

SHORT REPORT

ASSESSING THE MANAGEMENT OF HOSPITAL SURGE CAPACITY IN THE FIRST WAVE OF THE COVID-19 PANDEMIC IN BELGIUM



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■ FOREWORD

The year 2020 will forever be engraved in our memories as “the year the COVID-19 pandemic broke out”. A crisis on an unprecedented scale, which no one had anticipated. Images from Italy, which was the first European country to be hit hard, showed that even in a developed Western country, this unknown virus can bring the healthcare system to the brink of collapse.

Hospitals had to adapt to the new reality at record speed. Unprecedented measures had to be put in place: extra capacity was created for patients with COVID-19, and regular non-urgent care was completely put on hold. In order to manage all this, a new committee, the Hospital & Transport Surge Capacity committee, was set up at the beginning of March 2020. In June 2020, when the first wave of the pandemic came to an end, this committee asked KCE to assess its functioning and the response of the hospitals in order to draw lessons for the future.

In this report a scientific analysis is conducted to make proposals for improvement. To this end, six different methods were used, each with its own perspective on the subject. Cross-referencing this information led to a view, as objective as possible, of what happened, and subsequently to the conclusions and policy recommendations of this report.

Special thanks are due to all those who participated in the interviews and the online survey. Although in the meantime the second wave of the COVID-19 crisis had started, and is still raging today, there was a great willingness to participate and provide information. We are very grateful to all participants for this, because without their contribution this report would not have been possible.

The philosopher Kierkegaard put it this way: “*Life can only be understood backwards; but it must be lived forwards*”. Undoubtedly, many more scientific analyses will follow on what happened since the start of the COVID-19 crisis. This is necessary, and this will undoubtedly be accompanied by a number of additional pain points. But let us not forget the very difficult circumstances in which decisions had to be taken. At that time, there was only a limited set of data and a still very limited knowledge of the virus, so there was a great deal of scientific uncertainty surrounding many aspects of the crisis. Nevertheless, decisions had to be made on the basis of this limited set of data. Rather than looking for culprits in the past, the KCE analysis aims to contribute to drawing lessons for the future in a constructive way.

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■ KEY MESSAGES

- KCE received the assignment to document and evaluate the functioning and the measures of the Hospital & Transport Surge Capacity (HTSC) committee as well as the response of hospitals to these measures. The evaluation concerns the first wave of the COVID-19 pandemic (March-June 2020).
- The HTSC committee was installed early March 2020 as an advisory body of the Risk Management Group (RMG) with the aim to take measures to manage the hospital and transport capacity during the COVID-19 pandemic.
- The members of HTSC committee describe it as a unique platform to discuss hospital-related matters with representatives of the federal and federated authorities and the hospital umbrella organisations. Our assessment shows that the HTSC committee and the hospitals accomplished their mission during the first wave of the pandemic. It is indicated to turn this committee into a permanent advisory body of the RMG that can be activated in case of a crisis that requires additional hospital capacity.
- The hospital emergency plans have contributed to the professional and rapid response of hospitals at the time of the COVID-19 outbreak. Next to a generic hospital emergency plan it seems indicated to add crisis specific (including pandemic) components.
- The availability of adequate data about hospitals and capacity is essential to manage surge capacity. Yet, data systems appeared to be insufficient. As a consequence the existing data systems (ICMS) were adjusted and complemented with new data registration systems (COVID-related hospital surveillance and clinical survey of Sciensano).
- It is indicated to review the data systems in the near future with special attention for interoperability and reduction of registration burden (e.g. automatic data extraction). Especially for intensive care units a nationwide data system needs to be developed allowing real-time monitoring of hospital capacity (e.g. beds, equipment, staff), patient characteristics and outcomes.
- The hospital sector did a great effort to organise hospital and intensive care capacity for COVID-19 patients. The availability and motivation of the healthcare staff (medical, nursing, caring, support, etc.) are vital.
- Hospitals used a variety of measures (e.g. increase of work time, use of non-ICU nurses and physicians on ICU in mixed teams and after a fast training track). Stopping regular medical care was important during the first wave to be able to cope with the COVID-19 related hospital admissions.
- There is a large collateral damage of the surge capacity strategies used during the first wave of the COVID-19 pandemic: an important impact on the health and wellbeing of healthcare staff and consequences of postponed care (e.g. decrease and delay in cancer diagnosis, postponement of chronic care).
- Hospitals collaborated at the level of the loco-regional network (e.g. joint purchasing of protective equipment, clinical agreements, distribution of ICU admissions) and beyond (e.g. province, support nursing homes). To increase collaboration between hospitals in the future the preconditions for a successful collaboration need to be reinforced (e.g. payment at the network level).



■ SHORT REPORT

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1. INTRODUCTION

Disclaimer

It is unusual for a KCE report to start with a disclaimer. However, the current situation is exceptional. The main purpose of the report is to assess the management of hospital surge capacity – by public authorities and hospitals – in the first wave of the COVID-19 pandemic in Belgium. More specifically, we focus on the process of regulation of one specific committee, the Hospital & Transport Surge Capacity (HTSC) committee, and on hospital responses to the measures that were imposed on them by this committee. The aim of the report is to identify lessons and formulate recommendations for policymakers and hospitals for the current and potential future pandemics.

In the report, we discuss several phases and plans to create surge capacity in hospitals for COVID-19 cases. However, since the start of the pandemic, new insights became available and hospitals gave feedback to the committee. The committee responded by adjusting its measures. Without prejudging the results of this study, we can say that hospital staff, hospital management and the HTSC committee did a good job in the first wave of the COVID-19 crisis.

However, hospitals and the HTSC committee depend on measures that are taken beyond their power. If general measures to contain the outbreak and spread of the virus within society are insufficient, taken too late, or not adhered to, the incidence rates and associated hospital admissions are out of control. Even with the best plans every hospital system has its limits and will face capacity problems.

The assessment period in the report runs from March to the end of June 2020. At this moment (beginning of November 2020) Belgium is again hit hard by the pandemic and has one of the worst results in Europe. The lessons we identified from the assessment and the recommendations we make will hardly contribute to solving the current disastrous situation in Belgium. Moreover, new measures and initiatives are taken every day,

and it is not possible to take them up in a "static report". We would like the reader to keep this in mind when reading the report.

1.1. Scope and purpose of the report

The outbreak of the COVID-19 pandemic has presented unique challenges for most countries all over the world. While the pandemic's challenges were unprecedented, so were also public health and economic responses launched by governments. At the start of the pandemic crisis in Belgium in early March 2020, various initiatives were taken at different levels without consultation or consistency (for example, in some areas nursing homes imposed visitation restrictions or mayors decided to ban people who returned from regions at risk from going to public places and schools, etc.).¹ Therefore, the Prime Minister announced on 12 March that the "federal phase" came into force, which means that there is a national coordination of all measures by the Minister of Internal Affairs. The Belgian government declared a lockdown for the entire country from 18 March 2020, following the example of other (European) countries.

In response to the COVID-19 crisis several committees or task forces were put in place or were activated in Belgium, both inside and outside existing structures. One of these committees is the Hospital & Transport Surge Capacity (HTSC) committee, which was tasked with developing measures and guidelines relating to hospital surge capacity and hospital transport to cope with the pandemic.



Study aim

The Director-General of the Federal Public Service (FPS) Public Health, who is also the chairman of the HTSC committee^a, asked KCE (in June 2020) for an assessment of the HTSC committee, and of the response of hospitals.

The aim of this report is **to assess the process of regulation of the HTSC committee as well as the hospital responses to the measures that were imposed on them by the committee** in order to:

- document the policy process during the first wave;
- identify lessons concerning hospital capacity and transport for the current and potential future pandemics;
- and formulate recommendations for policymakers and hospitals.

It should be kept in mind that the role of this assessment cannot be compared to the role of an inquiry commission or any other kind of political commission.

Scope

The assessment period runs from the initiative to establish the committee until the end of June 2020. Initiatives that were taken by the committee after that date will be discussed only if they contribute to the aim of the study. The assessment of the committee is mainly focused on the establishment of the committee and the process of decision-making and communication to the hospitals, but not on the impact of measures on patient outcomes, staff well-being or the financial situation of hospitals. Evaluations that already existed are included in the study. Selected topics of that regulation are also assessed in an international comparative perspective.

The assessment of the response of hospitals is focused on, but not limited to, the creation of surge capacity, the role of the hospital emergency plan, and collaboration initiatives.

Although the HTSC committee also issued measures for psychiatric hospitals, the scope of this study is limited to **acute hospitals** (including university hospitals). This does, however, not rule out that some lessons identified or recommendations apply also to psychiatric hospitals.

Outline

For a better understanding of the role of the HTSC committee, we first describe the organisational structure of COVID-19 crisis management in Belgium (section 1.2). Since the main mission of the HTSC committee was to help hospitals to cope with a surge in demand for critical care beds, we define “surge capacity” in section 1.3. Section 1.4 gives a brief overview of the methods that were applied in the [scientific report](#).

1.2. Governance of the COVID-19 crisis: a complex institutional structure reflected in the tangle of bodies

Belgium is a federal state with three communities and three regions. As a result of this complex institutional structure, there are eight ministers responsible for health: one federal and seven regional health ministers. As a consequence, also the organisational model for the governance of a public health crisis has a complicated structure, and even more so since the COVID-19 crisis. The Coalition Agreement of the new government (30 September 2020) includes the objective to streamline the existing governance structures of crisis management.

^a On 6 October 2020 he was appointed “corona commissioner” and since then he is no longer chairman of the HTSC committee.



A complete overview of the organogram can be found in Figure 1 in Chapter 1 of the [scientific report](#). In this short report, we limit the overview to bodies that predominantly focus on public health. A simplified structure is given in Figure 1.

Governance before the COVID-19 crisis

Following the International Health Regulations (IHR) of the World Health Organization (2005) Belgium established a **National Focal Point (NFP)** which is defined as *“the national centre that shall be accessible at all times for communications with WHO IHR Contact Points”*.² One of the functions of a NFP is the coordination of the analysis of national public health events and risks, including collaborative risk assessment with the WHO on public health events.

The NFP in Belgium is appointed by the **Inter-ministerial Conference (IMC) Public Health** at the proposal of the federal Minister of Public Health. The IMC Public Health is one of many IMCs that were established to coordinate policy between the federal and federated entities. The NFP is an official point of contact and consists of two pillars, risk analysis and risk management concerning communicable diseases, biological, chemical and nuclear health crises with international effects; and the communication regarding health crises with a risk of international spread.

As described in the protocol agreement of 11 March 2008, the Belgian monitoring and risk management system consists of three actors:¹

1. The National Focal Point
2. A **Risk Assessment Group (RAG)** which analyses the risk for the population on the basis of epidemiological and scientific data. This

group is coordinated by Sciensano (formerly the Scientific Institute of Public Health), and is composed of epidemiologists of Sciensano and the Superior Health Council^b, and representatives of the health authorities of the federal state and the federated entities. Experts with specific knowledge of the health risk can be consulted. The RAG gives advice to the Risk Management Group.

3. A **Risk Management Group (RMG)** which relies on the advice of the RAG to decide what measures need to be taken to protect public health. The RMG is composed of representatives of the health administrations and all ministers of health, and is chaired by the Belgian NFP. The RMG receives instructions from the IMC Public Health and also submits its recommendations to the IMC. In the event of a serious crisis, the RMG meets regularly to manage all health-related aspects of the crisis. If this crisis requires coordination between different sectors and administrations, a crisis cell is set up at the National Crisis Centre (NCCN) of the FPS of Internal Affairs.

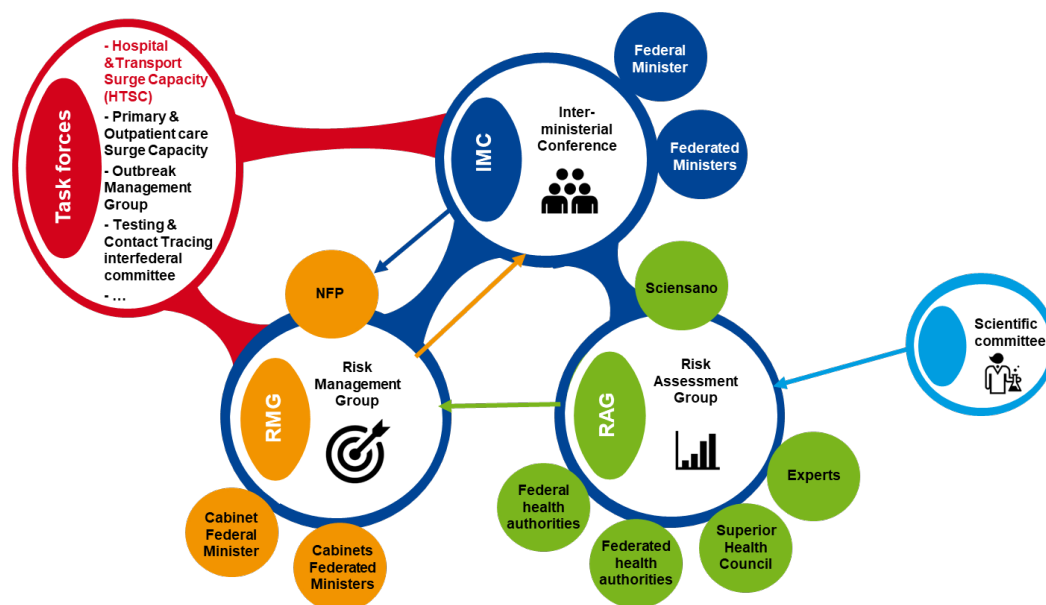
The NFP, RMG and RAG are supervised by the IMC Public Health.

New governance structure since the COVID-19 crisis

At the start of the COVID-19 crisis, additional structures were put in place. A **Scientific Committee Coronavirus** was established (in January 2020) to advise health authorities on the latest scientific developments about this new virus. The committee gives scientific advice to, amongst other, the RAG.

Several task forces were set up, which are supervised by the RMG and the IMC Public Health. The **HTSC committee** is one of these task forces. In Figure 1 a (non-exhaustive) list of other new task forces is given.

^b Scientific establishment linked to the FPS Public Health that draws up scientific advisory reports that aim at providing guidance to political decision-makers and health professionals.

**Figure 1 – Organisational structure of COVID-19 crisis management**

Source: adapted from FPS Public Health (2020)³; NFP = National Focal Point



1.3. How do we define surge capacity?

In the literature as well as in policy documents, diverse definitions are used for “surge capacity”. In this report, we follow (where possible) the definition provided in one of the technical guidance papers of the WHO: *“Surge capacity is the ability of a health system to manage a sudden and unexpected influx of patients in a disaster or emergency situation. Creating surge capacity involves a comprehensive approach linking the four S’s of surge capacity: space (or structure), staff, supplies and systems.”*⁴

- **Space** (structure): covers hospitals and beds, and facilities (such as triage areas or cohort units with adequate air ventilation) that are already available or could be equipped for specific emergency needs; and structures beyond the hospital setting that are repurposed (for example hotels).
- **Staff**: concerns the provision of sufficient numbers of appropriately skilled and supervised health and social care workers. Special attention has to be given to specialisations that are needed and to an analysis of potential shortfalls.
- **Supplies**: relates to the availability of specific equipment for emergency deployment, both for patient care and health worker safety. In the context of COVID-19, this covers intubation equipment, mechanical ventilators, specific medications, extracorporeal membrane oxygenation equipment (ECMO), personal protective equipment (PPE), etc.
- **Systems**: refers to modes of working (such as the activation of integrated policies and procedures) that ensure an optimum surge capacity response. This covers decision-making, communication, continuity of operations and supply chain management.

1.4. Methods

Mixed-methods approach

The study applies a mixed-method approach. The methods used are outlined in detail in the beginning of each chapter of the [scientific report](#). The following data collection techniques were applied:

- In-depth interviews with members of the HTSC committee, representatives of the hospital sector and content experts (25 interviews)
- Document analysis of the minutes of the meetings of the HTSC committee and of the letters the committee sent to the hospitals
- Online survey of Belgian acute hospitals (62 out of 98 acute hospitals participated)
- International comparison of the development of hospital surge capacity approaches in selected countries (England, Germany, Italy and the Netherlands)
- Literature review of international tools and guidelines for hospital surge response strategies
- Analysis of other Belgian initiatives that evaluated topics relevant to surge capacity via surveys, data analyses, etc.

For specific topics additional information was retrieved via the consultation of experts. Given the short timeframe (June-December 2020) to conduct this study, it was not feasible to apply KCE’s position statements regarding patient involvement in health policy research.⁵ Instead we interviewed one representative of patient organisations.



Merits and challenges of an “in-action” review

Since the COVID-19 pandemic is still very much prevalent, and the HTSC committee is continuing its mission, the current report can be seen as an “in-action” review of the regulation of the HTSC committee and hospital response. An in-action review entails that we “learn during action”, which is in this case the COVID-19 pandemic. An in-action review is designed to quickly identify best practice and key learnings and to apply them in a tighter time-scale to improve the outcome of an ongoing response.^{6, 7}

Conducting an in-action review is, however, also challenging because of the ongoing response. The assessment period runs from the beginning of March until the end of June 2020. Initiatives taken by the committee after that date are discussed only if they contribute to the aim of the study. The current (November 2020) stage of the pandemic in Belgium is more critical than it was at the end of the assessment period. Hence, new insights became available and measures were adapted. These changes in regulation are often in line with what we learn from the first months of the pandemic. Therefore, to avoid that lessons identified are lagging behind reality, an in-action review not only looks back, but may also include “a forward look to assess strategic options in the upcoming phases of the pandemic”. The lessons identified and options for the future are reflected in the recommendations to this report.

2. HOSPITAL PREPAREDNESS FOR COVID-19

Epidemics challenge health systems because they cause an acute increase in the demand for hospital services and health services in general. In this chapter we discuss the preparedness of hospitals for the COVID-19 pandemic. A central element in this is the hospital emergency plan. A hospital emergency plan (HEP) describes the procedures to efficiently deal with a sudden influx of patients without jeopardizing care for already admitted patients and to increase the admission capacity of the hospital quickly. Of course, hospital preparedness is more than having a HEP. Also the starting point of the hospital capacity in terms of beds, equipment and staff before the pandemic outbreak is of utmost importance (see Chapter 5).

2.1. A brief history of the hospital emergency plan

Greater uniformity in hospital emergency plans since 2016

The Royal Decree of 23 October 1964 (and further modifications) defines the licencing standards for hospitals.⁸ Having a HEP is one of these licensing standards. A HEP defines what needs to be done in case of a disaster inside (e.g. blackout, chemical accident, hospital bacteria, etc.) or outside (e.g. chain collision, flood, attack, etc.) the hospital. However, until recently there was a large diversity in how hospitals defined such plans, and a survey carried out by the FPS Public Health in 2013 made clear that about one-third of hospitals did not have a licensed HEP.⁹ Therefore, between 2014 and 2016, a task force prepared a “template” (and corresponding legislation) for a generic HEP, which is suitable for all kinds of disaster incidents and for all hospital types. Although the template is a generic document, it can be modulated and adapted to the size, type or special aspects of the hospital or emergency situation.⁹ Contrary to the previous plans, which focused on the procedure to set up a hospital crisis management committee, the new plan is more focused on operational readiness.



Since the 6th State reform in 2014, licensing standards are determined by the federated authorities. To avoid different licensing standards in Flanders, Wallonia or Brussels, a Protocol Agreement was concluded between the federal government and federated authorities on 26 October 2016.¹⁰ The Agreement defines the content, procedures and different roles within the HEP with the aim to increase uniformity in these HEPs for the whole country. The Protocol Agreement builds on the Common Statement of 27 June 2016 of the federal and federated authorities in which they declared to align on the HEP.

At the start of the COVID-19 pandemic most hospitals had prepared a HEP but did not yet receive formal approval

In 2019, each of the federated authorities issued a Decree (with the same content) that defines the licensing standards for the HEP, including the procedure for approval. It was decided that every hospital had to dispose of an approved HEP on 31 December 2019^c. However, the deadline for submitting the HEP to the municipal authorities has been extended to 31 December 2020, and the deadline for submitting the HEP to the competent minister to 1 August 2021.

At the start of the COVID-19 pandemic, hospitals were at a different stage of licensing of the HEP. Ninety-two percent of the responding hospitals (49/53) in the survey had submitted their HEP to the municipal authorities for approval but most of them (34/49) had not received a response yet, 13 hospitals received a favourable advice and 2 hospitals a conditional advice. Although the majority of hospitals had no approved HEP at the start of the crisis, the procedure for approval had the effect that hospitals at least went through the thinking process of drawing up a HEP (including setting up the necessary processes within their organisation) which helped to be ready for crisis management.

