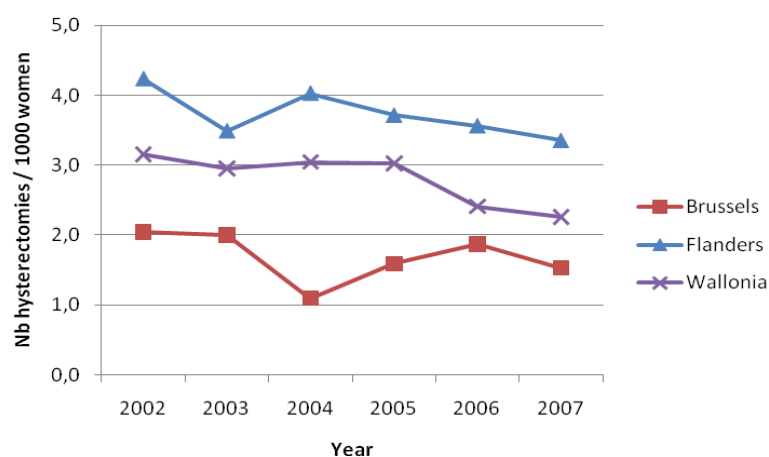
When considering the OECD data (vaginal hysterectomy only), Belgium was found to have a high rate compared to other countries (158 per 100 000 females in 2005).

Related performance indicators

-

QS1: INCIDENCE OF SERIOUS ADVERSE EFFECTS OF BLOOD TRANSFUSION

Definition

Description

Incidence of serious adverse effects of blood transfusion

Source

- RIVM (the Netherlands)[145]
- International organisations/initiatives: AHRQ[146], HCQI[147]

Numerator

Number of serious adverse effects of blood transfusion.

ICD-9-CM codes:

- 999.6: ABO incompatibility reaction
- 999.7: Rh incompatibility reaction
- E876.0: Mismatched blood in transfusion

Denominator

All medical and surgical discharges (including deaths).

Exclusion:

- Cases with pre-existing transfusion reaction (i.e. as principal diagnosis);
- Long stays (definition of long stays: see indicator QS3).

Harmonisation of definition with international organisations

The RIVM calculates the number of serious adverse effects for all blood transfusions. This is in contrast to the AHRQ and HCQI, where the number of serious adverse effects of blood transfusion are calculated for all medical and surgical discharges. To allow international comparison the latter definition was adopted for this project.

Rationale and indicator characteristics

Blood transfusion reactions are considered serious when leading to death; a life-threatening, disabling or incapacitating condition; hospitalisation or prolonged stay; or morbidity. Overall, this complication is rare. Nevertheless, the indicator is considered to very likely reflect actual medical errors. It is therefore clearly a *safety* indicator.

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[145]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[146]   Agency for Healthcare Research and Quality. Guide to Patient Safety Indicators. Version 3.1 (March 12, 2007).

[147]   Millar J, Mattke S, and the members of the OECD Patient Safety Panel. Selecting Indicators for Patient Safety at the Health Systems Level in OECD Countries. OECD Health Technical Papers 2004, n° 18.

Data source(s)

Source database(s)

MCD: see Supplement 2 for periodicity and data quality.

Comparability

Comparison with the results from the AHRQ and HCQI project is possible. The same ICD-9-CM codes were used to allow the comparison. Two other codes not mentioned by the AHRQ and HCQI project could potentially be used too: 999.8 'Other transfusion reaction' and 518.7 'Transfusion related acute lung injury (TRALI)' (this last code only applies since 2007). However, the first code is very aspecific (including reactions after treatment with cytostatica). TRALI is a poorly understood complication, and cannot yet be prevented.

Results

Amongst 3 138 113 hospital discharges in 2004, there were 46 stays with a secondary diagnosis code of ABO incompatibility (n=42) or Rh incompatibility (n=1) or mismatched blood in transfusion (n=3), corresponding to a blood transfusion reaction rate of 0.0147 per 1 000 discharges. In 2005, the rate decreased to 0.0096 per 1 000 discharges: 31 stays had either an ABO incompatibility (n=22) or a Rh incompatibility (n=6) or mismatched blood in transfusion (n=3). In 2004, the rate was 0.017 cases per 1 000 discharged females against 0.011 cases per 1 000 discharged males. Conversely, in 2005 the rate in females was 0.006 against 0.014 per 1 000 males discharged. Most of the cases were babies aged 1 year or less (59% in 2004 and 52% in 2005).

In comparison, the AHRQ found a transfusion reaction rate of 0.004 per 1 000 discharges in 2007 ("provider level").

Related performance indicators

-

QS2: INCIDENCE OF HEALTHCARE RELATED INFECTIONS

Definition

Description

Incidence rate of healthcare related infections:

- Cumulative incidence: the number of healthcare related infections that occur minimally 48 hours after admission (for intensive care unit: later than 48 hours in the ICU) divided by the total number of hospital discharges with a surgical or medical APR-DRG for patients with a length of stay of more than 48 hours.

- Incidence density: the number of healthcare related infections that occurs minimally 48 hours after admission per 1000 hospital days.

Source

- RIVM (the Netherlands)[148]
- International organisations: ECHI (long list)[149]

Numerator

Number of patients with nosocomial infections.

- Nosocomial septicaemia in curative care
- Nosocomial infections in intensive care
- Clostridium difficile
- Multi-resistant enterobacteriaceae

Denominator

All hospital discharges with a surgical or medical APR-DRG for patients >18 years and a length-of-stay of more than 48 hours, x 1 000.

Harmonisation of definition with international organisations

HELICS has data about nosocomial infections in the intensive care units.

Rationale and indicator characteristics

According to the European Centre for Disease Control and Prevention, more than 4 million persons are estimated to acquire a healthcare-related infection in the EU every year[150]. The number of deaths occurring as the direct consequence of these infections is estimated to be at least 37 000. The most frequent infections are urinary tract infections, followed by respiratory tract infections, postoperative infections (see indicator QS4) and bloodstream infections. Multi-resistant Staphylococcus aureus (MRSA) is isolated in approximately 5% of all healthcare-related infections (see indicator QS6). Approximately 20–30% of the healthcare-related infections are considered to be preventable by intensive hygiene and control programmes.

As to nosocomial infections in the intensive care unit, pneumonia and bacteraemia are selected. The incidence of pneumonia and blood stream infection is compared internationally.

Participation in the surveillance of nosocomial septicaemia in curative care, nosocomial infections in intensive care, and multi-resistant enterobacteriaceae is on a voluntary basis. Participation in the surveillance of Clostridium difficile is obligatory (Koninklijk Besluit – Arrêté Royal 01/07/2007). The participation in the HELICS network for the surveillance of nosocomial infections in intensive care units is also voluntary.

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[148] Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[149] http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

[150] http://ecdc.europa.eu/, accessed November 13th 2009.

Data source(s)

Source database(s)

- NSIH, Surveillance van Nosocomiale Septicemieën (Hospitalwide). Nationale Feedbacks 2002-2008 / Surveillance nationale des septicémies nosocomiales (Hospital-wide). Feedbacks Nationals 2002-2008.

- NSIH, Nationale surveillance van Nosocomiale Infecties op Intensieve Zorgen. De nationale cumulatieve ICU feedback jan '97 – dec '03. / Surveillance Nationale des infections nosocomiales aux Unités de Soins Intensifs. Feedback national cumulatif janvier 97 - janvier 04.

- Surveillance of nosocomial infections in intensive care units. Statistical Report 2000-2003, March, 2005. http://helics.univ-lyon1.fr/helicshome.htm.

- NSIH, Clostridium difficile-infecties in Belgische ziekenhuizen: resultaten van de nationale surveillance, juli 2006 - december 2008. / NSIH, Infections à Clostridium difficile dans les hôpitaux belges. Résultats de la surveillance nationale, Juillet 2006-Décembre 2008.

- NSIH, Jans B, Prof. Glupczynski Y & GOSPIZ, Surveillancerapporten van Multiresistente *Enterobacter aerogenes* (MREA) in de Belgische ziekenhuizen: 2000-2008. / NSIH, Jans B, Prof. Glupczynski Y & GOSPIZ, Surveillance d'*Enterobacter aerogenes* Multi-Résistant (MREA) dans les hôpitaux belges: 2000-2008.

Periodicity

For the septicaemia in curative care, the NSIH unit of the Scientific Institute of Public Health has yearly data from 2002 until 2008. For the nosocomial infections in the intensive care, there are data for the period 01/01/1997 – 31/12/2003. International data on infections in the ICU are available for the period 2000-2004. Data on infections with Clostridium difficile are available in the NSIH-unit of the IPH for the period July 2006 – December 2008. Data on Multiresistent Enterobacter aerogenes are available from July 2000 – June 2008.

Comparability

For ICU infections, HELICS has comparable data of Belgium with other European countries (incidence rates of pneumonia and blood stream infections).

Results

The evolution of the incidence of nosocomial septicaemia is positive. After an increase between 2002 and 2005 to a top of 7.2 per 1 000 admissions, the incidence of nosocomial septicaemia decreased to 6.1 per 1 000 admissions in 2008 (Table 108).

Table 108: Incidence of nosocomial septicaemia (per 1 000 admissions) (source: NSIH).

Year	Incidence
2002	5.5
2003	6.5
2004	7.0
2005	7.2
2006	7.0
2007	6.0
2008	6.1

In the period 1997-2003, 6% of the intensive care patients acquired a pneumonia after at least 2 days of stay in the intensive care unit. Two percent of intensive care patients acquired a bacteraemia after a stay of at least 2 days in the intensive care unit.

Compared to other European countries, Belgium has an average incidence of nosocomial pneumonia and blood stream infections acquired at the intensive care unit (Figure 76).

Figure 76: Incidence of nosocomial pneumonia and blood stream infection after a stay on the intensive care unit (source: HELICS).
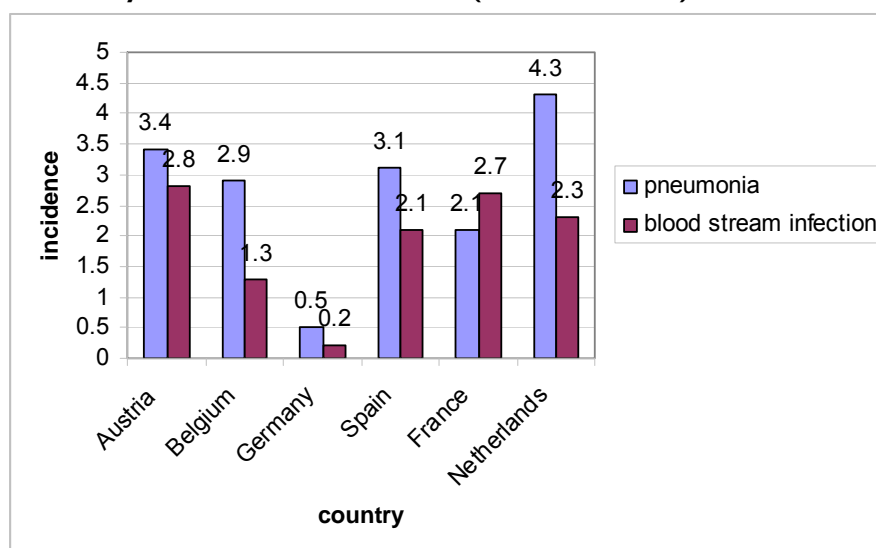
The incidence and incidence density of nosocomial Clostridium difficile infections increased between 2007 and the first semester of 2008, but decreased again in the second semester (Figure 77 and Figure 78).

Figure 77: Incidence of nosocomial Clostridium difficile infections per 1 000 admissions (source: IPH - NSIH).
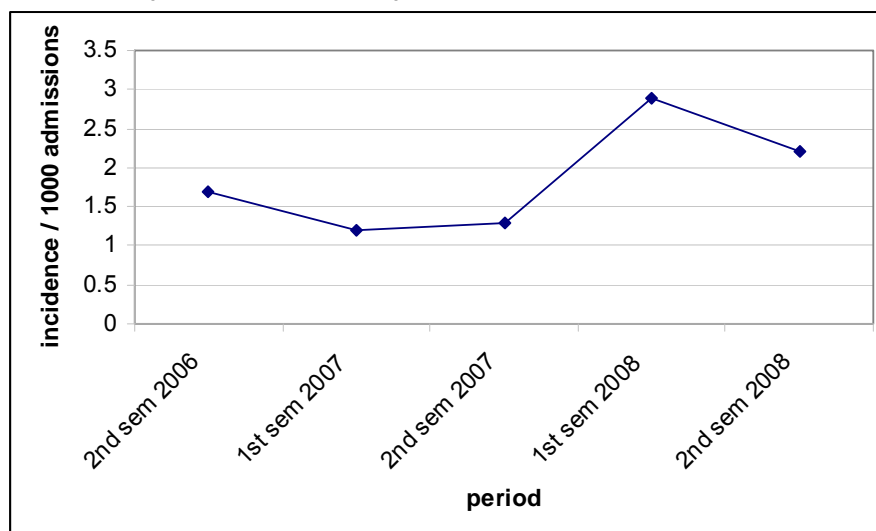
Figure 78: Incidence density of nosocomial Clostridium difficile infections per 1 000 hospital days (source: IPH - NSIH).
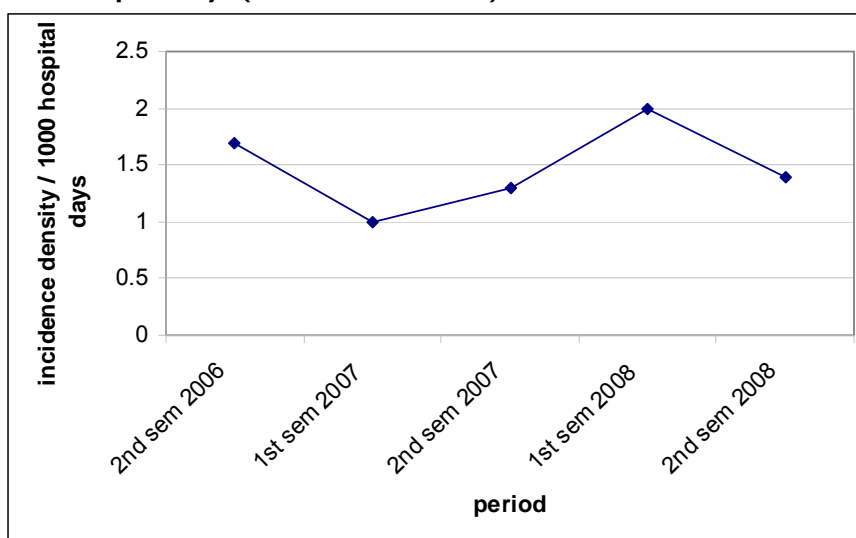
A decreasing trend is observed in the incidence (Figure 79) and incidence density (Figure 80) of nosocomial Multiresistent Enterobacter aerogenes.

Figure 79: Incidence of nosocomial Multiresistent Enterobacter aerogenes per 1 000 admissions (source: IPH - NSIH).
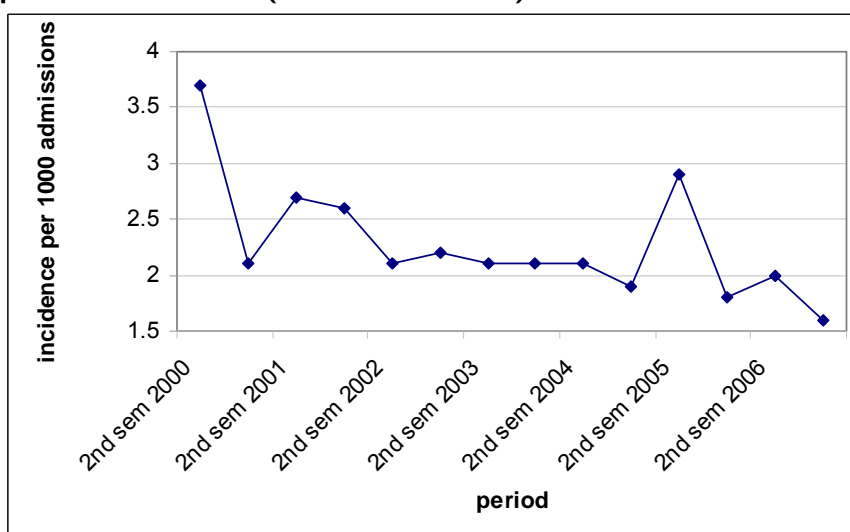
Figure 80: Incidence density of nosocomial Multiresistent Enterobacter aerogenes (source: IPH - NSIH).
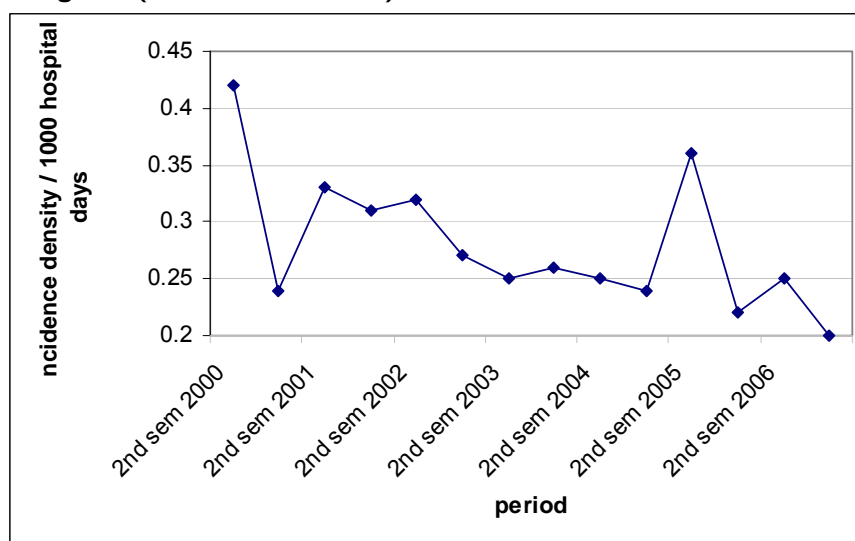
Related performance indicators

QS4: Postoperative surgical site infections

QS6: Number of nosocomial MRSA infections

QS3: INCIDENCE OF DECUBITUS IN HOSPITALS

Definition

Description

Incidence of decubitus in hospitals.

Source

- RIVM (the Netherlands)[151]
- Other international organisations/initiatives: AHRQ[152], HCQI[153]

Numerator

Number of incident cases of decubitus in hospitals.

ICD-9-CM code: 707.0 Pressure ulcer. Secondary diagnosis field.

Denominator

All medical and surgical discharges.

Exclusion:

- One-day stays
- Long stays: a MCD stay is defined as a long stay if the patient is not discharged at the end of the semester and (s)he already stayed at least 6 months consecutively in the hospital. In this case, the information is collected per semester. Consequently, the long stay is divided in several semester sections. A stay of more than 6 months may thus be a regular stay (covering max. 1 year) or a long stay (covering min. 6 months). All stays of more than one year are long stays per definition.
- Stays with length of stay of less than 5 days
- Stays with pre-existing condition of pressure ulcer (primary diagnosis)
- MDC 9 (Skin, Subcutaneous Tissue, and Breast)
- MDC 14 (pregnancy, childbirth, and puerperium)
- Stays with any diagnosis of hemiplegia, paraplegia, or quadriplegia
- Stays with ICD-9-CM code of spina bifida or anoxic brain damage
- Stays with an ICD-9-CM procedure code for debridement or pedicle graft before or on the same day as the first operating room procedure (surgical cases only)
- Stays of patients admitted from a long-term care facility or an acute care facility

No exclusion was made of stays with diagnosis of Stage I or Stage II pressure ulcer as the corresponding ICD-9-CM codes are posterior to 2005.

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[151]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[152]   Agency for Healthcare Research and Quality. Guide to Patient Safety Indicators. Version 3.1 (March 12, 2007).

[153]   Millar J, Mattke S, and the members of the OECD Patient Safety Panel. Selecting Indicators for Patient Safety at the Health Systems Level in OECD Countries. OECD Health Technical Papers 2004, n° 18.

