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

KCE REPORT 259C

PERFORMANCE OF THE BELGIAN HEALTH SYSTEM - REPORT 2015

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HEALTH SERVICES RESEARCH

Federaal Kenniscentrum voor de Gezondheidszorg
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PERFORMANCE OF THE BELGIAN HEALTH SYSTEM - REPORT 2015

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FOREWORD

'The cult of performance' is an expression we owe to French sociologist Alain Ehrenberg. In his titular book, published in 1991, he unravels the burden this quest imposes on the modern individual. This new societal – even anthropological – claim has penetrated all aspects of our life: work, sports, culture, family, our emotional and sexual life. And each success – partial and temporary – that we achieve in its name, costs us a bit of our health. It might therefore seem contradictory to measure the performance of a health system. But we have to be realistic: our resources are limited and the needs are abundant; we have to consider the efficiency of our choices. Part of our collective responsibility is to verify to what extent the resources invested in our health system meet the fixed objectives. It is however not enough to invoke grand aspirations, such as sustainability or accessibility of the system; we have to take into account quantified and realistic targets. Which does not prevent us to be ambitious.

This report invites the concerned authorities to prioritize their efforts. We are aware that this assessment is only a snapshot (although a repeated one, as this report is already the third one of its kind) of a number of aspects of the health system, considered through a limited number of indicators. Just as our holiday pictures, when looking at them in the midst of winter, make us wonder on how "we have changed", these indicators reveal a reality that already belongs to the past on the date they are published. Are they therefore useless? That would mean ignoring the virtue of 'tendencies'. Just as our holiday pictures can reassure ("I still look good.") or alarm us ("I have to get back to the gym!"), the ever evolving indicators should make us reflect on our priorities for the future that we have to implement today.

This report is foremost a source of inspiration for the public authorities, but can also be a worthwhile read for all those who are part of the system, the institutions, the caretakers and – let's not forget them – the patients. But we hope that this report will also touch other more 'peripheral' actors, such as teachers, the media, the social partners,…Health also depends on everyone's interpretation of the stakes. Finally, this report concerns all of us, simple citizens: it urges us to behave responsibly, collectively as well as individually. We all have our future in our hands, wherever we are.

KCE was not the only contributor to this report. We would like to thank with all our heart RIZIV-INAMI and the Scientific Institute of Public Health (WIV-ISP) for their excellent collaboration throughout this whole project, the inter-administration group consisting of representatives of the federal and regional/communal health administrations for their constructive feedback and their implication in this project and finally the forty scientific experts of the different administrations who validated the definitions and the indicators' results.

Christian LÉONARD
Deputy general director

Raf MERTENS
General director

LIST OF ABBREVIATIONS

ABBREVIATION	DEFINITION
ADL	Activities of daily living
AMI	Acute myocardial infarction
BAPCOC	Belgian Antibiotic Policy Coordination Committee
BMI	Body Mass Index
CII	Concentration Index of Inequality
CT	Computed Tomography
DDD	Defined Daily Dose
DTP	Diphteria - Tetanus - Pertussis
EC	European Commission
ECDC	European Centre for Disease Control and Prevention
ECHI	European Community Health Indicators
ECHIM	European Community Health Indicators Monitoring
ECL	European Cancer League
EFPIA	European Federation of Pharmaceutical Industries and Associations
EL	Educational Level
EPS	Permanent Sample
ER	Emergency Room
EU	European Union
EU – SILC	European Union Statistics on Income and Living Conditions
FOBT	Faecal Occult Blood Test
FOD – SPF	Federal Public Service
FRKVA – CFQAI	Federal council for quality of nursing activities
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GMR	Global Medical Record
GP	General Practitioner
HAI	Hospital-acquired infections
HBSC	Health Behaviour in School-aged Children

HCQI	Health Care Quality Indicators
HFA-DB	Health for All Database
HIS	Health Interview Survey
HIV	Human Immunodeficiency Virus
HLY	Healthy Life Years
HSPA	Health System Performance Assessment
IADL	Instrumental activities of daily living
IMA – AIM	Intermutualistic Agency
IMC	Inter-ministerial conference
ISCED	International Standard Classification of Education
KCE	Belgian Health Care Knowledge Centre
MDT	Multidisciplinary team
MPG – RPM	Hospital psychiatric data
MRSA	Methicillin-resistant *Staphylococcus Aureus*
MZG – RHM	Hospital discharge data
NSIH	National Surveillance of Infections in Hospitals
NSP	National Surveillance Programme
OECD	Organisation for Economic Co-operation and Development
OOP	Out-of-pocket
PAF	Population Attributable Fraction
PPP	Purchasing Power Parity
PROM	Patient reported outcome measure
PSI	Patient Safety Indicators
PYLL	Potential Years of Life Lost
QALY	Quality-Adjusted Life Year
RAI	Resident Assessment Instrument
RIZIV – INAMI	National Institute for Health and Disability Insurance
ROB – MRPA	Home for the elderly
RR	Relative Risk

RVT – MRS	Nursing home
SE	Socioeconomic
SES	Socioeconomic status
SHA	System of Health Accounts
SHARE	Survey of Health, Ageing and Retirement in Europe
SP	Specialist Physician
THE	Total Health Expenditures
UPC	Usual Provider Continuity
US	United States
VAZG	Agency for Care and Health of the Flemish Community
VDAB	Work and Employment Office (Flanders Region)
WHO	World Health Organization
WIV – ISP	Scientific Institute of Public Health

KEY MESSAGES

- Health System Performance Assessment (HSPA) is a process that allows the health system to be assessed holistically based on measurable indicators. This report is the third one on Belgian HSPA: it contains 106 indicators, and aims to monitor the accessibility, quality, efficiency, sustainability and equity of our health system.
- From a citizen's perspective, the assessment is quite positive: a large part (78%) of the Belgian population reports to be in good health, which is a better result than the EU-15 average. The Belgian population also reports to be satisfied with their contacts with the health system, especially in ambulatory care. However, a more balanced image appears when examining the whole set of indicators.
- Accessibility of the system is pursued by a universal insurance coverage and the existence of social safety nets (maximum billing, increased reimbursement of medical expenses). However, some concerns subsist: there is a high level of out-of-pocket payments (18% of total health expenditures, which is high compared to other European countries), and the number of households reporting to have delayed contacts with health services for financial reasons remains substantial, especially in the lowest income group.
- Most aspects of the quality of care are situated within the EU-15 average, with some better points, such as a lower mortality from causes avoidable through the health system, and some worse points, such as indicators for appropriateness of care (for instance, prescription of antibiotics or medical imaging exams) and nosocomial infections. However, a favourable evolution is observed in colorectal cancer survival and in the coordination of care for cancer patients and for patients with diabetes.
- Preventive care does not always meet international targets: some infant vaccination coverage figures are still lower than the recommended immunization threshold, breast and cervix cancer screening coverage are suboptimal and not improving and influenza vaccination of the elderly is even diminishing.
- Several indicators of health promotion and lifestyle show poor results, such as the stagnation of obesity in adults, the still high prevalence of daily smokers, the low rate of physical activity practice, risky alcohol consumption (binge drinking) in young men and insufficient health literacy in the population.
- Some of the mental health and mental healthcare indicators are alarming. Suicide rates remain high, hospitalisation rates in psychiatric wards continue to increase, as does the use of antidepressants. Waiting times for a first contact with mental health centres are long, questioning the accessibility of those services.
- Quality of care in residential facilities for the elderly shows mixed results: MRSA carriage is decreasing, and the prevalence of pressure ulcers is relatively low. There is room for improvement in accessibility of specialists, and the number of polymedicated elderly remains high.
- Accessibility and quality of care at the end of life also show mixed results: more use is made of palliative services, and the aggressiveness of care at the end of life is relatively low. The hospital remains the most frequent place of death.

- The health system is becoming more efficient in some aspects, as suggested by the increased use of low-cost medication, by the shift from classical hospitalisations (at least one night) to one-day surgery, and by a decrease in the length of stay for a normal delivery. However, also inefficiencies persist in different areas, as indicated by large unexplained geographic variation in some interventions or healthcare costs, over-use of investigations/equipment and inappropriate treatment in many domains of care.
- Socioeconomic inequalities are observed in health outcomes, in financial accessibility, and in the use of preventive services.
- Large regional variations are observed for many indicators.
- The indicators on current GP and nurse workforce availability question the Belgian capacity to cope with future health needs due to demographic changes. The proportion of (new) GPs among all specialties does not reach the quotas fixed by the Planning Commission, and the average age of practising GPs is increasing faster than in other specialties. Although the number of nursing graduates has increased in the last years, the number of nurses per patient in the hospital is lower than in other countries.
- Total health expenditures represent 10.2% of our gross domestic product, and are mainly financed by the public sector (78%). Expenditures on health are slightly higher than the EU-15 average. Per capita health spending has remained unchanged in real terms for both 2012 and 2013 compared to 2011.

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PART 1 – CONTEXT AND METHODS

1. CONTEXT AND OBJECTIVES

1.1. Introduction

Health System Performance Assessment (HSPA) is a process aiming to assess the health system holistically, a 'health check' based on measurable indicators. HSPA is specifically mentioned in the Tallinn Charter[1] signed by all countries from the European region of the World Health Organization (WHO). Each HSPA is developed along the lines of a conceptual framework that is specific to the country.

HSPA is an ongoing process, with a repeated monitoring feeding the information needs of health policy. In Belgium, this process has begun in 2007 and we are currently in its third iteration (see Box 1).

The strategic objectives of the Belgian HSPA process are:

1. to inform the health authorities about the performance of the health system and to offer a support for policy planning;
2. to provide a transparent and accountable view of the health system performance, in accordance with the commitment made in the Tallinn Charter;
3. to monitor the health system performance over time.

The "Report 2015" continues on the path set out by the two previous reports, and aims to monitor the accessibility, quality, efficiency, sustainability and equity of the Belgian health system.

1.2. International initiatives

HSPA is a process that is driven by national perspectives and priorities. The role of international agencies resides in promoting the principles of HSPA, in acting as a forum for sharing experience, and mostly in gathering data from national sources. Reliable and comparable data are a key factor for successful HSPA.[2]

HSPA initiatives at European level are mainly conducted by WHO, European Observatory on Health Systems and Policies, Organisation for Economic Co-operation and Development (OECD) and European Commission (EC). Details on these international initiatives are presented in Box 2. An additional source often cited is the "Euro Health Consumer Index",[3] not detailed further here because published by a single country private organisation, while all above-mentioned initiatives are from international collaboration.

Box 1 – Health System Performance Assessment (HSPA) in Belgium

HSPA is a country-owned process to assess holistically the health system ('health check'). It is based on indicators, which provide 'signals', aiming to contribute to the strategic planning of the health system by policymakers.

In Belgium, the following reports were published so far:

- **Report 2009**: conceptual framework and feasibility study for 54 indicators[4]
- **Report 2012**: 74 indicators and first full evaluation[5]
- **Report 2015 (this report):** 106 indicators

These reports are the result of a collaboration between the KCE, the WIV – ISP and the RIZIV – INAMI.

Box 2 – European organisations involved in HSPA

World Health Organization (WHO)

WHO was the first international organisation to initiate the debate on health system performance assessment in 2000, with the publication of the "World Health Report".[6] The year 2008 marked the signature of the "Tallinn Charter on Health Systems for Health and Wealth", in which the member states committed to "promote transparency and be accountable for health systems performance to achieve measurable results".[1] Over the years, WHO developed several methodological publications on HSPA.[7, 8]

WHO also maintains the Health for All Database (HFA-DB), which provides a selection of core health statistics covering basic demographics, health status, health determinants, and healthcare resources, utilization and expenditure in the 53 countries in WHO European Region. The HFA-DB is an important source for, for instance, the European Community Health Indicators Monitoring (ECHIM) system (see below).

Finally, WHO is the promotor of the new European health policy framework, Health 2020, in which health objectives are defined.[9]

European Observatory on Health Systems and Policies

The European Observatory on Health Systems and Policies supports and promotes evidence-based health policymaking through comprehensive and rigorous analysis of the dynamics of healthcare systems in Europe. The Observatory is a partnership that includes (among others) the Governments of eight European countries (including Belgium), WHO and EC.

The Observatory developed the Health Systems and Policy Monitor, a platform that provides a detailed description of health systems as well as up to date information on policy relevant reforms and changes. The Observatory also produces country-based reports, Health Systems in Transition (HiT), that provide a detailed description of the healthcare system and of reforms and policy initiatives. The last HiT for Belgium was published in 2010,[10] and a new one is currently under preparation. The Observatory also publishes methodological research on HSPA.[11, 12]

Organisation for Economic Co-operation and Development (OECD)

The OECD carries out work on health data and indicators to produce international comparisons and economic analyses of health systems. Key statistical publications include among others *OECD Health Statistics 2015* (a database containing more than 1200 indicators covering all aspects of health systems for the 34 OECD member countries) and *OECD Health Care Quality Indicators* (HCQI),[13] which compares the quality of health services in different countries. Finally, it maintains the *System of Health Accounts* (SHA) database, which contains comparative tables on health expenditures.

The OECD also publishes *Health at a Glance* reports.[14] They provide the latest comparable data on different aspects of the performance of health systems in OECD countries.