Reflex and treatment capacity define the available capacity in a hospital

The HEP defines two concepts related to capacity. **Reflex capacity** refers to the minimum number of patients a hospital can take up (at the hospital site with a licensed specialised emergency department) in the first two hours of a disaster and is put equal to 3% of the number of licensed beds, per hour. This reflex capacity guarantees a capacity to provide the initial basic care.

Treatment capacity refers to capacity that is needed to treat patients after the initial reception and provision of basic care. It is defined in terms of the number of available beds per type of bed, ventilators and operating theatres that can be staffed within 15 minutes, etc. These data have to be registered in the “Incident Crisis Management System” (ICSM) platform (see Chapter 4).

Activation process of the HEP

The HEP distinguishes two phases: the “information phase” and the “action phase”. The **information phase** starts as soon as a disaster warning is received. The Risk Management Group (RMG) decided on 28 February that the federated authorities should warn all hospitals as soon as possible to activate this first phase of the hospital emergency plan.

The **action phase** consists of two levels. In **level 1** only a limited number of extra staff is needed, some services are reorganised (emergency department, ICU or operating theatre) and the reflex capacity is sufficient for the number of affected patients. In **level 2** a larger number of extra staff is involved, a large part of the hospital has to be reorganised and the number of patients exceeds the reflex capacity of the hospital. In the letter of 13 March, all hospitals were required to activate level 1 of the action phase from 14 March.

^c The original deadline for Flanders was 1 July 2019.



2.2. The hospital emergency plan: an appropriate instrument in case of a pandemic?

Our findings are based on interviews with members of the HTSC committee, hospital managers and representative bodies of the hospital sector, on the hospital survey and on surveys conducted by other organisations (the FPS Public Health and Zorgnet-Icuro (the Flemish umbrella organisation of hospitals)).

Positive evaluation but also some points for improvement

The general tenor of the interviews, the hospital survey and the survey organised by the FPS Public Health was that the HEP enabled hospitals to quickly respond to the outbreak of the pandemic. Although the HEPs are not fully tailored to a crisis of such magnitude and duration, process of revising the HEPs, the activation of the plans, the included procedures and the experience of the hospital coordination cells contributed to a fast and accurate management of hospital capacity.

A point for improvement that came out of the interviews and surveys is the financing of the HEP coordinator role. Since the coordinator of the HEP is judged to be insufficiently financed via the hospital budget, insufficient time was allocated to this role prior to the crisis. Another suggestion that was made is to increase training of the HEP processes (e.g. training sessions about HEP processes, simulations, dry runs) and communication about its content (e.g. role and tasks of the coordination cell).

Hospitals activated the HEP action phase before it was required by the HTSC committee

Of the 62 hospitals that participated in the survey, 39 provided the exact date at which they activated the information phase, action phase 1 and, if relevant, action phase 2 of their HEP. Twenty-four (24/39) of them activated action phase level 1 of their HEP before it was made mandatory on

14 March. For most hospitals this happened in the week before 14 March, but other hospitals activated level 1 at the end of February or early in March. These are mostly very large non-university hospitals (with more than 450 beds). Some hospitals activated the information phase of the HEP quite early (the first one already in January 2020). These are also mainly very large hospitals.

Out of the 39 responding hospitals, 22 activated action phase level 2 during the first wave of the COVID-19 crisis (before 30 April). Most of them did it very shortly after 14 March, some of them even switched directly from the information phase to action phase level 2.

From 17 June hospitals were authorised to scale down to the information phase provided that all hospitals of a loco-regional network did so at the same time (see Chapter 7). This was only possible if the entire network had a COVID-19 load (confirmed and suspected) of less than 15% of the licensed ICU beds^d. Between 19 June and 1 July, at least 19 of the 25 loco-regional networks in the country confirmed scaling down to information phase (data FOD – SPF).

Hospital coordination cell: core members supplemented by crisis-dependent participants

The HEP clearly defines the roles and responsibilities of all involved parties and persons in hospital crisis management. When the HEP is activated, the hospital coordination cell takes over the coordination and command and makes subsequent decisions for the hospital. The mode of activation of the hospital coordination cell and its nominative composition are mentioned in the HEP. Permanent members are, among other, the CEO (Chief Executive Officer), CMO (Chief Medical Officer), CNO (Chief Nursing Officer), the HEP coordinator, the head physician of the emergency department and someone from the communication department. However, additional members can be called upon depending on the type of disaster.

^d For readability, in this report we use "licensed ICU bed", while it is actually "the function intensive care" that is licensed.



In all 57 responding hospitals, the CMO and the CNO took part in the hospital coordination cell. In most hospitals, also the CEO, the HEP coordinator, a hospital physician or nurse hygienist and the head physician of ICU were member of the cell. In 22 hospitals the head physician or nurse of the emergency department and in 17 hospitals someone from the communication department was also mentioned. Other participants were pharmacists, infectiologists, pulmonologists and the logistic department and to a lesser extent staff from the following departments: purchasing, technical, facility, clinical biology or labs, care management, ICT, administrative and financial, medical board, internal medicine, surgery and anaesthesia, prevention, biosafety, bed management, geriatrics, liaison with nursing homes, etc. These additional members were invited when needed.

Also separate existing committees were consulted or were newly set up in order to advise the hospital coordination cell. The most commonly reported was the hospital infection prevention and control committee. Yet a plethora of other committees was reported such as a nursing home support committee, human resources committee, laboratory committee, PPE committee, etc.

The hospital coordination cell had daily meetings in 41 out of 58 responding hospitals (71%) and three to six times a week in 15 hospitals (26%). In 57 out of the 58 responding hospitals all or most letters from the HTSC committee were discussed within the hospital coordination cell. Most hospitals also carried out an internal evaluation of their hospital coordination cell (54 out of the 58 responding hospitals – 93%) and/or HEP (44 hospitals – 76%).

Although the general perception was that in most hospitals the hospital coordination cell performed well during the crisis, a point to improve is the legal power that is attributed to the CMOs. The CMO is responsible for the quality of care in the hospital but lacks legal power. It was advised to review

the legal framework in which CMOs (and by extension head physicians of medical disciplines) operate^e.

Divergent viewpoints on extending the hospital emergency plan with a pandemic plan

At this moment, the HEP does not need to have a specific pandemic plan. Some members of the HTSC committee (from the hospital sector as well as from public authorities) stated to be in favour of keeping a generic HEP. They prefer a plan that focuses on generic (operational) actions such as creating ICU surge capacity or reinforcing the emergency department, regardless of the type of crisis, instead of a specific pandemic plan. This viewpoint does not exclude the possibility to add elements to the current HEP, such as steps to be taken to dispose of sufficient PPE.

The results of the survey are, however, clear: a large majority of responding hospitals (49/53) are in favour of a specific pandemic plan in the HEP. In half of the responding hospitals (27/52), the current HEP already contains a pandemic plan (defined as a specific part of the HEP related to the occurrence of a large-scale infectious disease in the general population).

Recurrent elements that, according to respondents, should be included in such a pandemic plan are: outbreak identification of infectious diseases (internal and external) and activation of the plan; specification of different phases and thresholds; up- and downscaling of regular care; upscaling of staff and (ICU) beds; composition of the committee; communication; isolation and cohorting of patients; PPE and drug stock management; collaboration within the loco-regional network and with primary care; visitor rules and instructions; instructions for ambulatory patients; education and psychological support of staff; data collection and analysis; and the transition from acute phase towards a situation of long duration.

^e The Act of 4 November 2020 gives more legal power to the CMO until 30 June 2021. For example, the CMO has the authority to give instructions to the medical specialists to ensure compliance with the measures concerning hospital capacity.



3. ROLE AND FUNCTIONING OF THE HOSPITAL & TRANSPORT SURGE CAPACITY COMMITTEE

The HTSC committee is a new task force that was established at the start of the COVID-19 pandemic, with the specific mission to take measures to increase hospital capacity in response to the pandemic. In this chapter we discuss the role and functioning of the committee, in the next chapters we discuss a selection of measures.

3.1. Mission of the HTSC committee

The establishment of the committee was the result of individual initiatives

A reconstruction of how and when the HTSC committee was established makes clear that the individual initiatives of field experts and civil servants, who acknowledged the potential threat of hospital capacity problems, played a decisive role. They assessed that it was urgently needed to develop and implement a national strategy to free up hospital capacity for COVID-19 cases. Within the existing structures, such as the Risk Assessment Group, the Risk Management Group or the National Crisis Centre (NCCN)^f, the focus in January and in early February 2020 was on case-definition and isolation of people coming from abroad rather than on preparedness for an outbreak of the coronavirus. According to the interviewed committee members, there was no pro-active response of public authorities in terms of a national hospital surge capacity strategy. Moreover, there also seemed to be a disconnection between the NCCN, the RMG and the department of the FPS Public Health responsible for hospitals (Directorate-General Healthcare) which certainly did not smoothen the decision-making process, especially because that department had, according to those respondents,

the expertise about hospital emergency plans, hospital capacity, etc. They perceived this knowledge as insufficiently present in the RAG, RMG and NCCN at that time.

The first reference to a “working group for hospitals” was made in the minutes of the RMG meetings of 6 February and 13 February. The first official meeting of the HTSC committee with a clearly defined mission was on 6 March. The launch of the committee has to be situated in a context of a global shortage of protective personal equipment (PPE) and when it became clear (via international contacts of content experts and shocking images in the media) what the impact of the COVID-19 virus was on hospital capacity in the North of Italy.

The committee had a clearly defined scope, but many other topics were discussed

In the letters of the HTSC committee to the hospitals (see section 3.4.1), the mission of the committee was explained: to monitor the number and type of COVID-19 patients admitted to hospitals, to discuss issues concerning capacity, inflow, through-flow and outflow of patients, and to propose decisions to the RMG concerning the organisation of adequate hospital care capacity for COVID-19 patients in Belgium. Ensuring sufficient ICU capacity was clearly the prime objective of the committee, certainly at the start of the crisis. However, in parallel measures were taken to also guarantee sufficient capacity on general hospital units. Transport was less prominently discussed during HTSC committee meetings.

Despite the clear scope of the committee, many other issues were discussed and were also covered in the letters to the hospitals. They are related to the organisation of hospital activities in the COVID-19 crisis, varying from stopping and resuming of regular hospital activities, testing of personnel and patients on COVID-19, availability and use of PPE, regulation of hospital visitors, cooperation with and support to nursing homes, intermediate care

^f The NCCN, within the FPS of Internal Affairs, is in charge of emergency planning and crisis management infrastructure. In particular, it ensures coordination, preparation of decisions, their possible execution and follow-up.

This federal organisation is linked to the crisis organisation at the local level. The NCCN is also responsible for providing uniform and consistent information to the public.



structures, case definitions, international cooperation, and many others. The interviewed committee members gave several explanations such as lack of decisions being taken in other committees, the unique composition of the committee (see section 3.2) or a deliberate strategy of some members in an attempt to put topics on the agenda of other committees in which they were not represented. While the broad scope of the committee was appreciated by some, others perceived these discussions as numerous and time-consuming. A recurrent comment of the interviewed committee members was that the HTSC committee treated both strategic (e.g. defining occupancy rates on ICU from which a hospital should transfer patients to another hospital) and operational issues (e.g. organisation of particular transports). This was perceived as quite cumbersome and slowing down the pace of decision making.

For some topics, separate committees were installed. For example, while initially part of the scope of the HTSC committee, it was decided to install a separate committee to deal with outpatient capacity issues (e.g. triage of patients, collaboration between general practitioners and emergency departments). The size of the COVID-19 crisis was reported to cause such a high workload that it could no longer be managed by the HTSC committee alone. Moreover, it would have required that the HTSC committee, with already a large number of members, was expanded with primary care representatives.

3.2. Composition of the HTSC committee

The HTSC committee is chaired and administratively supported by the Directorate-General Healthcare of the FPS Public Health, and is composed of representatives of the federal and federated ministers of health and health administrations, the federal health inspectors, the medical component of the Belgian Armed Forces, hospital umbrella organisations, the Scientific Committee Coronavirus and the Belgian Society of Intensive Care Medicine.

A total of at least 95 persons participated in one or more HTSC committee meetings in the period 1 March – 30 June 2020. However, part of this number of participants can be explained by the fact that the participating bodies were represented by multiple members (as a member or as a substitute) and by occasional attendance of external experts.

No transparent selection of committee members

Based on a transversal analysis of the interviews it can be concluded that the origin of the composition of the committee was not transparent, neither for the committee members nor for the hospital sector. While the Belgian healthcare sector has a long tradition with concertation committees, where representation is often based on well-defined criteria and processes, the composition of the HTSC committee is reported to be largely based on the judgment of its initiators. It evolved somewhat at the start but soon consolidated in a fixed panel. The content experts were mainly recruited, as reported by themselves and other committee members, because they raised the alarm.

A unique platform with most relevant actors

Despite this perceived lack of transparency, the authority of the committee was reported (by committee members and hospital sector representatives) as largely accepted and its unique composition within the complex Belgian institutional context was considered as one of its strengths. Also the atmosphere of mutual trust, building on good previous inter-personal relationships, was mentioned several times as one of the key components contributing to its success. It was perceived as rather exceptional that such a large committee with many different actors could make such firm and fast decisions. Many interviewed committee members (also) attributed this to the strong leadership of the chairman of the committee. The sense of urgency of the crisis also implied that who was competent (i.e. federal state or federated entities) for the measures taken by the HTSC committee concerning hospital surge capacity, was not questioned. Decisions in other domains, such as the role of hospitals to support nursing homes, were hampered by discussions on who was responsible for what.



Underrepresentation of field experts

The composition of the committee mainly included policymakers and hospital management representatives. While the latter liaised with their members to get feedback from hospitals, there was a general perception among the interviewed HTSC members that the voice of experts on the field was insufficiently covered by the committee members. This perception was confirmed during the interviews with the hospital sector representatives where some frustrations about the lack of representation of some groups were formulated.

A first group are the physicians, who were only represented via two content experts but not via a delegation of chief medical officers who were identified as the central actors on the field in many interviews. This argument holds a fortiori for the nursing profession who had no representative at all. From the interviews we identified two possibilities for their representation: a permanent representation or a targeted consultation at moments when their expertise could be of added value. This also applies to other domains of expertise that were mentioned as lacking within the committee (e.g. geriatric care, psychological support, rehabilitation).

Hearing the voice of the patient?

The impact of COVID-19 on patients and patient care is huge. There was not only the direct impact on patient's health but also the collateral damage of the COVID-19 pandemic because of specific measures. During the first wave all efforts went to crisis management. Non-essential care was stopped, visitors were banned, patients were transferred to hospitals (sometimes far away) where ICU was still available, etc. This resulted in distressing situations (e.g. patients who died alone, patients who had no support from their relatives when receiving bad news) and the postponement of both essential and non-essential care (see section 6.3).

During the first wave of COVID-19 the HTSC committee did not consult the voice of the patient in a systematic manner. From the interview with a representative of patient organisations we retain that they understand that the focus of the HTSC committee was on managing the crisis. A representation of the patient platform in the HTSC committee was not

advocated. Yet, a more structured involvement of patient representatives was suggested. The patient representatives could be formally consulted by the HTSC committee when topics are scheduled for which input from a patient perspective is desirable. In addition, it was suggested to give patient representatives the opportunity to put topics on the agenda of the HTSC committee, for example topics that emerge from their contacts on the field. This modus operandi was used during the first wave by RIZIV – INAMI (the National Institute for Health and Disability Insurance) but could also work for the HTSC committee. Topics for which the patient's voice could have been taken into account in a more structured way include for instance the restart of regular activities, visitor restrictions, transfers, etc. The patient representative criticized the lack of a proactive approach to (chronic) patients in the restart of regular care and held a plea to improve the information and communication strategy and transparency towards patients and the public.

3.3. Decision-making process of the HTSC committee

Data-informed meetings with decisions based on expert input

The HTSC committee had (almost) daily meetings. The meetings started every day with an overview of the key figures (number of admitted patients with COVID-19, ICU admissions, etc.). We analysed the minutes of 61 meetings that were held in the period 1 March – 30 June 2020. Most minutes of meetings had the same structure: participants, current numbers on COVID-19 patients in hospitals (national, provincial) and hospital bed availability, lessons from the data, issues discussed and issues not discussed. The minutes did not contain a list with decisions made.

The interviewed committee members reported that the HTSC committee heavily relied on the content experts in the committee to feed the initial discussions, also because of a lack of evidence on the (impact of the) new virus. The introduction of a topic was followed by a thorough discussion, taking into account feedback from the hospitals.



Strong leadership with a focus on the job

All interviewed committee members praised the pragmatic and strong leadership of the chairman of the committee. Far-reaching decisions were taken at the start of the crisis (for example, suspending non-urgent hospital activities) at a time when the sense of urgency was not yet present in other committees or decision-making bodies. The leadership style contributed to “unity of command” regarding hospital capacity issues. This was reported to be in sharp contrast with the lack of unity of command that was perceived in general. When there were (small) incidents with deviations in the communication or timing from what was decided it was discussed and corrected in a next meeting. Moreover, and despite the discussions of a large number of topics, the chairman always kept the focus on the job, namely “hospital and transport surge capacity”, which facilitated the decision-making process.

Limited political interference in the decisions of the HTSC committee

The HTSC committee was set up as an advisory committee for the RMG. All decisions and actions of the HTSC committee are supposed to be approved by the RMG. Although the RMG did not tolerate preliminary communication to the hospitals on measures that were not yet formally approved by the RMG, most of the advices of the committee regarding hospital surge capacity and transport were translated into decisions by the RMG and communicated as such to the hospital sector. Only for a limited number of topics committee members felt some political interference, for example for the admission policy of foreign patients.

There was a general perception among the HTSC committee members that the committee remained under the radar and this was perceived as positive because it kept them out of the political discussions and made it possible for them to work quite autonomously.

3.4. Communication between the HTSC committee and the hospitals

The main communication line between the HTSC committee and the hospitals were the letters of the committee. Additional communication channels were meetings of the hospitals with the federal health inspectors and with hospital umbrella organisations.

3.4.1. Measures to be enacted by hospitals were communicated by letters

The HTSC committee communicated with the hospitals by means of letters. We analysed the 16 letters that were sent to acute hospitals in the period 1 March – 30 June 2020 and were signed by the chairman of the RMG, the chairman of the HTSC committee, by a representative of the Scientific Committee Coronavirus and by the chairman of the Belgian Society of Intensive Care Medicine. The letters to the hospitals were drafted within the HTSC committee and then sent to the RMG for approval. The letters were not directly sent by the committee itself, but by the federated entities responsible for hospital licensing. There was a clear policy to communicate with one single voice.

All letters were directed to at least the hospital CEO and most of the times also to the CMO. Sometimes the coordinator of the hospital emergency plan was also addressed. Only after a few weeks, also the CNO was addressed.

Content and tone of the letters followed the course of the crisis

The broad scope of topics in the letters was already mentioned in section 3.1. The topics and content of the letters followed the course of the COVID-19 pandemic. In the period March-April drastic measures were taken to increase hospital capacity (for example suspending all non-urgent activities), while from May onwards the instructions were more tailored to preparedness for an eventual second wave.

Also the tone of the letters evolved during the pandemic course, from kind invitations to imperative measures. The same pattern could be seen in the clarity of instructions, for example concerning the surge capacity targets to



be reached. It should be kept in mind that the legal status of the (instructions of the) HTSC committee was not clear, neither were the consequences when hospitals refused to or were not able to put the actions into place. However, although the measures were far-reaching, it was reported by the interviewed committee members that the authority of the HTSC committee was not questioned, and that hospitals reacted in a very professional way. The interviewed respondents reported that there was a lot of solidarity and professionalism among hospital management and staff to accurately respond to the crisis, but also questioned whether such measures also would be accepted in case of consecutive waves.

Directive communication style sometimes lacking a clear rationale for the imposed measures

Although hospitals carried out the instructions of the HTSC committee, the communication style was perceived as very directive by interviewed hospital representatives. Some respondents interpreted this as a sign of lack of trust from the public authorities in the capability of hospitals to deal with the required surge capacity. Others, however, were in favour of the directive style because the measures provided a framework for hospitals to address the crisis and avoided discussions within the hospital. Respondents also criticized the fact that the underlying rationale of the somewhat theoretical, detailed and complicated directives was not always clear (see section 3.4.3), and that the measures were insufficiently tailored to the local level.

Hospitals received directives from various task forces and authorities. They stated that they were overloaded with instructions, often at unpleasant times (during weekends or late in the evening).

3.4.2. Additional communication channels for feedback

The communication via letters was complemented with daily video conferences per province held by the federal health inspectors. During these meetings additional background about the measures was given and questions were answered. It was also a way to collect feedback from the field. Hospitals stated that the role of the federal health inspectors was crucial to support hospitals that faced problems that transcended the level of their hospital. While this was highly valued, especially by hospitals in

places where the epidemic impact was the highest, it seems from the interviews that this strategy was not applied in a same manner for the entire Belgian territory, mainly because of personnel shortages. Also the umbrella organisations reported that they connected with their members and gave feedback at the HTSC committee. The same was done by the federated entities when they received feedback from hospitals in their region.

