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Federaal Kenniscentrum voor de Gezondheidszorg
Centre Fédéral d'Expertise des Soins de Santé
Belgian Health Care Knowledge Centre

SEASONAL INFLUENZA VACCINATION: PRIORITIZING CHILDREN OR OTHER TARGET GROUPS?

PART II: COST-EFFECTIVENESS ANALYSIS

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Research questions

- **Cost-effectiveness of seasonal influenza vaccination**
  - **In classical target groups**
  - **In children, including indirect effect**

Target groups	2008 coverage	Proposed coverage
Healthy 50-64 years	28%	38% 48%
Elderly 65-74 years	50%	75%
Elderly ≥75 years	71%	75%
Persons 1-64 years with co-morbidities	20%	40%
Pregnant women	~0%	50%
Health care workers	35%	50%
Healthy 18-49 years	11%	0%
Children 6 months-17 years	<0.1%	10 to 90%

Influenza vaccines

- Trivalent inactivated vaccine (TIV)
  - intradermal
  - licensed in >6 months

- Live attenuated influenza vaccine (LAIV)
  - nasal spray
  - not recommended <2 years of age
  - EU: 2-18y vs. US: 2-49y
  - no price yet → price parity assumed

Not yet in BE

Intranasal flu vaccine being administered to a child.
(Source: MedImmune Inc.)

Belgian data

- Outpatient cases from National Influenza Centre
- Attributable numbers of influenza admissions and deaths
  - Regression analyses on RHM/MZG and deaths
- Out-of-hospital resource use and duration:
  - Survey in general population with influenza symptoms (Dec 2011-March 2012; n=2250)
- In-hospital resource use: RHM/MZG-SHA
- QoL: Imputation of literature QoL to Belgium
- Social contact patterns

Literature reviews

- **Safety TIV/LAIV, economic evaluations, mathematical models, Quality of Life studies**