European Commission (EC)

The EC has developed European Community Health Indicators (ECHI), a set of indicators to monitor the health status of the European population, as well as determinants of health and certain aspects of European health systems. They are presented in an interactive web application (the Heidi data tool), which makes use of data from Eurostat, WHO, OECD and specialised databases.[15]

In 2014, the Social Protection Committee and Belgium also took the initiative to organise a peer review on HSPA in Brussels to facilitate the exchange of best practices between countries.[16] Finally, in 2014, the European Council Working Party[2] on Public Health decided to create an Expert Group on HSPA, and further urged improvement in the coordination of HSPA by member states and the Commission.[17]

1.3. Conceptual framework

Based on a review of the literature and a broad consultation of Belgian experts and stakeholders, the Dutch and Canadian frameworks[18, 19] were used as a starting point to develop the Belgian performance assessment framework.[4] These frameworks were selected because they are complementary and when combined cover the range of *dimensions* deemed as important by the consulted experts and stakeholders for assessing the performance of the Belgian health system. In addition, the combined framework was tailored to the Belgian health system context, by defining the scope of the framework as broad as possible (health system instead of healthcare system) and by adding a new dimension relevant to policymakers (the sustainability of the health system).

The resulting framework (Figure 1) is subdivided in three interconnected tiers, i.e. (1) health status, (2) non-medical determinants of health and (3) a tier representing the health system, with six *domains*: health promotion, preventive care, curative care, mental health care, long-term care, and end of life care. Health promotion is a domain which extends far beyond the boundaries of the health system.

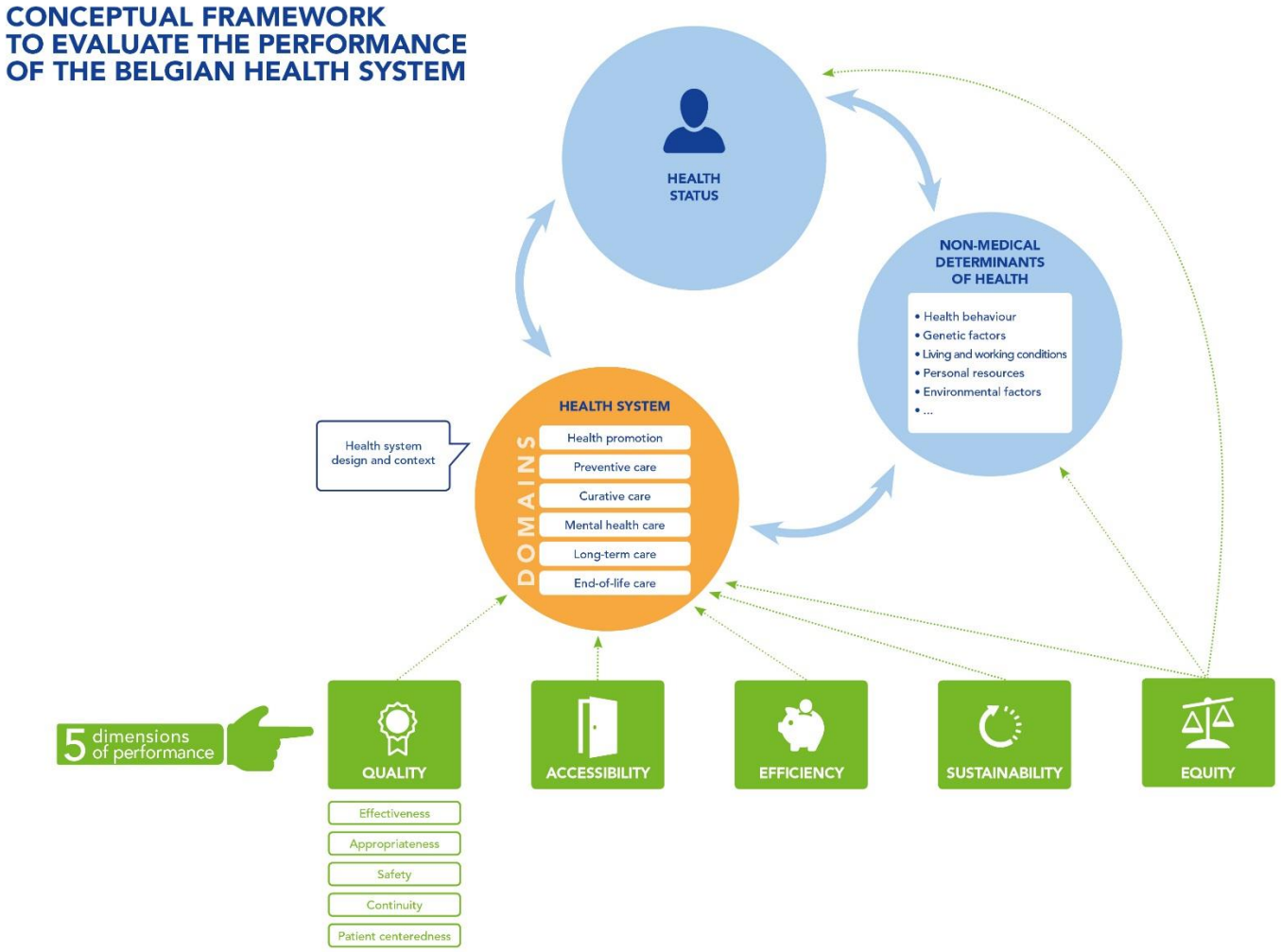
The performance of the health system is evaluated along four dimensions: **quality**, **accessibility**, **efficiency**, and **sustainability**. Quality of care is further subdivided into five sub-dimensions (effectiveness, appropriateness, safety, patient-centeredness, continuity). **Equity**, the fifth dimension, is a transversal dimension which is presented across all tiers.

1.4. Objectives of the 2015 report

The objectives of the 2015 report are:

- to propose and measure a set of indicators, covering all domains and dimensions of the Belgian health system, while keeping the number of indicators manageable (in this report, 106 indicators);
- to interpret the results in order to provide a global evaluation of the performance of the Belgian health system on the basis of several criteria, including comparison with targets and international benchmarking when appropriate.

Figure 1 – Conceptual framework to evaluate the performance of the Belgian health system



2. METHODS AND DATA

2.1. Selection of indicators and sources of data

The HSPA project aims to populate the conceptual framework with the most useful indicators. The starting point of the selection of indicators was to identify, after a search in the indexed and grey literature, the most relevant indicators for each domain/dimension, in collaboration with external experts (conceptual relevance). In a second stage, these indicators were confronted with data availability in data sources, to make maximal use of routinely available data (see Box 3). No new data collection was undertaken. The final selection of indicators was a compromise between the conceptual relevance (what would be ideal to measure) and the feasibility (availability of data and manageable number of indicators).

A total of 106 indicators have thus been selected and measured in this report, covering every domain and dimension in the conceptual framework. The list of indicators is presented in Appendix 1.

Box 3 – Sources of data in the Performance Report 2015

- **Statistics Belgium** is the main statistical authority in Belgium. It collects and disseminates all population and mortality data.
- **MZG – RHM and MPG – RPM** (Minimale Ziekenhuis Gegevens – Résumé Hospitalier Minimum and Minimale Psychiatrische Gegevens – Résumé Psychiatrique Minimal) are administrative hospital discharge data. They are collected and disseminated by the FOD – SPF Public Health.
- **IMA – AIM** (InterMutualistisch Agentschap – Agence InterMutualiste) data are billing data collected by all sickness funds. Data sources include the whole IMA – AIM database or a sample of it (EPS: échantillon permanent – permanente steekproef), and the IMA – AIM Atlas (an interactive web application).
- The **HIS** (Health Interview Survey) is organised every 4-5 years by the WIV – ISP and collects data from about 10 000 persons in Belgium.
- **Farmanet – Pharmanet** is a database from RIZIV – INAMI which contains information (use, volume, etc.) on all reimbursed medicines.
- The **SHA** (System of Health Accounts) database is maintained by the OECD. It contains details on health expenditure and financing at the country level.
- The **Workforce Register** is the national register on healthcare professionals maintained by the FOD – SPF Public Health. It contains information on new graduates and professionals licensed to practise.
- The **Cancer Registry** is an exhaustive national register of cancer cases. These data are linked to the IMA – AIM database to follow the care pathway of patients with cancer.
- Other national **registers** contain data on surveillance of hospital-acquired infections, surveillance of HIV, etc.
- Other **RIZIV – INAMI** databases (Doc N, Doc P) also provide information on providers of care and use of health services.

2.2. What's new in this report compared to the previous one?

Significant efforts have been made both to fill the data gaps of some indicators, and to find new indicators for less documented dimensions.

The major additions include (the following list is not exhaustive):

- Quality of care: the section has been extensively reviewed. It includes now indicators monitored by the OECD HCQI initiative, new indicators on patient centeredness, and new indicators on patient safety.
- Workforce: recent data from the national workforce register were included as well as new data on waiting times (accessibility of care).
- End of life: we collaborated with the Belgian Cancer Registry to monitor four indicators of quality of care at the end of life for a population of palliative patients with terminal cancer.
- Health promotion in health services: we added an indicator on the coverage of the global medical record +, which includes a part on preventive care.

New indicators are indicated with a ***- NEW*** sign in the synoptic tables in the results section.

Some indicators in the 2012 report have been removed or slightly modified for different reasons: because international organisations decided to stop monitoring the indicator, because results were based on a single outdated study which could not be repeated or because information from the indicator was considered redundant compared with other indicators.

As compared to the previous report (2012), the current report covers a larger variety of topics and includes 106 measured indicators (instead of 74 previously).

2.3. How did we perform the evaluation?

The results of the 106 indicators are summarized in synoptic tables presented in the results section (Part 2). These tables present most recent results, at a national level and by region, the source of data and the mean of EU-15 countries[a].

Evaluation based on level and trend

A pictogram (Table 1) presents the evaluation of the indicator, based on the most recent national result available and based on the evolution over time (mainly since 2008, to allow for a 5-year evaluation for most indicators). Contextual indicators, by definition, cannot be evaluated.

The value at the national level is compared to **targets** (national if they exist, international otherwise), to results from EU-15 countries **(benchmarking**), to **standards of care** (mainly for indicators derived from clinical guidelines), in that order. In the absence of targets, benchmarking or standards of care, the evaluation was based on a **consensus** among the authors of this report (expert opinion).

Regional differences (Flanders, Wallonia and Brussels)

Regions are always compared to the region with the best results, and regions having results that are at least 20% worse (in terms of relative risks) are highlighted in bold.

With respect to the regional comparisons, the specific context of Brussels has to be kept in mind: the Brussels region only consists of a single large urban area, while the other two regions consist of a mix of urban, suburban and rural environments.

[a] The term **EU-15** refers to the 15 Member States of the European Union as of December 31, 2003, before the new Member States joined the EU. These 15 Member States are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

Table 1 – Pictogram for the evaluation

⊕	Good results, and improving
●	Good results, and globally stable or trend not evaluated
⊖	Good results, but deteriorating
⊕	Average results, but improving
●	Average results, and globally stable or trend not evaluated
⊖	Average results, but deteriorating
⊕	Poor results, but improving (warning signals)
●	Poor results, and globally stable or trend not evaluated (warning signals)
⊖	Poor results, and deteriorating (warning signals)
C	Contextual indicator (no evaluation is given)

More data on our website!

For each indicator described below, a technical sheet is available on the KCE website in the Supplement. The indicator ID (example: P-1) in the synoptic tables refers to the ID in the document. It details the rationale for choosing the indicator, provides technical information on data sources and computation, gives all results (including subgroup analyses and benchmarking), limitations in interpretation, and bibliographical references.

PART 2 – RESULTS

3. PREVENTIVE CARE

Preventive care encompasses two aspects: it aims to reduce or suppress the occurrence of a disease (this is e.g. the purpose of vaccination); or it aims to detect as early as possible the occurrence of a disease, in order to initiate treatment as quickly as possible (this is the purpose of cancer screening, or the check-up visit at the dentist).

The 11 indicators in Table 2 were selected to evaluate the fulfilment of these aims of preventive care.

Vaccination against infantile diseases

Belgium performs well for the first doses of the vaccination schedule against diseases that necessitate very early vaccination: this is illustrated by the high rate of 3-dosis DTP (diphtheria, tetanus and pertussis) and polio vaccination coverage (with a higher rate than the EU-15 mean). However, the coverage of the full schedule vaccination – 4 doses for DTP and polio – falls back, and does not reach the critical threshold for pertussis (92%-95%) in Wallonia.

WHO has defined targets[b] for the elimination of measles.[20] Belgium has reached, for the first time in 2012, the WHO target of 95% for the first dose vaccination, which is a considerable improvement. However, the vaccination rate for the second dose is far too low in all regions (drop of 10-20% for the second dose). The intermittent resurgence of measles outbreaks in Belgium[21] and in other European countries highlights the need to improve the vaccination coverage: to reach the objective of elimination, continuous and targeted efforts are needed to reach a 95% coverage for both doses of measles vaccination.

Vaccination against Hepatitis B has started recently in Belgium and has very soon reached the critical threshold at a national level (and is quasi reached in all the three regions).

[b] Namely: reaching a 95% coverage rate for both doses of vaccination against measles, and reaching a measles incidence lower than 1 per million inhabitants.

Vaccination against influenza

Vaccination of elderly (65+) against influenza has declined constantly during the past five years, and, with 56% coverage in 2013, is far below the 75% WHO target. The decline is more pronounced in Wallonia and Brussels, and has also been observed in other European countries. One exception is the vaccination of elderly in the residential sector (nursing homes or homes for the elderly), where coverage results are much higher (82.2%, see P-4 in Table 11).