3.4.3. Hospitals perceived the instructions as clear but not always feasible

From the letters the HTSC committee sent to the hospitals, we selected nine measures all related to surge capacity (ICU beds, non-ICU beds, staff, etc.) and asked respondents to the hospital questionnaire to evaluate their clarity as well as their feasibility. Overall, the instructions were considered as clear, but the language in the letters was too bureaucratic, theoretical, too vague and not sufficiently reflecting the reality on the field. The fact that the instructions changed at a rapid pace hampered clarity.

However, the instructions were not necessarily perceived as feasible. For example, one of the letters stated that “*staffing for extra ICU beds should be the same as staffing for licensed ICU beds*”. For 37 of the 53 responding hospitals (70%) this measure was considered definitely or rather not feasible. Also measures regarding the transfer of patients within the loco-regional network were difficult to implement. One reason hospitals gave was that, certainly in areas with high prevalence rates, all hospitals from the same loco-regional network were very soon all confronted with capacity problems due to a shortage of competent medical and nursing staff. Measures related to the release of hospital beds were evaluated as definitely or rather feasible by a large majority of the respondents (from 78% to 86%).



3.5. Future role of the HTSC committee

HTSC committee as a crisis committee to manage surge capacity versus a permanent concertation body

The functioning of the HTSC committee was highly valued by its members. All interviewed committee members are in favour of a reactivation of the committee in case of a second wave or in case of another crisis that requires surge hospital capacity. The opinions about a future more permanent role are divergent. Those in favour see the committee as a more permanent “reflection committee” to discuss hospital-related or health policy topics. Others see its role limited to managing surge capacity in times of crisis. A recent law provides a legal framework for the functioning of the committee (until 30 June 2020).¹¹

4. THE IMPORTANCE OF DATA (SHARING) IN BATTLING COVID-19

Data play an important role in informing policy decisions. This was also the case for the decisions and measures of the HTSC committee. Therefore, before we discuss the measures that were taken by the HTSC committee to increase hospital capacity (see Chapter 5), this chapter examines data availability at the start and in the course of the pandemic.

4.1. Data on hospital capacity and patient numbers available within the HTSC committee

4.1.1. Daily registration of hospital bed capacity and occupancy

Since the main focus of the HTSC committee is to monitor hospital capacity to treat COVID-19 patients, figures on available capacity and on the number of admissions of COVID-19 patients were discussed in each meeting. Hereto, the HTSC committee used data from two surveys that hospitals had to fill out daily: the “Incident Crisis Management System” (ICMS, see Box 1) since 4 March and the “hospital surge capacity” (HSC) survey of Sciensano since 10 March. Both registrations concern aggregated data at the level of the hospital site (ICMS) or the hospital (Sciensano). The registrations were imposed by law on 30 April after publication in the Belgian Official Journal.¹² The content of the registrations changed several times since the start of the COVID-19 crisis.

According to the text in the Belgian Official Journal, the following data had to be filled out daily:

- in ICMS, per hospital site:
 - available capacity of beds, on which patients with COVID-19 could be admitted
 - available capacity of ICU-beds, on which patients with COVID-19 could be admitted
 - number of available ventilators



- number of available extracorporeal membrane oxygenation (ECMO) devices
- in the Sciensano HSC survey, per hospital, and split by confirmed and suspected COVID-19 cases:
 - total number of hospitalised patients with COVID-19
 - number of newly (since previous survey) admitted patients with COVID-19
 - number of patients with COVID-19 on the ICU
 - number of patients with COVID-19 who are mechanically ventilated
 - number of patients with COVID-19 receiving extracorporeal membrane oxygenation (ECMO).

Box 1 – What is ICMS?

ICMS or Incident Crisis Management System is the national security portal for the Belgian services involved in emergency planning and crisis management, under management of the Federal Public Service of Internal Affairs. It is a national web-based platform for data and information management and collaborative crisis management. The portal is accessible to all actors of crisis management, from the municipal level to the national level.¹³

When the hospital emergency plan is activated, the treatment capacity has to be reported in ICMS.

By discussion of the combined information of both registrations, the HTSC committee could see if available (ICU) bed capacity was in balance with bed occupancy and new admissions of COVID-19 patients. In this way it could decide if additional capacity had to be created or if hospitals in some regions were saturated and if inter-hospital transport was needed.

4.1.2. Additional parameters to monitor hospital surge capacity

In addition to the data described in section 4.1.1, the HTSC committee had additional parameters at its disposal. However, not all parameters were available at the start of the crisis.

Ad hoc surveys

Next to the above-mentioned daily surveys, hospitals were asked in the letter of 10 March to fill out a questionnaire regarding the number of available ventilators that are suited for treatment of COVID-19 patients and the number of available ECMO devices. These parameters were later integrated into ICMS and required to be filled out daily from 24 March (ventilators) and 30 March (ECMO) on. Additional questionnaires on test strategy and on laboratory capacity were sent out. In early April, the committee also sent out a survey to have an indication of the length of stay (LOS) of COVID-19 patients in ICU.

Clinical survey

In addition to developing the HSC survey, Sciensano was also commissioned to collect and process individual health data from hospitalised patients with a confirmed COVID-19 infection.¹⁴ This Clinical Survey was designed to measure risk factors and outcomes for each (confirmed) COVID-19 patient at admission and at discharge⁹, and was implemented on 14 March using a secured online questionnaire. The survey contains questions on clinical parameters, use of ICU, ICU length of stay and admission and discharge date, from which hospital LOS could be calculated.¹⁴ ¹³ Participation to this surveillance is strongly recommended, but not mandatory. At the end of June, the Clinical Survey covered admission and discharge data for 76% of admitted COVID-19 patients in 97 (out of 103^h) hospitals. In addition, no standardized unique patient identifier (e.g. social security number) was used during the first wave of the pandemic, hampering linkages with other data sources (e.g. billing data, cancer

⁹ Detailed information on the variables in the Clinical Survey can be found in Appendix 2 of Van Goethem et al. 2020.¹⁴

^h Including some specialised hospitals.



registry, hospital discharge data, death certificates) which can be important to treat research, clinical and policy questions now and in the future. Since 14 September the Clinical Survey migrated from the Sciensano to the Healthdata.be platform (i.e. the platform used by Belgian authorities to collect and store healthcare data in a uniform way). This migration included several changes such as the collection of the social security number of patients (allowing future data linkages, an improved match of the data that are collected at the time of admission and those collected at discharge) and a potential reduction in registration burden since data could be uploaded in batch. Although there were no changes to the law, hospitals were encouraged to collect data for all COVID-19 patients (admission and discharge).

4.1.3. Data visualisation and prediction models

It is unclear from the meeting minutes of the HTSC committee to what extent data-visualisation techniques or prediction models were used. A data-visualisation tool from DNalytics was made available for HTSC committee members, but it is not clear whether it was used and which data were visualised by the tool.

Also some meeting minutes mention the use of a prediction model by the HTSC committee but it did not come clear from the minutes how this model was applied or used to inform decisions and if other models were also used.

4.2. Shortcomings in data availability, definitions and registration

It appeared from several HTSC committee minutes that there were recurrent data problems: hospitals not reporting daily, missing data, mismatches between the HSC survey and ICMS numbers, changes in data definitions, wrong data input, unclear operationalisations of variables, etc.

4.2.1. Licensed, operational and available hospital beds

Basic data to manage hospital surge capacity were not available at the start of the crisis

Some vital parameters for creating hospital surge capacity were not available to the HTSC committee at the outbreak of the pandemic.

Important information on the number of ICU beds in Belgian hospitals was not available. For example, the number of ICU beds in FINHOSTAⁱ diverged from the number in the “annual hospital statistics¹⁵”. Gradually information on the number of ICU beds became available, improved and was used at every meeting of the HTSC committee.

In a same way, not only the number of patients with COVID-19 but also their length of stay (LOS) have an impact on the availability of beds and in consequence on the number of needed extra beds. In the first weeks of the pandemic, the HTSC committee had no information on the LOS in hospital and ICU. To have a first indication of the LOS of COVID-19 patients in ICU, the committee sent out a survey to the hospitals in early April. Between 67% to 73% of the ICU-admitted COVID-19 patients required ventilation, and the minimum length of ICU stay was estimated at minimally 10 to 15 days with a mean length of ICU stay of approximately 21 days. It lasted until the second half of May when the HTSC committee had access to reliable data on the LOS of hospitalised COVID-19 patients, derived from the Clinical Survey of Sciensano. The median LOS of the confirmed COVID-19 patients

ⁱ Hospital accounting data



was 8 days (P25=4; P75=14) and for patients who required ICU the median ICU LOS was 8 days (P25=4; P75=17).^{16, 17}

Administrative data about hospital capacity do not reflect the real capacity that is deployed on the field

All measures regarding bed capacity in the letters of the HTSC committee used the concept of licensed hospital beds to calculate extra ICU and non-ICU bed capacity. However, the concept of licensed beds is outdated as hospitals decreased the number of (operational) beds by shifting activity to day and outpatient care, by shortening the length of stay, etc. while the administrative number of licensed beds was more or less kept at the same level. As such, there are more licensed beds (administrative reality) than operational beds (reality on the field). To manage a crisis such as the COVID-19 crisis, the number of available operational hospital beds and ICU beds in particular should be known. After all, a licensed (not operational) bed can only be activated when the required staff (medical, nursing, etc.), infrastructure and equipment are available.

However, no data on available human resources were at the disposal of the HTSC committee. Some of the interviewed respondents suggested to collect information about the available staff and their expertise, how staff was made available for the surge capacity and to monitor well-being and absenteeism.

All these elements made the interpretation of capacity and occupancy difficult and it required changes to the surveys and communication to the hospitals. Also from reactions of the hospitals to the HTSC committee, it became clear that there were interpretation difficulties on how to fill out both ICMS and HSC questionnaires.

4.2.2. Detailed information on patient profiles was lacking

We mentioned before that the HTSC committee had for a long time no idea about the LOS of COVID-19 patients in ICU beds. To predict the capacity use of newly admitted patients and to control demand, interviewed respondents indicated that it is important to know how long patients stay in the hospital and on the ICU, what their comorbidities are, how long they are ventilated, where they come from, etc. During the first weeks of the pandemic, the HTSC committee had to make estimations based on internationally published figures. The Clinical Survey of Sciensano (see section 4.1.2) made an end to this situation.

4.2.3. Changing definitions, multiple data requests and data registration in separate platforms

ICMS is a static tool used for a dynamic process

Hospitals have diverging opinions on the usefulness of ICMS. Some respondents criticised the static nature of the platform: ICMS data only give a static view on hospital capacity (one moment in a day) which can rapidly change. Others questioned the appropriateness/usefulness of a daily ICMS data registration. According to several respondents (interviews) ICMS is designed for disaster management but not to manage an epidemic of the size and duration of the COVID-19 crisis.

Although some respondents stated that the ICMS registration is too detailed, others suggested to register additional variables such as the type of isolation rooms (negative and positive pressure) or the total capacity of the ICU including the maximal number of additional capacity (not only the available beds).



Lack of a central data platform constrains efficient data registration

In an open-ended question, respondents to the hospital survey were asked to describe the main potential areas of improvement for the ICMS data in the context of a pandemic compared to the current registration (September 2020). Respondents stated that the ICMS platform should evolve towards an automatic extraction from hospital information systems which match other data collection systems, preferably in one central data platform. Such central data platform also has the advantage that redundant data requests can be avoided (e.g. data on the number of ECMO devices was requested via ICMS and via ad hoc surveys). Awaiting such platform, they proposed to make ICMS registration more user-friendly and coding instructions simple and clear.

To enhance the motivation of hospitals to register the necessary data, it was suggested to provide a benefit in return (e.g. data transparency, feedback reports, dashboard at regional level). In Germany for instance, where hospitals have to register on a daily basis for three types of ICU beds the number of occupied beds, the number of available beds, and an estimation of the maximum capacity for new admissions in the following 24 hours, the information is made publicly available on a dedicated website (<https://www.intensivregister.de/#/intensivregister>). Since mid-November a feedback from Sciensano to the hospitals has been transmitted, which allows hospitals to compare their data (for example length of stay, standardised mortality) with national benchmarks.

Data registration instructions needed several adaptations along the course of the first wave

A recurrent issue in the HTSC committee letters concerned registration of data about available hospital capacity and about hospital occupancy/use. The instructions were extended and adapted several times and needed clarification and further specification along the road. The frequent and fast changes in terminology and definitions were considered (by the interviewees) as a burden and were a source of frustration for hospitals.

Doubts about the validity of the data

Several of the interviewed hospital representatives mentioned that the data guidelines given by the public authorities were insufficient to capture the complex reality on the field. Therefore, they agreed on data definitions within their single hospital or hospital group (e.g. duration that a patient with confirmed COVID-19 remains a COVID-19 patient; is an available ICU bed immediately operational or within a certain time frame). As such, it is possible that interpretations differed and validity problems occurred. The committee was aware of these problems and additional instructions (e.g. by giving examples) or explanations (e.g. zoom-sessions) by the responsible public authorities were given in an attempt to remediate this.

Multitude of data requests

Hospitals complained about the numerous ad hoc surveys and questions from public authorities and umbrella organisations. This was perceived as a burden for hospitals in time of crisis and it gave the impression that public authorities were not well coordinated.

4.3. Data sharing and data analysis to facilitate decision making

4.3.1. Large efforts to improve the data but there is still work to do

Important data were not available at the start of the crisis. Since then, a large effort was made by the HTSC committee, Sciensano and the hospitals to improve data availability and quality. Some examples were already given in the previous sections.

A recurrent issue during the interviews with HTSC committee members was the lack of exploitation of the collected data. Respondents referred to real-time data collections abroad allowing to have almost an instant view on patient and activity profiles (e.g. length of stay, co-morbidities) and outcomes (hospital-standardised mortality rates) on ICU.^{18, 19} They criticized the fact that in Belgium no real-time monitoring of ICUs and ICU patients exists on a nationwide level.



Nevertheless, the data systems that were set up by Sciensano at the start of the crisis also allow to answer many relevant clinical, policy and research questions. A good example is the analysis of hospital-standardised mortality rates. By combining the hospital aggregated data with data from the Clinical Survey it was possible to correct for patient (e.g. age, gender, co-morbidities, disease characteristics), treatment and hospital characteristics. Based on this analysis (not yet published) it appeared that ICU organisational characteristics, such as ICU overflow and a high proportion of additionally created ICU beds, were independently associated with in-hospital mortality. As a consequence, the focus of the implementation of the hospital surge plan during the second wave shifted from creating additional capacity to a maximal spread of COVID-19 patients at a national level making use of existing ICU beds as much and as long as possible.

Another initiative is a dashboard developed by the FPS Public Health. The HTSC committee can now consult this dashboard with daily updates of the bed occupancy of COVID-19 patients at ICU and other units, at the level of the hospital, hospital network, province, region and country. In addition, it includes short- and long-term predictions.

Despite the efforts that were made to improve the availability and use of data during the COVID-19 crisis, the current data systems can still be expanded. The interviewed respondents suggested to add, for example, the well-being and absenteeism of staff and the patient-to-nurse ratio. As soon as the number of COVID-19 admissions decreases for a longer period, it is therefore worthwhile to investigate which structural changes in the data systems would better prepare our country for a possible next crisis (e.g. automatic data extraction, real-time monitoring of patients, bed occupancy rate and outcomes, interoperability of data systems taking into account the only once principle).

4.3.2. Unlocking and sharing data to inform public health policy.

A data-driven response to the COVID-19 pandemic through rapid data collection, analysis, modelling, and timely reporting is of utmost importance for monitoring as well as for prediction purposes. Researchers can now access the data through an official application procedure. However, in interviews with experts from public administrations and from the research

community, it was mentioned that data sharing was (and still is) a debated issue. Therefore, it should be explored what the organisational, legal or technical barriers are to make optimal use of the available data by public authorities and the research community to inform public health policy.

4.3.3. Data requirements in internationally developed hospital surge capacity planning models and tools

Comparable data problems occurred in the selected countries

The problems Belgium faced regarding data registration and monitoring tools, were also faced in the selected countries we analysed. Each country requested a scientific organisation to initiate a system to monitor daily the epidemiological impact from COVID-19 regarding the number of new COVID cases and mortality. In addition, systems were set up to monitor hospital (ICU) admissions of COVID-19 patients and often in parallel another system to monitor availability of hospital (ICU) beds (normal plus extra created capacity). These monitoring systems were sometimes based on already existing surveillance systems (e.g. regarding flu-epidemics or ICU beds use) or they were completely new developed. Sometimes the monitoring systems were set up at a national level, sometimes at a regional level, sometimes both. Some monitoring systems related only to COVID-19 patients and other to all patients; some systems registered all hospital admissions and other only ICU. For example, in Germany an intensive care register was established during the swine flu in 2009. The system was reopened with a traffic light system during the COVID-19 pandemic. The register shows which hospitals in Germany have how much capacity. It is updated on a daily basis and all hospitals have access to the register.

Each country reported problems in the way the monitoring systems functioned and everywhere adaptations were needed along the way. Problems in having adequate overviews of availability and occupancy of hospital (ICU) beds were faced in each country. Most of the hospital availability and occupancy systems asked hospitals to fill out daily aggregated numbers of patients admitted/discharged or beds available/occupied. In each country part of the surveillance systems was made mandatory.



Evaluations in other countries done so far, all plea for more sophisticated monitoring systems based on real-time data on number of (ICU) admissions, (ICU) bed availability, length of stay, use of life support devices.

Capacity planning models and tools were developed to help public authorities and hospitals to plan and predict hospital capacity

The international research community has responded to the outbreak of COVID-19 with, among other things, the development of hospital surge capacity planning models and tools. Chapter 8 in the [scientific report](#) gives a detailed overview of eight selected planning models and tools. There are two major categories: (i) tools that provide a snapshot of a hospital's capacity on one particular moment and (ii) tools providing a more longitudinal perspective on hospital capacity. The first group, the static models, have the ability to identify which dimensions (i.e. beds, ventilators, or staff) are potentially in danger to be saturated and highlight what hospitals should focus on in order to meet surge capacity demands. The static models include a long list of parameters, including number of (ICU) beds, ventilators or staff, but also epidemiological parameters, such as infectious days (including numbers on contagious and non-contagious days), convalescent period, and symptomatic cases per confirmed COVID-19 case. Important in monitoring staff availability is the absenteeism percentage or even COVID-19 related sickness rate, as well as the applied patient-to-staff ratio.

The static models are not suited to make a prediction in the future, making it difficult to act proactively. Models providing a more longitudinal perspective on capacity also include COVID-19 related parameters, which facilitate to model patient flow. These additional patient flow indicators include the estimated proportion of patients who will need hospital and/or ICU care after being infected and length of stay measures.

5. ADAPTING HOSPITAL CAPACITY TO A SURGE AND FALL IN DEMAND

One of the main missions of the HTSC committee was to monitor the balance between hospital capacity and COVID-19 patients requiring hospitalisation (and ICU treatment, ventilator therapy, ECMO therapy) and eventually to transfer patients from saturated hospitals to others. In consequence, this issue was a constant in the HTSC committee meetings and the minutes of it. Surge capacity plans were developed and adjusted during the whole COVID-19 crisis. How the several plans were developed and on which basis (e.g. prediction models) did not come clear from the minutes.

In order to understand and assess the measures that were taken by the HTSC committee as well as the response of hospitals, we first briefly describe capacity before the pandemic outbreak (section 5.1).

5.1. Hospital capacity in the pre-pandemic phase

The strengths and weaknesses of the Belgian healthcare system in general and the hospital sector in particular, have been described in previous reports of KCE and other institutes. In terms of hospital capacity, we can summarize the situation before the outbreak of the pandemic as follows.

A dense hospital landscape with a large number of hospital beds

The Belgian hospital landscape is characterised by a large number of hospitals and hospital beds.²⁰ While the average number of acute care beds equals 3.7 per 1 000 population for OECD countries¹, Belgium is ranked 6th with 5 beds per 1 000 population.²¹ The OECD report also provides data on the number of intensive care beds. After all, intensive care beds are the most important bottleneck in hospital capacity for the treatment of the most severe COVID-19 patients. While the OECD average is 12 beds per

¹ The number of OECD countries for which an average value is mentioned, is not the same for the different indicators in section 5.1.



100 000 population, Belgium is ranked 4th with 17.4 intensive care beds per 100 000 population. It is, however, important to be cautious when comparing data between countries.

Another indication of the degree of (spare) capacity is the occupancy rate. With high occupancy rates, it is difficult for a hospital system to react to an unexpected surge of patients. Belgium also ranks 6th with an average occupancy rate of 81.8% in acute care beds (including psychiatric care beds). The average occupancy rate for OECD countries is 75.2%.