Harmonisation of definition with international organisations

The RIVM provides data on the prevalence of decubitus in hospitals, although it is unclear how the indicator was operationalised. Both the AHRQ and HCQI intend to measure the incidence of decubitus by only including discharges with ICD-9-CM code 707.0 in any secondary diagnosis field (numerator). This definition was adapted twice for the present report. First, no exclusion could be made of stays with diagnosis of Stage I or Stage II pressure ulcer as the corresponding ICD-9-CM codes are posterior to 2005 (for MCD data after 2005, this will be possible). Second, there is no indication of the major surgical procedure in the MCD database. Hence, stays were excluded when a debridement or pedicle graft was performed before or on the same day as the first operation room (OR) procedure (instead of before or on the same day as the major OR procedure).

Rationale and indicator characteristics

The occurrence of a decubitus ulcer in a hospitalised patient has a serious negative impact on the individual's health[154] and often leads to a much prolonged hospital stay. Decubitus ulcers can be prevented with good quality nursing care[155] [156].

Data source(s)

Source database(s)

MCD: see Supplement 2 for periodicity and data quality.

Comparability

Comparison with the results from the AHRQ and HCQI project is possible.

Results

Amongst 666 501 discharges in 2004 (after exclusions), there were 14.85 cases per 1 000 discharges with a secondary diagnosis of decubitus ulcer. In 2005, the rate amounted to 16.29 cases per 1 000 discharges. Importantly, these results still are an overestimation of the real incidence, even after the exclusions as described above. This is because the exclusions are no guarantee that all prevalent decubitus ulcers at admission are excluded. On the other hand, decubitus might well be underestimated during the coding process.

Women are more affected than men. In 2004, the rate of decubitus ulcer amounted to 13.48 cases per 1 000 discharged men and 16.09 per 1 000 discharged women. In 2005, the rates were 14.88 and 17.58 respectively. The rate clearly increases with age for both genders (Figure 81).

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[154]   Gorecki C, Brown JM, Nelson EA, et al. Impact of pressure ulcers on quality of life in older patients: a systematic review. J Am Geriatr Soc. 2009;57(7):1175-83.

[155]   McInnes E, Bell-Syer SE, Dumville JC, Legood R, Cullum NA. Support surfaces for pressure ulcer prevention. Cochrane Database Syst Rev. 2008 Oct 8;(4):CD001735.

[156]   Reddy M, Gill SS, Rochon PA. Preventing pressure ulcers: a systematic review. JAMA. 2006 Aug 23;296(8):974-84.

Figure 81: Decubitus ulcer rate per 1 000 discharges according to gender and age (2005).
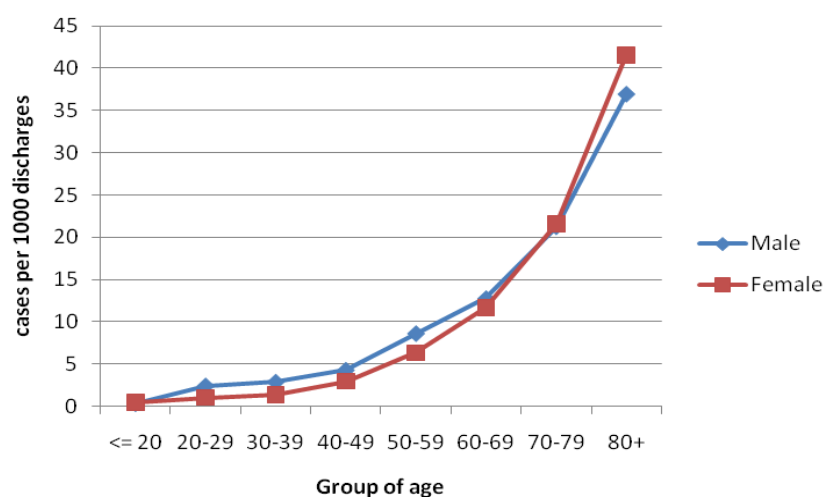
In comparison, the AHRQ found a rate of 25.098 per 1 000 discharges in 2007.

Related performance indicators

QS5: Incidence of decubitus in long-term care facilities and individuals at risk.

QS4: POSTOPERATIVE SURGICAL SITE INFECTIONS

Definition

Description

Incidence rate of postoperative surgical site infections:

- Cumulative incidence: the number of postoperative wound infections (PWI) in the 30 days after surgery (365 days if foreign bodies of non-human origin were implanted e.g. hip replacement) divided by the total number of surgical procedures corresponding to the National Nosocomial Infections Surveillance (NNIS) intervention code under surveillance with intervention date falling within the surveillance period of 3 months.

- Incidence density: the number of in-hospital surgical site infections in the 30 days after surgery (365 days if foreign bodies of non-human origin were implanted e.g. hip replacement) per 1 000 post-operative patient days.

Source

- RIVM (the Netherlands)[157]
- International organisations: ECHI (long list)[158]

Numerator

Number of incident cases of postoperative surgical site infections within 30 days after surgery (365 days if foreign bodies of non-human origin were implanted e.g. hip replacement) for the following NNIS-based surgery groups:

- coronary bypass surgery (CABG)
- colon surgery (COLO)
- hip replacement (HPRO)
- laminectomy (LAM)

Denominator

Total number of surgical procedures corresponding to the NNIS intervention code under surveillance with intervention date falling within the surveillance period of 3 months.

Harmonisation of definition with international organisations

ECHI uses a more general definition, namely the percentage of all operations. The Netherlands use other surgical categories.

The Hospital in Europe Link for Infection Control through Surveillance (HELICS) protocol ensures standardisation of definitions, data collection and reporting procedures for hospitals participating in the national/regional surveillance of surgical site infections (SSI) across Europe, in order to contribute to the European Union (EU) surveillance of nosocomial infections and to improve the quality of care in a multicenter setting. The EU surveillance of SSI is nowadays organized by the European Centre for Disease Prevention and Control (ECDC, Stockholm, Sweden).

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[157]   Westert GP, Verkleij H. Dutch Health Care Performance Report 2006. RIVM 2006.

[158]   http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

Rationale and indicator characteristics

Postoperative surgical site infections are often avoidable and sometimes severe complications of surgery. Hospital hygiene has an important role in the development of some of these infections. Postoperative surgical site infections are often occurring as complications of surgery and cause increased morbidity, duration of hospitalization and costs. It is thus an excellent indicator of the safety of curative care.

The Surveillance of Postoperative Wound Infections provides data for six surgical categories: coronary artery bypass graft surgery, colon surgery, hip replacement, laminectomy, vascular surgery and herniorrhaphy. The HELICS provides data for the four surgical categories mentioned in the definition, but also for cholecystectomy and caesarean section. For this report, only the four common surgical categories are considered, i.e. coronary artery bypass graft surgery, colon surgery, hip replacement and laminectomy.

Both the Belgian surveillance of postoperative wound infections and the HELICS surveillance of surgical site infections are voluntary.

Data source(s)

Source databases(s)

- Surveillance van Postoperatieve Wondinfecties, Nationale Resultaten 2001 – 2003, Epidemiologie, Oktober 2005; Brussel (België), Wetenschappelijk Instituut Volksgezondheid, WIV/EPI REPORTS Nr. 2005 – 015, Depotnummer: D/2005/2505/28 / Surveillance des Infections du Site Opératoire, Résultats Nationaux 2001 – 2003, Section Epidémiologie, Octobre 2005; Bruxelles (Belgique), Institut Scientifique de Santé Publique, IPH/EPI REPORTS Nr. 2005 – 016, N° de Dépôt: D/2005/2505/29
- Surveillance of Surgical Site Infections. Hospital in Europe Link for Infection Control through Surveillance (HELICS) Statistical Report 2004. http://helics.univ-lyon1.fr/helicshome.htm

Periodicity

Data are available for the period 1992-1996 and for the period July 2001-December 2003. HELICS data are available for 2004.

Data quality

Within the context of the Flemish quality decree, the participation to this data collection was particularly situated in Flanders (61 hospitals). Only 2 hospitals from the Walloon Region and none from the Brussels Capital Region participated. For two hospitals the data were not valid. The data of these two hospitals were removed from the data.

Comparability

The HELICS SSI statistical report for 2004 provides in-depth comparisons of SSI incidence rates for the HELICS set of NNIS intervention categories across 14 European countries, including Belgium.

Results

Figure 82 shows the cumulative incidence of postoperative wound infections (PWI), i.e. the number of PWI in the 30 days after surgery (365 days for hip replacement) divided by the total number of surgeries for the period of July 2001 until December 2003. The cumulative incidence for PWI is the highest for colon surgery (6%).

Figure 82: Cumulative incidence of postoperative surgical site infections (source: NSIH).
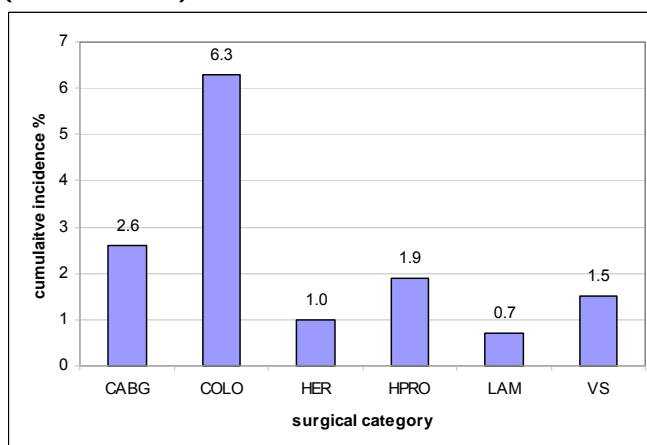
Looking at the incidence density, the same pattern can be found, with the highest incidence density observed for colon surgery (Figure 83).

Figure 83: Incidence density of post-operative surgical site infections (source: IPH – NSIH)
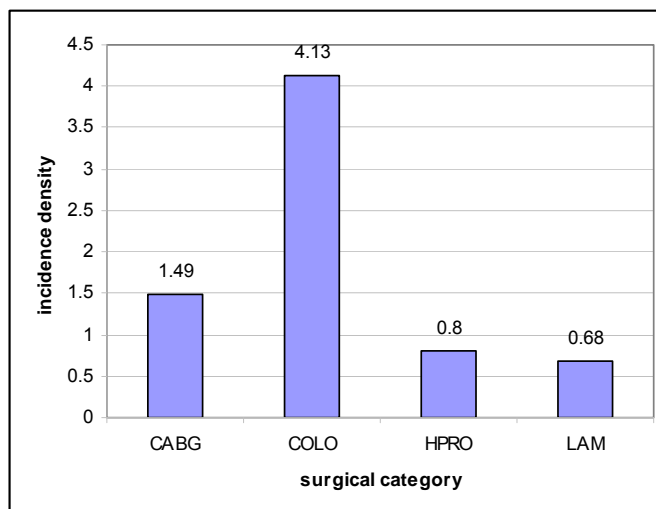
Compared to other countries, Belgium had a high cumulative incidence and incidence density of postoperative surgical site infections in 2004 (Figure 84 - Figure 90). For all international comparisons, Belgium scores higher than average, except for the cumulative incidence of surgical site infections after a laminectomy.

Figure 84: Cumulative incidence of post-operative surgical site infections due to coronary artery bypass graft surgery: an international comparison (source: HELICS)
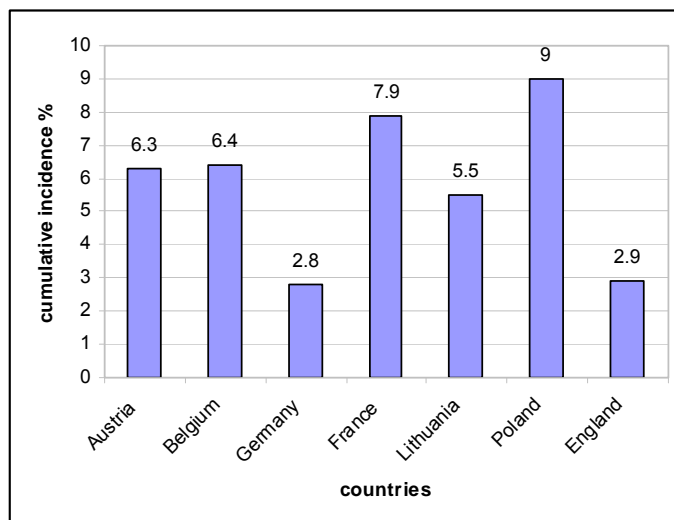
Figure 85: Cumulative incidence of post-operative surgical site infections due to colon surgery: an international comparison (source: HELICS)
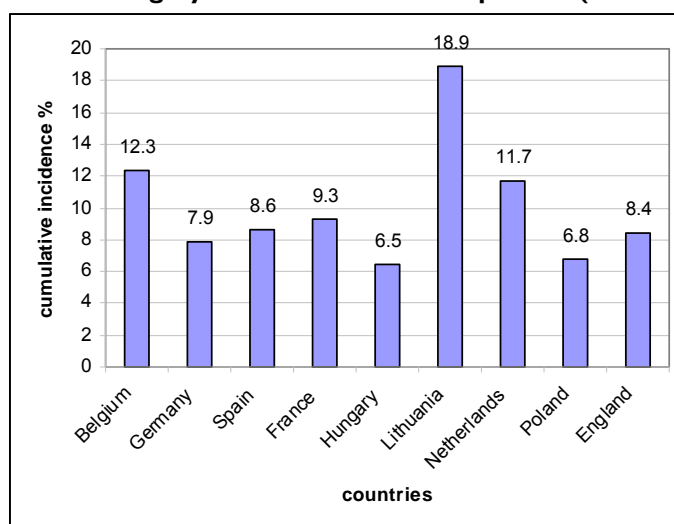
Figure 86: Cumulative incidence of post-operative surgical site infections due to hip replacement: an international comparison (source: HELICS)
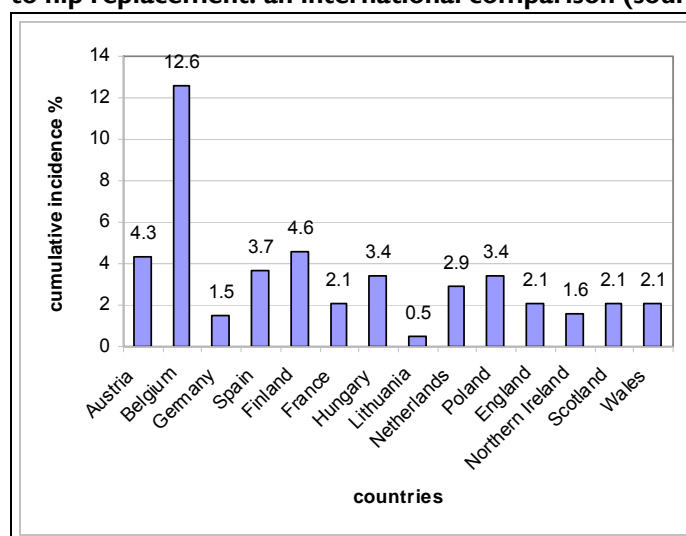
Figure 87: Cumulative incidence of post-operative surgical site infections due to laminectomy: an international comparison (source: HELICS)
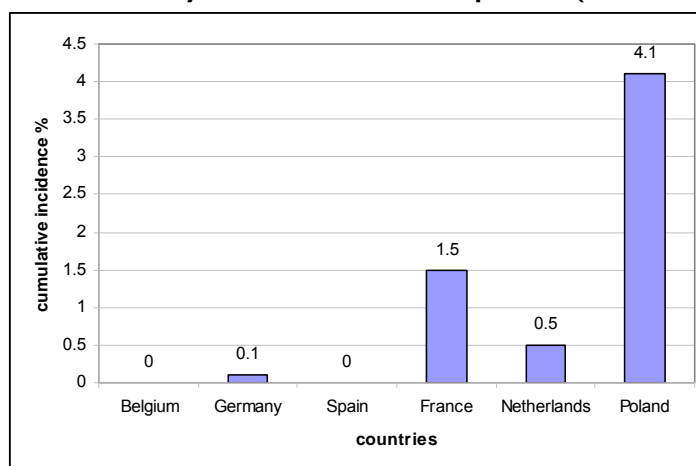
Figure 88: Incidence density of post-operative surgical site infections due to coronary artery bypass graft surgery: an international comparison (source: HELICS)
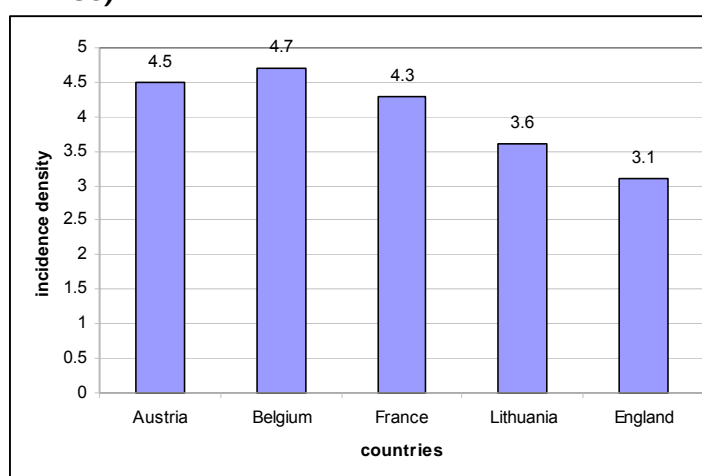
Figure 89: Incidence density of post-operative surgical site infections due to colon surgery: an international comparison (source: HELICS)
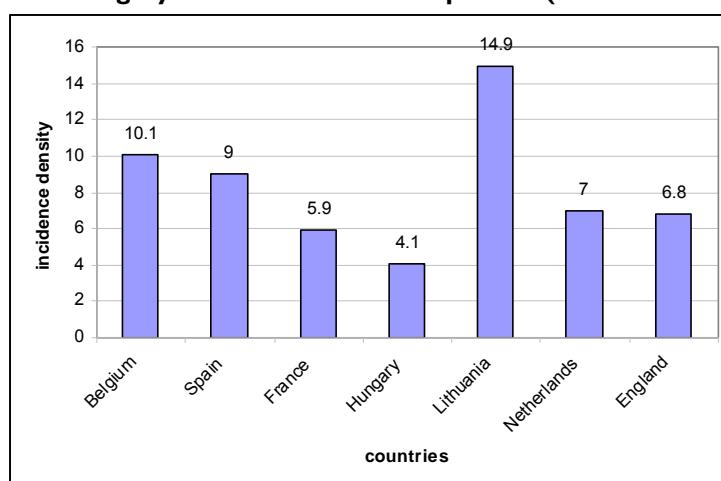
Figure 90: Incidence density of post-operative surgical site infections due to hip replacement: an international comparison (source: HELICS)
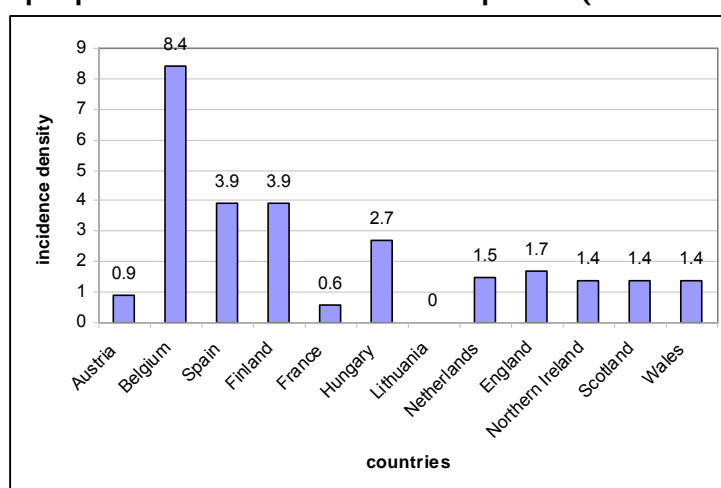
Related performance indicators

QS2: Incidence of healthcare related infections

QS6: Number of nosocomial MRSA infections

QS5: INCIDENCE OF DECUBITUS IN LONG-TERM CARE FACILITIES AND INDIVIDUALS AT RISK

Definition

Description

Incidence of decubitus:

     a. in long-term care facilities

     b. in individuals at risk

Source

- RIVM (the Netherlands)[159]

Numerator

     a. Number of incident cases of decubitus in long-term facilities

     b. Number of incident cases of decubitus in individuals at risk

Denominator

     a. Total number of individuals residing in long-term facilities

     b. Total number of individuals at risk for developing decubitus

Harmonisation of definition with international organisations

Not applicable.