Screening of Breast, Cervix and Colon cancers

Cancer screening coverage rates are quite low: 63% for breast cancer (stable over time, close to the EU-mean but below the generally accepted target of 75%), 54% for cervical cancer (decreasing over time, below the EU-15 mean of 60%) and only 16% for colorectal cancer (but increasing since the initiation of screening programmes in Federation Wallonia-Brussels (2009) and in Flanders (2013)). The data show a wide gap between the regions in terms of breast cancer screening: in Flanders women participate through the organized programme (50%), which is almost never the case in Wallonia and Brussels (7-10%), where women undergo breast cancer screening outside the organized programme. This raises questions about the overall efficiency of the programme. The regional differences in participation for the cervical and colorectal cancers screening are less pronounced.

Guidelines on breast cancer screening recommend that women younger than 50 years should not be screened, except in specific medical situations. Poor adherence to these guidelines indicates problems with the appropriateness of current preventive practices: a high proportion of women below 50 years old (35% in 2013) are screened. However, a decreasing trend of this inappropriate screening is observed in Flanders (from 31% in 2008 to 25% in 2013).

Preventive measures in oral health, measured as no regular contacts with a dentist

This indicator, the lack of regular contacts with a dentist[c], is the only one in this section which does not fall within the competences of the federated entities. The results are poor since 50% of the population has no regular contacts with a dentist with a higher rate in Wallonia (56%).

The low attendance rates and the fact that the majority of preventive and restorative care is fully reimbursed for all children up to 18 years (since May 2009), raise questions on the factors precluding access to (preventive) oral care. The better contact rate seen in teenagers (68% - data not shown in Table 2, see the Supplement)) can mainly be attributed to orthodontic treatment in that age span.

Conclusion

The performance indicators of preventive care provide a relatively dark picture in Belgium. The results on vaccination are heterogeneous: under critical threshold for measles in all regions and for pertussis in Wallonia, and insufficient coverage of vaccination of elderly against influenza, but good results for Hepatitis B vaccination and first doses of DTP. Cancer screening coverage rates for the three selected cancers (breast, cervical and colorectal) are quite low, compared to targets or to results from other countries. Finally, the rate of regular contacts with a dentist is too low.

[c] No regular contacts with a dentist is defined as not having at least two contacts in at least two different years during the last three years.

Table 2 – Indicators on preventive care

(ID) Indicator			Belgium	Year	Target	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
Vaccination coverage										
P-1	Polio, diphtheria, tetanus and pertussis vaccination in children (%, 3th/4th dose)	🟢	3d: 99.0 4d: 92.0	2012	WHO: 90 BE: 95	4d: 93.2	4d: 90.4	4d: 91.1	WIV – ISP	3d: 96.2(1) 4d: ---
P-2	Measles vaccination in children (%, 1th/2th dose)	🟢+	1d: 95.5 2d: 85.0	2012	1d: 95 2d:95	1d: 96.6 2d: 92.5	1d: 94.4 **2d: 75.5**	1d: 94.1 **2d: 75.5**	WIV – ISP	1d: 92.9(1) 2d: --
P-3 ***NEW***	Hepatitis B vaccination in children (%, 3th/4th dose)	🟢+	3d: 97.8 4d: 91.3	2012	4d: 90	4d: 93.0	4d: 89.2	4d: 89.6	WIV – ISP	3d: 91.3(1) 4d: ---
P-4	Influenza vaccination (% pop aged 65+)[a]	🔴	56.4	2013	75	60.6	**50.1**	**47.8**	IMA – AIM	55.0(1)
Incidence infectious diseases preventable by vaccination										
P-5 ***NEW***	Incidence of measles (new cases/million pop)	🟡+	6.1	2014	1 per million	7.8[b]	1.9	8.6[b]	WIV – ISP	---
Cancer screening[c]										
P-6	Breast cancer screening (% women aged 50-69)	🟡	62.7	2012	75	68.0	**55.6**	**52.9**	IMA – AIM	64.3(1)
P-7 ***NEW***	Breast cancer screening - organized programme (% women aged 50-69)	🔴	32.5	2012	75	49.6	**7.2**	**10.2**	IMA – AIM	---
P-8	Cervix cancer screening (% women aged 25-64)	🔴	53.6	2012	-	52.3	56.0	52.9	IMA – AIM	60.1(1)
P-9 ***NEW***	Colorectal cancer screening (FOBT) (% pop aged 50-75)	🔴+	16.5	2013	-	**16.2**	**16.4**	19.9	HIS	---
Over-screening cancer										
P-10	Breast cancer screening outside age target group (% women aged 40-49)	🔴	35.1	2013	-	28.3	**45.6**	**44.2**	IMA – AIM	---
Oral health – contacts with dentist										
P-11 ***NEW***	No regular contacts with dentist[d] (% pop aged 3+)	🔴	50.8	2012	-	47.3	56.0	55.3	IMA – AIM	---

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.
FOBT = Faecal occult blood test
[a] Excluding population residing in homes for the elderly and nursing homes; [b] The regional differences observed during a specific year are not highlighted, since epidemic diseases in children show fluctuations that are poorly rendered by a one year snapshot; [c] Within the last two years for breast and colorectal cancer screening, within the last three years for cervical cancer screening; [d] No regular contacts with dentist is defined as patients who do not have at least at 2 contacts on 2 different years over a three year period.
Source of results for international comparison: (1) OECD Health Statistics 2015.

4. CURATIVE CARE

4.1. Accessibility of care

Accessibility can be defined as the ease with which health services are reached in terms of physical access (geographical distribution), costs, time, and availability of qualified personnel.[22] Accessibility is a prerequisite for a high-quality and efficient health system.

In this report, we have defined 9 indicators to evaluate the accessibility of the healthcare system (Table 3). Some indicators are related to the workforce, addressing the availability of healthcare personnel, others are used to determine financial access. One indicator measures whether the system provides patients with timely access to healthcare.

Financial access to healthcare

Financial access to healthcare can be described along three dimensions: the population coverage, the service coverage and the portion of healthcare costs covered through health insurance.

Nearly the entire population is covered by the **compulsory public health insurance system**. The about one percent that is not covered concerns persons whose administrative and/or financial requirements are not fulfilled. The percentage is slightly higher in the Brussels region. It should be kept in mind that persons not affiliated with a sickness fund (e.g. undocumented migrants) are not included in the definition of 'population' in this indicator. Moreover, reliable and exhaustive data on the number of persons with private health insurance are currently not available.

Despite universal coverage by a public health insurance system, on average 8% of Belgian households declared in 2013 that they had to **postpone healthcare for financial reasons** (medical care, surgery, dental care, prescribed medicines, mental healthcare, eyeglasses or contact lenses). In the HIS of 2008 this percentage was equal to 14%. Also the EU-SILC survey (individuals aged 16 and over) contains a question on unmet needs for medical and dental care. The share of individuals postponing medical or dental care because of cost is much lower in the EU-SILC than in the HIS data but less items are included. The EU-SILC results show an increasing trend since 2011, especially for the lowest income quintile.

There is a large difference between the three regions, with the Brussels region having more than one in five of the households delaying healthcare for financial reasons.

Further analysis is needed to fully understand differences in the height and fluctuation of this indicator between years and between surveys.

Out-of-pocket payments are expenditures borne directly by a patient because health insurance does not cover the (full) cost of the health product or service. The share of out-of-pocket payments in total healthcare expenditure remained rather constant over the last decade and amounted to 17.9% in 2013. Measured in per capita terms, out-of-pocket payments increased from US $ 656 (PPP) in 2008 to US $ 760 (PPP) in 2013. In an international perspective, out-of-pocket payments represent a relatively large share in total healthcare expenditure in Belgium compared to the EU-15 mean (16.6%). Also the amount per capita is much larger than the European average (US $ 595 (PPP)). However, there are some doubts on the reliability of the Belgian data on out-of-pocket payments.[23]

The picture is somewhat more positive for the amount and evolution of **co-payments** for (partially) reimbursed products and services. One explanation for the better results for co-payments compared to out-of-pocket payments is that safety nets, such as the maximum billing system or increased reimbursement of medical expenses, target the protection of patients against large amounts of co-payments only. Other out-of-pocket payments such as over-the-counter medicines or supplements are not included in these safety nets.

Since out-of-pocket payments displaces resources available for other goods and services, they should be related to household consumption patterns to measure 'financial protection' in health. The Household Budget Survey (2014) showed that, on average, the share of out-of-pocket payments in total household consumption is 4.6%.[24] Higher income households spend relatively more on health than lower income households. The share of household consumption allocated to medical spending excluding long-term care expenditure (to make results more comparable between countries) amounted to 3.0% in 2013 in Belgium.[14]

For the service coverage (the range of covered services that are completely or partially reimbursed by health insurance) no indicators have been defined. Service coverage, defined as the proportion of primary health coverage in total health spending, largely varies by function of care: 84% service coverage for inpatient care, 78% for outpatient primary and specialist care, 57% for pharmaceuticals, 91% for ancillary services (i.e. clinical biology and medical imaging) and 49% for dental care and dental prosthesis.[25]

Availability of qualified personnel

Access to healthcare also depends on the availability of medical workforce. Current workforce availability was evaluated for physicians and nurses. Availability of specific groups (e.g. psychiatrists, indicator MH-2) or future workforce (indicators S-4 to S-10) can be found in other sections of this report.

In 2013, practising physician density in Belgium (2.95 per 1000 population) was lower than the EU-15 average (3.41 per 1000 population). Before 2009, all registered physicians (not only practising physicians, defined as physicians with at least one patient contact) were included in the density, which explained why Belgium had one of the highest physician densities in Europe (4.03 per 1000 population).

Also the density of practising nurses in 2012, defined as nurses employed in the healthcare sector, was lower in Belgium (9.51 per 1000 population) than the EU-15 average (10.77 per 1000 population). In 2012, 105 872 nurses were employed in the healthcare sector: most nurses work as employees in hospitals (53%), followed by the residential sector for elderly (14%) and home nursing (7%).

A large number of nurse vacancies can also point in the direction of access problems. The number of hospital nurse vacancies amounted to 2058 in 2013 (to put this number into perspective: in 2009, 66 800 nurses were working in the hospital sector). More detailed information is available for Flanders from the Public Employment Service of Flanders (VDAB), with data not limited to hospital nurses. Their data show that the number of nurse vacancies steadily increased between 2006 and 2011, and has slightly decreased since then. Although a vacancy in itself is not necessarily an indicator of shortage, vacancies for nurses are hard to fill and thus can be interpreted as referring to possible access problems.

Finally, a recent European study with data from 300 hospitals from 12 countries showed that Belgian hospitals have a comparatively high mean patient-to-nurse ratio (10.7 patients per nurse per 24h, versus 9 on average for all countries).[26] This study also demonstrated that the patient-to-nurse ratio is correlated with in-hospital mortality rates.[26] This indicator can thus also provide indirect information on the quality of care in hospitals. The robustness of the found association between patient-to-nurse ratios and adverse outcomes (in-hospital mortality) was confirmed by sensitivity analysis including non-nursing staff (e.g. care assistants). Moreover, in Belgium the reported patient-to-nurse ratio ranges from 7.5 to 15.9 between hospitals.

Waiting times

When patients face long waiting times to get an appointment with a specialist, this can be a barrier to timely access to healthcare services. More than 38% of the patients had to wait for two or more weeks to get an appointment with a specialist. This self-reported percentage is more or less the same in the three regions. About 10% of the patients considered this waiting time as problematic. Waiting times for a first face-to-face contact with an ambulatory mental health centre is provided in Chapter 5 (indicator MH-3). In 2013, 37% of patients had to wait one month or more for a first contact with such centre.

Conclusion

The percentage of households postponing healthcare for financial reasons is substantial, especially in the lowest income group. Moreover, the data in Table 3 only include persons affiliated with a sickness fund. To fully evaluate the protection provided by any health insurance system, population coverage, service coverage and the portion of healthcare costs covered through health insurance should be taken into account simultaneously.

Physician and nursing density are contextual indicators of accessibility of care, but, alone, they give insufficient information to assess whether sufficient workforce is available to meet the population health needs. Other elements, as for instance, the distribution of the healthcare workforce, particularly in rural areas, impact even more on access to care. Moreover, international comparison is complicated because countries use different methodologies to calculate workforce density and task distribution between nurses, physicians and other healthcare professions can be substantially different. In any case, the indicators on current nurse workforce availability all point in the same direction, i.e. Belgium is lagging behind compared to other countries in Europe in coping with demographic and epidemiologic changes (e.g. ageing population, higher prevalence of multiple chronic conditions).

Table 3 – Indicators on accessibility of healthcare

(ID) Indicator			Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
Financial accessibility									
A-1	Health insurance status of the population (% of population)		98.9	2014	99.4	99.2	97.8	RIZIV – INAMI	---
A-2	Out-of-pocket payments (% of total health expenditures)		17.9	2013	---	---	---	SHA	16.6(1)
A-3	Out-of-pocket payments (in US $ PPP/capita)		760	2013	---	---	---	SHA	595(1)
A-4	Self-reported delayed contacts with health services for financial reasons (% of households)		8.0	2013	5.0	**9.0**	**22.0**	HIS	---
Health workforce									
A-5	Practising physicians (/1000 population)	**C**	2.95	2013	---	---	---	RIZIV – INAMI	3.41(1)
A-6	Practising nurses (/1000 population)	**C**	9.51	2012	---	---	---	Workforce Register[a]	10.77(1)
A-7 ***NEW***	Number of nurse vacancies	**C**	2058	2013	---	---	---	FOD – SPF	---
A-8 ***NEW***	Patient-to-nurse ratio		10.7	2010	---	---	---	RN4CAST	9.0(2)
Waiting time									
A-9 ***NEW***	Waiting time of more than two weeks to get an appointment with a specialist (% of population asking an appointment)		38.4	2013	38.6	38.9	36.0	HIS	---

Good (●), average (●) or poor (●) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.
PPP = Purchasing power parity
[a] Last data available on practising nurses based on workforce register date from 2009. An extrapolation for later years has been performed by Belgium in collaboration with OECD.
Sources of results for international comparison: (1) OECD Health Statistics 2015; (2) RN4CAST study.