But bedside staffing levels are low

Belgium has a relative high number of nurses per 1 000 population.²¹ The most recent “Health at a Glance” publication reports 11 nurses per 1 000 population, which is higher than the OECD average of 8.8 nurses. Belgium is ranked 11th (5th place of EU-28 countries). Nevertheless, it is well documented that there is a large gap between the (potentially) available nursing workforce and bedside staffing levels in acute hospitals. The number of patients assigned to one nurse is among the highest in Europe. In 2019 on average 9.4 patients were assigned to one nurse on general hospital units.²² It was beyond the scope of the present study to explore possible explanations for this gap (for example, relatively more part-time working nurses, a higher number of hospital stays).

Staffing levels of other hospital staff is less well documented

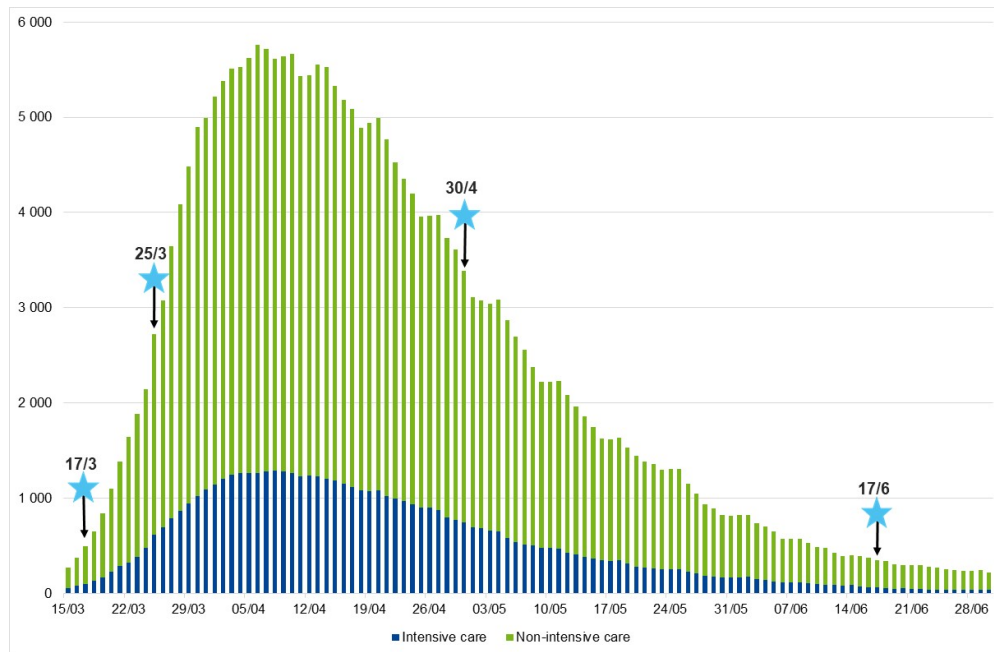
According to the OECD report, Belgium has relatively low numbers of doctors. The number of practising doctors amounts to 3.1 per 1 000 population, compared to the OECD average of 3.5 doctors per 1 000 population. While staffing levels for nurses are well documented, this is not the case for most other healthcare staff.

5.2. Hospital capacity in the surge phase

We can distinguish two periods in the measures that were taken to adapt hospital capacity to the number of patients: the **surge phase**, in which extra capacity was created in the rise of the pandemic, and the **post-surge phase**. In the post-surge phase measures were taken for phasing out / reducing capacity after the pandemic peak and for maintaining capacity in the event of future pandemic outbreaks. The surge phase runs from mid-March to the end of April, the post-surge phase starts at the end of April and runs until the end of June.

The measures run parallel to the evolution of the number of admitted patients. Figure 2 shows the number of admissions of COVID-19 patients between mid-March and the end of June, with a distinction between admissions in intensive care units and other admissions.

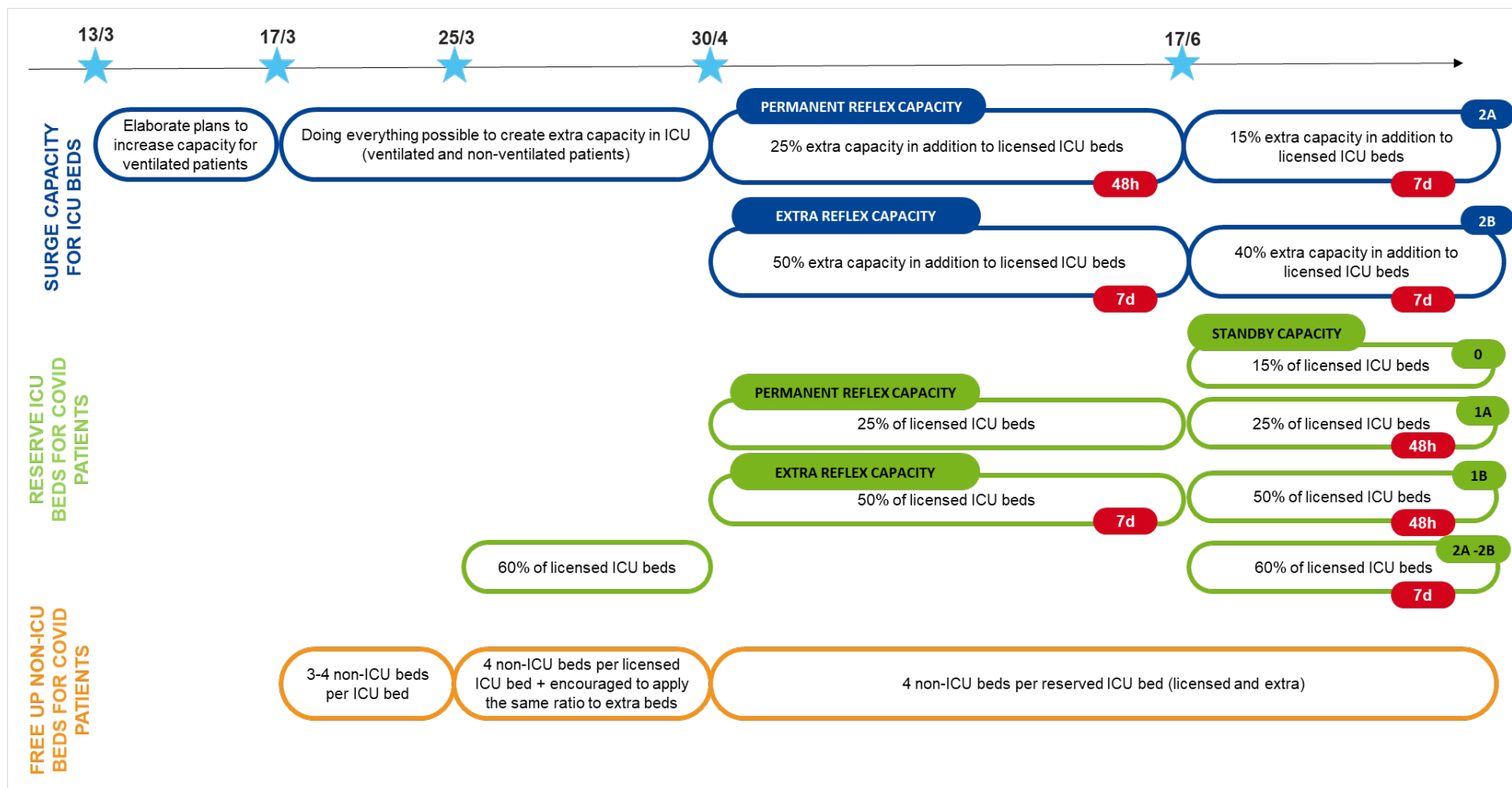
The measures that were taken in each period are visualised in Figure 3. In Chapter 3 of the [scientific report](#) a detailed description of these measures as they were communicated in the letters to the hospitals can be found. In Figure 2 and Figure 3 the letters are indicated with a blue star (top of Figure 3).

**Figure 2 – Number of hospital admissions of COVID-19 patients between March and June 2020**

Source: Sciensano (<https://epistat.wiv-isp.be/covid>). Legend: Stars indicate the date of the measures of the HTSC committee as shown in Figure 3.



Figure 3 – Hospital capacity planning between March and June 2020



The measures in the letter of 30/4 were also announced in the (attachment to the) letter of 24/04.



5.2.1. *From two reference hospitals to all acute hospitals*

Before the surge capacity plans came into play, the Military Hospital Queen Astrid was asked by the Minister of Public Health to admit Belgian citizens who returned from Wuhan for the period of their quarantine. Since the military hospital was not equipped to admit patients with respiratory infections they decided to split their burn care unit in two: a burn care unit and a quarantine unit for travellers from Wuhan. When the HTSC committee started and it became clear that ICU capacity would be the bottleneck, the military hospital took over as much burn patients as possible from the burn units of other hospitals to free up ICU space.

In the first week of March 2020, a “hospital and transport surge capacity plan” (see Appendix 1.1 in the [scientific report](#)) was prepared by the Scientific Committee Coronavirus in coordination with the Department Urgent Medical Care of the Directorate-General Healthcare of the FPS Public Health. The plan discerned four stages: in the first stage with a limited number of patients, only two reference hospitals are supposed to admit COVID-19 patients; in a second stage with more patients, reference and university hospitals admit COVID-19 patients; in the third stage all large hospitals (>550 beds) admit COVID-19 patients and in the fourth stage all hospitals admit patients as much as they are able to, and the hospital emergency plans are activated.

Framework for all hospitals to contribute to hospital surge capacity

However, already on 13 March it was decided by the HTSC committee that all hospitals had to free up and create additional capacity. The interviewed committee members acknowledged that the spectre of severe hospital capacity problems as seen in the North of Italy created a sense of urgency and helped them to take drastic and uniform measures. This decision was evaluated positively. However, in retrospect, if Belgium had been hit by COVID-19 as first European country, several of the interviewees assessed that a scenario with an acute shortage of intensive care beds was not unlikely.

The HTSC committee created uniform measures that applied to all hospitals. The willingness to contribute to the effort was reported to be present in all

hospitals but the extent of the efforts varied. The latter was also evidenced by an analysis of RIZIV – INAMI (Federal inter-administration hospital audit cell) where it was shown that hospitals that represented 50% of licensed ICU beds were responsible for 63% of COVID-19 ICU admissions.²³ The HTSC committee directives helped to decrease this variation. In addition, it supported hospital management to convince their medical staff to take these drastic measures.

5.2.2. *Building (acute) care capacity*

The surge phase can be defined as the period of March-April 2020, with a large increase in the numbers of hospitalised COVID-19 cases.

Measures to create capacity followed the course of the COVID-19 pandemic

In the surge phase hospitals were first asked (letter of 13 March) to make plans to increase ventilator capacity, e.g. by freeing up operating theatre and recovery rooms. In the letter of 17 March, measures were scaled up and hospitals were required to create extra ICU beds (for ventilated and non-ventilated patients), to free up non-ICU beds at a rate of 3 to 4 beds per ICU bed for COVID-19 patients and to discharge patients as soon as possible. Further specifications and measures followed in the letter of 25 March, in which hospitals were urged to reserve 60% of their licensed ICU beds for COVID-19 patients only and to reserve 4 non-ICU beds per licensed ICU bed for COVID-19 patients, and if possible a same ratio per extra created ICU bed was required.

The perception of the feasibility to implement the measures differed across hospitals

Smaller hospitals perceived the measures that were imposed in the surge phase as less feasible than larger hospitals did (see also section 3.4.3). For example, keeping 60% of their ICU beds for COVID-19 patients implied de facto that the entire ICU had to be reserved for COVID-19 patients. As a result, other hospital admissions requiring ICU were no longer possible or additional ICU beds had to be created. This was also demonstrated by an analysis of RIZIV – INAMI (Federal inter-administration hospital audit cell).



Smaller hospitals, defined in terms of the number of licensed ICU beds, created relatively more additional ICU beds but utilisation rates were lower.²³

Also the measure to free up 3 to 4 non-ICU beds per ICU bed was not equally feasible among hospitals. In hospitals with a large number of inpatient beds for cancer patients, for instance, it was more difficult to make this capacity available by postponing elective care without collateral damage compared to hospitals that have a lot of inpatient hospital beds in use for elective (surgical) care. Smaller hospitals had to turn a large part of their units into COVID units at a very early stage while larger hospitals could preserve relatively more non-COVID units. Therefore, it was perceived as a blunt measure. From 26 April the HTSC committee guidelines also made it possible to create surge capacity at the level of loco-regional networks. In some networks, respondents mentioned that this resulted indeed in agreements on ICU capacity for COVID-19 patients in which larger hospitals (partly) cover the required ICU capacity for COVID-19 patients to enable smaller hospitals to continue other medical activities (requiring ICU).

ICU capacity was created by transforming recovery rooms and PACU into ICU

To create extra ICU capacity, 66% of the responding hospitals (41/62 hospitals) used Post Anaesthesia Care Units (PACU) or recovery rooms. Twenty-nine hospitals (47%), mostly hospitals with more than 450 beds or university hospitals, used medium care units. Some of the responding hospitals (21%) used operating theatres as ICU. In the existing ICU, 39% of the responding hospitals increased the number of beds and 40% made small architectural adjustments to divide the unit into two separate areas (COVID and non-COVID). These strategies are similar to those adopted abroad. In the four countries selected in our international comparison (England, Germany, Italy and the Netherlands), hospitals made use of operation rooms and recovery room as ICU. They also redesigned other hospital areas (clinical and non-clinical spaces) into ICU. For a detailed analysis of the strategies that were set up in the four countries under study, we refer the reader to Chapter 7 of the [scientific report](#).

5.3. Hospital capacity in the post-surge phase

The post-surge phase started at the end of April 2020. At this point, the number of hospitalised COVID-19 cases gradually started to decline (see Figure 2). The HTSC committee and hospitals started to resume hospital services for all patients with the reintroduction of elective care (see sections 5.3.1 and 6.2.2) and to plan for possible future surges in COVID-19 case numbers (section 5.3.2).

5.3.1. Phasing out strategy

Based on the observed decreasing number of COVID-19 patients in hospitals and ICU, measures were launched in the letter of 24 April and further detailed in the letter of 30 April for downscaling of extra created capacity. Hospitals were required in a first phase to reserve a permanent reflex capacity of ICU beds for the treatment of COVID-19 patients consisting of 25% of their licensed ICU beds (A) and an additional 25% extra number of ICU beds to be operational within 48 hours (B). In addition, a permanent reserve of non-ICU beds was required, equal to at least 4 times the sum of (A) and (B). Finally, hospitals were asked to ensure in a second phase they could double the afore-mentioned capacity within 7 days when considered necessary by the HTSC committee. In a third phase hospitals must be able to triple the capacity of the first phase.

Hospitals were allowed to collaborate within the loco-regional network or within the province to ensure the required capacity.

Measures were perceived as threatening the resumption of delayed activities

Hospitals perceived the capacity measures in both phases (non-ICU beds equal to 4 times the sum of (A) and (B) and extra reflex capacity in 7 days) as unrealistic when capacity had to be shared with elective and other delayed activities. Hospitals indicated they prefer a more flexible approach in which they are allowed to take the necessary initiatives to free up non-ICU beds for COVID-19 patients when required at short notice.



5.3.2. *Maintaining capacity for a second wave*

Although in previous letters hospitals were required to be prepared for an eventual second wave, the letter of 17 June contained an update of the planned extra capacity per hospital and stated that hospitals need to permanently reserve minimally four times the sum of the permanent reserved licensed ICU beds and the number of additionally created ICU beds for the non-intensive treatment of COVID-19 patients.

The number of ICU beds that must be permanently reserved depends on the burden of COVID-19 patients at the loco-regional level or on a decision from the HTSC committee. It evolves from 15% of the licensed ICU beds (phase 0) to 25% (phase 1A), 50% (phase 1B), and 60% (phases 2A and 2B). In addition, 15% of extra ICU capacity should be created in phase 2A and an additional 25% in phase 2B. Hospitals should be able to activate phase 1A (from phase 0) and phase 1B (from phase 1A) within 48 hours. They must be able to switch from phase 1B to phase 2A and from phase 2A to phase 2B within 7 days.

5.4. Preparedness for a next wave and future crises

Measures should be more tailored and less drastic

Unless next outbreaks affect the entire Belgian territory with a demand for hospital capacity that cannot be reached without drastic measures, the general perception among the interviewed respondents was that a more tailored approach is indicated. There is now less shortage of PPE and testing capacity compared to the first wave. Moreover, the hospitals are now designed such that the patient flows can be separated safely.

Shutting down all non-urgent medical activities was reported to have caused an important impact on patients but also on the financial income of physicians and hospitals (see section 6.5). While a general shutdown of non-urgent care was assessed as overshooting by several respondents, they stated that this will also be less easily accepted given the large impact on patients, physicians and hospitals.

While during the first wave there was probably no alternative (lack of PPE, many unknowns, etc.) many respondents stated that for next waves the measures should be in proportion to the hospital capacity demands in a particular geographical area.

Concepts of alternative models emerge

There were several suggestions made during the interviews for new care models. A recurrent suggestion was to provide capacity for respiratory epidemics or other crisis situations in a more structural way. One of the suggested models was the development of a care programme covering prevention, treatment and rehabilitation of respiratory infections. A basic capacity could be attributed to all hospitals and more advanced capacity (with a higher reflex capacity) to a more limited number of hospitals. Respondents stated that this concept of care programmes should take into account the hospital network model (Chapter 7).

Another idea that was suggested is to expand the existing capacity of L-beds (beds for infectious diseases). Outside crisis periods, these beds could be used as permanent research capacity (to admit patients in the context of trials) with a payment system analogue for that of burn units (i.e. hospitals can use this capacity for other purposes but receive a fixed budget per bed).

Another model that was suggested is to build a national crisis hospital capacity consisting of different layers: individual hospitals; loco-regional networks; federal capacity. The respondents referring to such a model suggested that:

- All hospitals should be able to take up a role in case of disasters and public health crisis. This can be foreseen, as it currently is, after activation of the hospital emergency plans.
- At the level of loco-regional hospital networks a buffer capacity in terms of equipment and space can be dedicated in case of disasters and public health crises. This can be a wing of a hospital or a specific unit (used for other purposes when not required).



- Federal capacity with special equipped rooms (e.g. biosafety 3 level rooms in a 40-bed unit) and expertise to admit the most complex cases should be foreseen. It was mentioned that the calculation for different applications/scenarios (CBRNe – Chemical, Biological, Radiological, Nuclear, and Explosives; pandemic; train disaster; terrorist attack) will have to be made to estimate the required size (and budget) of such crisis capacity.

Training programmes

To be ready for next epidemic waves it was suggested in the interviews to train medical and nursing staff from other (but related) disciplines to take care of patients on an ICU unit. The same holds for other trainings (e.g. infection prevention & control, practical guidance on how to use PPE). Hospitals developed already some e-learning modules, training sessions, etc. The public authorities are working on financial support for hospitals via the hospital payment system.

5.5. The state of the healthcare workforce is a key determining factor in creating adequate capacity

5.5.1. Staff with ICU skills are the critical point to create additional capacity

Hospitals have created a substantial additional ICU capacity. While shutting down routine medical activities was reported to create a pool of staff available for non-ICU COVID-19 units, this was less evident for ICU. After all, this requires specific expertise from nurses, physicians and other staff.

Optimising staff numbers

Eighty-four percent of hospitals that participated in the survey (52 out of the 62 respondents) deployed **nurses** at the ICU who were not originally affected there but had an expertise in intensive care (such as those working in emergency departments, recovery rooms, operating theatres, etc.). They also had to create mixed teams including nurses both with and without expertise in ICU; 47 hospitals (76%) implemented such a strategy.

Thirty-two hospitals (52%) relied on former nurses with ICU expertise and 29 (47%) deployed nurses from general units to work at the ICU during the crisis. On the contrary, only 10 hospitals (16%) deployed students. Small hospitals (less than 200 beds) relied more than others on nurses from general units and much less on nurses from units with ICU expertise, on students and on former nurses. If the maximum capacity was reached, the main cause was a lack of nursing staff with the right skills to work on an ICU.

Hospitals experienced, compared to nursing staff, less problems in finding **physicians** with ICU expertise. In general, larger hospitals tended to rely more on physicians from units that are ICU-related, while small hospitals relied more on physicians from general units. When large hospitals deployed physicians from general units to work at the ICU, it was mainly in addition to physicians from ICU-related units. Specialists in training were also deployed at the ICU in 23 hospitals (37%), mostly large or university ones.

Optimising staff skills

A second element related to staffing concerns education of healthcare professionals. This includes several aspects, such as more basic (e.g. infection prevention and control, use of PPE) and advanced topics (e.g. care for critically ill patients). In addition, besides task-oriented training, attention should also be paid to generic skills such as leadership, crisis management, etc. During the first wave many local initiatives were taken. Hospitals provided training to nurses from units related to ICU (39 hospitals – 69%) but to a lesser extent to nurses from general units (17 hospitals – 27%). Hospitals also provided training for physicians.