Rationale and indicator characteristics

The occurrence of a decubitus ulcer in an individual has a serious negative impact on the individual's health[160] and often leads to a much prolonged hospital stay. Decubitus ulcers can be prevented with good quality nursing care[161][162].

Data source(s)

Source database(s)

No national data are available for long-term care facilities, nor are data on individuals at risk.

Comparability

Not applicable.

Results

None.

Related performance indicators

QS3: Incidence of decubitus in hospitals.

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[159]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[160]   Gorecki C, Brown JM, Nelson EA, et al. Impact of pressure ulcers on quality of life in older patients: a systematic review. J Am Geriatr Soc. 2009;57(7):1175-83.

[161]   McInnes E, Bell-Syer SE, Dumville JC, Legood R, Cullum NA. Support surfaces for pressure ulcer prevention. Cochrane Database Syst Rev. 2008 Oct 8;(4):CD001735.

[162]   Reddy M, Gill SS, Rochon PA. Preventing pressure ulcers: a systematic review. JAMA. 2006 Aug 23;296(8):974-84.

QS6: NUMBER OF NOSOCOMIAL MRSA INFECTIONS

Definition

Description

Incidence of nosocomial MRSA infections per 1 000 admissions.

Source

- International organisations: ECHI (long list)[163]

Numerator

Number of new nosocomial MRSA infections in acute care hospitals in the reporting period.

Nosocomial is defined as not present at admission, no known carriage (for 12 months), or first positive strain >48h after admission.

Denominator

Number of admissions in the reporting period x 1000.

Harmonisation of definition with international organisations

ECHI also measures the percentage of samples showing resistance by making use of the EARSS project data. The focus is on Staphylococcus aureus (MRSA) and Streptococcus pneumoniae.

Rationale and indicator characteristics

Staphylococcus aureus is an important cause of infections of the skin and mucosae, of postoperative wound infections, catheter infections, pneumonias, bacteremias and infections of articulations[164]. During the last 20 years, the incidence of nosocomial infections caused by the MRSA has increased significantly.

In Belgium the following indicator is already in use: total number of new *Staphylococcus aureus* strains resistant to Methicillin from clinical samples (all) in acute care hospitals in Belgium (hospitalised patients only, screening samples & duplicates excluded).

Only patients admitted to one of the following departments of acute care hospitals are taken into account:

- intensive care, intensive neonatology, coronary care, mixed departments (H-index)
- surgery, medicine, paediatrics, maternity, neonatology (N-index)
- psychiatry
- geriatrics and Sp-index as far as these two departments are physically part of the hospital or the fusion.

An admission is defined as a stay in a hospital bed of minimally one night. Samples of ambulant patients (e.g. day clinic, one-day clinic, haemodialysis department, policlinic services,…) are not included in the surveillance.

Institutions that are part of a fusion unity are asked to gather their data per hospital site. The data are gathered retrospectively per semester.

Participation in the surveillance of MRSA is obliged since 2007 (Koninklijk Besluit Besluit – Arrêté Royal 10/11/2006).

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[163]   http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.
[164]   Hoge Gezondheidsraad. Richtlijnen voor de beheersing en preventie van overdracht van het methicilline-resistente staphylococcus aureus (MRSA) in Belgische ziekenhuizen. Juni 2005.

Data source(s)

Source database(s)

Institute of Public Health (IPH): National Surveillance of Infections in Hospitals (NSIH): Nationale Surveillance van Methicilline-Resistente *Staphylococcus aureus* (MRSA) in acute ziekenhuizen. / Surveillance nationale du *Staphylococcus aureus* résistant à la Méthicilline (SARM) dans les hôpitaux aigus.

Periodicity

Annual data are available since 1994. Surveillance is continuous and actually counts 28 observation periods of 6 months each.

Comparability

No international organisations include data on MRSA, making comparison difficult. An exception is the European Antimicrobial Resistance Surveillance System (EARSS), but this European program does not focus on nosocomial acquisition and considers MRSA from blood cultures and cerebrospinal fluid only. Differences between countries concerning the coverage and participation, the quality of the lab results, and the frequency of sampling are also possible.

Results

The global mean incidence was calculated by the average of the mean incidences of the hospitals in the first and the second semester. An increasing incidence was found between 2001 and 2004, after which the incidence again decreased to 2.0 in 2008 (first semester only, analysis 2008/2 is ongoing) (Figure 91).

The application of the recommendations for the control of MRSA (since 2003), the national hand hygiene campaigns, and the rationalization of the use of antibiotics probably influenced this positive evolution. Nevertheless, the interpretation of the indicator remains influenced by the screening practices which vary in coverage rate and intensity between hospitals[165].

Figure 91: Mean incidence of nosocomial MRSA (source: NSIH).
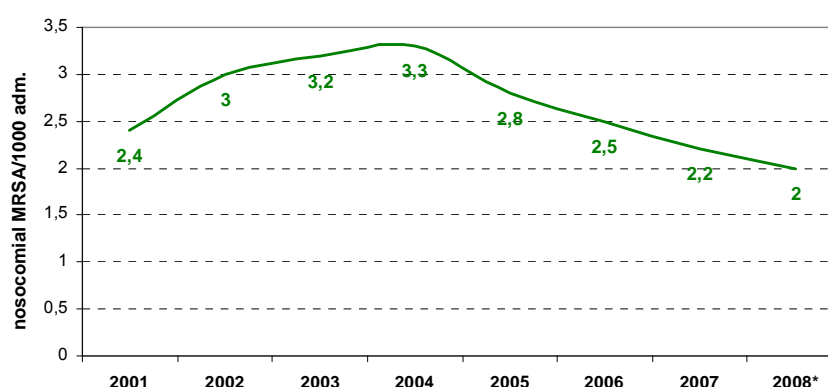
For the calculation of the incidence by region, only data from hospitals participating at least 5 times since the start of surveillance are taken into account. The incidence was the lowest in the Flemish Region, increasing in all regions between 2001 and 2004, but again decreasing afterwards (Figure 92). The decrease was most impressive in the Brussels hospitals: from 6/1000 admissions in 2004 to 2/1000 admissions during the first semester of 2008.

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[165] Jans B., Struelens M., 2009. Surveillance van MRSA in de Belgische acute ziekenhuizen: tweede semester 2008.

Figure 92: Mean incidence of nosocomial MRSA: by region (source: NSIH).
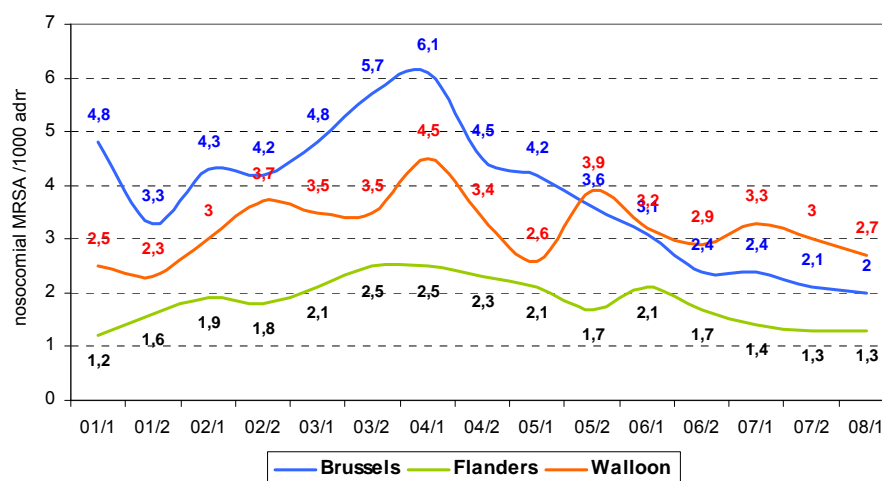
Related performance indicators

QS1: Serious adverse effects of blood transfusion

QS2: Incidence of healthcare related infections

QS6.1: Number of AB prescriptions

QS6.1: NUMBER OF AB PRESCRIPTIONS

Definition

Description

The volume in defined daily dose (DDD) of antibiotics prescribed within ambulatory care.

Source

- International organisations: OECD[166]

Numerator

The volume of antibiotics or antimicrobials for systemic use (ATC J01) (measured by DDD, expressed in grams) prescribed within ambulatory care.

Data are gathered and DDDs are calculated according to the 2007 ATC classification. The GPs included in the data are acknowledged GPs (NIHDI number 003-004).

Denominator

(Total Belgian mid-year population/ 1 000)/ 365 days.

Harmonisation of definition with international organisations

The OECD also uses the ATC/DDD system, created by the WHO Collaborating Centre for Drug Statistics Methodology.

Indicator characteristics

An increase of pathogens resistant against antibiotics is observed[167]. Recent studies found a significant association between high antibiotic usage and this emerging resistance [168] [169]. Therefore, the WHO urged its Member States to encourage appropriate and cost-effective use of antibiotics[170].

However, some comments should be made on this indicator. The DDD not exactly reflects the used doses within a country. One should also take into account the impact of the packaging of the medicine which has changed over time, and which can influence the number of DDDs a patient purchases. This can be different from other countries. Furthermore, this indicator reflects the average use, but it reflects neither the proportion of the population that takes that DDD, nor the simultaneous combination of antibiotics per patient. Another point of discussion is that there is no 'standard' which defines the correct use of antibiotics, since there is also some concern about underuse which could have a negative effect on morbidity and mortality. In other words, a lot of discussion is possible about which indicator is the most appropriate to measure the usage of and the resistance against antibiotics. For this project, the volume in DDD has been chosen, while this makes it possible to compare Belgium with other countries.

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[166]   OECD   Health   Data   2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[167]   Delaere, B. Antibioticaresistentie in de Huisartsengeneeskunde / La resistance aux antibiotiques en médecine générale. NIHDI. Available from: http://www.inami.fgov.be/care/nl/doctors/promotion-quality/guidelines-antibiotics/ objectif-doelstelling/pdf/resistance.pdf (Nl.) / http://www.inami.fgov.be/ care/fr/doctors/promotion-quality/guidelines-antibiotics/objectif-doelstelling/pdf/ resistance.pdf (Fr.) (Accessed 12/10/2009).

[168]   Goossens H, Ferech M, Vander Stichele R, and Elseviers M (2005). Outpatient antibiotic use in Europe and association with resistance: a cross-national database study. Lancet 365(9459):579-87.

[169]   Bronzwaer SL, Cars O, Bücholz U, et al. (2000) A European study on the relationship between antimicrobial use and antimicrobial resistance. Emerg Infect Dis. 3: 278–82.

[170]   World Health Organization (1998). World Health Assembly (fifty-first). Emerging and other communicable diseases: antimicrobial resistance. WHA51.17.

Data source(s)

Source database(s)

NIHDI (Prescription of antibiotics – feedback to the general practitioners)[171].

Periodicity

There are yearly data available since 1997.

Comparability

OECD (and ECHI) have data on the pharmaceutical consumption by daily defined dose, according to the anatomic therapeutic chemical classification. There are differences concerning the OECD data in the version of the ATC index used by the countries: France uses the version of 2006, Belgium 2007, the Netherlands 2008, and Germany 2009.

Results

Where a decreasing trend was observed in the prescribed DDD per 1 000 Belgian inhabitants per day between 1998 and 2004, in recent years the trend is again increasing (Table 109).

Importantly, the DDD not exactly reflects the used dose within a country. One should also take into account the impact of the package of the drug which has changed over time, and which can be different across countries. Furthermore, this indicator reflects the average use, but not the proportion of the population that takes the medication, nor the simultaneous combination of antibiotics per patient.

Compared to other countries, the AB prescription rate is high (Figure 93).

Table 109: Antibiotics (ATC J01) prescribed in Belgian ambulatory care services (1997-2007) (source: NIHDI).

Year	Total DDD	DDD/1000 inh./day	
	GPs	GPs	Total ambulatory care
1997	73 270 918	-	25,4
1998	77 028 514	-	26,4
1999	75 786 221	21,3	26,2
2000	73 444 618	21,8	25,3
2001	67 261 732	20,7	23,7
2002	71 124 497	20,9	23,8
2003	72 067 664	20,8	23,8
2004	66 974 051	19,5	22,7
2005	72 125 340	20,9	24,3
2006	70 926 658	20,2	24,2
2007	-	21,5	25,4

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[171]   NIHDI (2008), Tableaux de bord pharmaceutiques, délivrances pharmaceutiques, dans le secteur ambulant: 2006 / Farmaceutische kengetallen farmaceutische verstrekkingen ambulante praktijk: 2006, Comité d'évaluation des pratiques médicales en matière de médicaments conseil scientifique / Comité voor de evaluatie van de medische praktijk inzake geneesmiddelen, Dienst voor geneeskundige verzorging – wetenschappelijke raad, Brussel, 90 p.

Figure 93: Antibiotics (ATC J01) prescribed in Belgian, French, German, Dutch, Swedish and UK ambulatory care services (1997-2007) (source: OECD).
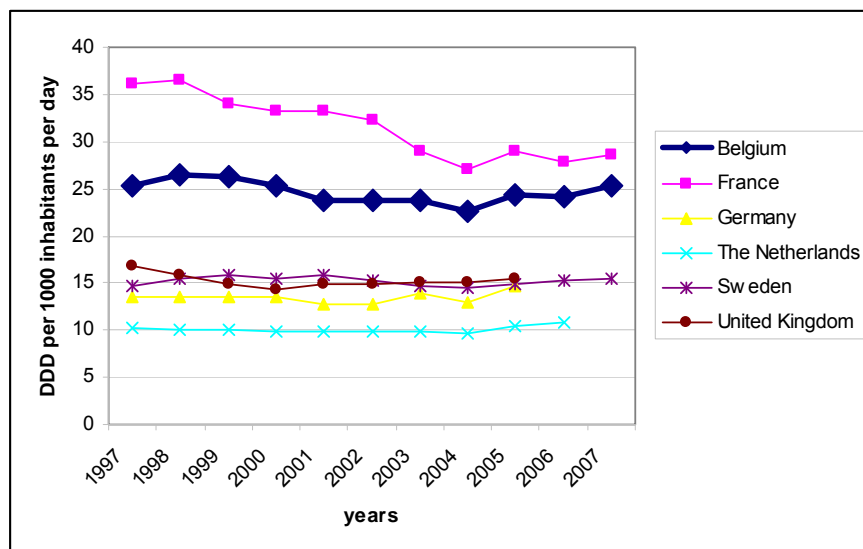
Related performance indicators

QS6. Number of nosocomial MRSA infections.

QS7: MEDICAL RADIATION EXPOSURE OF THE BELGIAN POPULATION

Definition

Description

Medical radiation exposure of the Belgian population.

Source

-

Numerator

Total prescribed medical radiation dose.

Used nomenclature codes and their presumed radiation dose:

Nomenclature number	Radiation dose	Exam type
451474, 451485, 451511, 451522, 451710, 451721, 451754, 451765, 462512, 462523, 462711, 462722, 462755, 462766	20	Contrast barium enema
451813, 451824, 462814, 462825, 451894, 451905, 462895, 462906	15	Cholangiowirsungography
458850, 458861	12	CT vertebra
458813, 458824	10,63	CT neck/thorax/abdomen
451312, 451323, 451356, 451360, 451393, 451404, 451430, 451441, 462431, 462442	10	Contrast barium enema
453121, 464111, 464122, 453110, 453132, 453143, 464133, 464144	9,6	Coronarography
453154, 453165, 453176, 453180, 453235, 453246, 464236, 464240, 453272, 453283, 464273, 464284, 453294, 453305, 464295, 464306	7,5	Arteriography
450531, 450542, 461532, 461543	7,2	Intravenous urography
450634, 450645, 461635, 461646, 450671, 450682, 461672, 461683, 450715, 450726, 461716, 461720, 461591, 461602, 450590, 450601	7,2	Urologic X-ray
458835, 458846	5,7	CT vertebra
453073, 453084, 464074, 464085, 453095, 453106, 464096, 464100	5	Angiocardiopneumography
453515, 453526, 464516, 464520, 453530, 453541, 464531, 464542	5	Digital substraction angiography
453316, 453320, 464310, 464321, 453331, 453342, 464332, 464343, 453390, 453401, 453412, 453423	5	Venography
442971, 442982	4,94	Nuclear medicine
442212, 442223, 442234, 442245, 442396, 442400, 442411, 442422, 442455, 442466, 442492, 442503, 442514, 442525, 442595, 442606, 442610, 442621, 442632, 442643	4,3	Nuclear medicine
450074, 450085, 461075, 461086	4,2	Hysterosalpingography
455475, 455486, 466476, 466480	4,2	X-ray lumbar spine
455593, 455604, 466594, 466605	3,5	X-ray spine
455394, 455405, 466395, 466406, 455416, 455420, 466410, 466421	2,6	X-ray cervical/dorsal spine

Nomenclature number	Radiation dose	Exam type
451614, 451625, 462615, 462626, 451776, 451780, 462770, 462781, 451850, 451861, 462851, 462862	2,3	Cholangiography
458673, 458684	2,1	CT skull
451135, 451146	2	Esophageal X-ray
459196, 459200, 469195, 469206	2	Fistulography
458732, 458743	1,7	CT sella turcica
455534, 455545, 466535, 466546	1,6	Sacroiliacal X-ray
458872, 458883, 458894, 458905	1,554	CT limbs/joint
455276, 455280, 466270, 466281	1,2	Pelvic X-ray
455254, 455265, 466255, 466266	1,2	Hip X-ray
454016, 454020, 454031, 454042, 465043, 465032, 454053, 454064, 454075, 454086, 453471, 453482, 464483, 464472	1	Cerebral angiography
455711, 455722	1	Arthrography
451835, 451846, 459115, 459126, 469114, 469125	1	Radioscopy
450030, 450041, 4611031, 461042	0,1	Pelvimetry
451010, 451021, 450516, 450520, 450015, 450026, 461510, 461521	0,83	Abdomen X-ray
452793, 452804, 463794, 463805	0,7	Laryngeal X-ray
455335, 455346	0,64	Rib X-ray
455873, 455884	0,35	Sternal X-ray
450192, 450203	0,34	Mammography
452712, 452723, 463713, 463724	0,23	Chest X-ray
455630, 455641, 466631, 466642	0,22	Skull X-ray
450096, 450100, 461090, 461101	0,17	Mammography
451076, 451080	0,13	Swallow X-ray
452690, 452701, 463691, 463702	0,06	Chest X-ray
307090, 307101, 377090, 377101, 307112, 307123, 377112, 377123, 307134, 307145, 377134, 377145	0,02	Dental X-ray
455291, 455302	0,02	Rib X-ray
455136, 455140, 466130, 466141	0,0168	Shoulder X-ray
455814, 455825, 466292, 466303, 455836, 455840, 466314, 466325	0,0144	X-ray shoulder/clavicula
455851, 455862, 466336, 466340	0,0126	Upper leg X-ray
455696, 455700, 466690, 466701	0,01	Nose X-ray
307016, 307031, 307042, 307053, 307064	0,01	Dental X-ray
455210, 455221, 466211, 466222	0,00408	Lower leg X-ray
455195, 455206, 466196, 466200	0,0009	Ankle X-ray
455232, 455243, 466233, 466244	0,00088	Knee X-ray
455070, 455081, 466071, 466082, 455092, 455103, 466093, 466104, 455114, 455125, 466115, 466126	0,0006	Arm X-ray
455151, 455162, 466152, 466163	0,00032	Toe X-ray
455173, 455184, 466174, 466185	0,0003	Foot X-ray
455033, 455044, 466034, 466045	0,00014	Hand X-ray
455011, 455022, 466012, 466023, 455055, 455066, 466056, 466060	0,00012	X-ray fingers/wrist

Denominator

Total Belgian mid-year population.

Harmonisation of definition with international organisations

The European Commission uses this information from several European countries to compare the medical radiation exposure across Europe[172]. The same definition is used for this project.