4.2. Quality of care

Quality is defined as ”the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”.[27] In this report, the concept has been further subdivided into 5 sub-dimensions: effectiveness, appropriateness, safety, continuity of care and patient centeredness.

4.2.1. Effectiveness of care

Effectiveness is defined as the “degree of achieving desirable outcomes, given the correct provision of evidence-based healthcare services to all who could benefit but not those who would not benefit”.[22] Effectiveness indicators are typically outcome (results) indicators: patient reported outcomes (PROMs), adverse events (such as mortality, avoidable admission, and incidence of bacterial resistance) and sentinel events (e.g. wrong-site surgery). Six indicators were chosen among internationally published indicators to assess effectiveness (Table 4).

The effectiveness of **primary care** is measured by avoidable hospital admissions for two chronic conditions, namely asthma and complication of diabetes. Effectiveness indicators for **hospital acute care** are 5-year relative survival rate for cancer (breast and colorectal cancer) and case-fatality within 30 days after admission for acute myocardial infarction (AMI) and ischemic stroke.

Several indicators analysed in other sections of this report can also be interpreted in terms of effectiveness. Some examples are:

- Safety indicators: incidence of hospital-acquired MRSA infections (QS-2); incidence of post-operative sepsis after abdominal surgery (QS-4); prevalence of hospital-acquired cat II-IV pressure ulcers (QS-5);
- Mental health indicators: deaths due to suicide (MH-1); rate of involuntary committals in psychiatric hospital wards (MH-4);
- Preventive care indicators: incidence of measles (P-5); cancer survival rates for cancers for which a screening programme exists (breast cancer QE-3 and colorectal cancer QE-4).

Avoidable hospital admissions

High hospital admission rates for asthma and complication of diabetes can be interpreted as pointing to poor effectiveness of first-line care, as well as to poor coordination or continuity of care.[28]

Belgium is situated around the EU-15 average for both indicators, but this is not very informative, as differences between countries can be due to many other factors than to effectiveness of care, such as difference in prevalence of the disease, in accessibility of care or in methodology for measuring the indicator.

Asthma-related admissions show a decreasing trend in the early 2000, which was also observed in other EU-15 countries, but stabilized since 2008. Rates are similar in Wallonia and Flanders, but higher in Brussels.

Admissions for complications of diabetes are also decreasing (but mainly among women), and this is also the case in other EU-15 countries.

Cancer survival

Five-year survival rates after breast and colorectal cancer are outcome indicators measuring the effectiveness of the health system for specific diseases. Both cancers can be screened and programmes are implemented at the regional level. The relative survival rate can reflect both advances in public health interventions (greater awareness of the disease, improvement of screening programmes) as well as improved treatments.

In the most recent study comparing countries,[29] Belgium has outstanding 5-year survival rates for colon and rectal cancer, but lower than average results for breast cancer. However, comparison of survival results between European countries is complicated by methodological limitations, and should thus be interpreted with caution.

The 5-year relative survival rate after the diagnosis of breast cancer and colorectal cancer is 88.3% and 64.8% respectively, in a cohort of patients diagnosed in 2008. Compared to patients diagnosed in 2004, the survival rate is stable for breast cancer patients and a moderate increase is observed for colorectal cancer patients. Notable increases in survival are specifically observed for stage II and stage III patients with colorectal cancer (results shown in the Supplement).

Mortality after acute myocardial infarction (AMI) or ischemic stroke

The 30-day AMI case-fatality rate reflects the processes of care, such as timely transport of patients and effective medical interventions. Case-fatality after AMI decreased in Belgium between 2000 and 2012, mirroring the trend observed in other European countries.[28] Part of this reduction can probably be attributed to better treatment, particularly in the acute phase of myocardial infarction. More investigation is needed to explore the causes of the higher mortality in Wallonia and Brussels compared to Flanders.

The management of ischemic stroke has evolved over the last decade, with clear advances in thrombolytic treatments and the emergence of stroke units.[28] Mirroring the trends in other European countries, case-fatality after ischemic stroke decreased slightly in Belgium between 2000 and 2004, but stabilized in recent years. Results are similar across the three regions.

Case-fatality rates for AMI and for ischemic stroke are slightly above the EU-15 average.

Conclusion

The measurement of effectiveness of care is limited in Belgium mainly because of lack of patient reported outcomes measurement (PROMs). PROMs measure how patients function in relation to a health condition and its therapy (e.g. hip or knee replacement, pain control at end of life).[30] This kind of measure is routinely reported in the Dutch performance report.[31] In Belgium, PROMs are not collected, with the exception of some local initiatives.

The subset of indicators was chosen among internationally published indicators. Belgium is situated around the EU-15 average for all effectiveness indicators, except for colon and rectal cancer, where results are better than in other countries. However, international comparisons should be interpreted with caution because of methodological issues. Trends over time are more reliable and are therefore equally informative for policymaking:

- Both indicators on avoidable hospital admissions (asthma and diabetes) show a decreasing trend which might be due to an improvement in the quality of primary care.
- Five-year relative survival after colorectal cancer shows a notable increase for stage II-III patients.
- Case-fatality rates after AMI have decreased in recent years, as in other European countries.
- The results of the indicators in other dimensions (safety, prevention, etc.) show a positive evolution.

Table 4 – Indicators on effectiveness of care

(ID) Indicator			Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean) [BELGIUM]
Effectiveness primary care – avoidable hospital admissions									
QE-1 ***NEW***	Asthma hospital admissions in adults (/100 000 pop)	🟡	38	2012	36	36	**55**	MZG – RHM	35[(1)] [BE: 37.9]
QE-2 ***NEW***	Complication of diabetes hospital admissions in adults (/100 000 pop)	🟡+	177	2012	167	189	195	MZG – RHM	176[(2)] [BE: 181]
Effectiveness hospital care – health outcomes									
QE-3	Breast cancer 5-year relative survival rate (%)	🟡	88.3	2008	88.9	89.6	88.6	Cancer Registry	83.6[(3)] [BE: 82.7]
QE-4	Colorectal cancer 5-year relative survival rate (%)	🟡+	64.8	2008	66.4	64.4	62.5	Cancer Registry	58.9/58.4[(3) (4)] [BE: 61.7/62.9]
QE-5 ***NEW***	Case-fatality within 30 days after admission for AMI (pop aged 45+, admission-based, %)	🟡+	7.3	2012	6.5	**9.3**	**8.0**	MZG – RHM	7.0[(1)] [BE: 7.6]
QE-6 ***NEW***	Case-fatality within 30 days after admission for ischemic stroke (pop aged 45+, admission-based, %)	🟡	8.9	2012	9.1	8.7	8.9	MZG – RHM	8.0[(1)] [BE: 9.2]

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.
AMI = acute myocardial infarction
Sources of results for international comparison: [(1)] OECD Health Statistics 2015, results for Belgium concern the year 2009; [(2)] OECD Health at a Glance 2014; [(3)] EUROCARE-5 study, cohort 1999-2007, results for Belgium (Flanders) are indicated between [ ]; [(4)] Results for colon/rectum cancer are presented separately in the EUROCARE-5 study.

4.2.2. Appropriateness of care

Appropriateness of care can be defined as "the degree to which provided healthcare is relevant to the clinical needs, given the current best evidence".[22] Appropriateness can be assessed through several methods. The strongest method is to measure to what extent medical practice follows **recommendations from clinical guidelines**. Another method often used is the analysis of **geographical variation.**

Six indicators related to acute and chronic care have been selected (Table 5). They refer to the application of guidelines (in follow-up of diabetic patients, in prescribing patterns of antibiotics or antidepressants, in use of inappropriate medical imaging techniques) or to the variability of caesarean section rates.

Other additional indicators are presented in the tables on preventive care (Table 2) for vaccination and screening, mental health (Table 9 for drug prescription and consumption) and end of life care (Table 12 for aggressiveness of care at the end of life).

Appropriateness of care for patients with a chronic disease (diabetes)

The appropriateness of care for patients with a chronic disease is evaluated by measuring the follow-up of diabetic patients.[d] Follow-up of diabetic patients is relatively stable: 68% of insulin-dependent patients are followed according to clinical guideline recommendations. The level is, however, lower for non-insulin dependent diabetics (43%). There are regional differences for both subgroup populations: for diabetics needing insulin, differences between Flanders and Wallonia reach almost 10%. For diabetic patients using oral antidiabetics, Brussels shows the highest coverage rates. For both groups, the bottleneck seems to be the retinal exams by ophthalmologists, especially for patients in residential care.

Appropriateness of care in prescribing patterns

Since the early 2000s, the authorities have been raising awareness among the public and the physicians concerning the issue of antibiotic resistance. Antibiotics should only be prescribed when necessary and the choice should preferably be in favour of first-line antibiotics. The **prescription of antibiotics** is used to evaluate guideline adherence.

Belgium ranks very high internationally for antibiotics consumption (similar to France for instance, but about 2.5 times higher than the Netherlands). In 2013 a high percentage (about 42%, stable over time) of total population received at least one antibiotic prescription, with higher figures in Wallonia (44.5%) than in Flanders (41.1%) and Brussels (36.4%). Numbers are especially high in the elderly residential sector (62.1%) and in elderly who receive home care (60.1%) compared to elderly who do not receive long-term care (43.4%, see QA-4 in Table 11), but this may simply be due to differences in populations. Furthermore, 55% of the antibiotics prescribed are second-line antibiotics (versus 17% in the Netherlands[32]). Poor scores on this indicator are also observed among children (> 38%).

Use of inappropriate techniques in medical imaging

Medical radiation exposure is particularly high in Belgium, mainly due to an extensive use of medical imaging tests. National campaigns organized by the FOD – SPF and by RIZIV – INAMI have succeeded in stopping the increasing trend and to return to levels of 2006. However, current doses are still in the high top of European countries.[33] Inappropriate techniques were responsible for 50% of medical radiation in 2013, mainly due to lumbar spine CT scans. The situation was improving between 2009 and 2012 but remained stable afterwards, mainly because the use of lumbar spine CTs was still increasing. A recent report also showed that prescription of medical imaging using radiation is more frequent in Wallonia.[34]

[d] For diabetic care, the guidelines recommend that glycated haemoglobin, albumin and creatinine are monitored preferably once a year, and at least every 15 months. It is also recommended that an ophthalmologist performs a dilated fundus examination every year in order to detect early ocular complications.

Geographic variability in surgical procedures

Geographic variability for elective surgical procedures can be an indication of inappropriate care. Caesarean section has been chosen in this report as an illustration, but there are many others (such as for instance hip or knee replacement, two procedures for which Belgium ranks in the top of EU-15 countries).[34]

While WHO states that there is no reason to have caesarean section rates higher than 10-15%,[35] rates are still high and increasing in the EU-15 region (23.4% of live births). The rates in Belgium are lower (20.4%), stabilized over the last years, and show a large variability between hospitals.[36]

Indicators of appropriateness in other sections of this report

Also indicators described in other domains can be linked to appropriateness. In the **preventive domain** (Table 2), breast cancer screening does not seem appropriately performed: the participation rate to the organized screening programme is low (especially in Wallonia and Brussels), and screening outside the target age group is substantial. In the **mental health** domain there are indications of inappropriate prescription of medication, as the recommended duration for antidepressant medication (at least three months) is not met in a substantial proportion of patients using antidepressants.

Conclusion

Several indicators illustrate that appropriateness is not optimal in many domains (preventive, acute, long-term and elderly care). For many indicators Belgium performs poorly compared to international benchmarks and only a small improvement in recent years can be observed.

The results for antibiotics and antidepressants prescription indicators are poor, as well in volume as in quality. Caesarean section rates recently stabilized but still show a high variability between hospitals. Exposure to medical radiation due to inappropriate imaging has stopped to decrease due to an increasing use of spinal CT scans.

Inappropriate care (over- under- and misuse of resources) has consequences in several dimensions (safety, continuity, effectiveness, efficiency). Tackling inappropriate care to improve the performance of the health system is a real challenge in Belgium.

Table 5 – Indicators on appropriateness of care

(ID) Indicator			Belgium	Year	Target	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
Primary care – patients with chronic disease (guidelines)										
QA-1	Proportion of adult diabetics with appropriate follow-up[a] (% of diabetic patients under insulin)	🔴	67.8	2013		71.6	61.5	66.6	IMA – AIM	---
QA-2	Proportion of adult diabetics with appropriate follow-up[a] (% of diabetic patients under oral antidiabetics only, aged 50+)	🔴	43.4	2013		43.5	42.2	47.9	IMA – AIM	---
Primary care – prescribing patterns (guidelines)										
QA-3	Use of antibiotics (total DDD/1000 pop/day)	🔴	28.7	2012		--	--	--	Farmanet – Pharmanet	21.8(1)
QA-4	Use of antibiotics at least once in the year (% of population)	🔴	41.7	2013		41.1	**44.5**	36.4	IMA – AIM	---
QA-5	Use of antibiotics of second intention[b] (% total DDD antibiotics)	🔴	55.4	2013		54.9	59.2	53.2	IMA – AIM	---
Inappropriate medical imaging										
QA-6 ***NEW***	Medical radiation exposure due to inappropriate medical imaging (mSv/capita/year)	🔴	0.90	2014		--	--	--	RIZIV – INAMI	--
Acute care – variability in surgical procedures										
QA-7	Caesarean sections (/100 live births)	🔴	20.4	2012	10-15	19.7	21.0	20.3	MZG – RHM	23.4(1)

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.
DDD = defined daily dose
[a] Appropriate follow-up is defined as patients receiving regular retinal exams and blood tests (glycohemoglobin and serum creatinine); [b] Antibiotics of second intention are: amoxycilline with clavulanic acid, macrolides, cephalosporins and quinolones.
Source of results for international comparison: (1) OECD Health Statistics 2015.