It is worthwhile to join forces and combine some of the initiatives to develop even better, more efficient and harmonised educational support and training tools for the future. This requires action from public authorities, universities, schools of higher education and the hospitals.



Large involvement of non-caring staff and allied health professionals

Alongside nurses and physicians, hospitals highly relied on additional staff in other domains such as cleaning staff (48 hospitals – 77%), maintenance staff (31 hospitals – 50%), technical staff (22 hospitals – 35%), laboratory staff (20 hospitals – 32%) but also logistic staff, administrative staff, paramedical staff, physiotherapists, speech therapists, occupational therapists or staff to monitor dressing and undressing procedures.

Same issues experienced abroad

From our international comparison we learned that finding enough healthcare professionals to staff the extra beds was one of the most difficult issues in each of the countries under study. Common strategies to tackle this included training of non-ICU personnel in such a way that they could be deployed in ICU (to staff ICU with mixed teams of experienced and less experienced ICU staff); adaptation of working conditions; easing licensure requirements; and financial incentives. Italy also looked for personnel abroad and made use of transferring personnel from less affected areas to the more affected regions. However, the impact of the different strategies on the number of staff working on COVID-units is unclear.

For a detailed analysis of these strategies, we refer the reader to Chapter 7 of the [scientific report](#).

5.5.2. Hardly any explicit measures of the HTSC committee related to staff

The communication of the HTSC committee regarding surge capacity mainly related to surge / scaling up of (ICU) bed capacity and to a much smaller extent to surge in stuff (ventilators, ECMO, PPE) or surge of staff (number of extra personnel needed, training of new personnel, strategies to find extra personnel, etc.).

Although some letters defined capacity in terms of beds, equipment and staff, there were hardly any measures targeting explicitly workforce supply and skills. The only explicit measure related to staff was defined in the letter of 20 May, in which hospitals were required to comply with the staffing standards of licensed ICU beds also for the additional ICU beds that were

created. However, no guidance was provided on how to implement such measure. In the hospital survey, the measure was judged as not feasible (definitely not or rather not) by 70% of the respondents. After all, hospitals match the operational beds and the required staffing levels for ICU with the number of beds that are financed via the hospital budget. As such, the number of operational beds in ICU can be lower than the number of licensed beds. Since the staffing is based on operational beds, upscaling to the level of licensed beds (or beyond) can in general not be done with nurses with ICU expertise. Consequently hybrid models were deployed (see section 5.5.1).

5.5.3. Impact of the pandemic on staff well-being and health

The societal value of the healthcare workforce was demonstrated during the crisis. Healthcare staff have been at the forefront during the COVID-19 pandemic. They treat or care for severely ill or dying patients with the risk of becoming infected themselves. The interviews, the survey results and the results of surveys conducted by other organisations all point in the same direction: the impact of the COVID-19 pandemic on staff well-being cannot be underestimated. This awareness was also translated into recent policy actions. In June 2020 a Law was voted to increase the hospital budget with 300 million euro in a structural way to enable hospitals to hire more staff (nurses, healthcare assistants and supporting staff to allow more direct patient care time for nurses).²⁴ In addition, in the same month, an agreement between the social partners was concluded to improve the labour conditions (mostly salary) of nurses amounting to a structural budget increase of 600 million euro.



Well-being of staff is a major concern of hospitals

In the hospital survey respondents were presented a list of topics and were asked to evaluate to what extent they were concerned about each topic in case of a resurgence or second wave of the COVID-19 pandemic. One of these topics was the well-being of various types of hospital staff. The large majority of the 60 responding hospitals was definitely or rather concerned about the well-being of nurses and other care staff (98%), of physicians (93%) and non-care staff (93%). Moreover, 50 of the 60 responding hospitals (83%) reported being concerned about the absenteeism of staff. The survey was conducted in the first half of September 2020. In the meantime (November 2020) this concern became even more pressing with staff absence rates of 20% to 30%, and in some hospitals with peaks up to 40% (an analysis of the causes of absenteeism is beyond the scope of this study).²⁵

The emotional toll of COVID-19 for healthcare workers

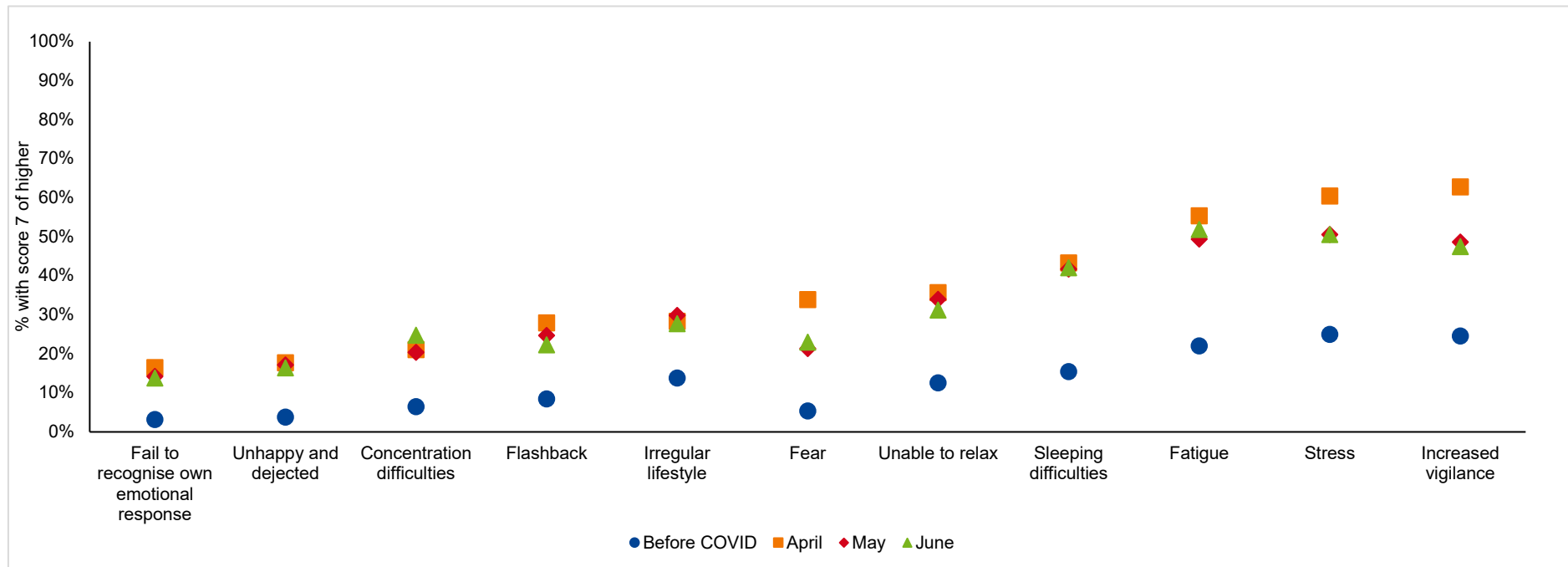
An online survey was conducted within “De ZorgSamen” initiative (see Box 2) to find out the psychological impact and the impact on professional functioning and experience of COVID-19 on healthcare and welfare staff. Only the results for the psychological impact on hospital staff are given in Figure 4. The number of participants (hospital staff only) was 903 in April, 506 in May and 609 in June. For the impact on professional functioning and experience we refer the reader to Chapter 6 in the [scientific report](#).

Box 2 – De ZorgSamen initiative

“De ZorgSamen” is an initiative of Zorgnet-Icuro, the Flemish umbrella organisation of hospitals and other healthcare organisations. Within the task force “COVID-19 Care” the initiative developed towards an online platform for the entire Flemish healthcare and welfare sector including many partners (e.g. universities, public authorities, non-profit organisations). One of the partners (LIGB – KU Leuven) took the lead in an online survey that aims to monitor the well-being of staff within the domain of healthcare and welfare at regular time intervals. The surveys are cross-sectional, it is not possible to study a cohort of healthcare professionals over time.²⁶ Participation is on a voluntary basis and anonymous. The survey was open for four days per period (April, May and June 2020).²⁷



Figure 4 – Percentage of hospital staff with a score of 7 or above out of 10 for 11 personal psychological reactions



Source: Vanhaecht (2020)²⁷

To study the psychological impact of COVID-19 on hospital staff a list of 11 personal reactions was questioned. Each respondent gave a score from 0 (never present) to 10 (always present) for the past week as well as under normal circumstances (before the COVID-19 period). In April 2020 an increase for all personal psychological reactions could be observed compared to a normal situation (pre-COVID-19). The impact on staff who worked with COVID-19 patients was larger for all 11 dimensions compared to other staff.

Three acute stress reactions (fear, stress, increased vigilance) showed an increase in April 2020 but decreased again in May and June to a level that is still much above the pre-COVID-19 level. A remarkable result was observed for nurses (not shown on Figure 4). While 5% of hospital nurses experience fear in normal circumstances, this increased to 57% in April (34% in May; 24% in June). For other hospital staff the increase was less pronounced.



The dimensions that are related to long-term pressure (fatigue, sleeping difficulties, unhappy and dejected, concentration difficulties) all increased in April and stayed more or less at the same level in May and June.

In the interviews conducted in our study, medical and nursing staff working on COVID-units were reported as being very committed and ready to work additional hours (from part-time to full-time, cancelling holidays, overtime, etc.). Also in the survey organised by the HTSC committee and the FPS Public Health^k the flexibility, motivation and professionalism of healthcare staff was emphasized. Yet, respondents stated that the medical and nursing staff underestimated the duration of the epidemic exposing them to a risk of fatigue and exhaustion. In some hospitals psychologists were deployed to support hospital staff but this seems not be a general policy. In general, the psychosocial impact of the COVID-19 crisis on the hospital staff was reported to have received too little attention. Also in the communication of the HTSC committee little attention was paid to psychosocial support to staff. Therefore, the duration and severity of the crisis require that initiatives (e.g. by hospitals and umbrella organisations, with support of public authorities^l)²⁸ are developed to support the psychosocial well-being of healthcare professionals.

Increased risk of burnout

Fear, stress and other mental health problems might lead to burnout or to leaving the profession. According to a survey organised by the French-speaking association of intensive care nurses (SIZ Nursing, see Box 3) the risk on burnout among nurses has increased since the start of the COVID-19 pandemic.

The authors report that 45% of the respondents had an increased risk of loss of personal accomplishment, 46% an increased risk of depersonalisation and 57% an increased risk of emotional exhaustion. Also,

71% of the respondents showed an increased risk on at least one of the three dimensions.²⁹ Moreover, 70% of the nurses reported a higher workload since the start of the COVID-19 pandemic. This higher workload was also confirmed by a workload measurement on 5 COVID-19 ICUs. The authors of the survey also showed that the experienced increase in workload was significantly associated with the risk of burnout. In addition, it was observed that working in units with COVID-19 patients and having experienced deaths of COVID-19 patients were associated with an increased risk of burnout.

Box 3 – Survey on the well-being of French-speaking nurses in Belgium

On 21 April SIZ Nursing, the French-speaking association of intensive care nurses, launched a survey on the well-being of nurses. They received a response from 4 552 French-speaking nurses (29% Brussels-Capital Region; 71% Walloon Region).²⁹ Most respondents worked on ICU (about 28%), general internal medicine and surgical units (about 23%) and home nursing (14%). Other places of work included COVID-units, nursing homes, psychiatric units, emergency services, rehabilitation centres, operating rooms, medico-technical services and ambulatory care.

The Maslach Burnout Inventory was used to measure the risk of burnout on three dimensions: emotional exhaustion, depersonalisation, and lack of personal accomplishment.³⁰ All reported associations are the result of univariate analysis.

^k The HTSC committee sent out a survey to the hospitals in which the HEP and the functioning of the committee were questioned. The results were processed by experts at the FPS Public Health. The KCE was allowed to make use of these results in this study.

^l In 2020, 11.7 million of the 300 million euro to hire new staff is reserved as a one-shot measure for psychological support of the healthcare staff (156 FTE psychologists).



6. DISRUPTION AND RESUMPTION OF REGULAR MEDICAL AND ELECTIVE SURGICAL CARE

6.1. All countries were confronted with choices about how to prioritise care

COVID-19 has confronted all health systems with choices about how to prioritise care in order to free up hospital bed capacity to treat patients affected by COVID-19 and to minimise exposure to the virus. The Nuffield Trust published an overview of measures that countries have taken to cancel or delay services, to minimise exposure and maximise health workforce capacity.³¹ Table 4 (p. 18) in that report gives an overview for a long list of countries on the definition of services that were delayed, the date of restrictions and the date of reintroduction. A comparable table can be found in Panteli (2020) which is based on the COVID-19 Health Systems Response Monitor (HSRM) of the European Observatory on Health Systems and Policies.³²

No uniform definition of urgent or essential care

The down- and upscaling of medical care in different countries has in common that a stepwise approach is used where medical activities for which postponement has the least impact on patient's health are stopped first. Care that is urgent or essential is continued. Yet, countries differ in how they define urgent or essential care, and also in the degree of detail to specify the concerned services. The definitions have in common that services cannot be delayed when there are major disadvantages to the patient's health. Some countries delayed all elective care, others only elective surgeries. Although countries varied in their approach to preventive care, cancer screening programmes were paused in a striking number of countries. The final decision on which services to delay often lies with individual physicians.

The timeline of these down- and upscaling measures follows the pandemic in the respective countries. For example, Italy was the first country to postpone non-urgent care (29 February 2020). Most countries followed in early to mid-March. Denmark was the first country to loosen the restrictions (13 April 2020) and to return to the activation of delayed activities.

The average time span between the date when restrictions begun and the date of restarting (part of) regular care is 45 days.³³ For Belgium this was 54 days.

Prioritising services for resumption

The timing, pace and approach that countries take to resume postponed services depend on the resources they had going into the crisis, as well as how they were impacted by the virus.³¹ Notwithstanding these differences, some common features emerge. First, countries applied a phased approach, with prioritising most time-sensitive and urgent services, with risk of deterioration of the patients' health. Some countries also took account of waiting lists. Second, frameworks were developed to help providers to prioritise. In most countries, medical associations played an important role in the development of these frameworks to guide the different clinical specialties in this decision-making process.

While emergency care services continued (but also decreased) during the first wave, countries used different prioritisation strategies to resume care. This includes, in the first place, care for which timeliness of intervention is important. The interpretation of what this entails differs across countries but oncological care is a typical example.³⁴

Furthermore, a common element is that countries were cautious to restart activities that require hospital capacity (e.g. ICU, rehabilitation) that is a bottleneck when the COVID-19 pandemic peaks again.³⁴ In Germany for instance, at the end of April, hospitals were asked to keep 25% of all ICU beds available for COVID-19 patients, starting from a previous target of 50%. However, due to the federal structure of the hospital system in Germany, it was allowed that this capacity was ensured at the state level (*Länder*) instead of in each hospital. Hence, a state could have all these ICU beds in one hospital for COVID-19 patients and other hospitals without



COVID-19 units. In May they could restart elective surgeries, in a stepwise way and linked to a frequent re-evaluation of ICU bed capacity. In addition, a list of prioritised elective interventions was drafted by the German Association for General and Visceral Surgery. This list included surgeries of patients with rapidly progressing diseases and manageable comorbidities. Nevertheless, despite the existence of this list the individual physician still makes the treatment decisions. The same association also created a list of diseases that may always require urgent surgery, such as hernias with incarceration, gastrointestinal bleeding, organ transplants, etc. In the Netherlands, an “urgency list” was validated after an extensive multi-stakeholder dialogue. This list of procedures was used to prioritise when to scale up regular hospital care.

The future of remote care technology

Digital care is advised in several surge capacity guidelines.³⁵⁻³⁷ It was used abroad during the first wave of the COVID-19 crisis.³⁸

There are several modes how digital care could be applied in times of a pandemic crisis. **Tele-consultation** in which a healthcare professional communicates with a patient via videoconference, telephone, or email gives possibilities to ensure care continuity without needing the hospital physical structure and avoids that a patient should visit the hospital. **Tele-expertise**, by which healthcare professionals communicate with each other, allows for instance that experienced healthcare professionals that are in quarantine give advice to less experienced ones that are on site. Also support from the hospitals to nursing homes could be arranged this way. **Tele-monitoring**, in which patients are equipped with smart technology that sends data to the hospital, allows to discharge patients sooner from hospital and still ensure monitoring of vital functions.

Organising trainings could also be done in a remote way. A performant digital healthcare structure is, however, essential for sharing data between healthcare organisations and central governmental bodies.

In our survey of Belgian hospitals, the opinions were divided regarding the implementation of digital care in case of a second wave; 26 respondents (44%) stated they were rather or definitely concerned while 33 of them (56%)

were rather or not concerned. Setting up tele-health activities at the network level has been judged as (rather or very) relevant in case of such crisis by 42 respondents (75%). Opinions were also divided concerning the organisation of tele-intensive care between hospitals of the network: 56% found it a rather or very relevant idea but 21% stated it is not at all relevant, particularly in Flanders.

6.2. Postponement of all hospital services except for urgent and necessary services in Belgium

Like in many health systems, also in Belgium regular medical and non-urgent elective surgical care was cancelled or delayed to free up acute care capacity in hospitals for a surge in COVID-19 patients.

6.2.1. Communication of the HTSC committee to the hospitals left room for interpretation

The letter of 13 March stipulated that hospitals had to stop all elective consultations, investigations and procedures by 14 March. The letter stipulated further that all urgent and necessary consultations, investigations and treatments could be maintained, and that all current vital treatments (e.g. chemotherapy, dialysis) or necessary daily rehabilitation could be continued. The letter of 16 April further specified what essential care is that could be continued, such as treatment of chronic conditions in cases that postponing would lead to irreversible or unacceptable deterioration, treatment of acute mental health problems and preventive activities such as vaccinations and neonatal screening.



Large support of drastic measures during the first wave of the epidemic

From the interviews, we can deduce a general support for this drastic measure. It was perceived as essential, at that point in time, to enable the creation of sufficient and additional hospital and ICU capacity for COVID-19 patients. It was taken in a context of catastrophic images from abroad (i.e. hospital capacity shortage in the North of Italy), an exponential rise in COVID-19 cases, hospital and ICU admissions, a shortage of PPE and testing capacity, and many unknown factors (about the disease, its treatment, epidemiological data, etc.).

A differentiated approach is indicated

However, there was also a general consensus among the respondents (hospital sector and committee) that in the future a reduction of regular medical activities should be phased and proportionate to the local epidemic situation. During the first wave the interpretation in most hospitals was, according to interviewed respondents, very strict: urgent or necessary care was interpreted as “urgent and necessary care can be continued”, while it is important that, in future, necessary or urgent care can continue. They stated that also the restrictions on elective non-necessary care can be less severe, e.g. continue with elective care and patient profiles that do not require ICU capacity if there are enough anaesthesiologists available. Such a differentiated approach would have less impact on public health, hospitals (budget, organisation, etc.), physician income and functioning and avoid lengthy discussions and negotiations between the CMO and the medical staff within individual hospitals.

6.2.2. A stepped process for resuming hospital services

It lasted until the launch of exit measures before guidance on the definition of urgent or necessary was given. In the letter of 24 April hospitals were informed that the HTSC committee, together with several organisations representing the medical specialists, was preparing practical guidelines on how regular hospital care could be restarted. This preparatory work led to guidelines presented in the HTSC committee letter of 30 April and consisted of several elements (see Chapter 3 in the [scientific report](#) for a detailed overview):

1. To continue with all urgent and necessary care. Hospitals were asked to analyse all postponed care and to contact patients in such a way that patients with the highest priority receive care before patients with lower priority care needs. To determine priority, the union of professional organisations of medical specialists (VBS – GBS) published a (dynamic) list of grades of emergencies per medical specialism, which offers an orienting framework for individual clinicians.
2. Under certain conditions (related to, for example, the availability of sufficient staff, adequate stock of PPE or medications), regular hospital care could be resumed in a stepwise manner:
 - a. From 4 May:
 - consultations, hospital at home activities and mobile teams
 - non-surgical day-care activities (geriatrics, psychiatry)
 - surgical day-care activities that do not require intensive care
 - b. From 11 May:
 - inpatient admissions/activities that do not require intensive care
 - activities that may require intensive care.

The letter also stated that competent federal governmental organisations (such as the FPS Public Health or RIZIV – INAMI) dispose of instruments to monitor the restart of activities and the compliance with all above-mentioned requirements.



Slow and uniform restart of regular activities

Based on the interviews with hospital sector representatives, there seemed to be a perception that the HTSC committee was far too long reluctant to restart regular medical activities. The required buffer capacity, at the time when the number of COVID-19 cases dropped drastically, was considered too large. In addition, the ability of hospitals to create additional capacity at short notice was said to be underestimated.