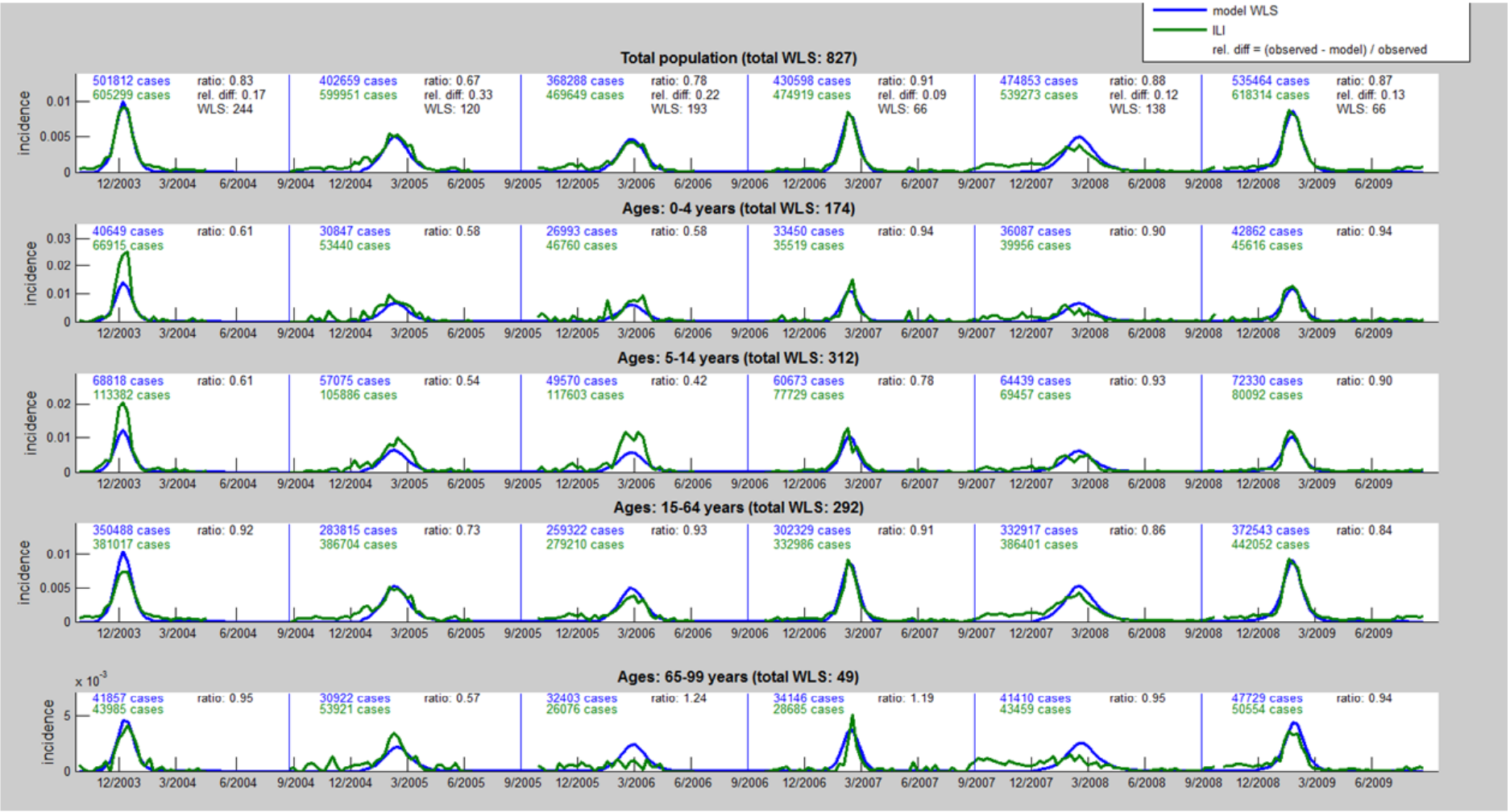
TIV

Season	High-medium intensity		Low intensity	
Age group	Good match	Poor match	Good match	Poor match
6 m - 17 years	65%	48%	30%	16%
18-64 years	65%	60%	45%	22%
≥65 years	60%	55%	42%	20%

LAIV

LAIV dose schedule	Efficacy (95%CI)
VE 2 doses	81% (69–89%)
VE 1 dose	75% (8–93%)
VE 2 doses year 1, 1 dose year 2	81% (64–90%)

Dynamic model: model-based and observed ILI incidence rates in Belgium (2003-2009)



Over 5600 vaccination options were modeled

Vaccination of children

Mean number of influenza outcomes in all ages under 80% coverage

Vaccination options	Hospital admissions (95% CI)	Deaths (95% CI)
Current situation	4002 (2703–5575)	470 (297–676)
TIV <2 yrs + LAIV in 2-17 yrs -1037	2965 (1909–4331)	395 (245–580)
TIV in <2 yrs -177	3825 (2587–5340)	463 (293–666)
LAIV 2-17 yrs	3110 (2016–4504)	403 (250–591)
LAIV 5-17 yrs	3366 (2213–4800)	432 (271–626)
LAIV 12-17 yrs	3778 (2536–5296)	448 (647–282)

CE children vaccination

Cost-effectiveness compared to the current situation at 50% coverage

Vaccination option	Median ICER (per QALY gained)	Median ICER at 25% reduced costs
LAIV in 12-17 years	€42 046	€30 411
LAIV in 5-17 years	€44 260	€32 014
LAIV in 2-17 years	€44 280	€32 009
TIV <2 years and LAIV 2-17 years	€44 415	€32 058

- LAIV always more CE than TIV
- Same conclusions if 4-valent
- €20 000/QALY if longer immunity (6yrs)

PCV7 no replacement: €10 000/QALY
HPV 3 doses at 12 yrs: €33 000/QALY
PCV7 with replacement: €45 000/QALY

Vaccination of adults

Cost-effectiveness of increasing coverage in adult age groups compared to the current situation (median values)

Vaccination options	Median ICER (per QALY gained)
0% in 18-49 y, 75% in 65+ y	-€44 036
0% in 18-49 y, +20% in 50-64 y	-€6 815
75% in 75+ y	€23 688
+20% in 50-64 y, 75% in 65+ y	€39 053

Cost-saving but detrimental for 18-49 years

Most effective: prevents 350 admissions and 60 deaths
But very high cost and less CE

Vaccination of risk groups

Cost-effectiveness of increasing coverage in risk groups compared to the current situation (median values)

Vaccination options	Median ICER (per QALY gained)
Pregnant women, +50%	€6589
Health care workers, +15%	
- **Assuming no secondary case**	€24 102
- **Assuming 0.4 secondary case**	€13 114 - €732
Persons with comorbidities, +20%	
- **In <15 years**	€22 008
- **In 15-49 years**	€24 768
- **In 50-64 years**	€14 378

Recommendations I

- Childhood vaccination is as cost-effective as other vaccines if costs reduced by ≥25%
- Childhood vaccination should not replace vaccination of adults at risk
- Prefer LAIV over TIV, if similar price
- Need for effective vaccines in <2 years

Recommendations II

- Reinforce vaccination ≥75 years, pregnant, HCW and co-morbidities
- ↑ vaccination in all ≥50 years reduces severe outcomes but high cost. Would be CE if reduce in parallel vaccination in 18-49 years.
- Conclusions valid for 4-valent vaccines
- Need for monitoring long-term impact if changes

Colophon

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- Publication date: 12 July 2013
- Domain: Health Technology Assessment (HTA)
- MeSH: Influenza Vaccines; Influenza, Human; Pregnancy; Comorbidity; Health Personnel; Infant; Child, Preschool; Child; Adolescent; Young Adult; Middle Aged; Aged; Cost-Benefit Analysis; Costs and Cost Analysis.

Colophon

- **NLM Classification: WC 515**
- **Language: English**
- **Format: Adobe® PDF™ (A4)**
- **Legal depot: D/2013/10.273/43**

This document is available on the website of the Belgian Health Care Knowledge Centre.