4.2.3. Safety of care

Safety can be defined as "the degree to which the system does not harm the patient".[22] Four types of indicators evaluate safety of care in this report: healthcare-associated infections, complications after surgery, complications related to nursing care and polymedication in the elderly (Table 6).

Healthcare-associated (or nosocomial) infections

The prevalence of hospital-acquired infections (HAIs) in hospitalized patients is 7.1%. This is higher than what would be expected based on the case-mix of Belgian patients (compared to the case-mix and results of European patients included in the European Centre for Disease and Control survey) and it is also above the EU-average (5.7%). Progress remains thus to be made in HAI prevention.

The second indicator is the incidence of nosocomial MRSA, a major nosocomial infection for which surveillance is mandatory in all Belgian hospitals since 2007. The follow-up of this indicator shows positive results, with a constant decrease of infections since 2004. Probably the national recommendations to control MRSA, which were published in 2003, are one of the factors contributing to this positive result. However, the incidence of nosocomial MRSA remains higher in Wallonia compared to the other regions.

Complications after surgery

Complications after surgery, recorded in the hospital discharge database, are compiled into the so-called Patient Safety Indicators of the OECD Health Quality of Care Indicators (HCQI) framework. Results show a small decreasing trend for deep vein thrombosis or pulmonary embolism after knee and hip replacement, and a stable result for postoperative sepsis after abdominal surgery. A regional difference is noticed with the lowest incidence of complications after surgery observed in Flanders. Both indicators show higher results than EU-15 countries, but methodologies are slightly different.

Complications potentially sensitive to nursing care

Pressure ulcers have serious negative impacts on patient health and can be prevented by appropriate nursing care. Results from a recent survey organized by the Federal Council on the Quality of the Nursing activities showed a prevalence of 5.1% of pressure ulcer (cat II-IV). Prevalence of pressure ulcer is highest in Wallonia. At this moment it is difficult to benchmark these results against results from other countries, but they offer a baseline for future measures.

Polymedication by elderly

The last type of indicators relates to the issue of polymedication in elderly patients, which may have an adverse impact on their health, a.o. by increasing the risk of drug interactions. Two indicators have been selected to monitor this phenomenon: polymedication (at least 5 different medicines per day) and excessive polymedication (at least 9 different medicines per day). The expression 'excessive polymedication' refers only to the concomitant use of at least nine different medicines, but has no negative connotation here in terms of inappropriate polypharmacy.

For both indicators, results from the Health Interview Survey show decreasing trends since 2008, and very small regional variations. These positive results are somewhat in contradiction with increasing trends for pharmaceutical consumption in general.[37] Possible reasons for these opposite results (health survey versus billing data) should be further investigated. Moreover, the prevalence of excessive polypharmacy is higher among the 'older elderly' (85+). This group deserves particular attention because 'older elderly' have an increased risk of adverse effects of medications, due to potentially impaired kidney and liver functions.

Conclusion

The majority of the selected indicators of safety show intermediate results, except one: the prevalence of hospital-acquired infections which is worse than expected and clearly needs to be improved. The positive trend over time observed for the indicators (when available) should be confirmed in the next years.

Table 6 – Indicators on safety of care

(ID) Indicator			Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
Healthcare-associated infections									
QS-1 ***NEW***	Prevalence of hospital-acquired infections (% of patients hospitalised)	🔴	7.1	2011	---	---	---	WIV – ISP NSIH	5.7[(1)]
QS-2	Incidence of hospital-acquired MRSA infections (/1000 hospital stays)	🟡+	1.2	2013	0.7	**1.5**	**0.9**	WIV – ISP NSIH	---
Complications after surgery[a]									
QS-3 ***NEW***	Incidence of post-operative pulmonary embolism or deep vein thrombosis, after hip or knee replacement (/100 000 hip or knee surgery discharges)	🟡+	472	2012	330	**720**	**595**	MZG – RHM	385[(2)]
QS-4	Incidence of post-operative sepsis after abdominal surgery (/100 000 abdominal surgery discharges)	🟡+	2114	2012	1780	**2267**	**3118**	MZG – RHM	1736[(2)]
Complications during hospitalisation – quality of nursing care									
QS-5	Prevalence of hospital-acquired cat II-IV pressure ulcers (% of patients hospitalised)	🟡	5.1	2012	4.0	**7.7**	**5.9**	FRKVA – CFQAI	---
Polymedication									
QS-6 ***NEW***	Polymedication (5 or more different medicines within last 24 hours) (% pop aged 65+)	🟡+	27.4	2013	27.2	27.2	29.2	HIS	---
QS-7 ***NEW***	Excessive polymedication (9 or more different medicines within last 24 hours) (% pop aged 65+)	🟡	5.6	2013	**6.0**	4.9	4.7	HIS	---

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.
MRSA = Methicillin-resistant Staphylococcus aureus; FRKVA-CFQAI = Federale Raad voor de Kwaliteit van de Verpleegkundige Activiteit – Conseil Fédéral pour la Qualité de l'Activité Infirmière; NSIH = National Surveillance of Infections in Hospitals
[a] Patient Safety Indicators based on hospital discharge data
Sources of results for international comparison: [(1)] European Centre for Disease Control, based on EU-30; [(2)] OECD Health at a Glance 2014 (but methodology not completely comparable).

4.2.4. Continuity of care

Continuity of care addresses "the extent to which healthcare for specified users, over time, is smoothly organised within and across providers, institutions and regions, and to which extent the entire disease trajectory is covered".[22]

Four aspects of continuity have been distinguished: **informational continuity** (the availability and use of data from prior events during current patient encounters), **relational continuity** (an ongoing relationship between patients and one or more providers), **management continuity** (the coherent delivery of care from different providers across different care settings) and **coordination of care** (the connection between different health providers over time to achieve a common objective).

Six indicators have been selected that encompass these different aspects (Table 7).

Informational continuity in general practice

The global medical record (GMR) allows the general practitioner to gather information over time and centralize the medical data of his/her patients.

In 2013, among patients with at least one contact with their GP within the last three years, 62% had a GMR (QC-1). This result could be improved, particularly in Wallonia and Brussels, where coverage is even lower. Nevertheless, the use of a GMR is increasing over time since its implementation in 2001, and more than 82% of the 75+ have a GMR.

A limitation of this indicator is that one cannot conclude that patients without a GMR have no informational continuity, as they can have a medical record without being registered in the GMR system.

Relational continuity with a general practitioner

The Usual Provider Continuity (UPC) index is the proportion of encounters with the "usual patient GP", i.e. the GP consulted most frequently by the patient on a two-year period.

Over the period 2012-2013, nearly 70% of patients encountered their usual GP minimum three times out of four GP contacts (UPC ≥ 0.75). This percentage has remained quite stable since 2008, is higher in the group aged 65-84 and is higher in Wallonia.

Management continuity between hospital and general practice

Despite the supposed advantage of having a contact with a GP within the week after hospital discharge, this was the case for only 54.6% of hospitalisations in elderly patients (65+) in 2013. This proportion has decreased slightly since 2008, is higher in Flanders and Wallonia compared to Brussels, and is higher in patients in residential care (QC-3, Table 11).

A limitation of this indicator is that neither the reason for hospitalisation nor the length of the stay have been taken into account, although these factors influence the need of a GP contact after hospitalisation.

Coordination in ambulatory care for diabetic patients

To optimize care provided to diabetic patients, several measures have been implanted by RIZIV – INAMI (diabetes passport, care trajectories for chronic diseases and convention for diabetes self-management).

The majority (91%) of diabetic patients using insulin are covered by one of the systems (mainly convention), which contrasts with the low rate in the group of patients using oral antidiabetics (16%, half diabetes passport, half care trajectory). For both patient groups, the proportion is higher in Flanders and there is a positive trend over time in all regions. This indicator is also lower for patients in the residential sector.

Continuity of care is also a contributing factor to the effectiveness of the health system. Admissions for complication of diabetes show a decreasing trend over time (QE-2, Table 4), which is encouraging, even if the real impact of continuity of care on this outcome is difficult to estimate.

Coordination in hospital care for cancer patients

Multidisciplinary team (MDT) meetings have been implemented in many countries as the predominant model of cancer management in order to ensure that all patients receive timely evidence-based diagnosis and treatment, and to ensure continuity between different providers of care.

Overall, about 84% of cancer patients were discussed at a MDT meeting in 2012. Although an increasing trend is noticed for the three regions, cancer patients are still more frequently discussed at a MDT meeting in Flanders (86%) compared to Brussels (83%) and Wallonia (80%).

A limitation of this indicator is that, because it focuses on a specific category of diseases, it provides only a restricted picture of the intramural coordination of care.

Conclusion

Continuity of care indicators show contrasting results. Coordination of care shows good results in primary care for diabetic patients using insulin (measured as being registered in a care protocol) or within hospital setting for patients with cancer who need to be discussed in MDT meetings. Results are, however, disappointing for diabetic patients who are not using insulin. It looks as if, for this patient population, the structure exists to promote coordination of care, but is hardly used. The three other indicators relate to GPs and show intermediate results: the use of a GMR should continue to improve, relational continuity measured by the UPC index could be better even if this is relatively good among the most vulnerable patients (elderly and lower socioeconomic groups) and the occurrence of contacts after a hospitalisation of an elderly patient is disappointing.

This evaluation is hampered by two limitations: these few indicators only reflect a partial view of the multi-faceted concept of continuity of care, and a comparison with results from other countries is very difficult, due to the lack of international indicators, and hence data, in this dimension.

Table 7 – Indicators on continuity of care

(ID)	Indicator		Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
Informational continuity in general practice									
QC-1	Coverage of global medical record (% of pop with at least one contact with their GP within three years)	🟢+	62	2013	73	**48**	**44**	RIZIV – INAMI IMA – AIM	---
Relational continuity in general practice									
QC-2	Usual Provider Continuity index ≥ 0.75	🟡	69.6	2013	68.5	73.1	65.2	IMA – AIM	---
Management continuity between hospital and GP									
QC-3	GP encounter within 7 days after hospital discharge (% patients 65+)	🟡-	54.6	2013	57.5	52.8	**38.6**	IMA – AIM	---
Coordination in ambulatory care									
QC-4 ***NEW***	Proportion of adult diabetics (under insulin) with a convention/passport/care trajectory (% of patients)	🟢+	90.8	2013	91.5	90.6	87.7	IMA – AIM	---
QC-5 ***NEW***	Proportion of adult diabetics (under oral antidiabetic only) with a convention/passport/care trajectory (% of patients, 50+)	🔴+	16.1	2013	21.8	**9.2**	**12.8**	IMA – AIM	---
Coordination in hospital care									
QC-6	Patients with cancer discussed at the multidisciplinary team meeting (%)	🟢+	83.6	2012	85.8	79.7	83.4	Cancer Registry + IMA – AIM	---

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.
GP = general practitioner

4.2.5. Patient centeredness

Patient centeredness is defined as "providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patients' values guide all clinical decisions".[38] The assessment of patient centeredness typically concerns the acknowledgement of patients' needs, wants, preferences, the quality of the provider-patient communication (a good communication requires several competencies such as listening, explaining, courtesy) and the patients' and carers' involvement (enabling patients to manage their care and to make informed decisions about their treatment options). However, the measurement of these skills is a challenge. In Belgium, the Scientific Institute of Public Health (WIV – ISP) included the OECD instrument dedicated to patient experiences with ambulatory care[39] in the Health Interview Survey 2013.[40]

In general, patient satisfaction is very high on the four selected items (above 90% for QP-1 to QP-4), both for general practitioners and specialists. A comparison between 13 European countries showed that Belgium is positioned at the top for the four indicators.

Patients with a lower educational level appear to be slightly less satisfied than patients with a higher educational level regarding the four items for specialists, but this was not the case for contacts with general practitioners.

The satisfaction level is lower in Brussels for two items: the time dedicated to the patient by the general practitioner or specialist (QP-1) and the opportunity to ask questions to the specialist (QP-3).

Conclusion

The new four indicators on patient centeredness, based on the last HIS (2013), refer to patient experience. Previously, patient centeredness was assessed by questions on patient satisfaction, but this was broadly criticized, both on the validity of the concept and the accuracy of the measures.

Belgian physicians in ambulatory care appear to meet patient expectations in terms of time spent with them, explanation, openness to questions and shared decision making. There are, however, several limitations. Firstly, there are limits at the HIS representativeness (e.g. patients with low national language skills). Secondly, these indicators are limited to ambulatory care. In the section on care at the end of life, the percentage of terminal cancer patients dying at their usual place of residence (EOL-4, Table 12) is also an indicator of patient centeredness. The results are less positive than for patient experience in ambulatory care. Finally, initiatives to improve patient centeredness are fragmented and not easily identified. Large scale data measuring the performance on patient centeredness are lacking in all settings.