According to the interviewed committee members, pressure from hospitals on the HTSC committee to relax the measures increased. In retrospect, they agree that a more differentiated approach, allowing hospitals in less affected areas to restart regular activities earlier, would have been more expedient.

Hospitals restarted regular activities at a different pace

Respondents mentioned that the impact of the epidemic on the hospital and hospital staff influenced the pace at which hospitals restarted their regular activities. In hospitals that were heavily impacted they reported that a slower start was taken because their medical, nursing and other staff was often exhausted and not yet ready for the job. Yet, this strategy was not followed everywhere and some hospitals, under pressure by loss of income for both the hospital and physicians, restarted too drastically. They acknowledged having insufficiently taken into account the potential negative impact on the wellbeing of their nursing staff that was heavily affected by the COVID-19 crisis (see section 5.5.3).

6.3. The impact of COVID-19 responses on essential and non-essential hospital services

At this moment it is impossible to assess the full impact of the COVID-19 pandemic for the observation period of this study (March-June 2020). However, some first results on the volume and type of care that was postponed are emerging, as well as on the impact on patients (see section 6.4).

RIZIV – INAMI and IMA – AIM^m analysed hospital activity in the first wave of the pandemic (and further). A detailed description can be found in Chapter 6 of the [scientific report](#).

6.3.1. Large differences between hospitals in suspending regular activities

IMA – AIM compared all inpatient hospital admissions in acute hospitals in the period 6 January – 30 August 2020 (weeks 2 to 35) with the same period in 2019.³⁹ The data did not allow to make a distinction between COVID-19 and non-COVID-19 patients.

A discrepancy between 2019 and 2020 is observed from week 11 (9 March) (see Figure 5). On 14 March, the lockdown in Belgium was announced and the HTSC committee imposed hospitals to suspend all elective activities. As stated above, elective activities could resume on 11 May (week 20), but consultations and day-care activities were allowed to resume from 4 May onwards (week 19).

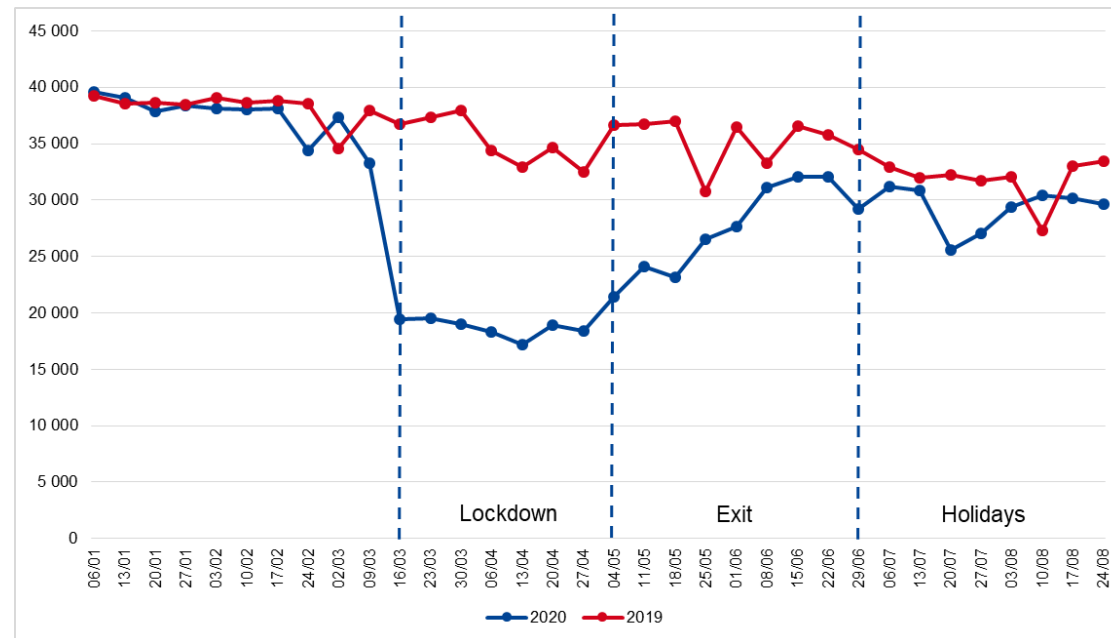
^m IMA – AIM (Intermutualistic Agency) gathers patient data from all seven Belgian sickness funds and prepares them for analysis. The IMA – AIM databases contain billing data for healthcare reimbursed by compulsory health insurance in Belgium.



In the lockdown period (see also the surge phase in section 5.2), inpatient hospital activity was 47% lower in 2020 compared with the same weeks in 2019. In the exit period (week 19-27 or post-surge phase) the difference was 23%, and in the period July-August the difference reduced to 9%. The global picture hides large differences between hospitals. In the lockdown period the reduction ranged from 31% to 63%, in the exit period from 10% to 39% and during the holiday period differences between 2019 and 2020 ranged from +3% to -33%.

RIZIV – INAMI (federal inter-administration hospital audit cell) estimated that the number of non-COVID related hospital admissions decreased with 27% in March and 62% in April, compared to what was expected based on 2019 data. In August a reduction of 11% in the number of hospital admissions was estimated. In April and May large differences between hospitals were reported.

Figure 5 – Number of hospital admissions in Belgian acute hospitals, comparison between 2019 and 2020, by week



Source: Versailles et al. (2020)³⁹



6.3.2. *A broad range of activities was suspended*

Overall decline in hospital services but largest effect for surgery and paediatrics

For most hospital services IMA – AIM observed a substantial difference in the number of admissions during the lockdown period and the same period a year before. In particular, the decrease amounted to 66% in surgery, 57% in paediatrics, 38% in internal medicine and 36% in geriatrics. At the end of the exit period the number of hospital admissions for surgery, internal medicine and geriatrics was almost at the level of 2019. For paediatrics however, the decrease lasted longer: the number of admissions was still 44% lower during the exit period than during the same period in 2019.

An important and unexpected decrease in activity was observed in neonatology services (both intensive and non-intensive) starting during the lockdown period and getting larger during the exit as well as the holiday period. The number of admissions in non-intensive neonatology services was 71% lower during the exit period compared to the same period in 2019, and 80% lower during the holidays. For intensive neonatology services, these percentages are 75% and 83% respectively. Formulating or analysing possible explanations for these results is beyond the scope of the present study.

Finally, ICU services showed a moderate decrease in admissions with respect to 2019 (-16% during the lockdown period, -14% during the exit period and -8% during the holidays). As it is not possible to distinguish non-COVID-19 from COVID-19 patients in the data, we cannot calculate the decrease in regular ICU activity. However, an analysis of RIZIV – INAMI on billing data showed an increase in expenditure for ICU. For example, an increase of 40% was found in April 2020 compared to expenditure for ICU in April 2019. For other hospital services expenditures decreased by 31%.⁴⁰

Not only elective procedures and non-essential services were postponed but also essential and urgent care

The analysis of RIZIV – INAMI on billing data revealed that also for **urgent medical services** a substantial decrease in expenditure was noticed.⁴⁰ For stroke admissions a decrease of 19% and 16% in expenditure could be observed in March and April respectively. In May there was still a decrease of 2% while in June an increase of 3% was observed. Expenditure for heart attacks decreased in March (-9%), April (-34%) and May (-16%) while an increase of 40% was observed in June 2020 compared to 2019. A last example are prostatectomies for which expenditure decreased by 30% (March), 66% (April), 55% (May); for June an increase of 40% compared to the same month last year was observed.

RIZIV – INAMI (federal inter-administration hospital audit cell) grouped billing codes into three categories for surgical interventions, based on literature and consultation of medical experts: essential surgical interventions (70 clusters), non-essential surgical interventions (53 clusters) and mixed surgical interventions – essential or not depending on the context (21 clusters).²³ For non-essential surgical interventions a median reduction of 95% was noticed in April, for the mixed category a median reduction of 83%. Also for essential surgical interventions the median reduction in activities was substantial: 47% but with large differences between interventions. For the mixed category there was a large variation between hospitals, ranging from -97% to -27%; for essential surgical interventions the reduction ranged from -80% to -25%.

During the first wave of the COVID-19 pandemic the submission of data from the anatomo-pathology labs was accelerated which allowed the Belgian Cancer Registry to compare the number of **newly diagnosed cancers** during the COVID-19 pandemic with the number that was expected based on the previous year.⁴¹

Each month 5 725 new cancer cases are expected in Belgium (all cancers except non-melanoma skin cancer). On 14 March 2020 all non-essential consultations, examinations and procedures were cancelled. Almost simultaneously, also the screening programmes for breast, cervical and colon cancer were stopped. After the sharp decrease in the number of new



cancer diagnoses in March 2020, also in April 2020 there was a decrease of 44% compared to April 2019. From mid-April the number of new cancer cases started to increase to reach almost the level of the year before in June 2020.⁴¹

The decrease was present among all age groups except for children and adolescents upon the age of 19 years where after an initial decrease of 12%⁴¹ the number of diagnoses in the period March-September 2020 are similar as the same period in 2019.⁴² The most prominent decrease was observed in the oldest age group (>80 years: -51% in April). For the period March-September 2020 there was still a decrease of 18% in this age group compared to the year before.

The incidence of cancer diagnoses (period March-September 2020) when compared to the same period in 2019 is about 20% lower for skin-, bladder, renal- and head & neck cancers. For prostate cancer and haematological malignancies (except for acute leukaemia with a limited decrease of 2%) the decrease is around 15% while for aggressive cancer types (lung, oesophageal and pancreas cancer) a decrease of around 10% was observed.

The temporary cancelation of population screening contributed to the decrease. For each of the three cancer types for which population screening is organised a decrease was observed in April 2020: colon cancer (-49% for men; -58% for women in the age categories targeted by screening). A similar decrease was observed for breast cancer (-51% in the target group). For cervix cancer the decrease was 20% in the target group.⁴¹ In the meantime the catching up of diagnoses during the exit period started but only for cervix cancer the same level as the year before was obtained.⁴²

The analysis conducted by RIZIV – INAMI (federal inter-administration hospital audit cell) also showed the impact of the COVID-19 pandemic on oncological care. The number of multidisciplinary oncological team meetings decreased in April 2020 with 35% and in May with 45%. Chemotherapy treatments remained relatively stable in April but dropped with 11% in May.

Both results are potentially related to a reduction of newly diagnosed cases. The large observed drop (-81% in April, -54% in May) of endoscopies with biopsies (important in cancer diagnostics) supports this assumption.²³

Reasons to postpone care include both supply- and demand-based factors

There are still many unknowns about the reasons why care was postponed.³² Yet, as is reported in international evaluations, also in Belgium the observed reduction in healthcare utilisation cannot only attributed to supply-side factors (shutting down elective care, etc.). From the interviews and a survey conducted by the Flemish Patient Platform (see section 6.4) we learn that fear and regulations to limit community spread (e.g. prohibited to make non-essential transfer, minimise contact with other people) also potentially impacted the demand for healthcare services.

6.4. Emerging evidence on unmet needs

It was beyond the scope of this report to document the available evidence on unmet needs due to postponed or cancelled care in Belgium or abroad. Instead, we summarise the limited evidence from surveys that were organised by the Flemish Patient Platform.

Postponement of hospital care has a self-reported impact on the health of chronic patients

The Flemish Patient Platform organised three online surveys on postponing care among chronic patients during the COVID-19 crisis.ⁿ A first survey (from 3 to 13 April) targeted patients who postponed care during the first wave of the COVID-19 crisis (from 6 March to 13 April).⁴³ Of the 542 respondents with a chronic condition, 348 had a scheduled appointment in the hospital; 81% reported that the appointment was postponed (70% on initiative of the hospital, 6% own initiative, 5% not possible to make appointment). The postponed care included follow-up appointments with

ⁿ We only report the results of the first two surveys because of the low number of respondents in the third survey.



medical specialists (40%), investigation (20%), a first consult with a medical specialist (11%), a consultation after surgery (6%) and other (23%).

Forty percent of the respondents with postponed hospital care indicated that this had a moderate to severe impact on their health (e.g. worsening of chronic pain). Only 45% of the patients with postponed care stated that they received sufficient information from the hospital about the care that was postponed. For appointments that took place (19%) an alternative method (mostly teleconsultations) was reported in 39% of the cases.

In a second survey, conducted between 5 June and 14 June, 151 out of 316 respondents with a chronic condition had to postpone care during the lockdown (between 16 March and 3 May).⁴⁴ Only 38% of them reported that these postponed appointments had taken place since the restart (after 4 May). The question about the impact of postponing care on their health was filled out by only 82 respondents: 29% indicated to experience a moderate to severe impact. The average number of days between the original (but postponed) and new appointment in the hospital was 77 days (ranging from 8 to 224 days). The majority of postponed appointments were scheduled as appointments within the hospital setting (69%) while 27% were remote appointments (e.g. telephone; mail; video) or took place on another location (3%).

6.5. Compensating hospitals and health professionals for extra costs and income losses

8% decrease in turnover compared to 2019

The COVID-19 pandemic has a major impact on the financial situation of hospitals. The MAHA analysis of 2020 analysed the impact of COVID-19 on revenues and expenses of the hospitals, based on a sample of 31 acute hospitals (of which 6 university hospitals).⁴⁵ For these hospitals, the financial results of the first half of 2020 were compared with those of 2019.

The sum of additional costs (e.g. due to the purchase of protective equipment) and lower revenues (e.g. due to lower fees and therefore lower deductions on these fees) in the first half of 2020 accounted for an 8% decrease in turnover compared to the first half of 2019.

Financial support from the government to limit the damage

Advances of 2 billion euro were granted to hospitals. Of these, 1 billion euro was paid in April 2020 (for acute hospitals), 500 million in July 2020 and 500 million in October 2020, each time for acute and psychiatric hospitals. The Royal Decree of 30 October 2020 lays down the rules and timing of the regularisation of these advances to hospitals and to medical specialists and other healthcare providers in hospitals remunerated by fees.⁴⁶ The regularisation takes into account the extent to which hospital costs depend on the number of COVID-19 patients, the number of COVID-19 hospital days, on which type of nursing unit (intensive care or not) and with which support in an intensive care unit (with ventilation, with ECMO or neither of them).

Lump sum payments are provided for exceptional additional costs, (partial) compensation for missed activities, as well as the additional costs to ensure extra capacity in the emergency department and in intensive care. Financial arrangements have also been drawn up for physicians in training.

New nomenclature codes for care professions

Additional measures were taken for physicians and other care professions (e.g. by creating new nomenclature codes) to support them in new care services and the adapted care context as a result of COVID-19. We refer to the website of RIZIV – INAMI for an overview of the measures that were taken (<https://www.riziv.fgov.be/nl/covid19/Paginas/default.aspx>).



7. THE IMPORTANCE OF HOSPITAL COLLABORATION

7.1. The loco-regional clinical hospital networks: a first step towards collaboration

7.1.1. The recent history of loco-regional networks

Loco-regional networks aim to break a tradition of stand-alone and competing hospitals

Belgian hospitals have a tradition as stand-alone organisations competing for patients and providing the full range of services, including very specialised and complex services.⁴⁷ However, some recent reforms were designed following international trends. The Act of 28 February 2019 introduced clinical hospital networks: a maximum of 25 loco-regional clinical hospital networks can be established, with a maximum of 13 networks in the Flemish Region, 8 in the Walloon Region and 4 in the Brussels Capital Region.⁴⁸ Collaboration is within a contiguous geographic area (except in large cities) and hospitals in the network must offer care assignments^o that are complementary to each other. Each acute hospital is obliged to join one such network.

While determining the maximum number of networks is a federal competence, the federated authorities are competent for defining licensing standards for the networks. At the outbreak of the COVID-19 pandemic, the majority of the loco-regional networks were not licensed yet.

Before the COVID-19 pandemic hospital networks focused mainly on clinical collaborations

In the survey, hospitals were asked about collaborations in the loco-regional network before the COVID-19 crisis. The majority of the responding hospitals (54/58) reported to collaborate with one or more hospitals within the loco-regional network. The most commonly reported type of collaboration was a clinical collaboration (49 responding hospitals), followed by a collaboration between pharmacies (33 hospitals), between laboratories (31 hospitals) and via joined investments in equipment (28 hospitals). Other, less frequent collaboration types are joint purchasing, development of patient care pathways, complementary trainings, exchange of information about good practices, joint quality improvement projects, ICT collaboration, collaboration regarding human resources and meetings between the management committees.

7.1.2. The use of loco-regional networks as a policy instrument to regulate surge capacity was controversial at the start

Collaboration regarding surge capacity at the level of loco-regional networks was limited at the start

The interviewed committee members and sector representatives assessed that during the first wave of the COVID-19 crisis, and especially when the epidemic peaked, the role of the loco-regional hospital networks was perceived as being rather limited. Most interviewed respondents pointed to a lack of maturity of the networks as determining factor. Many networks are not licensed yet, do not have official governing bodies, or governance still requires a lengthy negotiation process with and between the individual hospitals. Moreover, in a recent past hospitals of the same loco-regional network were competitors and are now supposed to work together, while other hospitals that belong to different networks have a long tradition of

^o A care assignment includes all activities of hospitals related to a hospital service, a hospital function, a hospital department, a heavy medical device, a medical service, a medical-technical service or a care programme.



working together. The hospital payment system in which budgets are allocated to individual hospitals and not to a network, and the different financial arrangements between the hospital and its physicians are additional barriers. Also in Flanders the mismatch between primary care zones and loco-regional hospital networks was seen as an obstacle to collaborate with primary care at the level of the hospital network.

The HTSC committee gradually increased the (potential) role of networks

As mentioned before, in the initial phase of the crisis, nine hospitals were assigned as reference hospitals to admit all patients with COVID-19. This strategy soon changed to involving all acute hospitals. They were asked to increase capacity (letter of 10 March) in such a way that a maximum number of patients that fit within their capacity and expertise, could be admitted. Already in the letter of 13 March it was suggested to collaborate within the loco-regional network. Several subsequent letters encouraged hospitals to do so.

The proposed measures regarding the creation of extra capacity were initially addressed to individual hospitals. Later surge capacity targets for an eventual second wave were formulated at the network level. The letter of 24 April (and following letters) explained that it was allowed that hospitals within a loco-regional network or province create the extra capacity in a combined way with the other hospitals from that network or province. At this moment, the incidence of hospital admissions started to decrease.

From this we can conclude that already from the very beginning of the crisis, the HTSC committee gave a central role to collaboration of hospitals within their loco-regional network. However, the rather non-committal request in the first letters changed along the course to more directive requests and clear instructions on what hospitals needed to do.

7.2. Diverse areas of collaboration at both the loco-regional network and the province level during the first wave

In the survey, hospitals were presented a long list of possible areas of collaboration and were asked whether or not they had collaborated with other hospitals during the first wave of the COVID-19 crisis. Potential areas of collaboration included the transfer and admission of patients, non-COVID-19 activities, joint investments in equipment, measures concerning PPE or medicines, exchanges or training of staff, clinical collaboration, testing, bed capacity, the establishment of intermediate structures, support to other sectors or eHealth. Most often, hospitals collaborated in the transfer or admission of patients, in the exchange of PPE and in clinical work.

There are, however, regional differences in the type of collaboration as well as in the level of collaboration (province, loco-regional network, etc.). For detailed results we refer to Chapter 5 of the scientific report.

It is important to note that the survey asked about the presence of collaborations and not on the frequency and the intensity of the collaborations. This is an important limitation especially in the light of the results of the interviews (and open questions). The general perception of interviewed key informants was that loco-regional networks played only a small role in the management of the hospital surge capacity. The survey showed that hospitals did report to collaborate on several issues within their network. In the next paragraphs we describe in detail the areas of collaboration.