Rationale and indicator characteristics

In December 2006, the Superior Health Council published recommendations to reduce the medical radiation exposure[173]. It stressed the need to follow the guidelines about the referral for diagnostic imaging that were elaborated by the Consilium Radiologicum in 2004 and that were based on the guidelines of the European Association of Radiology[174].

Based on the results that are presented below, a national campaign will be launched to sensibilize the public, prescribers and providers about the recommendations. The indicator can be considered as a means to follow-up the implementation of these recommendations, which is linked to the dimension *appropriateness*. However, since the indicator primarily gives an indication about the radiation exposure, it is also linked to the dimension *safety*. Furthermore, it gives an idea about the use of newer technologies (innovation as a subdimension of *sustainability*), requiring less irradiation.

Data source(s)

Source database(s)

- NIHDI (numerator): see Supplement 2 for periodicity and data quality.
- Denominator: FPS Economy - Directorate-General Statistics and Economic Information, Demographics division (http://www.statbel.fgov.be/figures/d21_nl.asp)

Comparability

The same calculations are done by neighbouring countries such as the Netherlands and Germany. However, the reliability and completeness of the data available from different countries is extremely variable and strongly cautions against over-interpreting the data when making international comparisons.

Results

Between 2005 and 2008, the medical radiation exposure in Belgium rose from 2.15 to 2.42 mSv per capita. The most important contributor to medical radiation is CT, accounting for 52.6% of the medical radiation in 2005 and even 58.4% in 2008 (Figure 94). The contribution of X-rays and scintigraphies is decreasing.

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[172] Health Protection Agency. European Guidance on Estimating Population Doses from Medical X-Ray Procedures. Health Protection Agency, Centre for Radiation, Chemical and Environmental Hazards, Radiation Protection Division; 2008.

[173] Superior Health Council. Publication n° 8080.

[174] Guidelines for referral to medical imaging. http://www.riziv.fgov.be/care/nl/doctors/promotion-quality/guidelines-rx/pdf/guidelinesnl.pdf, accessed September 2nd 2009.

Figure 94: Relative contribution to medical radiation by type of examination.
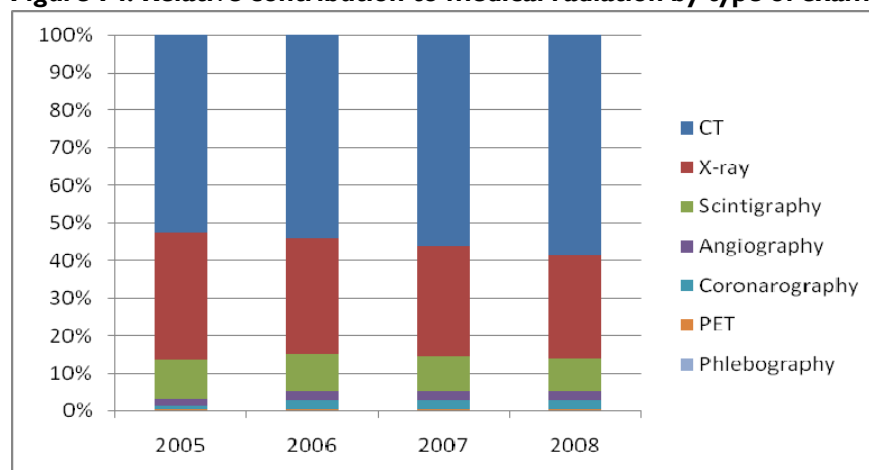
In 2008, the Directorate-General for Energy and Transport of the European Commission published a report on radiation protection in Europe[175]. Compared to other European countries, Belgium has a high medical radiation exposure. For 2002, the Netherlands reported a medical radiation exposure of 0.45 mSv per capita.

Related performance indicators

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[175]   Health Protection Agency. European Guidance on Estimating Population Doses from Medical X-Ray Procedures. Health Protection Agency, Centre for Radiation, Chemical and Environmental Hazards, Radiation Protection Division; 2008.

QC1: NUMBER OF PEOPLE WHO ARE NOT REGISTERED WITH A GP

Definition

Description

Number of people who are not registered with a GP.

Source

- RIVM (the Netherlands)[176]
- Other international organisations: AHRQ[177]

Numerator

Number of Belgian citizens that are not registered with a general practitioner in a given year.

In Belgium, no data are available on the number of citizens with a unique general practitioner. However, since 2002 the global medical file (GMD) is implemented in Belgium, where a patient can ask a unique general practitioner to manage his/her medical information. This system was used as a proxy to calculate the present indicator. The following NIHDI billing codes are used: 102771, 102793.

To calculate the nominator with IMA data, we calculated the number of insured people not having any of these billing codes during a given year (Figure 95).

Denominator

All Belgian citizens.

Figure 95: Flowchart of indicator QC1.
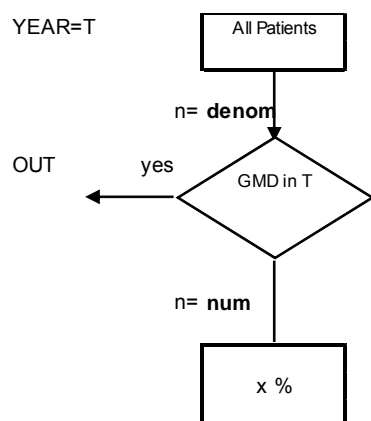
Harmonisation of definition with international organisations

The RIVM measures the percentage of the Dutch population that is not registered with a GP or dentist. This definition (excluding registration with a dentist) was adopted for this project. On the contrary, the AHRQ measures the people with a usual primary care provider.

Rationale and indicator characteristics

By leaving the coordination of medical care to one central person, e.g. the general practitioner, the quality of care is expected to increase. Referral to and communication

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[176]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care
         Performance Report 2008. RIVM 2008.
[177]   AHRQ National Healthcare Disparities Report 2008. http://www.ahrq.gov/qual/nhdr08/nhdr08.pdf,
         accessed September 1st 2009.

with other care providers becomes more efficient, and double investigations or contrasting treatments can be avoided. It is therefore not only an indicator of *continuity* (coordination), but also of *efficiency* and *effectiveness*.

Data source(s)

Source database(s)

IMA (see Supplement 2 for periodicity and data quality). For the present report the permanent sample 2002-2007 was used. The results were obtained on the simple sampling (without over-representation of the 65+ patients).

Comparability

Since a proxy is used, comparability with the Dutch and US results is limited.

Results

As presented in Table 110, the percentage of individuals without a GMD dropped from 79.4% (95%CI 79.3-79.6%) in 2002 to 67.1% (95%CI 67.0-67.3%) in 2007. The decreasing trend was statistically significant (test for trend p<0.0001).

Table 110: Percentage of individuals in the permanent sample without GMD, 2002 – 2007.

Year	% without GMD	95% CI	
2002	79.4%	79.3%	79.6%
2003	70.8%	70.7%	71.0%
2004	69.4%	69.2%	69.6%
2005	68.5%	68.3%	68.7%
2006	66.5%	66.3%	66.7%
2007	67.1%	67.0%	67.3%

In 2002, a GMD was created with the code 102771 for 20.6% of the Sickness funds enrolees. The code 102793 (administrative prolongation of the GMD) was used for the first time in 2003. In 2007, the first code was used for 66 758 individuals (25.5%) in the sample. The second code for administrative prolongation of an existing GMD was recorded for 19 426 individuals or 7.4% of the sample. Together they represent 32.9% of the 2007 sample. Forty-nine individuals (0.04%) had both billing codes recorded in 2007.

Figure 96 shows that the percentage of people without GMD is lower in Flanders than in the two other regions.

Figure 96: Percentage of individuals without GMD per region, 2002 – 2007.

Related performance indicators

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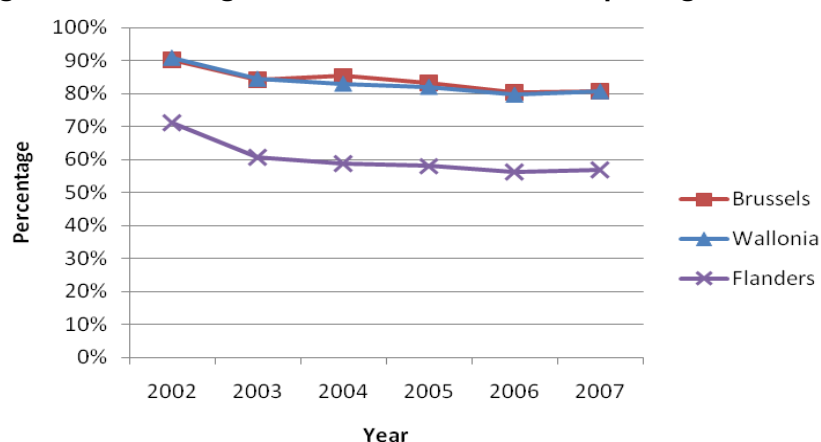
QC2: AVERAGE LENGTH OF STAY

Definition

Description

Average length of stay is computed by dividing the number of days stayed (from the date of admission in an in-patient institution) by the number of discharges (including deaths) during the year.

Source

- OECD[178]
- Other international organisations/initiatives: WHO[179], ECHI long list[180]

Numerator

Total length of stay of all acute care hospitalisations.

Denominator

Total number of acute care discharges (including deaths).

Exclusion of:

- One-day stays,
- stays entirely or partially spent in rehabilitation units or psychiatric units,
- stays exceeding 90 days.

Harmonisation of definition with international organisations

The OECD definition was adopted. In contrast to the OECD, ECHI provides the average length of stay for a limited number of diagnoses.

Rationale and indicator characteristics

The length of stay is determined by several factors, including patient characteristics (e.g. severity of illness) and care provider characteristics (e.g. use of clinical pathways). It is therefore not only considered an indicator of *efficiency*, but also of *continuity* (smooth organisation within institution).

Data source(s)

Source database(s)

MCD: Supplement 2 for periodicity and data quality.

Comparability

Several countries included in the OECD comparison use different methodologies to calculate the average length of stay. Some countries may include same day separations (counted either as 0 or 1 day), thereby resulting in an under-estimation of average length of stay compared with countries that exclude them. Also, some countries may only include data related to general hospitals, while others might include data also for specialised hospitals (generally involving higher length of stays than in general hospitals). Caution should be exercised when making international comparisons due to the possibility that countries may provide data for different types of institutions.

Results

The average length of stay respectively amounted to 6.85 and 6.74 days in 2004 and 2005 (Table 111).

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[178]   OECD   Health   Data   2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[179]   WHO European Health For All Database. http://www.euro.who.int/hfadb, accessed August 21st 2009.

[180]   http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

Table 111: Average length of stay in acute care for 2004 and 2005.

2004			2005		
N stays	**N days**	**Mean days**	**N stays**	**N days**	**Mean days**
1 643 351	11 259 547	6.85	1 651 427	11 133 823	6.74

These results slightly differ from those calculated by the FPS Public Health itself and transmitted to the OECD (Figure 97). The definition of 'acute' used in the present report excluded stays not entirely spent in acute care, which explains our lower length of stay. Discussion about the correct in- and exclusion criteria is therefore recommended.

Overall, the average length of stay is declining internationally. Compared to the EU-15 average, the average length of stay in Belgium is about 1 day longer (Figure 97). Only, Germany and the UK have a longer average length of stay than Belgium.

Figure 97: Evolution of the average length of acute stays in selected OECD countries between 1995 and 2006 (source: OECD).
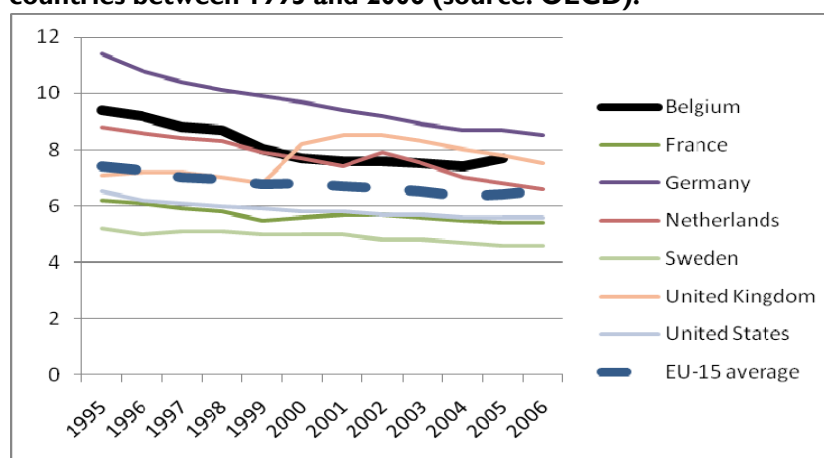
Related performance indicators

S6: Acute care bed days, number per capita.

S6.1: Number of acute care beds.

E1: Surgical day case rates.

A1: NUMBER OF PHYSICIANS AND NURSES

Definition

Description

    a. Number of physicians per 1 000 population

    b. Number of nurses per 1 000 population

Source

- RIVM (the Netherlands)[181]
- International organisations: OECD[182], WHO[183], ECHI short list[184]

Numerator

    a. Number of clinically active physicians x 1 000

According to the source database, some terms need clarification:

- FPS Health, Food Chain Safety and Environment:

A care provider is <u>recognized</u> (Nl: erkend; Fr: agréé) by the FPS Health, Food Chain Safety and Environment if certain conditions are fulfilled. For example, a licensed general practitioner needs to have an initialised (Nl: geviseerd; Fr: visé) diploma and a successfully completed internship in general practice of 3 years.

- NIHDI:

A care provider is considered <u>'in activity'</u> if (s)he is registered in the NIHDI (and thus has a NIHDI code) and if none of the following situations of inactivity are applicable: provisional certification, deceased, abroad, suspension, deletion, discontinuation. Care providers that retired without informing the NIHDI are still considered 'in activity' (i.e. overestimation). Being 'in activity' is regardless of the field of activity.

A care provider is included in the so-called <u>'profiles'</u> if he provided at least 1 clinical service (i.e. consultations, visits, technical acts, but not prescriptions) during a given year or the 2 preceding years. General practitioners working in medical houses are not necessarily included in these profiles (i.e. underestimation).

Importantly, not all care providers are professionally active, and only a proportion of active care providers do provide curative or preventive healthcare. Other fields of activity are scientific research, administrative service, employment in pharmaceutical companies and insurances. Above this, professional activity can be full-time or part-time.

Physicians can be <u>accredited</u> if certain conditions are fulfilled: activity level of 1 250 patient contacts/year, the completion of a Continuing Medical Education program, medical record for each patient, and compliance with specific guidelines. The proportion of accredited physicians will be discussed in indicator S2 'Qualification levels of healthcare providers'.

    b. Number of nurses x 1 000

For the nurses registered in the NIHDI (and by definition having a NIHDI number), the same distinction is made between nurses 'in activity' and profiled nurses (see above). Midwives constitute a separate category.

Denominator

Total mid-year Belgian population.

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[181] Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[182] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[183] http://www.who.int/whosis/en/, accessed August 20th 2009.

[184] http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

Harmonisation of definition with international organisations

The OECD definition was adopted because of the comparability. This definition is also used by the WHO since 2006.

Rationale and indicator characteristics

The number of care providers gives important information on the medical workforce and thus the *accessibility* of healthcare. Together with the number of graduates, this information can be used for health providers supply planning.

Data source(s)

Source database(s)

Numerator

- FPS Health, Food Chain Safety and Environment (https://portal.health.fgov.be/portal/page?_pageid=56,12036478&_dad=portal&_schema=PORTAL)
- NIHDI: yearly statistics (http://www.riziv.fgov.be/presentation/nl/publications/annual-report/index.htm)

Denominator

- FPS Economy - Directorate-General Statistics and Economic Information, Demographics division (http://www.statbel.fgov.be/figures/d21_nl.asp)

See Supplement 2 for periodicity and data quality.

Comparability

Several countries included in the OECD comparison use different methodologies to calculate the number of physicians and nurses. The level of activity is also different. Comparison is therefore potentially dangerous.

Results

Physicians

According to the FPS, the total number of physicians rose from 43 620 in 2005 to 44 727 in 2007 (average annual increase: +1.3%) (Table 112). This increase was due to an increase in the number of licensed physicians, while the number of physicians in training decreased.

Table 112: Evolution of the number of physicians in Belgium between 2005 and 2007 according to the FPS statistics.

	31/12/2005	31/12/2006	31/12/2007
Recognized GPs	14 412	14 464	14 519
GPs in training	584	503	510
Recognized specialists	21 599	22 256	22 890
Specialists in training	3 641	3 366	3 273
Physicians with particular license	3 692	3 772	3 992
Physicians with particular license in training	162	135	174
GPs with granted rights	3 477	3 647	3 651
All physicians living in Belgium*	**43 620**	**44 124**	**44 727**

* The groups in this table are not mutually exclusive. A physician with a recognized specialisation can be in training for another specialisation or particular license. This explains why the numbers in bold do not correspond to the sum of the separate groups. It is this sum of the separate groups that was used by the OECD to calculate the number of registered physicians in Belgium until 2004.

The data of the FPS also allow to give an idea about the gender distribution in the medical profession (Table 113). At present, there is still a predominance of males in the group of recognized physicians, although the relative proportion of females is slightly increasing. On the contrary, in the group of physicians in training, the feminisation of the profession is clear and still increasing.

Table 113: Evolution of the number of physicians in Belgium between 2005 and 2007 according to the data of the FPS, by gender.

	31/12/2005	31/12/2006	31/12/2007
Recognized physicians			
Males	68,4%	67,7%	67,0%
Females	31,6%	32,3%	33,0%
Physicians in training			
Males	43,4%	43,3%	42,1%
Females	56,6%	56,7%	57,9%

According to the data of the NIHDI, the absolute number of physicians 'in activity' increased from 42 176 to 43 212 between 2005 and 2008 (Table 114). In 2007, this corresponded to 4.03 physicians per 1 000 population. These data are used by the OECD to calculate the number of practising physicians in Belgium (Figure 98). However, when only taking into account active physicians according to the definition of the NIHDI (i.e. included in the profiles), the number of physicians per 1 000 population amounted 3.18 in 2007.

Table 114: Evolution of the number of physicians in Belgium between 2005 and 2008 according to the NIHDI statistics.

	2005	2006	2007	2008
Recognized GPs[1]				
In activity	14 179	14 273	14 220	14 156
Profiled	12 760	12 724	12 656	
GPs in training[2]				
In activity	672	580	528	534
Profiled	421	396	353	
GPs with granted rights[3]				
In activity	3 365	3 174	3 185	3 218
Profiled	580	549	534	
Recognized specialists				
In activity	20 372	20 801	21 459	22 020
Profiled	17 864	18 175	18 719	
Specialists in training				
In activity	3 588	3 598	3 447	3 284
Profiled	1 652	1 619	1 484	
Total				
In activity	**42 176**	**42 426**	**42 839**	**43 212**
Profiled	**33 277**	**33 463**	**33 746**	

[1] NIHDI number 003-004 or 007-008; [2] NIHDI number 005-006; [3] NIHDI number 000-009, 001-002.

Importantly, these data do not take into account the real activity level of the physicians. In 2008, the NIHDI published a study evaluating the number of active general practitioners and the number of full-time equivalents (FTE) in 2005[185]. Of the 18 473 generalists (= recognized GPs + GPs in training + GPs with granted rights) as recorded by the FPS in 2005 (Table 112), 18 216 were 'in activity' according to the NIHDI (Table 114). Of the generalists 'in activity', 13 761 were profiled. Only 12 097 of these had more than 500 patient contacts a year.

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[185] http://www.inami.fgov.be/information/nl/studies/study40/pdf/study40.pdf, accessed August 27th 2009.

Without the physicians working in medical houses, this corresponded to 8 642 FTE (defined as 41-42 working hours a week and 14-27 patient contacts a day).

According to the OECD, in Europe only Greece has a higher density of practising physicians than Belgium (Figure 98) (data not shown for Greece). However, when considering active physicians only, the Belgian density remains below the EU-15 average (not shown on the figure).