Table 8 – Indicators on patient centeredness of care

(ID) Indicator			Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
Patient experiences with ambulatory care									
QP-1 ***NEW***	Doctor spending enough time with patients during the consultation (% of respondents, contact with GP/SP)	●	GP: 97.7 SP: 96.3	2013	GP: 98.0 SP: 97.1	GP: 97.5 SP: 96.1	GP: 96.6 SP: 93.9	HIS	87.1(1)
QP-2 ***NEW***	Doctor providing easy-to-understand explanation (% of respondents, contact with GP/SP)	●	GP: 98.1 SP: 95.5	2013	GP: 98.3 SP: 96.0	GP: 98.2 SP: 95.7	GP: 97.4 SP: 93.2	HIS	91.1(1)
QP-3 ***NEW***	Doctor giving opportunity to ask questions or raise concerns (% of respondents, contact with GP/SP)	●	GP: 98.1 SP: 95.3	2013	GP: 96.6 SP: 95.4	GP: 97.4 SP: 96.4	GP: 96.9 SP: 91.9	HIS	89.3(1)
QP-4 ***NEW***	Doctor involving patients in decisions about care and/or treatments (% of respondents, contact with GP/SP)	●	GP: 95.8 SP: 92.1	2013	GP: 96.0 SP: 91.8	GP: 95.8 SP: 92.5	GP: 95.0 SP: 92.0	HIS	86.1(1)

Good (●), average (●) or poor (●) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

GP = general practitioner; SP = specialist
Source of results for international comparison: (1) OECD Health Statistics 2015.

5. MENTAL HEALTHCARE

Reforms focus on de-institutionalization but lack of data to monitor this trend

During the last decennia of the 20th century the mental healthcare sector in Belgium as in most industrialized countries[41], underwent several waves of reform, characterized by a strong de-institutionalization movement. This movement emphasized the need to reintegrate mentally disordered persons into the society by shifting from large psychiatric hospitals towards alternative services in the community.[42] Yet, important data limitations hamper adequate performance measurement within the mental healthcare sector. The indicators relevant to monitor these evolutions (e.g. case management) could not be developed because of limitations in current data structures. Instead, we relied on general indicators (e.g. suicide rates) and indicators focusing on the psychiatric hospitalisation episodes (e.g. number of hospitalisation days in psychiatric hospitals; involuntary committals).

This report includes 10 indicators that yield specific information on mental health. The results have several limitations and give only a partial picture of the performance of the mental healthcare sector. Nevertheless, some important lessons can be drawn.

Suicide rates remain high

First, when comparing the Belgian data in an international context, suicide rates (18.3 per 100 000 population) appear to be considerably higher than in other European countries (10.6 for EU-15 countries). No firm conclusions can be drawn from these results. Suicide, after all, is only a proxy indicator of the mental health status of a population and should be viewed in combination with other mental health-related indicators. Yet, it should be noted that there are indications that there is room for improvement. A recent report from the socialist sickness funds, for instance, showed that among its members who were hospitalised for a suicide attempt (about 4000 persons between 2011-2013) 27% of them had no follow-up encounter with their GP or psychiatrist in the 3 months after their hospitalisation.[43] Despite the slight decrease in the suicide rates, the results indicate that the concerted action on this topic[44] requires further continuous support to increase the pace of these improvements. Secondly, there are substantial regional differences. It is shown that suicide rates are considerably higher in Wallonia (21.9 per 100 000 population) compared to Brussels (11.9) and Flanders (17.4). The apparently low suicide rate in Brussels might be due to data artefacts (e.g. delays in submitting the reasons for violent deaths by the public prosecutor).

Antidepressants: frequently prescribed but poor guideline adherence

Although an increase in the prescription rates of antidepressant drugs can be observed throughout Europe, Belgian rates (71 DDD per 1000 population/day) remain considerably higher compared to other European countries (64.6 DDD). Figures are considerably higher in Wallonia (88.1 DDD) compared to Flanders (65.1 DDD) and Brussels (54.7 DDD). It should be investigated whether this can be explained by socioeconomic and demographical differences or whether this is due to other reasons (e.g. professional culture, dissemination of evidence-based guidelines).

Two additional indicators, compared to the previous performance report (2012), give more information about the prescription of antidepressants. A first additional indicator shows that the increase in number of adults with antidepressant medication (MH-7) has been slowing down in recent years (e.g. from 12.3 in 2006 to 13.3% in 2008) and is now relatively stable (13.4% in 2013). Furthermore, the highest prescription rates are observed among the elderly receiving long-term care (Table 11: 37.4% receiving home care, 47% in nursing homes or homes for the elderly and 16.6% for the elderly not receiving long-term care).

A second additional indicator is a proxy measure of **guideline adherence.** Major depression requires at least three months of antidepressant use. A high percentage of adults receive antidepressant therapy for a shorter period (<3 months, MH-8): 47.4% in 2013. These high short-term prescription rates are relatively stable over time. Also the prescription of antidepressants known for their anticholinergic side-effects among the elderly (potentially causing falls) seems to stabilize at approximately 15%. The (in)appropriateness of antidepressant medication is an important point of attention in the Belgian setting.

Number of psychiatric hospitalisation days remain high despite reforms

Despite recent reforms aiming to make a shift from inpatient mental healthcare towards ambulatory alternatives, results of these reforms are not yet visible. The number of psychiatric hospitalisation days even increased from 304 per 1000 population in 2000 to 336 per 1000 population in 2012. Two contextual variables which are expected to decrease (on the long-term) as a result of these reform efforts remained relatively constant: the emergency room visits for social, mental or psychic reasons (2008 and 2012: 1.5% of emergency room admissions in general hospitals) and number of involuntary committals in psychiatric hospital (6.8 per 10 000 population in 2008; 7.0 per 10 000 in 2012).

Next, it is shown that in Flanders the number of hospitalisation days in psychiatric hospital wards is higher than in other regions. It should be investigated if these admissions are appropriate or if they are due to shortcomings in the service offer (e.g. insufficient community-based alternatives, insufficient case management). Data from Flanders, after all, show that a substantial percentage of patients have to wait one month or more for a first contact with an ambulatory mental health centre (37% in 2013), a percentage that has slightly increased over time.

Conclusion

The results on the mental health and healthcare indicators remain alarming. Past reforms are not (yet) sufficiently visible and suicide rates remain high. In addition, performance monitoring in this domain remains challenging since data systems ideally should allow to monitor patients' entire care path (including outpatient care), which is to date insufficiently the case.

Table 9 – Indicators on mental health and mental healthcare

(ID) Indicator			Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
Health Status									
MH-1	Deaths due to suicide (/100 000 pop)	🔴	18.3	2012	17.4	21.9	11.9	Statistics Belgium	10.6(1)
Accessibility of care									
MH-2 *NEW*	Practising psychiatrists (/1000 pop)	**C**	0.17	2013	---	---	---	RIZIV – INAMI	0.18(1)
MH-3 *NEW*	Waiting time longer than 1 month for first contact in ambulatory mental health centre (% of pop with contact in ambulatory mental health centre)	🔴	---	2013	37	---	---	VAZG	---
Appropriateness of care									
MH-4	Rate of involuntary committals in psychiatric hospital wards (/10 000 pop)	**C**	7.0	2012	6.8	5.8	**9.8**	MPG – RPM	---
MH-5 *NEW*	ER visits for social, mental or psychic reason (% of admission in ER in general hospitals)	🟡	1.5	2012	1.5	1.3	**1.8**	MZG – RHM	---
Appropriateness of prescribing pattern in ambulatory patients									
MH-6	Use of antidepressants (total DDD/1000 pop/day)	🔴	71	2013	65.1	**88.1**	54.7	Farmanet – Pharmanet	64.6(1)
MH-7	Use of antidepressants (% of adult population, at least once in the year)	🔴	13.4	2013	11.9	**16.6**	**14.7**	IMA – AIM	---
MH-8 *NEW*	Percentage of patients with short duration (< 3 months) of antidepressants treatment (% of pop under antidepressant)	🔴	47.4	2013	47.1	47.5	48.3	IMA – AIM	---
Safety of prescribing pattern in ambulatory patients									
MH-9	Patients (65+ years old) prescribed antidepressants with anticholinergic effect (%)	🔴	15.4	2013	**18.5**	12.2	10.3	IMA – AIM	---
Contextual indicator									
MH-10 *NEW*	Number of hospitalisation days in psychiatric hospital wards (/1000 pop)	**C**	336	2012	**363**	284	261	MPG – RPM	---

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.
VAGZ = Vlaams Agentschap Zorg en Gezondheid; ER = Emergency room
Source of results for international comparison: (1) OECD Health Statistics 2015.

6. LONG-TERM CARE FOR THE ELDERLY

Long-term care is defined as a range of services required by persons with functional, physical or cognitive disability, who need help for an extended period of time with basic activities of daily living (ADL). This is often combined with basic medical services (such as nursing care), domestic help or help with instrumental activities of daily living (IADL).[45] There are two main kinds of **residential facilities**: **homes for the elderly**[e]**,** which provide nursing and personal care to older persons with mainly low to moderate limitations, and **nursing homes**[f]**,** for persons strongly dependent on care but without need of permanent hospital treatment.
In addition, **home nursing care** is available to persons with low to severe ADL and/or cognitive limitations, irrespective of their age. Care provided by home nurses includes technical nursing interventions and basic nursing care (mainly hygienic care in patients with ADL dysfunction).[46]

Accessibility of long-term care services

According to the latest demographic projections made by the Belgian Federal Planning Bureau (2015), the share of older persons in the total population (aged 65 or older) is expected to rise from 18% in 2014 to 25% in 2060, which will result in an increased need for long-term care services.[47] Monitoring the number of recipients of long-term care services is thus an important indicator of accessibility but also of sustainability of the health system.

In 2013, a higher number of elderly received long-term care services in residential care (8.4%, LT-1) compared to elderly receiving home nursing care (4.9%, LT-2). This difference is most pronounced in Brussels (10.1% versus 3.2%).

In the last HIS, nine percent of the population (aged 15+) declared to be an informal carer, with higher rates in Brussels (18%, LT-3) and in older age groups. The last SHARE (Survey of Health, Ageing and Retirement in Europe) showed that 20% of the Belgian population aged 55+ were informal carers. This is the highest rate among all participating countries.

Fall incidents in the elderly

Fall incidents are a common cause of morbidity and mortality in the elderly. The last HIS revealed that 20% of them reported a fall incident in the past 12 months (LT-4), with an average frequency of two times a year. However, a decrease over time was noticed in all three regions.

Safety in residential care

A (new) indicator assesses **safety of care in residential facilities**, namely the **prevalence of pressure ulcers in residents**. Results from a survey in Flemish elderly homes revealed that 4% of residents had a pressure ulcer (LT-5). This indicates the necessity of preventive measures to reduce the risk of pressure ulcers and to avoid conditions for them to become severe and fatal.

There are currently no national data, there is no evolution over time, and international data on this topic are not available either. However, this information will hopefully be available after implementation of the **interRAI** (resident assessment instrument).

The second indicator on safety in residential care shows that 12% of residents are **carriers of MRSA** (LT-6), a result which has been decreasing over time, especially in Flanders.

Quality indicators from previous sections, specifically on population aged 65+

In Table 11 a comparison is made for several indicators between elderly not receiving any kind of long-term care, receiving home nursing care, and being in residential facility.

Overall, a stay in a residential facility is associated with a higher influenza vaccination rate (P-4), a higher contact rate with GPs (QC-2 and QC-3), a lower contact rate with ophthalmologists in diabetic patients (QA-1 and QA-2), a higher use of medications (antibiotics QA-4, antidepressants MH-8, polymedication (QS-7 and QS-8), and a lower use of anticholinergic antidepressants (MH-10).

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[e] Dutch: woonzorgcentra (previously called rustoorden voor bejaarden – ROB); French: maison de repos pour personnes âgées (MRPA)

[f] Dutch: rust- en verzorgingstehuis (RVT); French: maison de repos et de soins (MRS)

Conclusion

Quality of care in residential facilities for the elderly shows mixed results: MRSA carriage is decreasing, and the prevalence of pressure ulcers is relatively low. There is room for improvement in accessibility of specialists, and the number of polymedicated patients remains high.

Table 10 – Indicators on long-term care for the elderly (population aged 65+)

(ID) Indicator			Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean) [BELGIUM]
Use of long-term care services									
LT-1	Long-term care in residential facility[a,b] (% pop aged 65+)	**C**	8.4	2013	7.8	9.1	10.1	IMA – AIM	8.7 (1)
LT-2	Long-term home nursing care[c] (% pop aged 65+)	**C**	4.9	2013	5.2	4.7	3.2	IMA – AIM	4.1(1)
LT-3	Informal carers (% of pop aged 15+)	**C**	9	2013	8	8	18	HIS	15.6(2) [BE: 20.6]
Safety for elderly									
LT-4 ***NEW***	Fall incident during the last 12 months (% pop aged 65+)	**C**	20	2013	19	19	**28**	HIS	---
Safety in residential care									
LT-5 ***NEW***	Prevalence of pressure ulcers (grade II-IV) in home for the elderly[a] (% of residents)	🟡	---	2013	3.97	---	---	VAZG	---
LT-6 ***NEW***	Prevalence of MRSA carriage in residential facility (% of residents)	🟡+	12.2	2011	7.9	**18.3**	**14.7**	WIV – ISP	---

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.
VAZG = Vlaams Agentschap Zorg en Gezondheid.
[a] Home for the elderly in Dutch: woonzorgcentra (previously called rustoorden voor bejaarden – ROB) and in French: maison de repos pour personnes âgées (MRPA)
[b] Nursing home in Dutch: rust- en verzorgingstehuis (RVT) and in French: maison de repos et de soins (MRS)
[c] Long-term nursing care at home data is based on per diem lump sum billings
Sources of results for international comparison: (1) OECD Health at a Glance 2013, but no data on Belgium published; (2) OECD statistics 2015 based on SHARE survey, on population aged 55+.