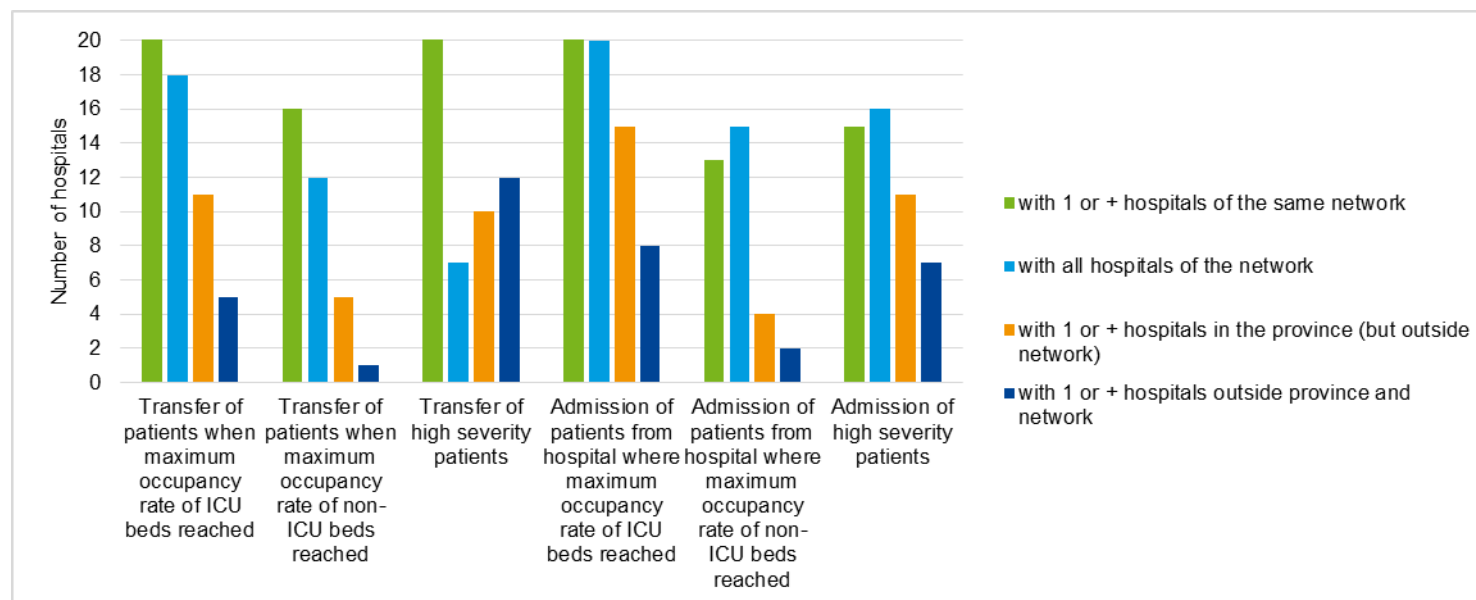
Transfers and admissions of patients occurred at various levels

A large majority of hospitals was involved in the transfer or admission of patients during the first wave of the COVID-19 crisis. Transfers and admissions were organised when hospitals reached the maximum occupancy rate of ICU or non-ICU beds or for high severity patients. The type of collaboration is not uniform across the country or across hospital type (see Figure 6). Although the collaborations were reported to occur mainly at the loco-regional network level, with some or all hospitals of the network, also other levels such as the province were reported. For instance, four out of the five responding hospitals in the province of Limburg collaborated to transfer ICU patients to hospital(s) outside the network. This is logical since

Limburg was the province with the highest number of hospital admissions during the first wave. Several respondents indicated that the loco-regional network is not the appropriate level to collaborate during a pandemic. After all, most hospitals are located in the same area: when one hospital encounters capacity problems the others too.

All six small responding hospitals (with less than 200 beds) reported collaborations to transfer ICU and high severity patients and five of them to transfer also non-ICU patients.

Figure 6 – Transfer and admission of patients during the first wave of the COVID-19 crisis, by level of collaboration



**Most collaborations for PPE, drugs and equipment at the network level**

Also the exchange of PPE (75%) and to a lesser extent the exchange of drugs (64%) was the reason for collaboration. Sixty percent of the responding hospitals collaborated with other(s) to buy PPE, but only 29% made joint investments in equipment. Collaborations for PPE and drugs took place mainly at the loco-regional network level, but also outside the network. However, joint investments in equipment only took place within the loco-regional networks, and mainly in Wallonia and Brussels. In Flanders, only four of the 34 responding hospitals collaborated for the joint investment in equipment, compared to eight out of 17 in Wallonia and four out of five in Brussels.

Limited exchanges of staff

Exchange of staff was not a major area of collaboration: only 18% of the responding hospitals exchanged nurses with other hospital(s), 13% exchanged physicians, 11% care staff, 9% logistic staff and 8% other staff. Globally, only a few hospitals (11) said they collaborated to exchange staff during the crisis, but when they did, they exchanged several categories of staff and this mainly within the loco-regional network. Collaboration for exchanging physicians and/or nurses occurred mainly in small hospitals (with less than 200 beds).

Repartition of required bed capacity: not the norm and mainly with the entire network

Among the 56 responding hospitals, 23 hospitals (41%) collaborated with other hospitals for the repartition of the required bed capacity during the first wave of the COVID-19 crisis. This collaboration mainly occurred at the loco-regional network level with all hospitals of the network.

Other collaborations mainly at the network level

Other areas of collaboration were pursued by some hospitals: 74% had a form of clinical collaboration, 57% collaborated for their support to nursing homes, 38% for the set-up of testing centres, 37% for the training of staff, 31% regarding eHealth possibilities, 27% for their support to home care and 25% for the set-up of intermediate structures. For all of them, the major level of collaboration was the loco-regional network.

The loco-regional network is the major level of collaboration, but the province is sometimes more appropriate

For 49 of the 56 responding hospitals (88%), the loco-regional network level was the main level of collaboration in the first wave of the crisis (see Table 1). Existing collaborations before the crisis or the geographical proximity were given as reason. Collaboration beyond the network level mainly took place because of capacity problems (for example, because of the saturation of ICU beds at the network level) or because of specific patient requirements (for example, because ECMO was needed) that could not be dealt with within the loco-regional network.

However, when asked about the most appropriate level of collaboration during a crisis such as the COVID-19 crisis, 31% (18/58 responding hospitals) favoured the provincial level. Several respondents indicated that the capacity needs for a type of crisis such as COVID-19 go beyond the loco-regional network. They stated that it is better to organise the initial collaboration at the level of the province and when saturated switch to the national level. Respondents also argued that the provinces are more homogeneous in geographical terms compared to some loco-regional networks which is an advantage when managing a public health crisis. Several respondents were suggesting a mixture (e.g. loco-regional network and province; province and regions) or preferred to immediately organise collaboration at the level of the regions or nationwide.



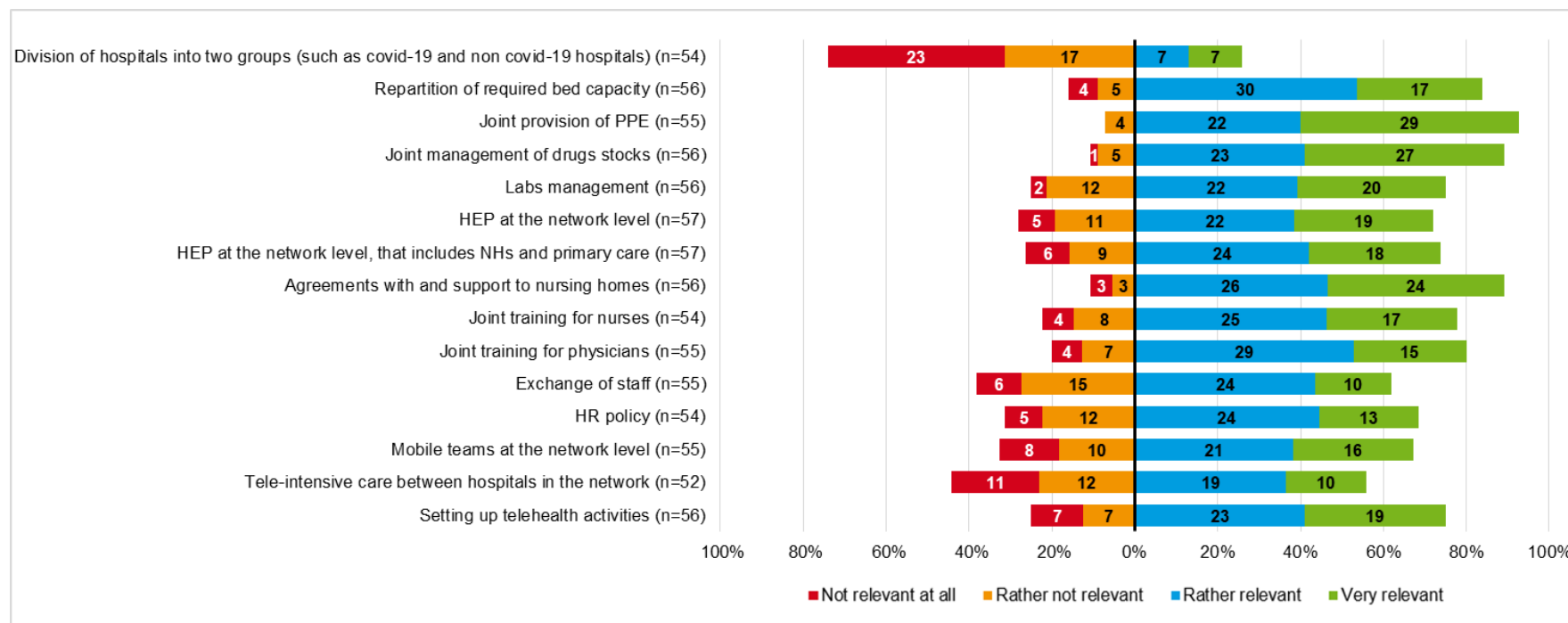
Table 1 – Main level of collaboration during the first wave of the COVID-19 crisis and most appropriate level of collaboration in case of such a crisis

	Flanders	Wallonia	Brussels	All respondents
	(n=34)	(n=17)	(n=5)	(n=56)
Main collaboration partners during the first wave				
Hospital(s) of the loco-regional network	29 (85%)	16 (94%)	4 (80%)	49 (88%)
Hospital(s) of the province	4 (12%)	1 (6%)	1 (20%)	6 (11%)
Hospital(s) outside the province	1 (3%)	0 (0%)	0 (0%)	1 (2%)
Most appropriate level of collaboration	(n=35)	(n=18)	(n=5)	(n=58)
Loco-regional network	20 (57%)	7 (39%)	2 (40%)	29 (50%)
Province	9 (26%)	8 (44%)	1 (20%)	18 (31%)
Other	6 (17%)	3 (17%)	2 (40%)	11 (19%)

7.3. Further development of loco-regional networks in tackling a crisis like the COVID-19 crisis

Large willingness to expand measures at the level of the loco-regional network

In the survey, hospitals were presented a range of measures they had to evaluate in terms of relevance, when taken at the level of the loco-regional network, for tackling a crisis like the COVID-19 crisis. For all proposed measures, a (large) majority of hospitals stated that such measure at the level of the network was rather or very relevant (see Figure 7). According to the interviewed stakeholders, also from a policy point of view it makes sense to organise several issues at the network instead of the individual hospital level because of the advantages linked to the larger scale, such as cost savings and increased flexibility (e.g. bed management).

**Figure 7 – Perceived relevance of measures that can be taken at the level of a loco-regional network to deal with a crisis such as the COVID-19 crisis**

Joint management of PPE and drug stocks were judged as (very or rather) relevant by respectively 93% and 89% of responding hospitals. Already during the first wave of the crisis this type of collaboration was important.

The idea of an (hospital) emergency plan organised at the loco-regional network was considered relevant by 72% of responding hospitals and by 74% if the plan also includes nursing homes and primary care. Eighty-nine percent of the respondents (50/54 hospitals) evaluated the loco-regional organisation of agreements with and support to nursing homes as (rather or very) relevant.

Setting up tele-health activities at the network level was judged as (rather or very) relevant in case of such crisis by 42 respondents (75%). Opinions are more divided concerning the organisation of tele-intensive care between hospitals of the network: 56% found it a rather or very relevant idea but 21% stated it is not at all relevant.

**Although collaborations regarding staffing were limited during the first wave, hospitals consider it a relevant measure**

Although very limited exchanges of staff between hospitals occurred during the first wave, the majority of hospitals (62%) judged such exchanges as a relevant measure to deal with a crisis such as the COVID-19 crisis. In addition, 67% of the respondents evaluated the idea of having mobile teams at the network level as (rather or very) relevant to deal with such a crisis. Human resources policy could also be organised at the network level according to 69% of the respondents. The joint training for physicians or nurses at the network level was evaluated as (rather or very) relevant by respectively 80% and 78% of the responding hospitals.

Hospitals are strongly opposed to dividing hospitals in COVID and COVID-free hospitals

There is only one exception to the willingness to expand measures at the network level, namely, dividing hospitals into COVID and non-COVID hospitals. In the hospital survey 23 of the 54 responding hospitals (43%) assessed this measure as not relevant at all, and an additional 17 hospitals (31%) as rather not relevant.

The reasoning behind such division is that routine treatments and appointments can continue in COVID-free hospitals. This approach has been used in Germany and in Italy. While this idea is supported by some respondents in the survey and even reported as being implemented in some hospitals with multiple sites during the first wave of the pandemic, such a scenario is considered as unrealistic mainly because of the hospital payment system which is at the individual hospital level. Also fear of income loss and of the population having a negative image of COVID hospitals contribute to the resistance against such split. Moreover, the limited mobility of medical and nursing staff and the (perceived) lack of quality and safety of patient transport and the higher patient cost of such transport are also barriers to implement such model. Another argument that was brought forward was that with a pandemic of the same size as the first wave, the capacity of all hospitals is needed.

No consensus on mandatory collaboration within the loco-regional network

When asked whether public authorities should oblige hospitals to collaborate within their loco-regional network in case of a crisis such as the COVID-19 pandemic, opinions were divided. Fifty-five percent of the respondents (29/53 hospitals) were in favour of a collaboration within the network imposed by public authorities. There are, however, large regional differences: in Wallonia 71% of the respondents were in favour, against 47% in Flanders and 50% in Brussels. The results for Brussels have to be interpreted with caution given the small number of respondents.

Those who answered that collaboration within the loco-regional network should be mandatory in case of crisis were further asked which types of collaboration should be made mandatory in priority. Responses were in line with the results in Figure 7.

7.4. The importance of adequate transport**Patient transport: a complex division of competences, unclear terminology and many actors**

The organisation of patient transport services in Belgium is complex. Again, the institutional context is one of the contributing factors to this complexity with both the federal and the federated authorities involved in the organisation of patient transport services. The federal level is responsible for emergency patient transport, the federated level for non-emergency transport, including inter-hospital transfers.

However, the terminology is confusing and does not necessarily reflect the medical urgency of the transport. Patients can call a 112-ambulance (emergency transport) while the transport is non-urgent from a medical point of view. And vice versa, for an inter-hospital transport non-emergency transport services are used, while the transport can be urgent from a medical point of view.



Many actors are involved in patient transport, especially for non-emergency medical transport. Possible actors are hospitals, private companies and not-for-profit organisations, with different models (for example, staff and vehicle provided by hospital; staff provided by hospital but vehicle by private company). Some private companies are only available on hours that are profitable (daytime). The existence of different actors and different models has implications for the use of patient transport services. Interviewed committee members stated that hospitals that collaborate with private companies risk to have to call-in the support of 112-services for time-critical transport outside daytime hours. Another practice that was reported is that hospitals with 112-ambulances use their 112-transport for inter-hospital transport (and indicate these services as unavailable for 112-transport).

Support of the HTSC committee to facilitate transport of COVID-19 patients

Various measures were taken to support patient transport: further development of the 112-protocols, additional transport capacity (such as ambulances for COVID-19 patients), financial support for inter-hospital transport via the hospital budget and deployment of capacity provided by Defence. The federal health inspectors played an important role in this by proactively estimating capacity problems and arranging transport, without relying on legal levers.

Limited inter-hospital transports during the first wave reflects surge plans

During the first wave, the surge plans of the HTSC committee were mainly aimed at maximising available capacity and creating additional (ICU) capacity for COVID-19 patients in all hospitals. Such an approach requires less patient transports than in the current patient distribution plan (implementation of the measures in the letter of 17 June in Figure 3).

The survey of hospitals shows that a large number of hospitals collaborated when their own capacity was insufficient. For example, 74% (42 of 57 responding hospitals) transferred high severity patients to another hospital, and 64% (36 of 56 hospitals) admitted critically ill patients from

another hospital. Most of these transports took place within the loco-regional network.

Under the current distribution plan, hospitals can transfer patients by either contacting the hospitals in the loco-regional network or province themselves, or by requesting a transfer from the Patient Evacuation Coordination Centre (PECC), which then arranges the transport to a hospital with available beds. Between 1 October and 15 November 2020, 1 178 transfers of COVID-19 patients were registered while 629 such transports were done between 1 March and 30 June.

7.5. Hospitals take the initiative to support to nursing homes

It was not part of the scope of the study to assess the collaboration between hospitals and nursing homes. Nursing homes were not surveyed. However, both during the interviews and in the hospital survey this subject was often discussed. It emerged from the interviews, for example, that the RMG did not follow the proposal of the HTSC committee to set up an inter-federal committee for nursing homes. The argument against such inter-federal committee was that nursing homes mainly fall within the competence of the federated authorities. The HTSC committee itself did not impose any measures on hospitals regarding collaboration with nursing homes. There was only an “orientation note” from the FPS Public Health with proposals on how hospitals could support the nursing homes.

It is clear from the interviews and the hospital survey that the hospitals spontaneously took initiatives to support the nursing homes in their neighbourhood (e.g. 30 out of 53 hospitals reported that they supported nursing homes). Examples of support are the sharing of expertise (e.g. infection prevention and control, management support), the provision of equipment (e.g. PPE) and personnel. The discontinuation of regular care created some space for this among the hospital staff. In addition, hospitals considered it was their duty to support nursing homes wherever possible.

**Strengthen future collaborations through collaboration between hospital networks and primary care**

Hospitals mainly (but certainly not exclusively) collaborated with nursing homes with which they already have a history (e.g. through the 'functional relationship' which is a document that specifies, among other things, agreements about the hospitalisation of residents of the nursing home). In the interviews it was emphasized that these partnerships should be strengthened and go beyond the current interpretation of the functional relationship, which is often of a more administrative nature. Respondents suggested that the positive experiences from the first wave should be further developed into agreements (e.g. emergency planning, external geriatric liaison, sharing of expertise in infection prevention and control) between nursing homes and hospitals within a loco-regional hospital network.

8. EVALUATION OF THE MANAGEMENT OF HOSPITAL SURGE CAPACITY IN BELGIUM: LOOKING BACK AND FORWARD

Documenting the surge capacity response during the first wave of COVID-19 at a moment when the second wave hits the Belgian hospitals even more

This study aimed to evaluate the Belgian policy response regarding hospital surge capacity in the context of the first wave (March – June 2020) of the COVID-19 pandemic. More in particular we evaluated the newly established HTSC committee and its measures as well as how hospitals perceived and responded to these measures. Besides documenting the Belgian hospital surge and transport strategy, the intention was to identify lessons and formulate recommendations for policymakers and hospitals.

The context in which this evaluation was made is very particular. After all, the COVID-19 pandemic is still ongoing. We received the assignment at the end of the first wave (June 2020). At that moment, partly due to the threat of a second wave, several ad hoc evaluations (initiated by the committee and its members) resulted in adjustments and improvements to the Belgian hospital surge and transport strategy.

However, these adjustments seem to be evaporated by the fast emerging second wave of the pandemic which peaks at the time of writing of the report (November 2020), a new reality hitting the Belgian hospital capacity and its staff in a harder way than before. It sadly illustrates that when a pandemic is not contained (by measures outside the hospital sector) every hospital system is vulnerable. Indeed, the Belgian hospital landscape, which in an international context is known to have a large hospital and ICU capacity, is hardly hit by this second large outbreak of the COVID-19 pandemic in the community.



Each healthcare system has its limits to what extent it can create capacity. Also each hospital system will face ethical dilemmas to what extent it is willing to create extra capacity and to take the collateral damage. Ethical guides are necessary, for example regarding triage protocols (these were developed in each of our selected countries to support healthcare professionals in case difficult choices had to be made regarding hospital or ICU admission).

Some of the observations we made are already (partly) dealt with, others require more adjustment on the long term. In the next sections we wrap up each of the topics we have studied.

The hospital emergency plan facilitated a fast and pro-active response of hospitals to the COVID-19 pandemic but could benefit from crisis-specific components

Our study demonstrated that the Belgian hospital sector managed at very short notice to deal with a new and exponential growing hospital population. Hospital crisis coordination cells were activated which resulted in a rapid adjustment to a new reality including separating patient flows, rebuilding hospital units, freeing up capacity (e.g. by postponing regular care), educating staff (e.g. regarding PPE, ICU). Although not all hospitals disposed of a licensed HEP, they all set up the necessary processes within their organisation. This was definitely an important factor in the flexible and fast reaction of hospitals to an unprecedented challenge. Yet, our study also raised some important points that need to be tackled in the future. While the generic character of the HEPs enables hospitals to deal with a large number of crisis situations, our evaluation made clear that disaster-specific components are to be added. While such a component is already provided for CBRNe (Chemical, Biological, Radiological, Nuclear, and Explosives) threats, it is worthwhile to consider other disaster-specific, including pandemic-specific, components.⁴⁹⁻⁵¹ In addition, it seems worthwhile to strengthen the position of HEP coordinators and to increase the training and simulations (e.g. dry runs) of crisis situations in the future.