Figure 98: Evolution of number of physicians per 1 000 population in selected OECD countries between 1995 and 2006.
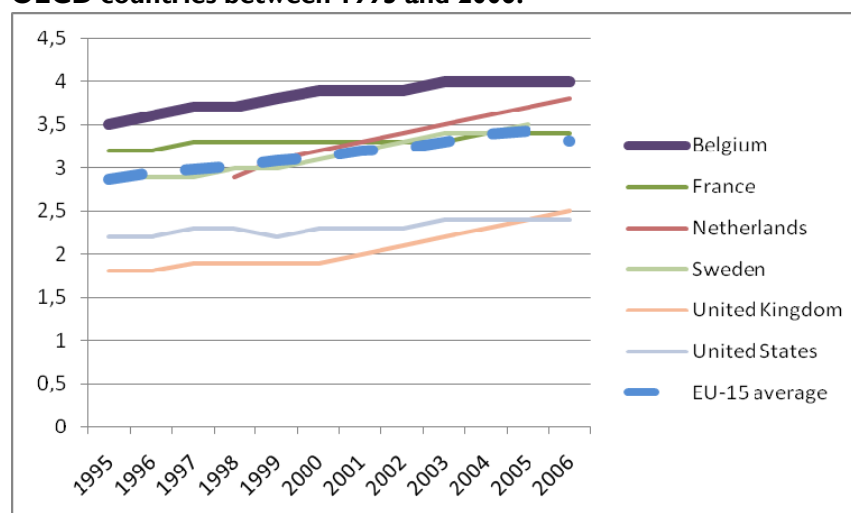
Nurses

To have a complete picture of the number of nurses in Belgium, information is necessary on the following categories: nurses working in hospitals, self-employed nurses, nurses working in nursing homes and midwives. The statistics that are available from the NIHDI are only for nurses with a NIHDI number, encompassing self-employed nurses and midwives (Table 115). However, the same problems arise as for the physicians when interpreting these data, since they do not take into account the real activity level of the nurses.

Table 115: Evolution of the number of self-employed nurses and midwives in Belgium between 2005 and 2008 according to the NIHDI statistics.

	2005	**2006**	**2007**	**2008**
Self-employed nurses in activity	64 191	65 952	62 700	64 756
Midwives in activity	5 300	5 467	5 505	5 592
Profiled self-employed nurses and midwives*	22 071	22 802	23 622	

* Not reported separately.

No other reliable data are available at present on the other categories. Therefore, the calculation of the total number of nurses is impossible at the moment.

Related performance indicators

S2: Qualification levels of healthcare providers.

S3: Medical and nursing graduates.

A2: INSURANCE STATUS OF THE POPULATION

Definition

Description

Insurance status of the population, including being uninsured.

Source

- RIVM (the Netherlands)[186]
- International organisations: OECD[187], ECHI (long list)[188], AHRQ[189]

Numerator

Number of (1) insured individuals, (2) uninsured individuals and (3) individuals with a complementary and/or private insurance.

Denominator

Total mid-year Belgian population.

Harmonisation of definition with international organisations

The OECD definition is adopted.

Background and indicator characteristics

Belgium has a compulsory health insurance system, in principle covering the entire population (employees, self-employed, civil servants, unemployed, pensioners, minimum income recipients, disabled, students, foreign nationals, as well as all of their dependents) and a wide range of services. Payments are predominantly fee-for-service with out-of-pocket payments. Out-of-pocket payments are paid by the patient as co-payments for ambulatory and inpatient care and as supplements. They are relatively large but some patients enjoy special protection. Uninsured can still exist, if beneficiaries do not fulfil the administrative and/or financial requirements (as e.g. asylum seekers), but their number is limited. An uninsured person can be defined as someone who is not affiliated with a sickness fund and hence is not entitled to compulsory health insurance[190]. This does not mean that "uninsured people" have no right to necessary medical care. They are covered by the public municipal welfare centres (OCMW/CPAS).

Data source(s)

Source database(s)

- Number of insured individuals: Annual report of NIHDI (http://www.riziv.fgov.be/presentation/nl/publications/annual-report/index.htm)
- Number of individuals with private insurance: Assuralia (http://www.assuralia.be/nl/stat/Gezondheid/index.asp)
- Denominator: FPS Economy - Directorate-General Statistics and Economic Information, Demographics division (http://www.statbel.fgov.be/figures/d21_nl.asp)

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[186]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[187]   OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[188]   http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

[189]   AHRQ National Healthcare Disparities Report 2008. http://www.ahrq.gov/qual/nhdr08/nhdr08.pdf, accessed September 1st 2009.

[190]   De Graeve D, Lecluyse A, Schokkaert E, Van Ourti T, Van de Voorde C. Personal contribution for health care in Belgium. Impact of supplements. Equity and Patient Behaviour (EPB). Brussel: Federaal Kenniscentrum voor de gezondheidszorg (KCE); 2006. KCE reports 50 (D/2006/10.273/68).

Comparability

International comparability is possible.

Results

For many years now, the health insurance coverage approaches 100% in Belgium (Figure 99). Based on data provided by the NIHDI, the proportion of uninsured persons ranges between 0.6 and 0.8%, with a dip in 2007 (1.4%). These data are slightly better than those of the Netherlands[191]. Other European countries, such as Sweden and the UK, have an insurance coverage of 100%.

Exact data on the number of individuals with a private insurance are unavailable for Belgium. According to Assuralia (www.assuralia.be), the percentage of individuals having a private insurance provided by a private insurer rose from 37.9% in 2001 to 49.8% in 2007. Data on private insurance provided by public insurers are unavailable.

Figure 99: Evolution of the health insurance coverage in Belgium and selected OECD countries, 1995 – 2007.
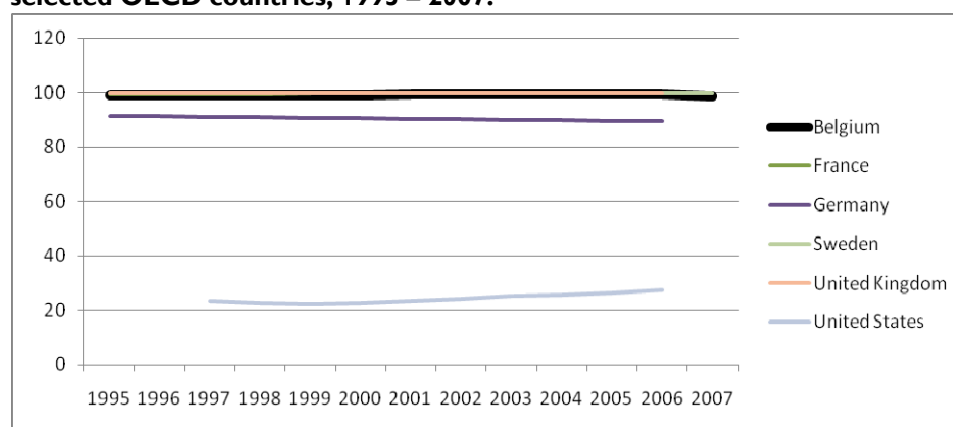
Related performance indicators

A3: Amount of co-payments and out-of-pocket payments.

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[191]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

A3: AMOUNT OF CO-PAYMENTS AND OUT-OF-POCKET PAYMENTS

Definition

Description

Amount of co-payments and out-of-pocket payments.

Source

- RIVM (the Netherlands)[192]
- Other international organisations: OECD[193]

Numerator

Amount of co-payments and out-of-pocket payments.

HF.2.3 in the ICHA-HF classification of healthcare financing.

Denominator

Total healthcare expenditure.

Harmonisation of definition with international organisations

The OECD definition was adopted. Out-of-pocket expenditure on health comprise cost-sharing, self-medication and other expenditure paid directly by private households, irrespective of whether the contact with the healthcare system was established on referral or on the patient's own initiative. Cost-sharing relates to provisions of health insurance or third-party payers for beneficiaries to cover part of the medical cost via a fixed amount per service (co-payment) or a set share of the price tagged to services (co-insurance, also labeled in some countries 'ticket modérateur') or a fixed amount to be born before the third-party gets involved (deductible). Self-medication includes informal payments extracted by medical care providers above the conventional fees, to over-the-counter prescriptions and to medical services not included in a third-party payer formulary or nomenclature of reimbursable services.

Rationale and indicator characteristics

Financial *access* is a basic condition for a functional healthcare system[a]. Foregoing necessary treatment because of its cost can be detrimental to a person's health. High out-of-pocket payments that affect other necessary expenses are also considered undesirable. Care is generally considered financially inaccessible when people limit or postpone the use of necessary care because of (excessively) high costs, or when they have to relinquish other basic necessities because they need care.

Data source(s)

Source database(s)

OECD Health Data.

Comparability

OECD Member countries are at varying stages of implementing the System of Health Accounts (SHA). Therefore, the data reported in OECD Health Data 2008 are at varying levels of comparability.

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[192]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[193]   OECD   Health   Data   2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

Results

Between 2003 and 2007, the out-of-pocket expenditure rose from 5.46 to 6.23 billion euro (Table 116). However, proportionally the total health expenditures rose more importantly in this period. Per capita, the out-of-pocket expenditure rose from €526 in 2003 to €586 in 2007.

Table 116: Out-of-pocket expenditure in Belgium, 2003 – 2006 (source: FPS Social Security).

	2003	2004	2005	2006	2007
Out-of-pocket:					
- Absolute number*	5 458	5 812	5 743	5 691	6 227
- % of total	19,5%	19,0%	18,5%	18,0%	19.0%
- Per capita	526,05 €	557,68 €	548,11 €	539,53 €	586,03 €
Total healthcare expenditure*	27 387	29 488	30 838	31 675	32 774

* In million euro.

Related performance indicators

A5: Additional illness-related costs for chronically ill people.

S1: Healthcare expenditures according to the System of Health Accounts (OECD).

A4: COVERAGE OF PREVENTIVE CHILD HEALTHCARE

Definition

Description

Proportion of Belgian children aged 0-3 at the end of the calendar year that visited a health centre.

Source

- RIVM (the Netherlands)[194]

Numerator

Number of infants aged 0-3 at the end of the calendar year that visited a health centre (of Kind en Gezin or ONE).

Focus on

1. underprivileged: 6 criteria: if they fulfil 3 or more of these criteria:

   - monthly income: Irregular monthly income, available income (minus debts) is lower than the living wage, living on an unemployment benefit and/or living wage. Amount of living wage for a family with children is € 834, 14.

   - education parents: lower education, professional education, special education, not finished lower secondary education end / or illiterate.

   - employment parents: precarious employment, unemployment of both parents or of the single-parent, and / or working in a sheltered workplace.

   - low stimulation level: of children, not or irregularly attend pre-school education and / or difficulties with the nursing of children

   - housing: decayed, unhealthy and / or unsafe house; too small and / or too little utilities.

   - health: poor health of the family members, lack of knowledge and participation of the healthcare, chronic illnesses and / or disabilities in the family

2. migrant

Denominator

Total number of infants aged 0-3 at the end of the calendar year.

Harmonisation of definition with international organisations

The same definition is used as in the Netherlands, except for the age range.

Rationale and indicator characteristics

This indicator gives an impression to what extent the children are reached through the healthcare system. Therefore, it is considered an indicator of *accessibility*.

Data source(s)

Source database(s)

- Flemish Community: Kind en Gezin (Child and Family): Statistisch Jaarverslag
- French Community: Office de la Naissance et de l'Enfance: Direction des consultations et des visites à domiciles (DCVD)

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[194]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

Periodicity

Both Kind en Gezin as ONE produce data each year.

Data quality

Kind en Gezin: no quality plan for the moment, but there is already some attention paid to the quality of the data[195].

ONE: follows several steps to assure the quality.

Comparability

Only the Netherlands uses this indicator, but with a different age range.

Results

In the Flemish Community, almost 90% of the children visited a health centre of Kind en Gezin before the first birthday in 2007 (Table 117). This percentage decreases when the children get older (79.9% at the age of two, and 54.8% at the age of three). In the French Community the same evolution can be seen (Table 118). In 2007, almost 75% of the children went to a health centre of ONE in their first year of life.

Table 117: Percentage children that visit a health centre of Kind en Gezin (source: K&G).

	1st year of life	2nd year of life	3th year of life
2000	82.0%	62.7%	
2001	82.8%	65.5%	
2002	83.5%	70.6%	
2003	85.9%	70.6%	50.7%
2004	86.7%	74.1%	55.0%
2005	88.1%	76.1%	54.0%
2006	88.9%	78.0%	55.2%
2007	89.3%	79.9%	54.8%

Table 118: Percentage children that visit a health centre of ONE (source: ONE).

	1st year of life	2nd year of life	3th year of life
2005	72.8%	70.4%	51.2%
2006	75.2%	71.6%	52.8%
2007	74.9%	72.0%	53.1%

Related performance indicators

QE5: Vaccination coverage of children

QE8: Breast feeding

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[195] Van de Sande S, De Wachter D, Swartenbroeckx N, Peers J et al. Inventaris van databanken gezondheidszorg - Supplement. KCE Reports vol.30 Suppl.. Brussel : Federaal Kenniscentrum voor de gezondheidszorg (KCE) ; Mei 2006. Ref. D/2006/10.273/16.

A5: ADDITIONAL ILLNESS-RELATED COSTS FOR CHRONICALLY ILL PEOPLE

Definition

Description

Additional illness-related costs for chronically ill people.

Source

- RIVM (the Netherlands)[196]

Numerator

Amount of additional illness-related costs for individuals with chronic illness.

Denominator

Health-care related costs for individuals with chronic illness.

Harmonisation of definition with international organisations

The exact definition used in the 2008 RIVM report is unclear. No other useful definitions were found.

Rationale and indicator characteristics

Financial *access* is a basic condition for a functional healthcare system[a]. Foregoing necessary treatment because of its cost can be detrimental to a person's health. High out-of-pocket payments that affect other necessary expenses are also considered undesirable. Care is generally considered financially inaccessible when people limit or postpone the use of necessary care because of (excessively) high costs, or when they have to relinquish other basic necessities because they need care. This is certainly true for patients with a chronic condition.

Data source(s)

Source database(s)

No data are readily available.

Comparability

Not applicable.

Results

The calculation of additional illness-related costs for chronically ill people would require a good definition of chronic diseases and a cost-of-illness study of each identified chronic disease. This was not feasible within the time-frame of the present project.

Related performance indicators

A3: Amount of co-payments and out-of-pocket payments.

S1: Healthcare expenditures according to the System of Health Accounts (OECD).

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[196]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care
        Performance Report 2008. RIVM 2008.

E1: SURGICAL DAY CASE RATES

Definition

Description

Surgical day case rates in a given year.

Source

- CIHI (Canada)[197]
- International organisations: OECD[198], ECHI long list[199]

Numerator

Number of surgical day cases.

Surgical day cases were selected using the MCD variable *hosptype2*.

Denominator

All surgery cases.

Stays with a surgical APR-DRG were selected from the MCD. Long stays were excluded (definition of long stays: see footnote for QS3).

APR-DRG	MDC	Label Refined DRG
001	p1	Liver transplant
002	p4	Heart &/or lung transplant
003	p2	Bone marrow transplant
004	p3	Tracheostomy except for face, mouth & neck diagnoses
005	p3	Tracheostomy for face, mouth & neck diagnoses
020	1	Craniotomy for trauma
021	1	Craniotomy except for trauma
022	1	Ventricular shunt procedures
023	1	Spinal procedures
024	1	Extracranial vascular procedures
025	1	Nervous system proc for peripheral nerve disorders
026	1	Nervous syst proc for cranial nerv & oth nerv sys disord
070	2	Orbital procedures
071	2	Intraocular procedures except lens
072	2	Extraocular procedures except orbit
073	2	Lens procedures w or w/o vitrectomy
090	3	Major larynx & tracheal procedures except tracheostomy
091	3	Other major head & neck procedures
092	3	Facial bone procedures except major head & neck
093	3	Sinus & mastoid procedures
094	3	Mouth procedures
095	3	Cleft lip & palate repair
096	3	Sialoadenectomy & salivary gland procedures
097	3	Tonsillectomy & adenoidectomy procedures
098	3	Other ear, nose, mouth & throat procedures
120	4	Major respiratory procedures
121	4	Non-major respiratory procedures

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[197] Canadian Institute for Health Information. National Consensus Conference on Population Health Indicators. Final Report. CIHI 1999.

[198] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[199] http://ec.europa.eu/health/ph_information/dissemination/echi/echi_en.htm, accessed August 20th 2009.

APR-DRG	MDC	Label Refined DRG
122	4	Other respiratory system procedures
160	5	Major cardiothoracic repair of heart anomaly
161	5	Cardiac defibrillator implant
162	5	Cardiac valve procedures w cardiac catheterization
163	5	Cardiac valve procedures w/o cardiac catheterization
164	5	Coronary bypass w malfunctioning coronary bypass graft
165	5	Coronary bypass w/o malfunctioning coronary bypass w cardiac cath
166	5	Coronary bypass w/o malfunctioning coronary bypass w/o cardiac cath
167	5	Other cardiothoracic procedures
168	5	Major thoracic vascular procedures
169	5	Major abdominal vascular procedures
170	5	Permanent cardiac pacemaker implant w ami, heart failure or shock
171	5	Perm cardiac pacemaker implant w/o ami, heart failure or shock
172	5	Amputation for circ system disorder except upper limb & toe
173	5	Other vascular procedures
174	5	Percutaneous cardiovascular procedures w ami
175	5	Percutaneous cardiovascular procedures w/o ami
176	5	Cardiac pacemaker & defibrillator device replacement
177	5	Cardiac pacemaker & defibrillator revision except device replacement
178	5	Upper limb & toe amputation for circ system disorders
179	5	Vein ligation & stripping
180	5	Other circulatory system procedures
220	6	Major stomach, esophageal & duodenal procedures
221	6	Major small & large bowel procedures
222	6	Minor stomach, esophageal & duodenal procedures
223	6	Minor small & large bowel procedures
224	6	Peritoneal adhesiolysis
225	6	Appendectomy
226	6	Anal & stomal procedures
227	6	Hernia procedures except inguinal & femoral
228	6	Inguinal & femoral hernia procedures
229	6	Other digestive system procedures
260	7	Pancreas, liver & shunt procedures
261	7	Major biliary tract procedures
262	7	Cholecystectomy except laparoscopic
263	7	Laparoscopic cholecystectomy
264	7	Other hepatobiliary & pancreas procedures
300	8	Bilateral & multiple major joint procs of lower extremity
301	8	Major joint & limb reattach proc of lower extremity for trauma
302	8	Major joint & limb reattach proc of lower extrem exc for trauma
303	8	Dorsal & lumbar fusion proc for curvature of back
304	8	Dorsal & lumbar fusion proc except for curvature of back
305	8	Amputation for musculoskelet system & conn tissue disorders
306	8	Major joint & limb reattachment procedures of upper extremity
307	8	Cranial & facial bone reconstructive procedures
308	8	Hip & femur procedures except major joint for trauma
309	8	Hip & femur procedures except major joint for nontrauma
310	8	Back & neck procedures except dorsal & lumbar fusion
311	8	Skin graft & wnd debrid for open wnd, ms & conn tiss dis, exc hand
312	8	Skin grft & wnd debrid exc opn wnd, for ms & conn tis dis, exc hand
313	8	Knee & lower leg procedures except foot
314	8	Foot procedures