Table 11 – Indicators reported previously in other sections, specifically on population aged 65+

(ID)	Indicator	Year	Source	None (65+)	Receiving home care (65+)	In nursing home or home for the elderly (65+)	
Prevention							
P-4	Influenza vaccination (% pop aged 65+)	2013	IMA – AIM	49*	64.5*	82.2*	🟢
Adherence to guidelines							
QA-1	Proportion of adult diabetics (under insulin) with appropriate follow-up (% of patients)	2013	IMA – AIM	74.8	58.1	41.3	🔴
QA-2	Proportion of adult diabetics (under oral antidiabetics only) with appropriate follow-up (% of patients, aged 50+)	2013	IMA – AIM	47	37.4	26.2	🔴
QA-4	Use of antibiotics (% of population, at least once in the year)	2013	IMA – AIM	43.4	60.1	62.1	🟡
QA-5	Use of antibiotics of second intention (% total DDD antibiotics)	2013	IMA – AIM	60	58.2	53.4	🟡
Safety of prescribing patterns							
QS-6	Polymedication (5 or more different medicines within last 24 hours) (% pop aged 65+)	2013	HIS	Living alone: 31.3 Cohabiting: 24.3	-	40.2	🟡
QS-7	Excessive polymedication (9 or more different medicines within last 24 hours) (% pop aged 65+)	2013	HIS	Living alone: 3.8 Cohabiting: 5.4	-	17	🔴
Continuity of care							
QC-2	Usual Provider Continuity index ≥ 0.75	2013	IMA – AIM	85.7	86.9	82.1	🟢
QC-3	GP encounter within 7 days after hospital discharge (% aged 65+)	2013	IMA – AIM	48.4	67.7	69	🟡
Appropriateness and safety of prescribing patterns							
MH-7	Use of antidepressants (% of adult population, at least once in the year)	2013	IMA – AIM	16.6	37.4	46.8	🔴
MH-8	Percentage of patients with short duration (< 3 months) of antidepressants treatment (% of pop under antidepressant)	2013	IMA – AIM	48.6	41.8	28.7	🟡
MH-9	Patients (65+ years old) prescribed antidepressants with an anticholinergic effect (%)	2013	IMA – AIM	17.7	14.9	8.6	🟡

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

No time trends have been evaluated in this table.
**Influenza: results for 65+ in nursing home or home for the elderly for Brussels and Wallonia only (results for Flanders not available in IMA – AIM data);*
DDD = defined daily dose.
None refers to "Neither in nursing home nor home for the elderly nor receiving home care". Long-term nursing care at home data are based on per diem lump sum billings.

7. CARE AT THE END OF LIFE

Palliative care is “an approach that improves the quality of life of patients and their families facing the problem of life-threatening illness, through the prevention and relief of suffering by means of early identification, assessment and treatment of pain and other problems (physical, psychosocial and spiritual)”.[48] This definition emphasizes the different aspects of palliative care, such as the holistic approach by a multidisciplinary team of care providers, a target population not restricted to cancer patients but to all patients with a life-threatening illness and the necessary support for the family.

Belgium has developed many structures and services for palliative patients, such as palliative networks, palliative home-care teams, palliative lump sum payments for the patient staying at home, palliative functions in hospitals and in residential facilities for the elderly.[49] In addition to palliative structures, Belgium has developed a legal regulation of euthanasia for adults and children.[50]

This report did not aim to give a comprehensive overview of the current use of palliative care services but to select, in consensus with Belgian experts, some warning indicators for clinical practice and policymakers. A major limitation was that data on end of life were only available for terminal cancer patients; it is not sure that we can extrapolate the results to all end of life situations.

Access and lack of timeliness

More than half of terminal cancer patients received palliative care at home or in hospital[g] in 2012 (EOL-1). This percentage has been slightly increasing over time, and is higher in Flanders.

This result is probably an underestimation of the reality, as patients may receive palliative care in the hospital without specific billing.

The indicator on the (lack of) timeliness of palliative care is presented as a warning signal for a potential shortcoming in policy initiatives to make patients and healthcare providers sufficiently aware of the importance of a well-timed initiation of palliative care: 20% of terminal cancer patients died within one week after the start of palliative care (EOL-2).

Aggressiveness of care at the end of life

In addition to timeliness of palliative care, aggressiveness of care (e.g. inappropriate treatments in the final phase of life) is also an important information for both healthcare providers and policymakers.[51] About 11% of terminal cancer patients still received chemotherapy in the last 14 days of their life (EOL-3), with higher rates in Wallonia. The data, however, make no distinction between curative and palliative chemotherapy, nor with unexpected deaths in cancer patients, which hampers the interpretation of these results.

Patient centeredness

In spite of the current organisation of palliative services supporting the patient and his relatives to help the patient stay at home, 65% of cancer patients died in a hospital, only 23.6% died at home and 6% in residential care (thus 29.6% died in their usual place of residence, EOL-4). The proportion of patients who died in a hospital is higher in Brussels. Trend analysis predicts a more than doubling of deaths in residential facility for elderly and a decrease in deaths at home and in hospital in 2040.[52]

Conclusion

The four indicators on end of life care give only a partial image of the current practice in Belgium, focused on timeliness, aggressiveness of therapy and patient centeredness in cancer patients. Efforts should be made to include other patient groups (such as patients suffering from dementia or other chronic diseases). This is in line with the Global Atlas of Palliative Care[53] in which the definition of palliative care is extended to persons with a wide range of chronic conditions as well as life-threatening/limiting conditions.

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[g] Palliative care as identified in billing data: this includes patients receiving a lump sum for palliative care at the usual place of residence, patients with visits of the general practitioner or nurse within a palliative setting, patients hospitalized in palliative units or hospitalized patients with visits of multidisciplinary palliative care teams.

Table 12 – Indicators on end of life care for patients with terminal cancer

(ID) Indicator			Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
EOL-1 ***NEW***	Patients who received palliative care[a] (% of terminal cancer patients who died in the year)	⊕	51.0	2012	55.9	44.9	**42.6**	Cancer Registry + IMA – AIM	---
Lack of timely palliative care									
EOL-2	Patients who died within one week after start of palliative care (% of terminal cancer patients who received palliative care and died in the year)	🟡	19.6	2012	17.4	**22.6**	20.1	Cancer Registry + IMA – AIM	---
Aggressiveness of care at the end of life									
EOL-3	Patients who received chemotherapy in the last 14 days of life (% of terminal cancer patients who died in the year)	🟡	11.2	2012	9.7	**12.6**	10.0	Cancer Registry + IMA – AIM	---
Patient centeredness									
EOL-4	Death at usual place of residence (home or in residential care) (% of terminal cancer patients who died in the year)	🔴	29.6	2012	29.9	27.6	**18.2**	Cancer Registry + IMA – AIM	---

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.

[a] Palliative care as identified in billing data: this includes patients receiving a lump sum for palliative care at their usual place of residence, patients with visits of the general practitioner or nurse within a palliative setting, patients hospitalized in palliative units or hospitalized patients with visits of multidisciplinary palliative care teams.

8. EFFICIENCY OF THE HEALTHCARE SYSTEM

Defining efficiency

Efficiency in healthcare is concerned with the relation between inputs (e.g. money, time, labour, capital) and intermediate outputs (e.g. numbers treated, waiting times) or ultimate health outcomes (e.g. life years gained, quality-adjusted life years gained (QALYs)). Ideally, these final health outcomes and not the intermediate outputs should be the focus of economic evaluations.[54] However, the relation between inputs and outcomes is complex and is driven by factors outside the control of health system managers.[55] Numerous definitions of efficiency in healthcare can be found in literature (see section 11 in the Supplement). The main difference between these definitions is the way in which quality is captured.[56]

A related concept is *value for money* which is also determined by the relationship between inputs (money) and outputs (valued outputs or outcomes). Valued outputs can be either health gains, positive patient experience, reduced inequalities or broader social and economic benefits of health services.[57]

Measuring efficiency

Efficiency in healthcare is usually measured at three levels[58]: healthcare system level, subsector level and disease-based level.

Each viewpoint has its advantages and disadvantages. A frequently used indicator of efficiency at the system level is life expectancy related to health expenditure per capita. The major disadvantage of this indicator lies in the fact that health expenditure is only one of the many determinants of life expectancy. This is the reason why this analysis was not performed in this report. Indicators at the subsector level have the advantage that they more easily lead to sector-specific (e.g. hospital sector) recommendations and actions. However, outcome measures at hospital level are not widely available yet. Outcome measures related to specific diseases are available, but relating disease-specific outcomes to inputs remains a challenge.

Efficiency indicators selectin this report

Three indicators have been selected to evaluate the efficiency of the healthcare system (Table 13). All three are measured at the subsector level. As in other European countries, the trend in Belgium is towards a more efficient use of care services, as each of the three indicators shows a positive evolutions over time: an increase in the use of low-cost medication, continued the shift from classic (at least one night) to one-day surgical hospitalisations, and a decrease in the length of stay for a normal delivery (which is a more comparable indicator between countries than the overall average length of stay because of differences in patient case-mix). Despite the decrease, postpartum length of stay is still higher than the EU-15 average.

Table 13 – Indicators of efficiency of healthcare

(ID)	Indicator		Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
E-1	One-day surgical admissions (% of surgical admissions)	⊕	48.5	2012	50.6	43.2	50.8	MZG – RHM	---
E-2	Length of stay normal delivery (mean, days)	⊕	4.0	2012	3.9	4.0	4.0	MZG – RHM	3.0(1)
E-3	Use of low-cost medication (% of total ambulatory DDDs)	⊕	54.8	2014	55.3	54.1	54.7	Farmanet – Pharmanet	---

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

DDD = Defined Daily Dose
Source of results for international comparison: (1) OECD Health Statistics 2015.

Other indications of (in)efficiency

The indicators shown in Table 13 illustrate a positive picture of the efficiency of the Belgian healthcare system. However, they are only partial indicators of efficiency. Other indicators analysed or mentioned in this report can also give indications on the (technical) efficiency of the system. After all, inefficiencies in the use of resources (inputs) can relate to many factors. Large unexplained geographic variations in the quantity of care or in healthcare costs (which can indicate inappropriate indication for treatment), screening outside the target groups, over-use of investigations/equipment and inappropriate treatment are examples which are often analysed in international literature.

Table 14 gives one indicator for each of the four above-mentioned sources of inefficiency. These indicators have already been discussed in other sections of this report (see indicator ID) and are detailed in the Supplement. It should be kept in mind that many other indicators discussed in other sections of the report can be re-interpreted in terms of efficiency.

Table 14 – Illustrative indications of inefficiency

Source of inefficiency	Indicator	Indicator ID		Result for Belgium
Unexplained geographic variation	Variation in knee arthroscopy and in cardiac catheterisation (coefficient of variation measured at level of province)	None[a]	🔴	0.36 (knee arthroscopy) 0.24 (catheterisation)
Screening outside target group	Breast cancer screening outside age target group: women aged 40-49, within last two years (%)	P-10	🔴	33.3
Over-use of investigations/equipment	Medical radiation exposure from inappropriate exams of the Belgian population (mSv/capita/year)	QA-6	🔴	0.90
Inappropriate treatment	Percentage of patients with short duration (< 3 months) of antidepressants treatment (% of population under antidepressants)	MH-7	🔴	59

[a] *This indicator has no ID number because it was not described in previous tables. It was chosen for illustrative purposes only.*

9. SUSTAINABILITY

Sustainability can be defined as the system's capacity:[59]

- to stay durably financed by public sources;
- to provide and maintain infrastructure and workforce (e.g. through education and training), facilities and equipment;
- to be innovative;
- to be responsive to emerging needs.

For the four elements of the definition, in total 13 specific indicators were selected (Table 15).

Sustainability as presented in this report is a broad and heterogeneous concept. The combination of sub-dimension (expenditures, workforce, place of hospitals and innovation) reflects this variety and proposes a large panel of indications of a sustainable healthcare system.

Financial sustainability

One specific aspect of this dimension is the financial sustainability which comprises economic and fiscal sustainability. Economic sustainability refers to the growth in health expenditures as a proportion of GDP. Total expenditures are sustainable up to the point at which the social cost of these expenditures exceeds the value produced. Fiscal sustainability refers to the capacity to collect public revenues (taxes and social contributions) to meet the public expenditures. [60] Total (S-1) and public (S-3) health expenditures are thus complementary to reflect the financial sustainability of the system[60]. The third indicator (S-2), total health expenditures per capita allows to make international comparisons.

In Belgium, as well as in other European countries, total health expenditures have increased from 8.0% of GDP in 2000 to 10.2% in 2013. In absolute terms, this amounts to € 40.6 billion, which represents € 3619 per capita. Also public health expenditures have increased from 6.0% of GDP in 2000 to 8.0% in 2013[61].

The third indicator is a measure of the capacity of the system to be financed by public sources (S-3): 78% of the health expenditure is financed by the public sector. Public spending on health as a percentage of total public spending was equal to 15% in 2013.