The HTSC committee has accomplished its mission but needs to dispose of procedures to consult specific expertise

The main mission of the HTSC committee was to take measures regarding hospital surge capacity. While there were certainly growing pains (e.g. varying composition, unclear mandate, theoretical instructions, unclear data demands, communication at inappropriate moments), the general perception among the interviewed respondents is that the committee successfully accomplished its mission during the first wave of COVID-19. Some of the weaker points during the first wave (composition not transparent, mixing operational and strategic issues, etc.) are already (partly) solved. There is a clear organogram and some of the operational issues are delegated to operational cells (e.g. the transfers are managed by the "Patient Evacuation Coordination Centre").

Despite the important impact of the HTSC committee on the hospital sector its origin depended on personal initiatives. This should be avoided in future crisis situations. As the COVID-19 pandemic will, for sure, not be the last crisis situation with which Belgian hospitals are confronted, the HTSC committee could be legally embedded in a general crisis management approach of the public authorities and be given a more permanent character. This should include an activation procedure, a transparent composition procedure, a clear mandate, a potential role outside crisis situations (e.g. yearly meetings to discuss crisis plans), etc. The inclusion of other expertise in the HTSC committee needs to be considered. This can be a combination of a (limited) expansion of the permanent members (e.g. representation of the medical and nursing profession) and a systematic but targeted consultation procedure for some groups depending on the type of crisis or topics discussed (e.g. patients, ethical experts, palliative care, psychologists, geriatric care, psychological support and rehabilitation).



Modern communication adapted to reality on the field

The lack of unity of command is a recurrent critique in almost all domains related to the COVID-19 crisis in Belgium. Nevertheless, this critique was much less pronounced for the communication of the HTSC committee. The HTSC committee did many efforts to communicate the measures regarding hospital and transport surge via a unique communication channel (by using official letters). This does not mean that initiatives were always streamlined (e.g. many ad hoc surveys) and that communication towards the hospitals was harmonised. There were critiques on timing of the communication and the theoretical character of the measures. It is worthwhile to consider the development of a professional communication strategy with hospitals having a single point of contact to address their concerns. In addition, positively evaluated initiatives (e.g. daily or weekly feedback loops with the federal health inspector via video-conference) should be reinforced.

Develop a Marshall plan to ensure a sustainable workforce fit for the future

The COVID-19 crisis once more demonstrated that the healthcare workforce (i.e. physicians, nurses, healthcare assistants, allied health professionals) are the backbone and the most valuable asset of our healthcare system. At the same time the healthcare workforce has proven to be the Achilles heel. Our hospital staff (and by extension the staff working within the entire healthcare system) consists of highly trained professionals, a scarce resource outside crisis time that is even more difficult to find during a crisis. After all, the creation of additional hospital capacity requires, in the first place, additional staff (i.e. nurses and physicians). To ensure additional staff, Belgian hospitals employed similar approaches as those advised in consensus guidelines and used by other countries (e.g. increase working time, staff ICUs with mixed teams: ICU expertise and extenders from ICU-related disciplines, extended role for students, upgrade skills by fast-track training programmes). It is unclear what the effect of these measures was on patient care and staff well-being. This requires further evaluation. After all, the first evaluations show that the creation of additional ICU capacity (potentially with less skilled staff) was associated with an increased risk of standardised mortality. Finding sufficient personnel to staff

the additional capacity was for the largest part left to the initiative of the hospital sector. In future crises the coordination role of the public authorities could be enhanced (e.g. listing available staff according to expertise and dispatch them in function of the needs on the field, coordinate and harmonise fast-track training programmes to upgrade skills, monitor absenteeism rates). If the HTSC committee cannot take up this role, it should be done by other actors.

Nevertheless, the COVID-19 crisis painfully revealed the vulnerability of the healthcare workforce and problems that were left untreated for a long time. A prominent issue are staffing levels and working conditions of nurses. Indeed, a recent KCE report²² showed that the starting point before the crisis was far from ideal: too much patients assigned to one nurse, a high proportion of required nursing activities (e.g. timely medication administration, clinical observation) that could not be carried out due to the heavy workload, too many non-nursing tasks (e.g. transport of patients, delivering food trays) performed by nurses, a high risk of burnout, etc. Despite this poor starting position, the healthcare workforce gave it best, stretched itself in an attempt to ensure the best possible patient care in a difficult context (e.g. lack of PPE, fear to be contaminated or contaminate relatives, a high death rate, patients with a high patient acuity, uncomfortable and painful side-effects of PPE, long working days). The first evaluations of the impact of the COVID-19 crisis on the hospital and healthcare staff wellbeing show that this did not remain without consequences (e.g. increased levels of burnout, anxiety).

It is clear that the COVID-19 crisis placed investments in the healthcare workforce high on the political agenda. Large budgets were provided to improve working conditions of nurses (i.e. salary increase), and improve bedside nurse staffing levels. Also an improved compensation for physicians in training is being negotiated. It is now important to take policy actions to ensure that these budgets are translated into actions that make a difference in the field (e.g. lower patient-to-nurse ratios, improved task distribution, higher job satisfaction). Nevertheless, much more needs to be done. To ensure a sustainable healthcare workforce in the future several aspects need to be tackled (e.g. patient-to-nurse ratios, clinical leadership, career perspectives, working conditions, financial rewards, increase the pool of



personnel that can be staffed in crisis sensitive areas, task substitution) within the hospital sector and other settings. A Marshall plan including clear policy objectives seems indicated to ensure that hospital and by extension the entire healthcare sector succeeds to attract and retain the highly trained professionals it requires to ensure high-quality patient care in the future.

Collaboration between hospitals to increase efficiency and solidarity

The high volume of hospital admissions (and patients requiring ICU in particular) forced hospitals to collaborate. Our study demonstrated that, especially at the start of the first wave, the role of loco-regional networks was rather limited. Hospitals focused on their own capacity problems and management of the crisis. Nevertheless, hospitals also reported to collaborate but mainly on topics where efficiency might be the prime objective of the collaboration (joint purchasing of PPE or medication). The loco-regional networks were considered as not mature enough or not having enough power to react quickly on crisis situations. In areas that were hit hard by the pandemic all hospitals of a same loco-regional network were all in the same boat requiring collaboration at a higher level (e.g. the province, region or nation).

The HTSC committee gradually gave more importance to the role of loco-regional networks in its measures. Hospitals seemed to see the benefits of collaboration agreements about patient transfers especially in the context of restarting regular activities. In most cases, the larger hospital from the network took a larger share of the required COVID-19 ICU capacity to enable the smaller hospitals to continue their regular activities as long as possible. After all, hospitals with a low number of ICU beds have to stop regular medical care (that requires ICU resources) quite soon when these hospitals have to admit a few COVID patients requiring ICU care. In any case, the COVID-19 pandemic illustrated that to increase the success of collaborations at the loco-regional level the preconditions need to be established (e.g. some payments at the network level, efficient governance structure).

The HTSC committee deliberately chose not to give hospitals insight in the bed occupancy rates of other hospitals. The rationale was that hospitals otherwise risk to bypass the decisions of the federal health inspectors to

transfer patients between hospitals. As a first step towards transparency it could be considered to share the occupancy rates within the network (which is already done by some networks).

As noted above the collaboration within loco-regional networks has its limits. When an area has high hospital admission rates, all hospitals of the network will be saturated at the same time. Therefore collaboration arrangements at higher levels (province, region, nation, international) need to be provided. The federal health inspectors played an important role to facilitate transfers between hospitals but often lacked the power to enforce transfers. During a pandemic it seems required to legally enforce solidarity between hospitals. A recent law already expanded the power (temporarily until the end of June 2021) of CMOs to transfer patients (without consent of the patient) in case of capacity needs.

Data systems were changed or set up rapidly to manage hospital surge capacity

The data systems that were available prior to the COVID-19 pandemic were not adapted to manage a crisis with the size and duration of the current COVID-19 pandemic. Therefore current data systems (ICMS) were adapted or new systems (HSC and Clinical Survey of Sciensano) were launched at a very short notice. This caused several growing pains at the start of the first wave (e.g. unclear definitions, rapidly changing instructions, theoretical data concepts not reflecting the reality on the field) that were resolved along the way. Moreover, the Sciensano data were collected via web-surveys that were not integrated in current data collection and storing platforms. This caused not only a large registration burden for hospitals but also made that some important basic data requirements (e.g. unique patient identifier based on social security number) were overlooked. As such linkages with other patient-level data collected during the first wave are difficult. Many of these issues (e.g. possibility to upload data in batch, use of social security number) are partly solved by the migration of the data to the Healthdata.be platform. In addition, initiatives are taken to tackle other problems that were raised during the evaluation of the first wave:



- The data are increasingly used to answer policy and clinical questions (e.g. linking hospital standardised mortality rates to hospital characteristics, analysis of length of stay).
- The dashboards are professionalised: i.e. the HTSC committee is supported by a dashboard including daily updates of hospital occupancy rates on ICU and non-ICU at the level of the hospital, hospital network, province, the regions and the nation. Moreover, short- and long-term predictions are included in the dashboard.
- A feedback report about the data that hospitals submit is provided by Sciensano.
- The sharing of data with the research community is made possible via an official data request procedure. Nevertheless, based on interviews with researchers it appears that this process could be smoothened allowing faster access to the available data while respecting data security and privacy issues.

As such it can be concluded that many efforts were made to improve the data availability and use during the COVID-19 crisis to a point that most relevant information is available to manage the current COVID-19 pandemic. It can be considered to expand the data systems with elements that were, according to the interviews, missing such as staff wellbeing, absenteeism rates, patient-to-nurse ratios, etc. Nevertheless, the crisis made clear that, when the COVID-19 hospital admissions are low for a longer period, it is worthwhile to assess which structural changes to the data systems are needed to be better prepared in the future (e.g. automatic data extraction, real-time monitoring of patients, bed occupancy rates and outcomes, integration of data systems)



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■ RECOMMENDATIONS^p

This KCE report focuses on hospital capacity management during the first wave of the COVID-19 crisis and the functioning of the HTSC committee. The recommendations set out below are directly related to this scope. However, as mentioned in the disclaimer to this report, hospitals and the committee also depend on measures taken outside their domain. Consequently, the recommendations should be embedded in a broader evaluation and reflection on this health crisis. Among the many other points to consider are the alignment of hospital emergency plans with a general national crisis plan that also includes other healthcare actors; the availability and use of personal protective equipment; and the availability of physicians and nurses specialised in hospital hygiene.

RECOMMENDATION 1: THE HOSPITAL EMERGENCY PLAN

To the FPS Public Health and the hospital sector, in collaboration with the FPS Internal Affairs we recommend to:

- strengthen the function of the hospital emergency plan coordinator;
- provide (more) training on the hospital emergency plan and disaster exercises.

To the federated entities responsible for Public Health, in collaboration with the concerned actors, we recommend to:

- continue with the licensing process of the hospital emergency plans to ensure that every hospital has a licensed hospital emergency plan by mid-2021. The addition of a pandemic-specific part to the already licensed hospital emergency plans should be encouraged.

To the federated entities responsible for Public Health, after an agreement at the level of the Inter-ministerial Conference Public Health, and in close collaboration with the hospital sector and the relevant professional organisations, we recommend to:

- determine whether a pandemic-specific component has to be a criterion for hospital emergency plans, that can be made compulsory when the cycle of licensing of the hospital emergency plans is renewed. In the same reflection process it needs to be determined which other crisis-specific components (such as a pandemic component) in addition to CBRNe need to be included in the hospital emergency plan framework in addition to the generic components.

^p The KCE has sole responsibility for the recommendations.

**RECOMMENDATION 2: HOSPITAL & TRANSPORT SURGE CAPACITY COMMITTEE**

To the Inter-ministerial Conference Public Health and the involved public authorities we recommend to:

- reform the HTSC committee to a permanent advisory body of the Risk Management Group (RMG) that meets regularly outside crisis periods (e.g. 1 to 2 times a year) to discuss emergency plans, crisis capacity, etc. The conditions to activate the committee need to be defined as well as its composition, its mission, etc.;
- give the RMG the legal authority to develop the preconditions for making patient distribution plans between hospitals and hospital networks, proposed on the advice of the HTSC committee, legally enforceable in the context of a crisis requiring additional hospital capacity;
- create a legal framework to enforce patient transfers between hospitals upon patients, emergency dispatch centres, and hospitals. These transfers are part of a distribution plan that is approved by the RMG, after advice of the HTSC committee, when the demand for hospital capacity exceeds the supply at the level of the loco-regional networks.

To the RMG and the HTSC committee we recommend to:

- organise the HTSC committee in such a way that strategic and operational topics are treated separately;
- expand the current composition of the HTSC committee with representatives of physician and nursing organisations for strategic topics. In addition a procedure needs to be developed to consult additional expertise (e.g. patients, ethicists) in a systematic manner. The operational topics can be treated by a core group composed of representatives of the federal and federated public authorities and the hospital sector;
- increase the transparency of bed occupancy rates via disclosure of indicators from the HTSC dashboard (e.g. occupancy rate of ICU beds and non-ICU beds, short-term predictions) at the level of each loco-regional network. This should enable hospitals to make arrangements at the level of the loco-regional network in the first phase of a distribution plan.

**RECOMMENDATION 3: HEALTHCARE STAFF**

To the Inter-ministerial Conference Public Health and in close collaboration with the professional organisations, the social partners and the institutions responsible for education, we recommend to:

- embed the recent substantial investments in healthcare staff (e.g. the healthcare staff fund, social agreements, initiatives of the federated entities) in a general plan with a long-term vision for the entire healthcare sector with the ambition to attain a sustainable and future-oriented workforce that can continue to deliver care according to high quality standards, with attention for the health and wellbeing of healthcare staff and adapted to changing care needs. The plan should include, among other things, work conditions, salary schemes, career development opportunities, matching job content to knowledge and expertise, specialised versus broad employability of healthcare professionals, task shifting and psychosocial support during crisis situations.

To the federated public authorities responsible for Public Health we recommend to:

- further develop an online portal that allows to match, in case of a crisis, the demand for staff with the staff indicated to be available (e.g. inactive and/or retired staff, part-time staff, students).

To the relevant professional organisations and the healthcare sector we recommend to:

- further develop, harmonise and proactively implement education and training modules to prepare healthcare staff even better for future crises.

RECOMMENDATION 4: REFORM OF THE HOSPITAL SECTOR

To the Inter-ministerial Conference Public Health and in close collaboration with the healthcare sector we recommend to:

- define, in the context of the reform of the hospital sector, the type and volume of hospital, intermediate and ambulatory capacity in terms of staff (number and expertise), beds and equipment/infrastructure needed to prepare for future crises. This includes the role and capacity of other actors (e.g. Defence);
- strengthen collaboration between hospitals within loco-regional networks by fulfilling the preconditions for collaboration (e.g. joint payment at the network level);
- better coordinate the various collaboration types (loco-regional networks and collaborations within the primary care sector). In this context it is indicated to further develop expertise and



knowledge sharing (e.g. infection prevention and control, geriatric liaison) and care arrangements (e.g. advance care planning, admission and discharge criteria) between the care networks;

- further develop alternatives to classic hospital care, such as home care, residential care for the elderly, or rehabilitation care. The future need for hospital beds partly depends on the availability of these alternatives.

RECOMMENDATION 5: DATA SYSTEMS

To the FPS Public Health, in collaboration with Sciensano, the hospital sector and the relevant professional organisations we recommend to:

- implement a nationwide data system for ICU that allows to monitor the operational availability and use of ICU capacity, patient characteristics (e.g. diagnoses), and outcomes in real time (or at very short notice). The choice for a data system:
 - is based on past experience (e.g. the MICA-project) and experience gained during the current COVID-19 pandemic (e.g. ICMS and hospital surveillance from Sciensano);
 - allows automatic data extraction from the hospital information systems;
 - allows data on the hospital stay to be linked to other data systems, based on a unique patient identifier;
 - that generates feedback for hospitals about the type of patients and case-mix adjusted outcome measures.
- review the data system needed in the event of a crisis requiring hospital capacity, in the light of the experience gained during the current crisis and extend it to include indicators that were missing (e.g. healthcare staff absenteeism, available equipment). The data system should take into account the integration of data from the different levels of care and the increased interoperability between data-information systems, based on the 'only once' principle.

To the minister of Social Affairs and Public Health, in collaboration with the involved public authorities, we recommend to:

- strengthen the procedure of data sharing with the scientific community such that the available expertise is optimally mobilised in the context of a crisis situation and beyond in order to support policymakers with scientific work while respecting the applicable privacy rules.

**RECOMMENDATION 6: COMMUNICATION**

To the FPS Public Health, in collaboration with the federated public authorities responsible for Public Health, the National Crisis Centre and the RMG we recommend to:

- set up a centralised communication strategy and structure allowing clear communication of the measures to the hospital sector in the event of future crises, adapted to the reality of the field and in a standardised manner;
- provide a central point of contact for feedback from the hospitals.

To the National Crisis Centre we recommend to:

- have a clear communication strategy timely prepared to inform the general public about
 - the importance of the continuation of regular medical care in the different healthcare settings
 - ethical considerations in necessary measures (e.g. in relation to visiting arrangements, admission criteria) in the various care sectors.

RECOMMENDATION 7: DIGITAL CARE

To the Inter-ministerial Conference Public Health, the e-health platform, the FPS Public Health and RIZIV – INAMI we recommend to:

- accelerate the implementation of digital care in order to be less dependent on the physical care infrastructure in the hospital setting, to maximize the continuation of regular care in an alternative way and to ease the consultation of expertise from a distance. During the implementation the basic principles of good care as laid down in the professional codes of conduct, the law on the quality of healthcare professions, and the legal frameworks relating to privacy and e-health must be taken into account.

**RECOMMENDATION 8: ETHICAL ASPECTS**

To the Belgian Advisory Committee on Bioethics, in collaboration with the professional and patient organisations we recommend to:

- formulate an opinion that supports healthcare professionals to make ethical choices if in a crisis situation the demand for care exceeds the supply of care (e.g. intensive care);
- formulate an opinion that supports hospitals and healthcare professionals in dealing with aspects such as care at the end of life, visiting arrangements, etc. in the context of a crisis situation.

RECOMMENDATION 9: AGENDA FOR RESEARCH

To the research community we recommend to study:

- the collateral damage for patients and their family, the healthcare professionals and the healthcare institutions of the measures that were applied during the COVID-19 crisis and the causes of postponing care (e.g. stopping regular medical care, fear of infections in the hospital);
- which strategies for increasing capacity (staff, stuff, beds) are most efficient and by whom and how they should be implemented;
- how the organisation of the ICU capacity in Belgium (e.g. different expertise levels) is situated in an international context and which model (e.g. in terms of expertise and infrastructure) is indicated to provide the most adequate care context for the treatment and care of critically ill patients in the future;
- which of the strategies used to address staff shortages (e.g. expanding scope of practice, task- and role shifting) could be transformed into sustainable reforms that contribute to a resilient workforce and high quality patient care;
- how hospital emergency plans can be aligned with a general national crisis plan which also includes other healthcare actors such as primary care.



COLOPHON

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Acknowledgements: Koen Beullens (RIZIV – INAMI), Stijn De Kesel (FOD Volksgezondheid – SPF Santé Publique), Vera De Troyer (Zorgnet-Icuro), Carl Devos (KCE), Birgit Gielen (IMA – AIM), Chris Decoster (FOD Volksgezondheid – SPF Santé Publique), Bertrand Heymans (Commission communautaire commune de Bruxelles-Capitale (COCOM)), Johan Pauwels (RIZIV – INAMI), Walter Sermeus (KU Leuven), Stijn Van Kerckhove (FOD Volksgezondheid – SPF Santé Publique), Justine Verboomen (Agence pour une Vie de Qualité (AViQ)), Marie-Pascale Versailles (AIM – IMA), Katrien Verschoren (Zorgnet-Icuro)

Reported interests: All experts and stakeholders consulted within this report were selected because of their involvement in the topic of the management of hospital surge capacity in the first wave of the COVID-19 pandemic in Belgium. Therefore, by definition, each of them might have a certain degree of conflict of interest to the main topic of this report.

Layout: Ine Verhulst

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Publication date: 18 December 2020

Domain: Health Services Research (HSR)

MeSH: Hospital Bed Capacity; Critical Care; Pandemics; Health Workforce



NLM Classification: WX 186
Language: English
Format: Adobe® PDF™ (A4)
Legal depot: D/2020/10.273/34
ISSN: 2466-6459
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How to refer to this document?

Van de Voorde C, Lefèvre M, Mistiaen P, Detollenaere J, Kohn L, Van den Heede K. Assessing the management of hospital surge capacity in the first wave of the COVID-19 pandemic in Belgium – Short report. Health Services Research (HSR) Brussels: Belgian Health Care Knowledge Centre (KCE). 2020. KCE Reports 335C. D/2020/10.273/34.

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