APR-DRG	MDC	Label Refined DRG
315	8	Shoulder, elbow & forearm procedures
316	8	Hand & wrist procedures
317	8	Soft tissue procedures
318	8	Removal of internal fixation device
319	8	Local excision of musculoskeletal system
320	8	Other musculoskeletel system & connective tissue procedures
360	9	Skin graft & wound debrid for skin ulcer & cellulitis
361	9	Skin graft & wound debrid exc for skin ulcer & cellulitis
362	9	Mastectomy procedures
363	9	Breast procedures except mastectomy
364	9	Other skin, subcutaneous tissue & breast procedures
400	10	Amputat of lower limb for endocrine, nutrit & metabolic disorders
401	10	Adrenal & pituitary procedures
402	10	Skin graft & wound debrid for endoc, nutrit & metab disorders
403	10	Procedures for obesity
404	10	Thyroid, parathyroid & thyroglossal procedures
405	10	Other endocrine, nutrititional & metabolic procedures
440	11	Kidney transplant
441	11	Major bladder procedures
442	11	Kidney & urinary tract procedures for malignancy
443	11	Kidney & urinary tract procedures for nonmalignancy
444	11	Create, revise, remove renal access device
445	11	Minor bladder procedures
446	11	Urethral & transurethral procedures
447	11	Other kidney & urinary tract procedures
480	12	Major male pelvic procedures
481	12	Penis procedures
482	12	Transurethral prostatectomy
483	12	Testes procedures
484	12	Other male reproductive system procedures
510	13	Pelvic evisceration, radical hysterectectomy & radical vulvectomy
511	13	Uterine & adnexa procedures for ovarian & adnexal malignancy
512	13	Uterine & adnexa procedures for non-ovarian & non-adnexal malig
513	13	Uterine & adnexa procedures for ca in situ & nonmalignancy
514	13	Female reproductive system reconstructive procedures
515	13	Vagina, cervix & vulva procedures
516	13	Laparoscopy & tubal interruption
517	13	D&c & conization
518	13	Other female reproductive system procedures
540	14	Cesarean delivery
541	14	Vaginal delivery w sterilization &/or d&c
542	14	Vaginal delivery w proc except sterilization &/or d&c
543	14	Postpartum & post abortion diagnoses w procedure
544	14	Abortion w d&c, aspiration curettage or hysterotomy
582	15	Neonate, w organ transplant
583	15	Neonate, w ecmo
590	15	Neonate, birthwt <750g w major procedure
592	15	Neonate, birthwt 750g-999g w major procedure
600	15	Neonate, birthwt 1000-1499g w major procedure
610	15	Neonate, birthwt 1500-1999g w major procedure
620	15	Neonate, birthwt 2000-2499g w major procedure
630	15	Neonate, birthwt > 2499g w major cardiovasc procedure

APR-DRG	MDC	Label Refined DRG
631	15	Neonate, birthwt > 2499g w other major procedure
632	15	Neonate, birthwt > 2499g w other procedure
650	16	Splenectomy
651	16	Other procedures of blood & blood forming organs
680	17	Lymphoma & leukemia w major procedure
681	17	Lymphoma & leukemia w any other procedure
682	17	Myeloprolif disorder & poorly diff neopl w major procedure
683	17	Myeloprolif disorder & poorly diff neopl w any other procedure
710	18	Procedures for infectious & parasitic diseases
711	18	Procedures for postoperative & post traumatic infections
740	19	Procedure w principal diagnoses of mental illness
790	21	Skin graft & wound debridement for injuries
791	21	Procedures for complications of treatment
792	21	Other procedures for injuries
831	22	Extensive burns w procedure
832	22	Nonextensive burns w skin graft
833	22	Nonextensive burns w wound debridement & other procedures
850	23	Procedure w diagnoses of other contact w health services
870	24	Tracheostomy for hiv infections
871	24	Hiv w proc w multiple major hiv related infections
872	24	Hiv w procedure w major hiv related diagnosis
873	24	Hiv w procedure w/o major hiv related diagnosis
910	25	Craniotomy, spine, hip & major limb proc for multiple sig trauma
911	25	Other procedures for multiple significant trauma
950	0	Extensive procedure unrelated to principal diagnosis
951	0	Prostatic procedure unrelated to principal diagnosis
952	0	Nonextensive procedure unrelated to principal diagnosis

Harmonisation of definition with international organisations

According to the OECD, a *surgical day case* is defined as a patient who is given invasive surgical treatment (elective surgeries only) which is carried out in a dedicated surgical unit or part of a hospital and which leads to discharge on the day of the operation. This definition is also used in Belgium. The OECD provides data on the absolute number of surgical day cases, the proportion of surgical day cases per 1 000 population and the percentage of total surgery cases performed as day cases. For the present report only the last indicator was selected.

Rationale and indicator characteristics

Carrying out elective procedures as day cases where clinical circumstances allow (e.g. inguinal hernia repair, circumcision, cataract surgery, etc.) saves money on bed occupancy and nursing care. It is therefore considered an indicator of *efficiency*. Since the surgical day case rate has an influence on the system's capacity to provide and maintain infrastructure, it is also considered an indicator of *sustainability*.

Several Belgian hospitals have a dedicated surgical day care unit. The accreditation of these units is regulated by a Royal Decree.

Related indicators are measured by the Flemish Community (surgical day case rate for cataract surgery and varicectomy)[200].

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200   Vlaams Agentschap Zorg & Gezondheid: http://www.zorg-en-gezondheid.be/kwaliteitsindicatoren_zh.aspx.

Data source(s)

Source database(s)

MCD: see Supplement 2 for periodicity and data quality.

Comparability

Data are not available for all OECD countries (e.g. not available in France and the US). Not all OECD countries use the same definition or use data from all hospitals (e.g. the figures of the UK refer to public hospitals only).

Results

The percentage of day cases amongst the surgical cases was 42.12% and 42.89% in 2004 and 2005 respectively. Between 1999 and 2005, the surgical day case rate increased with 28.1% in Belgium. This increasing trend is also observed internationally (Figure 100).

Figure 100: Evolution of surgical day case rate in selected OECD countries, 1995 – 2006 (source: OECD Health Data 2008).
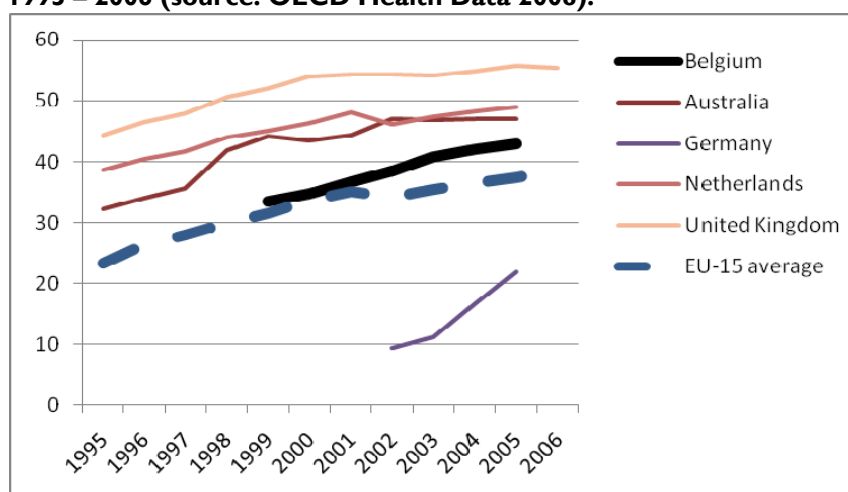
Related performance indicators

QC2: Average length-of-stay.

S6: Acute care bed days.

E2: HOME DIALYSIS

Definition

Description

Use of home care technology and proportion of renal dialysis patients using home dialysis.

Source

- RIVM (the Netherlands)[201]

Numerator

Number of individuals using home dialysis.

Used reimbursement codes:

- Haemodialysis (HD) hospital: 470470, 470481, 761272, 761283
- HD satellite: 761515, 761526
- HD domicile: 761456, 761493
- Peritoneal Dialysis (PD): 470374, 470385, 761471, 761530, 761552, 761574, 761655, 761670

The following patient categories are distinguished:

- Home HD: at least 80% of the dialysis duration during the complete period of the dialysis treatment related to home haemodialysis
- PD: at least 80% of the dialysis duration during the complete period of the dialysis treatment related to peritoneal dialysis
- PD – hospital HD: patients with both peritoneal dialysis and hospital haemodialysis in their treatment but at least 80% of the complete dialysis duration related to both peritoneal dialysis and hospital haemodialysis
- PD – satellite HD: patients with both peritoneal dialysis and satellite haemodialysis in their treatment but at least 80% of the complete dialysis duration related to both peritoneal dialysis and satellite haemodialysis

Denominator

All individuals undergoing renal dialysis.

Patients were included in the sample in case of chronic dialysis, defined as reimbursement corresponding to 7 consecutive weeks of chronic dialysis treatment in a given year (reimbursement code: see numerator). All patients ≥ 18 years old were included.

Harmonisation of definition with international organisations

The definition used by the RIVM was adopted. However, technical specifications were not found in the Dutch report.

Background and indicator characteristics

There are different treatment options for patients whose kidneys fail. The patients can be dialysed, either with HD or with PD. In both cases patients can also receive a kidney transplant, either from a deceased or a living donor. Ultimately, kidney transplantation is considered to be the most preferable option, whenever possible.

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[201]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

Substitution of the more expensive haemodialysis in hospital by the less expensive alternatives such as low-care haemodialysis in satellite centres and peritoneal dialysis has been slower in Belgium than in many other countries. This is thought to be partly due to the financing mechanisms for dialysis. Since 1995 the Belgian government has modified the financing system a couple of times, with the explicit goal of introducing incentives for substitution. For this reason, the indicator is categorised in the performance dimension *efficiency*. Since home dialysis is not indicated for all patients with end-stage renal disease, it is also considered an indicator of *appropriateness*.

Data source(s)

Source database(s)

IMA: see Supplement 2 for periodicity and data quality.

Comparability

Since no technical specifications were found in the Dutch report, it is impossible to judge the comparability between the 2 countries.

Results

Table 119 provides an overview of the evolution of renal dialysis in Belgium between 2003 and 2006 and the proportion of patients receiving home dialysis. Overall, an increasing number of dialysis patients is identified (+12.1% between 2003 and 2006). Furthermore, the proportion of home dialysis patients is increasing (+29.8% between 2003 and 2006), mainly because of an increase in peritoneal dialysis (+32.8% between 2003 and 2006). A decrease in home haemodialysis (-37.5% between 2003 and 2006) is identified. In younger age categories, the use of peritoneal dialysis is more prominent (Table 120).

Table 119: Evolution of renal dialysis and home dialysis in Belgium, 2003 – 2006.

Dialysis type	2003	2004	2005	2006
Total dialysis	6804	7371	7643	7630
Home HD	24	22	18	15
PD	530	618	677	704
PD – hospital HD	107	125	139	143
PD – satellite HD	1	1	2	4
≥80% home dialysis	554 (8.1%)	640 (8.7%)	695 (9.1%)	719 (9.4%)
All home dialysis	662 (9.7%)	766 (10.4%)	836 (10.9%)	866 (11.3%)

Table 120: Percentage of all dialysis patients receiving peritoneal dialysis per age category.

Age category	2003	2004	2005	2006
18-44 years	15,8%	19,1%	20,6%	20,7%
45-64 years	10,7%	11,2%	11,7%	12,6%
65-74 years	6,8%	7,8%	7,9%	8,7%
>= 75 years	4,4%	4,6%	5,2%	5,2%

In the Netherlands, an opposite evolution was found, with a decrease in home dialysis from 33% in 2002 to about 25% in 2007[202]. The relative decrease was mainly due to a drop in the number of peritoneal dialysis patients. On the contrary, the number of home haemodialysis patients rose between 1997 and 2007 from 91 to 128 respectively.

Related performance indicators

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[202]   Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care
         Performance Report 2008. RIVM 2008.

S1: HEALTHCARE EXPENDITURES ACCORDING TO THE SYSTEM OF HEALTH ACCOUNTS (OECD)

Definition

Description

Total healthcare expenditures according to the System of Health Accounts (OECD), expressed for a given year:

- As a whole (€ million)
- Per healthcare sector (€ million)
- Per capita (US$ PPP)
- As a percentage of the gross domestic product (GDP)

Source

- RIVM (the Netherlands)[203]
- Other international organisations: OECD[204], WHO[205]

Harmonisation of definition with international organisations

The OECD definition, which is also used by the WHO and Eurostat, was adopted.

Rationale and indicator characteristics

Trends in health expenditure are an important indicator of affordability, and thus *sustainability*. For international comparisons, the standard international definitions for healthcare and healthcare expenditure of the OECD's System of Health Accounts (SHA) are classically used. SHA aims at measuring consumption of health and long term care services.

The total health expenditure is broken down by healthcare function, providers and funding agents for the purpose of monitoring healthcare consumption.

The proportion of GDP devoted to healthcare and how this proportion changes over the course of time are also monitored.

Data source(s)

Source database(s)

- Purchasing Power Parities for GDP: OECD, http://stats.oecd.org/Index.aspx?datasetcode=SNA_TABLE4
- Gross Domestic Product: National Bank of Belgium, http://www.nbb.be/belgostat/startSDW.do
- Total healthcare expenditures: FPS Social Security

Comparability

OECD and EU Member countries are at varying stages of implementing the System of Health Accounts (SHA). Therefore, the data reported in OECD Health Data 2008 are at varying levels of comparability.

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[203] Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[204] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[205] http://www.who.int/whosis/en/, accessed August 20th 2009.

Results

The total health expenditure (THE) increased with 17.3% between 2003 and 2007, and fluctuated between 9.5% and 10.1% of the GDP in this period (Table 121). The THE per capita increased from 3 066 US$ PPP in 2003 to 3 461 US$ PPP in 2007, an increase of 12.9%.

Table 121: Total health expenditure in Belgium according to the System of Health Accounts, 2003 – 2007.

	2003	**2004**	**2005**	**2006**	**2007**
Absolute amount (€ million)	27 952	30 543	31 113	31 562	32 774
%GDP	9.5%	10.1%	10.1%	9.9%	10.0%
Per capita (US$ PPP)	3 066	3 272	3 301	3 332	3 461

In 2007, expenditure on curative care services accounted for more than 46% of the THE (Table 122). Of the 15 236 million € spent on curative care services, 9 003 million € (59%) was on in-patient care.

Table 122: Health expenditure per healthcare service in Belgium according to the System of Health Accounts, 2007.

Healthcare service	**Expenditure (€ million)**
Services of curative care	15 236
Services of rehabilitative care	1 328
Services of long-term nursing care	5 555
Ancillary services to healthcare	777
Medical goods dispensed to outpatients	5 766
Prevention and public health services	1 328
Health administration and health insurance	2 784
Total	**32 774**

Expressed as a % of the GDP, Belgium has amongst the higher THE in Europe (Figure 101). However, France, Germany and outside Europe also the US have a markedly higher THE. Similar results were found when expressed per capita (Figure 102).

Figure 101: Total health expenditure expressed as % of GDP in selected OECD countries, 1995 – 2006.
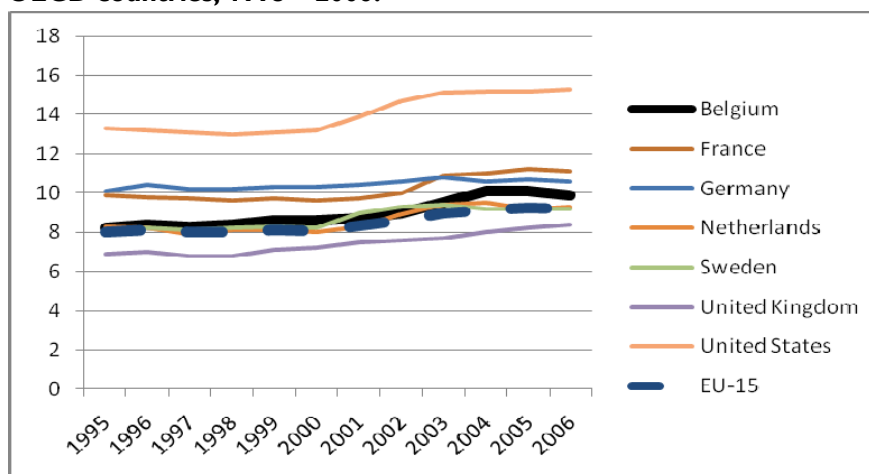
Figure 102: Total health expenditure expressed per capita (US$ PPP) in selected OECD countries, 1995 – 2006.
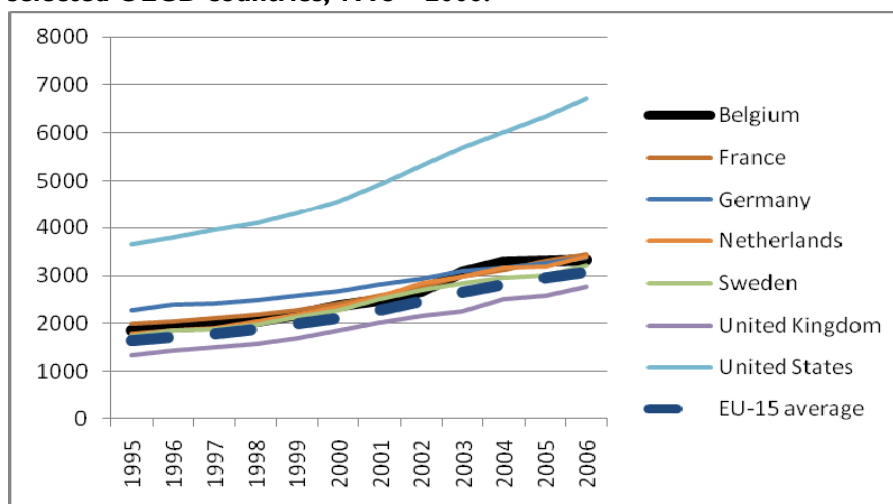
Related performance indicators

A3: Amount of co-payments and out-of-pocket payments.

S1.1: AMOUNT REIMBURSED BY THE MAXIMUM BILLING SYSTEM

Definition

Description

Amount reimbursed by the maximum billing system.

Source

-

Harmonisation of definition with international organisations

Not applicable.

Rationale and indicator characteristics

In Belgium, the Maximum Billing System (MAB) was implemented in 2002. When certain income conditions are met, households whose total annual co-payments exceed a ceiling may benefit from reimbursement of co-payments[206]. The system is articulated around different ceilings. The first ceilings are fixed at €450 and €650 for people with a low or modest income. The system is meant to safeguard the *accessibility* of the healthcare system. Since the MAB acts as a social care net, this indicator can also be considered as one that evaluates the system's capacity to be responsive to emerging needs of the population (part of *sustainability*).

Data source(s)

Source database(s)

- NIHDI: yearly statistics (http://www.riziv.fgov.be/presentation/nl/publications/annual-report/index.htm)

Comparability

Not applicable.

Results

Table 123 presents the reimbursements by the maximum billing system (MAB). The increase in the expenses between 2002 and 2003 can be explained by the start up of the system on the one hand and the fiscal shift of the MAB from 2002 to 2003 by some health insurers. The difference with the data presented in the KCE report 80 can be explained by the fact that the NIHDI report also includes the so-called fiscal MAB (part of the MAB that is paid by the taxman). However, since 2007 this fiscal MAB is entirely integrated in the so-called income MAB.

In 2003, the € 199 million of the MAB reimbursements represented about 0.71% of the Belgian total healthcare budget as calculated for indicator S1. By 2007, this percentage rose to 0.87%.

Table 123: MAB reimbursements (in 1 000 euro), 2002 – 2007.

2002	2003	2004	2005	2006	2007	2008	2009
87 646	198 987	238 266	252 843	288 916	286 575	277 153	304 211

Related performance indicators

S1: Healthcare expenditures according to the System of Health Accounts (OECD).

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[206] E Schokkaert, J Guillaume, A Lecluyse, H Avalosse, K Cornelis, D De Graeve, S Devriese, J Vanoverloop, C Van de Voorde. Effects of the Maximum Billing system on health care consumption and financial access to health care, KCE Report 80.

S2: QUALIFICATION LEVELS OF HEALTHCARE PROVIDERS

Definition

Description

Qualification levels of healthcare providers.

Source

- RIVM (the Netherlands) [207]
- International organisations: OECD[208]

Numerator

Number of healthcare providers per qualification level and per discipline.

Denominator

Total number of healthcare providers per discipline.

Harmonisation of definition with international organisations

The OECD provides data on the number of qualified and assistant nurses, the number of certain medical specialists (pediatricians, gynaecologists, anaesthesists, surgeons and psychiatrists), the number of dentists and pharmacists.

In the Dutch report, data on the different qualification levels of nurses and caregivers is provided. Since these data are not available for Belgium, the indicator is restricted to the provision of data on the number of physicians by specialty and the number of paramedics per discipline.

Rationale and indicator characteristics

As for indicator A1, the number of physicians by specialty and paramedics by discipline gives important information on the medical workforce and thus the *accessibility* of healthcare. Taking into account the specific target population of these healthcare providers, the indicator also gives information on *sustainability*.

Data source(s)

Source database(s)

Numerator

- NIHDI: yearly statistics (http://www.riziv.fgov.be/presentation/nl/publications/annual-report/index.htm)

Denominator

- FPS Economy - Directorate-General Statistics and Economic Information, Demographics division: http://statbel.fgov.be/
- Belgian Cancer Registry: yearly statistics (http://www.kankerregister.be/)

Comparability

Since a different approach was used, comparability is low.

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[207] Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

[208] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

Results

For the present indicator, healthcare providers in activity are studied, as defined in A1 number of physicians and nurses.

Table 41 presents the specialties of all healthcare providers in activity that are not in training (situation December 31st each year).

Table 124: Healthcare providers in activity, 2004 – 2008.

Specialists	2004	2005	2006	2007	2008
Anaesthesiologists	1747	1846	1899	1840	1896
Surgeons	1478	1503	1518	1468	1489
Neuro-surgeons	156	164	171	180	188
Geriatrists (*)	.	.	.	234	242
Plastic surgeons	202	214	221	231	243
Gynaecologists-obstetricians	1335	1352	1386	1422	1463
Ophtalmologists	1012	1022	1035	1061	1072
Specialists in ENT	603	613	625	637	648
Urologists	360	368	373	385	388
Orthopaedic surgeons	917	947	959	957	968
Stomatologists	306	302	305	305	312
Dermatologists-venerologists	656	675	685	701	713
Internists	2039	2058	2096	1561	1576
Internists + endocrino-diabetologists	.	.	.	195	201
Pneumologists	367	392	407	420	428
Gastro-enterologists	442	481	499	517	552
Paediatricians	1394	1438	1482	1520	1505
Paediatricians + neuro-paediatricians	.	.	52	.	52
Cardiologists	862	902	920	981	1011
Neuro-psychiatrists	575	478	460	442	421
Neurologists	228	256	270	293	321
Psychiatrists	1436	1569	1631	1672	1728
Rhumatologists	225	230	231	231	230
Specialists in physical and rehabilitation med	444	465	473	485	491
Clinical biologists	659	663	661	657	663
Anatomo-pathologists	287	296	309	319	318
Radiologists	1467	1500	1542	1569	1600
Radiotherapists-oncologists	163	169	179	182	195
Nuclearists (*)	320	320	322	321	320
Specialists in acute medicine	.	.	.	156	253
Emergency physicians (*)	.	.	.	383	406
Other specialists	156	149	142	134	127
Total specialists	**19836**	**20372**	**20853**	**21459**	**22020**
Dentists	8362	8363	8423	8350	8369
Pharmacists	11618	11882	12109	12305	12602
Bio-pharmacists	583	593	598	595	603
Physiotherapists	28252	24958	25406	25693	26124
Nurses	62211	64191	65952	62700	64756
Midwives	5084	5300	5467	5505	5592
Opticians	2206	3326	3255	3263	3320

Specialists	2004	2005	2006	2007	2008
Orthopaedists	560	434	454	475	482
Bandagists	8653	7533	7786	7918	8089
Implants suppliers	836	888	906	920	930
Logopaedists	3922	4252	4148	4465	4856
Audicians	1039	1085	1107	1137	1177
Dieticians	928	1022	1178	1329	1510
Podiatrists	172	215	239	255	276
Orthoptists	86	89	94	93	100

(*) including double qualification – Source: NIHDI

Table 125 presents the details of providers active in dentistry, for 2004-2008. Parondotology and orthodontics have emerged as new specialities since a few years, while the numbers of GPs and physicians dentists decreases. The number of stomatologists is stable.

Table 125: Number of dentistry providers in activity, 2004 – 2008.

Qualification	2004	2005	2006	2007	2008
GP	8163	8173	8243	7616	7563
Dentist holder of a capability license	9	6	4	2	2
Physician dentist before 1929	1	1	1	1	1
Physician dentist	189	183	175	167	159
Physician stomatologist	298	292	291	293	299
Specialist in parondotology	0	0	0	112	122
Specialist in orthodontics	0	0	0	387	411
GP in training	0	0	0	50	61
Specialist in parondotology in training	0	0	0	6	20
Specialist in orthodontics in training	0	0	0	9	30
Total	**8660**	**8655**	**8714**	**8643**	**8668**

Source: NIHDI

Table 126 presents the proportion of accredited physicians amongst GPs and specialists from 2004 to 2008. The proportion is calculated by dividing the number of accredited physicians in activity (situation 31/12 of each year) by the number of recognized physicians in activity (situation 31/12 of each year). The decrease of the accredited specialists was significant (2-sided $p<0.0001$), while no trend can be found in the case of the accredited GPs (2-sided $p=0.069$).

Table 126: Number of accredited physicians in activity, 2004 – 2008.

Qualification	2004	2005	2006	2007	2008
GPs	70.5%	68.7%	69.3%	70.0%	68.7%
Specialists	65.4%	62.2%	64.3%	64.4%	62.3%

Source: NIHDI – physicians in training excluded.

For some specialties, the number of specialists in function of their target population was calculated. For example, the number of geriatrists per 1 000 population aged 75 or more was 0.258 at the end of 2007. Table 127 shows the evolution of gynaecologists per 1 000 women aged 18-65 year. The number increased by 3.9% in 4 years.

The increase in paediatrists for the same period was 7.8% (Table 128). On the contrary, the number of dentists decreased by 2.2% on this period (Table 129).

Table 127: Gynaecologists in activity, 2004 – 2007 (situation 31/12).

Number of physicians / 1000 women aged 18-65	2004	2005	2006	2007
Gynaecologists-obstetricians	0.408	0.410	0.417	0.424

Table 128: Paediatrists in activity, 2004 – 2007 (situation 31/12).

Number of physicians / 1000 children aged 12 or less	2004	2005	2006	2007
Paediatrists	0.908	0.936	0.961	0.979

Table 129: Dentists in activity, 2004 – 2007 (situation 31/12).

Number of dentists / 1000 population	2004	2005	2006	2007
Dentists	0.801	0.796	0.796	0.783

The number of radiotherapists-oncologists per 1 000 cancer cases amounted to 2.69 and 2.81 in 2004 and 2005 respectively.

Related performance indicators

A1: Number of physicians and nurses.

S3: Medical and nursing graduates.

S3A: MEDICAL GRADUATES

Definition

Description

Number of students who have graduated in medicine from medical faculties or similar institutions, i.e., who have completed basic medical education in a given year.

Source

- OECD[209]
- Other international organisations: WHO[210]

Numerator

Number of medical graduates x 100 000.

Exclusion:

- Graduates in pharmacy, dentistry/stomatology, public health and epidemiology;
- Individuals who have completed post-graduate studies in medicine.
- Graduates with Masters and PhD degrees in nursing.

Denominator

Total Belgian mid-year population.

Harmonisation of definition with international organisations

The OECD definition was adopted.

Rationale and indicator characteristics

Since 1997, a *numerus clausus* mechanism is used to control the number of practising physicians in Belgium through a limitation of the number of medical students. Together with the number of practising physicians, the number of medical graduates can be used for medical supply planning. It is therefore mainly an indicator of *sustainability*.

In France, Germany and the Netherlands, the *numerus clausus* mechanism clearly led to a decrease in the number of medical graduates and practising physicians[211].

Data source(s)

Source database(s)

- Numerator: University Foundation (http://www.fondationuniversitaire.be/nl/)
- Denominator: FPS Economy - Directorate-General Statistics and Economic Information, Demographics division (http://www.statbel.fgov.be/figures/d21_nl.asp)

Periodicity

The University Foundation yearly updates its data on university admissions and graduates. The data are publicly available, with a delay of 2 – 3 years (in August 2009 the most recent available data were from 2006).

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209   OECD   Health   Data   2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

210   WHO European Health For All Database. http://www.euro.who.int/hfadb, accessed August 21st 2009.

211   Roberfroid D, Stordeur S, Camberlin C, Van de Voorde C, Vrijens F, Léonard C. Physician workforce supply in Belgium. Current situation and challenges. Health Services Research (HSR). Brussel: Federaal Kenniscentrum voor de Gezondheidszorg (KCE); 2008. KCE reports.72A (D/2008/10.273/07).

Data quality

The data published by the University Foundation are based on data from the Vlaamse Interuniversitaire Raad (VLIR; until 2000-2001), the Ministry of the Flemish Community – Department of Education (since 2001-2002) and the Conseil des Recteurs des institutions universitaires francophones (CRef).

Comparability

Several countries included in the OECD comparison use different methodologies to calculate the number of medical graduates. Comparison is therefore potentially dangerous.

Results

Since 1995, the number of medical students graduating is fairly stable between 1 750 and 1 950, with two peaks in 2001 (2 099 graduates) and 2003 (2 115 graduates) (Figure 103). Although a *numerus clausus* mechanism was implemented in 1997 to limit the number of practising physicians in Belgium (Figure 104, Figure 105), no clear decrease was found in the number of medical graduates in 2004 and 2005 (Figure 103).

Figure 103: Evolution of the absolute number of medical graduates between 1996 and 2005.
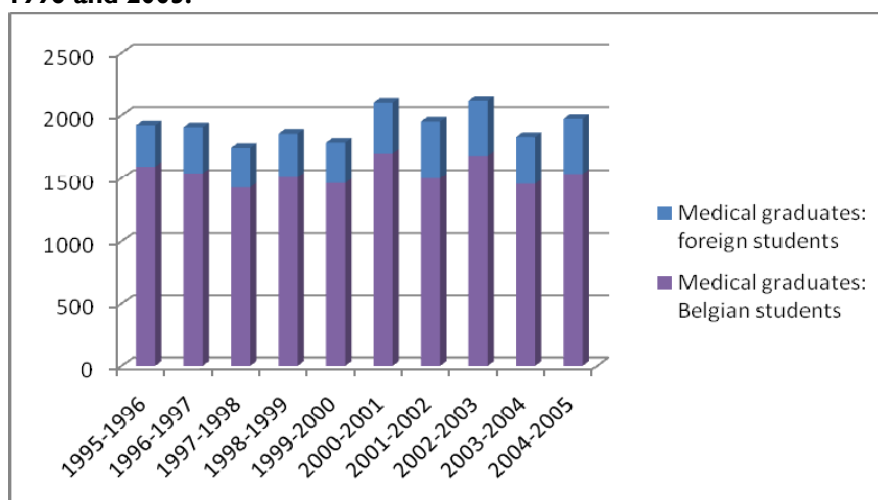
Figure 104: Evolution of the absolute number of first admissions between 1995 and 2005.
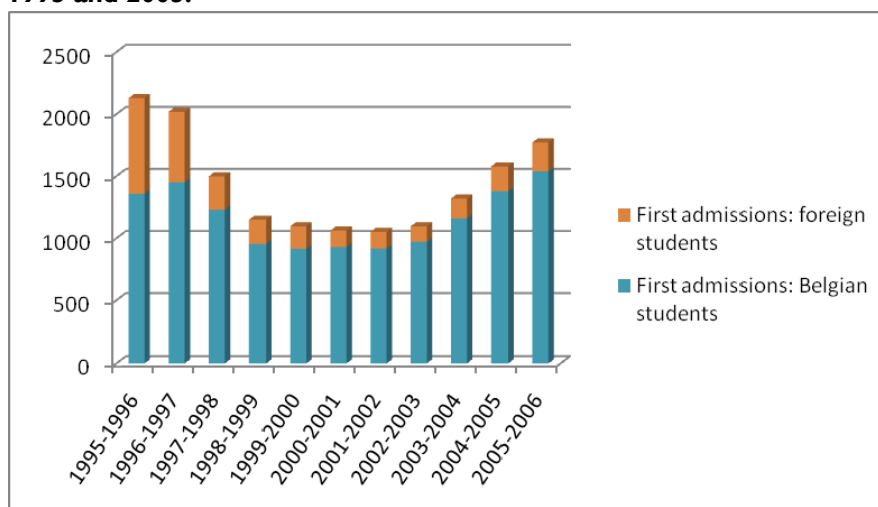
Figure 105: Evolution of the absolute number of all admissions between 1995 and 2005.
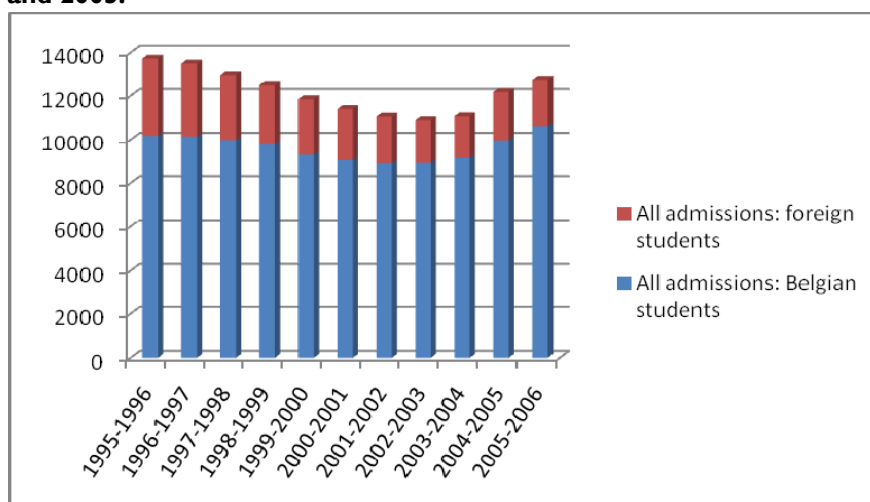
In comparison to other countries, the number of medical graduates per 100 000 population in Belgium is very high (Figure 106). It is more than twice as high as in Sweden and the UK, and even more than three times higher than in France, Germany and the US. In Europe, only Austria has a higher number (data not shown).

Figure 106: Evolution of the number of medical graduates per 100 000 population between 1995 and 2006 in a selection of OECD countries (source: OECD).
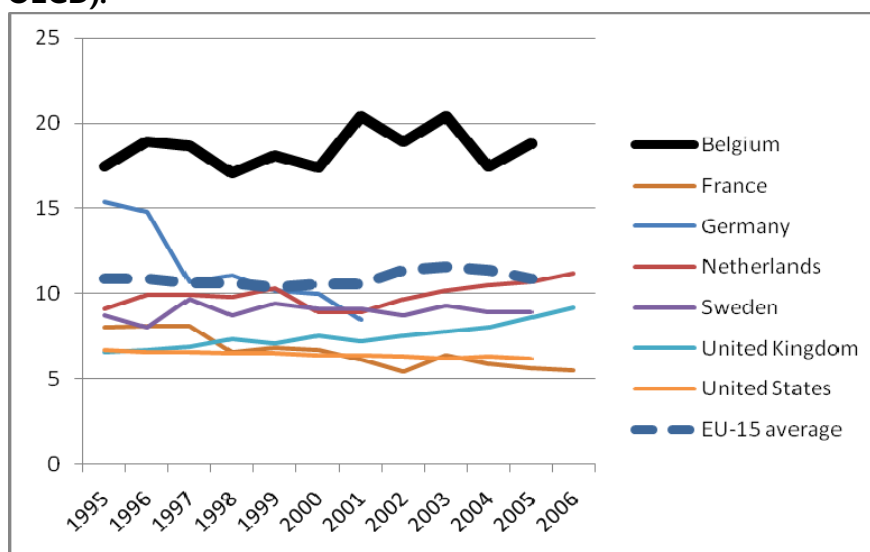
Related performance indicators

A1: Number of physicians and nurses per 100 000 population

S2: Qualification levels of healthcare providers

S3b: Nursing graduates

S3B: NURSING GRADUATES

Definition

Description

Number of students who obtained a recognised qualification in nursing in a given year.

Source

- OECD[212]
- Other international organisations: WHO[213]

Numerator

Number of nursing graduates x 100 000.

Inclusion:

- Graduates from an education programme required to become a registered or licensed nurse (normally comprising at least 2 years of post-secondary education in nursing)
- Graduates from a midwifery programme

Exclusion:

- Graduates from other fields of studies which do not provide a recognised foundation for the practice of nursing
- Graduates with Masters and PhD degrees in nursing.

Denominator

Total Belgian mid-year population.

Harmonisation of definition with international organisations

The OECD definition was adopted.

Rationale and indicator characteristics

In Belgium, nursing is a bottleneck profession. A dedicated Commission is in charge of following up the demand and supply of nurses and midwives in order to assure an appropriate workforce. Together with the number of practising nurses and midwives, the number of nursing graduates can be used for this supply planning. It is therefore mainly an indicator of *sustainability*.

Data source(s)

Source database(s)

- Data on nursing graduates are not available on a national level, but can be collected from the Ministry of Education of the Flemish and French Community.
- Denominator: FPS Economy - Directorate-General Statistics and Economic Information, Demographics division (http://www.statbel.fgov.be/figures/d21_nl.asp)

Comparability

Several countries included in the OECD comparison use different methodologies to calculate the number of nursing graduates. Comparison is therefore potentially dangerous.

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[212]   OECD   Health   Data   2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

[213]   WHO European Health For All Database. http://www.euro.who.int/hfadb, accessed August 21st 2009.

Results

Since the beginning of this century, the total number of nursing students is gradually increasing from 19 314 in 2000 to 23 069 in 2007 (Figure 107). This is also true for the students admitted in the first year: the number rose from 7 986 in 2000 to 9 538 in 2007.

Figure 107: Evolution of the total number of nursing students (source: www.npdata.be, accessed October 7th 2009).
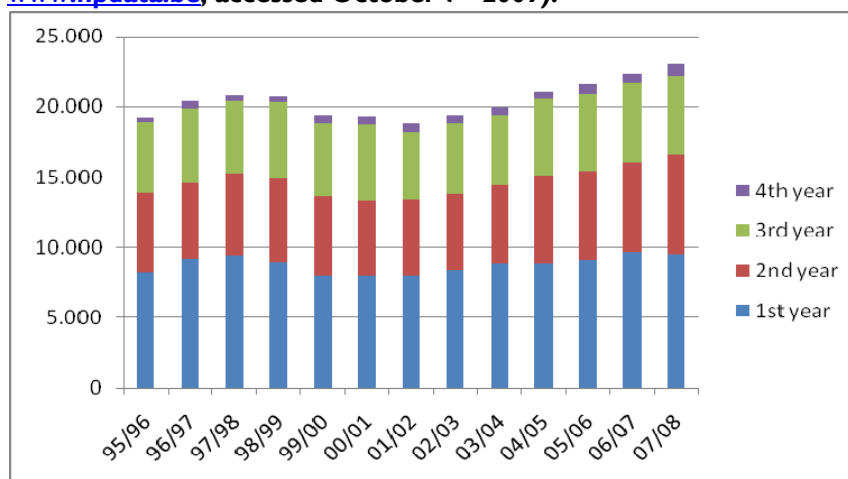
The calculation of the number of nursing and midwives graduates on a national level is more difficult due to different methodologies used by the different communities[214]. In the Flemish Community, no distinction is made between the so-called first and second diplomas (i.e. a 4th specialisation year) since 1993-1994, resulting in double counts. In the French Community, this distinction still is made. However, in the French Community a lot of foreign (mainly French) students who return to their country of origin after graduating are included in the data. Data on the number of physiotherapist or paramedics retraining are unavailable. Taking these difficulties into account, Pacolet et al. estimated the total number of nursing and midwives graduates to be around 4 000 in 2003-2004. This corresponds to a number of around 38 graduates per 100 000 population, being above the EU-15 average of 30.4 in 2004.

Related performance indicators

A1: Number of physicians and nurses per 100 000 population

S2: Qualification levels of healthcare providers

S3a: Medical graduates

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214   Pacolet J, Merckx S. Manpowerplanning voor de verpleegkunde en vroedkunde in België: synthese. Federale Overheidsdienst Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu, 2006.

S4: YEARLY AMOUNT OF THE SPECIAL SOLIDARITY FUND

Definition

Description

Yearly amount of the Special Solidarity Fund (SSF).

Source

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Harmonisation of definition with international organisations

Not applicable.

Rationale and indicator characteristics

Since 1990, the SSF is operational within the NIHDI and acts as a social care net, besides the compulsory health insurance[215]. The SSF reimburses certain costs related to rare diseases, rare indications or the application of innovative techniques, which are not (yet) covered by the compulsory health insurance system in Belgium or any other channel (private insurance – reimbursement abroad). The target audiences of the SSF are seriously ill patients for whom an expensive but not (yet) reimbursed treatment is essential. In other words, for these target groups, the SSF safeguards the *accessibility* to healthcare. Chronically ill children (children below 19 years suffering from cancer, renal insufficiency or any other life threatening disease, requiring a continuous or repetitive treatment of at least 6 months) are a specific target group of the SSF. In this case the SSF can reimburse up to € 650 additional costs on a yearly basis.

The "College of Medical Directors" is the decision making body within the SSF. This body assesses the individual application files submitted towards the SSF and takes the final decision regarding reimbursement. The annual budget of the SSF consists of a fixed amount, which is set each year by a Royal decree and taken from the global NIHDI budget.

Since the SSF acts as a social care net, this indicator might be considered as one that evaluates the system's capacity to be responsive to emerging needs (part of *sustainability*). However, the inclusion of this indicator needs to be re-evaluated after the publication of the ongoing KCE project.

Data source(s)

Source database(s)

- Annual report of the Special Solidarity Fund

Comparability

Not applicable.

Results

When looking at the expenses of the SSF (Figure 108) one has to notice that the expenses are the amounts actually paid by the health insurance during the budget period. Payments are not directly linked to the decisions on reimbursement as taken by the 'College of medical directors', since decisions in year x can lead to payment in year x + 1. In the table below an overview is given of the actual budget, the financial effect of the decisions taken by the 'College of medical directors' and the actual real payments executed during the corresponding year. One can notice the respective differences that can be substantial.

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[215] Ongoing KCE project, nr. 2008-25. Studie ter optimalisatie van de werkingsprocessen van het Bijzonder Solidariteitsfonds.

Figure 108: SSF Budget versus amounts granted and amounts paid since 1990.

Year	Budget (€)	Amounts granted (€)	Amounts paid (€)
1990	6.197.338	309.020	7.210
1991	6.197.338	767.080	321.838
1992	6.197.338	1.358.650	442.603
1993	2.478.935	1.837.150	1.211.662
1994	4.957.870	2.053.430	1.455.801
1995	497.870	1.704.630	1.363.069
1996	6.197.338	3.816.470	2.854.003
1997	6.197.338	4.802.780	3.889.873
1998	6.502.247	5.488.460	5.981.501
1999	5.453.658	5.974.000	5.248.924
2000	5.480.926	6.253.240	4.860.508
2001	8.061.497	6.600.120	8.477.758
2002	8.317.000	5.685.120	6.226.380
2003	13.017.000	14.235.080	14.430.593
2004	12.371.000	15.252.240	14.998.593
2005	22.377.000	7.184.528	7.031.980
2006	16.769.000	9.510.977	10.076.402
2007	22.090.000	11.205.651	11.661.714

Source: Annual report Special Solidarity Fund 2007

Related performance indicators

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S5: NUMBER OF GP'S USING AN ELECTRONIC MEDICAL FILE

Definition

Description

Number of GPs using an electronic medical file.

Source

- RIVM (the Netherlands)[216]

Harmonisation of definition with international organisations

Not applicable.

Rationale and indicator characteristics

In Belgium, every recognized GP that uses an approved software to manage the electronic medical files of his/her patients throughout the year, has the right to receive an allowance paid by the NIHDI the year after. The physician has to ask for the allowance by fulfilling a form and make a sworn statement about the fact that the software belongs to the list of approved softwares. In 2008, the allowance amounted to €755.04.

The use of electronic files in general practice can increase both the *quality* and *efficiency* of the care provided. The use of telematica and electronic medical files by practising physicians is an indicator of innovation (part of *sustainability*).

Data source(s)

Source database(s)

- NIHDI

Comparability

In the RIVM 2008 report, a comparison is provided between the Netherlands and several other countries. The results are based on a survey of primary care physicians. No other international comparisons are available.

In contrast, the data presented for this report are based on administrative data. As physicians have to ask for the allowance and as software must be approved, the rate of GPs actually using a software may be underestimated.

Results

Table 130 presents the number of GPs having received the allowance for the use of an approved software the year before. Importantly, the results are only presented for GPs having at least 500 patient contacts a year, a threshold that is considered to represent the actually practising GPs (see indicator A1). Physicians working in medical houses, physicians in training and GPs with granted rights are not included.

Table 130: Number of GPs having received the allowance, 2004 – 2008.

Number of contacts	2004	2005	2006	2007	2008
>= 500	6012	6190	6470	6835	6985
>=2500	4992	5064	5274	5551	5673

Table 131: Percentage of GPs having received the allowance, 2004 – 2008, per volume of contacts

Number of contacts	2004	2005	2006	2007	2008
>= 500	55%	57%	60%	64%	65%
>=2500	64%	66%	68%	73%	74%

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[216] Westert GP, Berg MJ van den, Koolman X, Verkleij H. Dutch Health Care Performance Report 2008. RIVM 2008.

Table 132: Percentage of GPs having received the allowance, 2004 – 2008, according to gender.

Number of contacts	Gender	2004	2005	2006	2007	2008
>= 500	Female	56%	58%	61%	66%	69%
	Male	55%	57%	59%	63%	64%
>=2500	Female	67%	69%	72%	76%	78%
	Male	63%	64%	68%	72%	72%

Table 133: Percentage of GPs having received the allowance, 2004 – 2008, according to language.

Number of contacts	Gender	2004	2005	2006	2007	2008
>= 500	F	40%	42%	45%	50%	52%
	Nl	58%	60%	62%	66%	67%
>=2500	F	48%	50%	54%	59%	61%
	Nl	65%	67%	70%	74%	75%

Table 134: Percentage of GPs having received the allowance, 2004 – 2008, according to year of birth.

Number of contacts	Year of birth	2004	2005	2006	2007	2008
>= 500	-1934	13%	13%	13%	15%	14%
	1935-1944	30%	30%	32%	35%	34%
	1945-1954	53%	55%	56%	60%	60%
	1955-1964	62%	63%	66%	70%	72%
	1965-1974	65%	67%	70%	74%	77%
>=2500	-1934	18%	18%	20%	21%	21%
	1935-1944	40%	41%	45%	48%	47%
	1945-1954	60%	61%	63%	68%	69%
	1955-1964	69%	71%	74%	78%	78%
	1965-1974	76%	77%	79%	82%	83%

The rate of registered GPs with more than 2500 contacts who have received the allowance in 2008 amounted to 74% (Table 131). This rate slowly increases every year. The rate is higher in women (Table 132), in the Flemish part of Belgium (Table 133) and in younger GPs (Table 134).

Compared to the rates mentioned in the RIVM 2008 report, Belgium performs only moderately on this indicator, with 60% of the practicing GPs using an electronic medical file in 2006 (Table 130). The Netherlands has the highest rates (98%), Canada the lowest (23%).

Related performance indicators

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S6: ACUTE CARE BED DAYS

Definition

Description

Acute care bed days, number per capita.

Source

- OECD[217]

Numerator

Total number of days of inpatient stays spent entirely in acute care beds.

Exclusion of:

- stays entirely or partially spent in rehabilitation units or psychiatric units
- long stays (would require a reconstruction of the patient pathway at the patient level, definition of long stays: see footnote for QS3).
- day cases

Denominator

Total mid-year Belgian population.

Harmonisation of definition with international organisations

The OECD definition is adopted.

Rationale and indicator characteristics

The number of acute care bed days per capita gives an idea about the population's need for acute care beds (indicator S6.1), and thus about the needed infrastructure. Together with the number of acute care beds, this indicator gives an idea about how this need is met (*sustainability*).

Data source(s)

Source database(s)

- MCD (numerator): see Supplement 2 for periodicity and data quality.
- FPS Economy - Directorate-General Statistics and Economic Information, Demographics division (denominator): http://www.statbel.fgov.be/figures/d21_nl.asp

Comparability

Several countries included in the OECD comparison use different methodologies to calculate the number of acute care bed days. Comparison is therefore potentially dangerous.

Results

In 2004 and 2005, the number of acute care bed days per capita was about 1.10 (Table 135). These results differ from those calculated by the OECD (Figure 109), which can be explained by our restriction to stays entirely spent in acute care. Discussion about the in- and exclusion criteria for this indicator is recommended.

Over the last 10 years, the number of acute care bed days seems to be declining slightly in Belgium, although it is still above the EU-15 average.

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[217] OECD Health Data 2009. http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed August 20th 2009.

Table 135: Acute care bed days per capita in Belgium, 2004 – 2005.

	N days	**Belgian mid-year population**	**N days / capita**
2004	11 675 966	10 421 137	1.12
2005	11 535 242	10 478 617	1.10

Figure 109: Evolution of acute care bed days in selected OECD countries, 1995 – 2005.
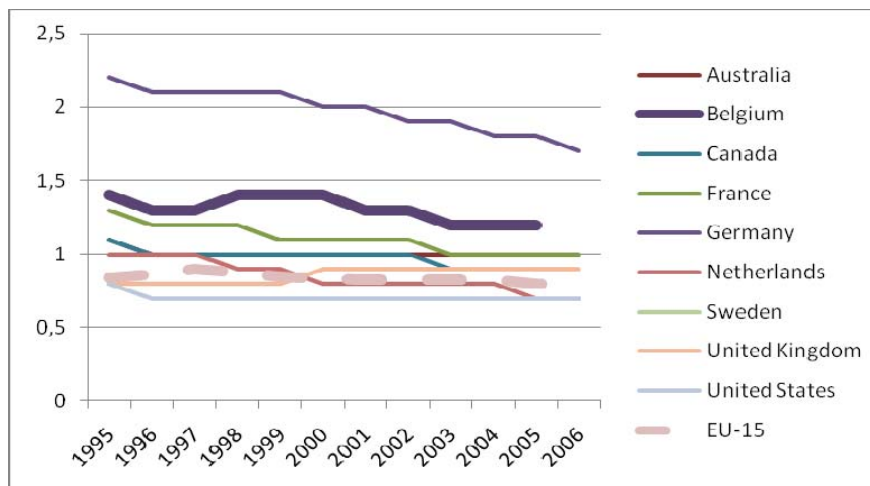
Related performance indicators

QC2: Average length-of-stay.

E1: Surgical Day Case Rates.

S6.1: Number of acute care beds.

S6.1: NUMBER OF ACUTE CARE BEDS

Definition

Description

Acute care beds, number per 1 000 population.

Source

- OECD[218]

Numerator

Total number of acute care beds.

The following bed indexes are included:

- B: treatment of tuberculosis department
- C: diagnosis and surgical treatment department
- D: diagnosis and medical treatment department
- E: paediatrics
- H: single hospitalisation
- H*: mixed hospitalisation
- L: contagious diseases department
- M: maternity
- NIC: intensive neonatal care
- G: geriatrics in acute hospitals.

Exclusion of:

- Beds allocated for other functions of care (such as psychiatric care, rehabilitation, long-term care and palliative care)
- Beds in mental health and substance abuse hospitals
- Beds for rehabilitation
- Beds for palliative care.

Denominator

Total mid-year Belgian population.

Harmonisation of definition with international organisations

The OECD definition is adopted.

Rationale and indicator characteristics

See indicator S6.

Data source(s)

Source database(s)

- FPS Public Health, Food Chain Safety and Environment (numerator)
- FPS Economy - Directorate-General Statistics and Economic Information, Demographics division (denominator): http://www.statbel.fgov.be/figures/d21_nl.asp

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[218]   OECD   Health   Data   2009.
http://www.ecosante.fr/index2.php?base=OCDE&langs=ENG&langh=ENG&valeur=&source=1, accessed
August 20th 2009.

Comparability

Exclusion of palliative care beds and psychiatric beds is not strictly done/possible by all OECD countries, rendering comparability difficult.

Results

Both the total number of beds (-1.3%) and the number of acute beds (-3.5%) decreased in Belgium between 2004 and 2007 (Table 136).

Table 136: Evolution of the number of acute care beds in Belgium, 2004 – 2008.

	2004	**2005**	**2006**	**2007**	**2008**
Total number of beds	70 990	70 864	70 526	70 409	70 084
Absolute number of acute beds	47 228	46 944	46 196	46 069	45 558
Number of acute beds / 1 000 population	4,53	4,48	4,38	4,34	

The decreasing trend is also apparent in other OECD countries. In comparison to other countries, Belgium has a rather high offer of acute care beds. In Europe, Germany has the highest number of acute care beds per capita.

Figure 110: Evolution of the number of acute care beds per 1 000 population in selected OECD countries, 1995 – 2007
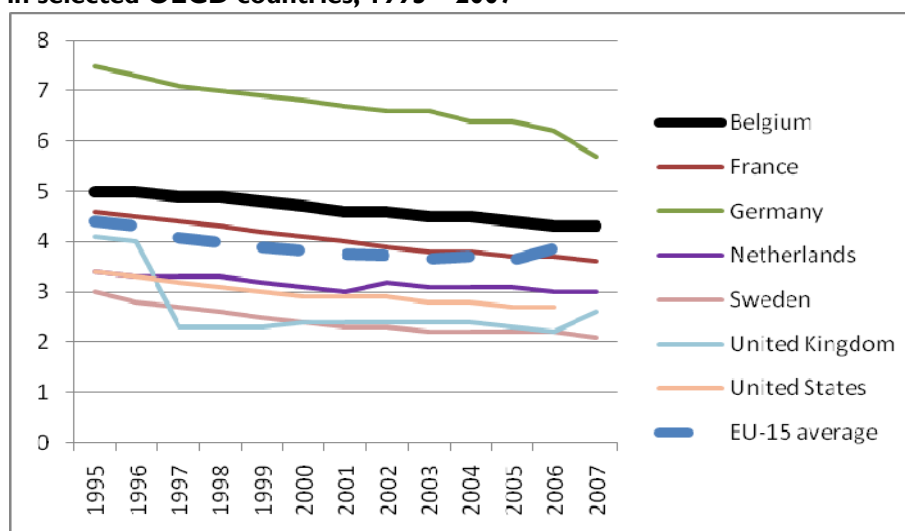
Related performance indicators

QC2: Average length-of-stay.

E1: Surgical Day Case Rates.

S6: Acute care bed days, per capita.

APPENDIX 5: DOCUMENTS RELATED TO THE STAKEHOLDER'S SURVEY

LIST OF INTERVIEW RESPONDENTS

Number interview	Organisation	Name	Function	Date interview
1	Flemish Community, Flemish Agency for Health & Health Care	Chris Vander Auwera Erwin De Kind	General Administrator Agency Member of Department Information & Support	28/5/2009
2	German Community	Karin Piraprez-Cormann	Head of Sector Family, Seniors & Health within Employment, Health and Social Department	15/06/2009
3	Brussels Region, Flemish Community Commission	Mathieu Voets Christine Jacobs	General Director Welfare & Health Head of Health Department	27/5/2009
4	Cabinet Onkelinx	Laurence Bovy	Director Strategic Cells Social Affairs & Public Health	6/5/2009
5	FPS Social Security	Dirk Moens	Attaché Social Policy, International Relations	27/5/2009
6	FPS Public Health	Dirk Cuypers	President Management Committee	9/6/2009
7	FPS Public Health – International relations	Leen Meulenbergs	Head of International Relations Department	9/6/2009
8	NIHDI	Jo De Cock Ri De Ridder	General Administrator NIHDI Coordinator Health Policy	2/6/2009
9	Socialistische Mutualiteiten	Joeri Guillaume Ivan Van Der Meeren	Coordinator Study Department Member of Study Department	27/5/2009
10	Christelijke Mutualiteit	Jean Hermesse	General Secretary	4/6/2009
11	Onafhankelijke ziekenfondsen	Pascal Mertens	General Director	2/6/2009
12	Federal Planning Bureau	Michel Englert Peter Willemé Sylvie Varlez	Head of Directorate General Member of Directorate General Member of Sustainable Development, Sectoral Directorate	17/6/2009
13	Absym	Marc Moens	Vice-president	29/5/2009
14	Vlerick Management School	Paul Gemmel	Professor Healthcare & Services (operations) Management	8/6/2009

Number interview	Organisation	Name	Function	Date interview
15	Kankerregister	Liesbet Van Eycken	President	29/4/2009
16	IPH	Johan Peeters Herman Van Oyen	General Director Head of Division Epidemiology	30/4/2009
17	KCE	Jean-Pierre Closon	Director a.i.	30/4/2009
18	French Community	Anne Liesse	Head of Cell Social-health data	4/6/2009
19	Walloon Region	Christine Bierme Magali Mosbeux Laurence Nick	Acting Director Hospital Care Attaché DG Social Action & Health Director Health Environment	26/05/2009
20	Federal Parliament – Chamber	Muriel Gerkens	President Health Commission	29/5/2008
21	Kartel	Pierre Driesma	Member	28/52009
22	Conseil Général INAMI / Algemene Raad RIZIV	Edouard Descampe	President	25/8/2009

Other stakeholders that were contacted:

Number interview	Organisation	
1	National Bank of Belgium	Was not interested in taking part as the study's objectives are not part of the Bank's competences.
2	FPS Economy - Directorate-General Statistics Belgium	Never answered telephone and electronic requests.
3	Social Affairs Commission of the Belgian Senate	Was not interested in taking part for the moment.
4	Public Health School ULB	Did answer positively, but did propose a date.
5	Public Health School KUL	Could not participate on the short term and was replaced by another stakeholder.

CATEGORISATION STAKEHOLDERS IN DATA SUPPLIER / DATA USER

Data supplier	Data user
FPS Public Health, FPS Social Security, NIHDI, Christian, Independent, Socialist, Bureau of the Plan, Kankerregister, ISP-WIV, KCE, Walloon region, Brussels Region, French Community, Flemish Community, German-speaking Community	French Community, German-speaking Community, Flemish Community, Brussels Region, Walloon region, FPS Public Health, FPS Public Health - international relations, FPS Social Security, NIHDI, Christian, Independent, Socialist, Bureau of the Plan, Chamber of Federal Parliament, Absym, Kartel, ISP-WIV, KCE, Vlerick, Cabinet of Minister of Social Affairs and Public Health, General Council NIHDI

PROJECT PRESENTATION DURING THE INTERVIEW

<u>Aim of the study</u>

This study aims to explore the possibilities to set up a performance measurement system for the Belgian health (care) system. This performance system will allow the Belgian government to be transparent and accountable for the Belgian health system performance; to compare it to the health system performance in other countries; and to monitor the health system performance over time. The ultimate goal is a high-performing health system that contributes to the health of the Belgian population.

<u>Study approach</u>

The study started with the identification of existing performance measurement systems and used indicators. A literature review was performed of seven countries and four international organisations. A meeting took place with international experts from Canada, the Netherlands, the WHO and OECD, to discuss the strengths and weaknesses of their system, its validation and evaluation, ant its use by policy makers. The experts also reviewed and validated the key findings of the literature review and completed lacking information.

Based on the literature review, and after discussion with Belgian experts, a conceptual framework has been developed based on the Dutch and Canadian models. A set of performance indicators is in the process of being selected. After a feasibility study, the results of the performance indicators will form the basis for a 'health performance indicator report'.

This interview is part of the methodology of the study, the objective being to understand the stakeholder's needs with respect to indicators and a performance evaluation system. It runs in parallel with the selection process of the indicators.

<u>The Belgian Framework</u>

The chosen framework was inspired by the Canadian and Dutch systems. It encompasses three tiers being health status, healthcare and non-medical determinants of health.

Health status: this tier addresses the question 'How healthy is the population residing in Belgium?'

Non-medical determinants of health: this tier encompasses the determinants that have an effect on health and on if, when and how we use care.

Health system: this tier has been grouped into 4 domains, including preventive care, curative care, long-term care and end-of-life care.

The health system performance encompasses four dimensions:

Quality: the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.

Accessibility: the ease with which health services are reached in terms of physical access, costs, time, cultural access, psychological access, and availability of qualified personnel.

Efficiency: the degree to which the right level of resources is found for the system (macro-level) and ensuring that these resources are used to yield maximum benefits or results.

Sustainability: the system's capacity to provide and maintain infrastructure such as workforce, facilities and equipment, and be innovative and responsive to emerging needs.

Equity is considered to be an overarching dimension.

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