Workforce

Another sub-dimension of sustainability is the system's capacity to provide and maintain a sufficient health workforce. Specific indicators to measure workforce sustainability are the number of new graduates (S-4, S-8), the share of the workforce who will retire in the near future (S-7, S-10), and the degree of specialisation (S-5, S-9).

Access, measured by the density of practising physicians and nurses (A-5, A-6, Table 3), could become a problem if there is a shortage of health profession graduates.

Physicians

The percentage of medical graduates per 100 000 population increased from 7.1 to 10.2 between 2008 and 2014 (S-4). The *numerus clausus* showed its first effects in 2004 (835 graduates in 2004 versus 1193 in 2003). A system of 'smoothing numbers' was also put in place, allowing the universities to dip into the pile of future quotas to provide agreements for current students. This explains the "surplus" in 2014 (1289).

However, orienting new graduates as GPs remains a problem. Although the share of medical graduates becoming GPs as a percentage of all medical specialities increased from 24% in 2008 to 28% in 2013 (S-5), the progression remains low given all the efforts made to improve the attractiveness of the GP profession since 2008. According to the Planning Commission, the share should be around 40%.[62] A consequence is that GPs have the oldest mean age (S-6), while in 2000 it was similar to the one of the other specialties.

Nurses

In 2014, a total of 5325 students graduated from nursing schools in Belgium. The density of 47.1 nursing graduates per 100 000 population (S-8) is above the EU-15 average of 42.2 per 100 000 population, but this comparison is biased by the substantial proportion of foreign students in the French Community who usually leave Belgium after the end of their study. No data were available for the Flemish community.

A higher percentage of new nursing graduates have a bachelor degree (S-9) in the French community (61.3%) than in the Flemish community (53.5%). There are indications that the proportion of nursing students with a bachelor degree has been slightly decreasing in recent years: a trend that needs to be carefully monitored to ensure a well-educated nursing workforce for the forthcoming years.

The percentage of nurses active on the Belgian labour market who are educated at the bachelor degree slightly increased between 2004 and 2009. With 56% of hospital nurses having a bachelor degree, Belgium is ranked 5th out of 12 European countries for which data were available (data in the Supplement).

Maintenance of facilities: utilisation of acute bed days

The number of acute care bed days per capita is indicative of the population's need for acute care beds, and thus of the needed infrastructure. In 2012, 12.4 million days were spent in acute care hospitals (classic hospitalisation only, excluding one day). Per capita, this represents 1.1 acute care bed days, which is also the European average (S-11). This figure is stable since 2003, while in the same period the average length of stay decreased sharply and the number of classic admissions increased by 11%.[63] If the increase in the number of classic admissions is due to e.g. an ageing population, and the shorter length of stay does not result in adverse effects on health outcomes, the combined effect can be interpreted as an improved efficiency of the hospital sector at a macro level.

Innovation

The delay between EU marketing authorisation and national accessibility of innovative medicines (S-12) is another indicator of the accessibility of the health system, in the sense that the shorter the delay, the sooner patients get access to innovative treatments, but it also reflects general sustainability of the health system, in its capacity to integrate innovation.

Based on an analysis of 70 new medicines granted with EU market authorisation between 2010 and 2012, Belgium scores poorly for the two access indicators: the percentage of medicines available (63%) is lower than the EU-8 average (79%) and the delay to access these new medicines is longer than the EU average (368 days compared to 278 days, S-12). This delay has, however, decreased since the first measures of this indicator (2005-2007).

Another indicator of an innovative system is the use of new technologies. In 2014, three quarters (76.7%) of the practising GPs use an electronic file with recommended software to maintain their patient's medical record (S-13). This has only slightly increased since 2008 (72.1%), and is higher in Flanders (84%). Maintaining a patient electronic file is probably not the most up to date indicator when referring to new technology, but new data on the use of the eHealth platform should be soon available, which is a more appropriate measure of the use of new technologies.[64]

Conclusion

The interpretation of sustainability indicators is hampered by the lack of defined thresholds which could be considered as sufficient. It is why some indicators are labelled as context indicators. However, some indicators deserve an improvement or a careful follow-up: the proportion of (new) GPs among all specialities, the proportion of nursing students with a bachelor degree, the delay between EU marketing authorisation and national accessibility of innovative medicines and the use of the electronic medical file.

Table 15 – Indicators on sustainability of the health system

(ID) Indicator			Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
Healthcare expenditures and financing									
S-1	Total Health Expenditures (% GDP)	**C**	10.2	2013	---	---	---	SHA	9.5[(1)]
S-2	Total Health Expenditures (€/capita)	**C**	3619	2013	---	---	---	SHA	US $ PPP 3860[(1)] [BE: $ 4256]
S-3	Total Health Expenditures (% financed by public sector)	**C**	77.8	2013	---	---	---	SHA	77.0 [(1)]
Health workforce in the future (inflow, outflow)									
S-4	Medical graduates (/100 000 population)	**C**	10.2	2014	---	---	---	Workforce Register	12.1[(1)]
S-5	Medical graduates becoming GP (% of those with medical specialisation)	⊕	28	2013	29[b]	26[b]	---	RIZIV – INAMI	---
S-6	Mean age of practising GPs (in FTE, years)	⊖	52.8	2013	---	---	---	RIZIV – INAMI	
S-7	Physicians aged 55+ (% of those practising)	⊖	43.2	2013	---	---	---	RIZIV – INAMI	34.8[(1)]
S-8	Nursing graduates (/100 000 population)	**C**	47.1	2014	---	---	---	Workforce Register	42.2[(1)]
S-9 ***NEW***	Nursing students following the bachelor track (% of new graduates)	**C**	---	2014	53.5[b]	61.3[b]	---	Workforce Register	----
S-10 ***NEW***	Nurses aged 50+ (% of those practising)	**C**	25.4	2009	23.7	25.1	28.2	Workforce Register	---
Maintenance of facilities									
S-11	Curative care bed-days (number/capita)	🟡	1.1	2012	1.1	1.2	1.0	MZG – RHM	1.1[(1)]
Innovation									
S-12 ***NEW***	W.A.I.T indicator for innovative medicines[a] (in days)	⊕	368	2012	---	---	---	EFPIA	278[(2)]
S-13	GPs using an electronic medical file (% of practising GPs)	⊕	76.7	2014	84.1	63.6	62.1	RIZIV – INAMI	---

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

GDP = Gross Domestic Product; PPP = Purchasing power parity; SHA = System of Health Accounts; FTE = Full time equivalents; GP = General Practitioner; EFPIA = European Federation of Pharmaceutical Industries and Associations

[a] W.A.I.T indicator defined as average number of days between marketing authorisation and patient access; [b] Data shown by communities (and not by region).

Sources of results for international comparison: [(1)] OECD Health Statistics 2015; [(2)] EFPIA reports.

10. HEALTH STATUS

The ultimate goal of a health system is to improve the health of the citizens. But health is a difficult concept to capture: up to now, it is chiefly measured by negative indicators (such as mortality) or by self-reported indicators (such as self-perceived health). Moreover, the link between health and the health system is usually thought to be weak.[65-67] Health is after all shaped by many determinants (biology, lifestyles, social conditions, environment, health policies), with the health system being just one of them. We include **7 health outcomes** in our dashboard (see Box 4), and interpret them as outcomes which are **possibly** influenced by the health system and/or by health promotion policies, among other determinants.

Box 4 – Premature, Avoidable, Preventable and Amenable mortality

Premature mortality is defined as mortality before 70 years (and expressed in potential years of life lost before 70 years).

The concept of **avoidable mortality** is based on the idea that certain deaths (for specific age groups and according to specific causes of death) could be 'avoided' or that their number could be reduced, if there had been more effective medical and public health interventions in place.[68]

- A death is considered to be **amenable** if, in the light of medical knowledge at the time of death, all or most deaths from that cause could have been avoided through good **quality healthcare**. Examples include deaths from appendicitis, pneumonia and peptic ulcer.
- A death is considered to be **preventable** if, in the light of understanding the determinants of health at the time of death, it could have been avoided by **public health policies** focusing on wider determinants of public health, such as lifestyles, socioeconomic status and environmental factors. Examples include deaths from road accidents, lung cancer, and alcohol-related diseases.

These two types of avoidable mortality are not mutually exclusive: some causes of death are considered to be both amenable and preventable (for instance, deaths from tuberculosis or breast cancer).

Indicators relying on death counts or causes of death

Life expectancy and **premature mortality** in Belgium have evolved positively. However, they rank quite poor among the EU-15 countries.

Mortality amenable to healthcare, on the contrary, ranks quite favourably among the EU-15 countries, mostly for men. This result can be interpreted as indication of an effective health system. The high premature mortality rate lies in not-amenable causes of deaths.

For those three indicators, the results are much better in women than in men. Important regional disparities are observed in favour of the Flemish region, with higher mortality rates in Wallonia, and generally intermediate results in Brussels. A socioeconomic gradient (worse outcomes for lower socioeconomic status) was observed for life expectancy (using data from the 2001 census). [69]

Infant mortality has declined significantly in the last decades, and has stabilized since 2009 around 3.5 to 4 per 1000. It is close to the EU-15 average. There has been a slight but non-significant excess of infant mortality in Flanders as compared with the other regions since 2009. This should be further explored, and in a first step the comparability of the data should be checked. A socioeconomic gradient was also observed (results available for Brussels and Flanders).[70,71]

Indicators including self-assessed health as part of their definition

We use two indicators using self-assessed health as part of the definition:

- the percentage of the population assessing their health as good or very good, as reported in the Health Interview Survey;
- the disability-free life expectancy (or Healthy Life Years), which pertains to the family of health expectancy. It combines life expectancy with the self-reported disability status, as declared with the Global Activity Limitation Indicator in the HIS.

Self-rated health was reported as good to very good by almost 80% of the population in the 2013 HIS. In all waves of the HIS, men rated their health better than women, while in 2013 the gender difference was smaller than in the previous years and no longer significant. There is also a socioeconomic gradient.

Healthy Life Years (HLY) at age 65 was 11.2 and 12.3 years in men and women respectively. Although women live longer than men, they do not live much longer in good health (in 2008, the number of HLY was equal in both sexes): women live more years with activity limitation. There are regional differences in the number of HLY in favour of Flanders. There has been an increase in HLY at 65 by about two years during the period 2001-2013. A socioeconomic gradient has also been observed.[69]

Conclusion

The indicators exclusively relying on mortality (except infant mortality) are evolving favourably, are better in women, are better in Flanders, worse in Wallonia and generally intermediate in Brussels. Belgium ranks poor as compared to the EU-15 average, except for mortality amenable to healthcare that ranks rather well, indicating an effective health system.

The indicators that rely also on self-rated health show a different gender pattern; women and men have quite comparable results, and sometimes men have even better results than women. The regional pattern is the same as for the mortality indicators. All health indicators show a socioeconomic gradient.

Table 16 – Indicators on health status

(ID)- Indicator			Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean) [BELGIUM]
Indicators based on mortality data									
HS-1	Life expectancy at birth (years)	⊕	M: 77.9 F: 82.9	2013	M: 78.9 F: 83.6	**M:76.1** **F: 81.7**	**M: 77.8** **F: 82.8**	Statistics Belgium	M:78.6 [BE:77.8] F:83.7 [BE:83.2](1)
HS-2 ***NEW***	Premature mortality (potential years of life lost before 70 years old /100 000 pop, age-adjusted)	🔴	M:4839 F:2709	2012	M:4194 F:2492	**M:6095** **F:3071**	M:4747 F:2863	Statistics Belgium	M:3750 [BE:4215] F:2074 [BE:2361](1)
HS-3 ***NEW***	Amenable mortality (rate/100 000 pop, age-adjusted)	⊕	M:119 F:86	2012	M:103 F:83	**M:145** F:91	**M:140** F:91	Statistics Belgium	M: 122 [BE:110] F:79 [BE:80](1)
HS-4 ***NEW***	Preventable mortality (rate/100 000 pop, age-adjusted)	🔴	M:272 F:142	2012	M:237 F:126	**M:341** **F:168**	M:273 **F:160**	Statistics Belgium	M:254 [BE:284] F:127 [BE:149](1)
HS-5	Infant mortality (deaths/1000 live births)	🟡	3.8	2012	**4.1**	3.4	3.5	Statistics Belgium	3.2 [BE:3.5](2)
Indicators based on self-assessed health									
HS-6	Healthy Life Years at age 65 (years)	🟢	M:11.2 F:12.3	2013	M:12.1 F:13.2	**M:9.6** **F:10.8**	**M:9.9** F:11.4	Statistics Belgium + HIS	M:9.8 [BE:10.8] F: 9.9 [BE:10.9](1)
HS-7	Self-perceived health (% pop 15+ in good or very good health)	🟢	77.9	2013	79.8	75.0	75.1	HIS	70.2 [BE:74.3](3)

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.
M = Male; F = Female
Sources of results for international comparison: (1) Eurostat; (2) OECD Health Statistics 2015; (3) Eurostat (EU-SILC)

11. HEALTH PROMOTION AND LIFESTYLES

Health promotion is “the process of enabling people to increase control over, and to improve their health”.[72] This process can be understood as the efforts made by a society to improve the health of its citizens. It covers a range of interventions, most of which situated for a considerable part outside the health(care) system (e.g. education, fiscal measures fostering greater equity, road security).

Box 5 – The place of health promotion monitoring in this report

A complete evaluation of the health promotion domain would require to rate crucial dimensions of the health promotion interventions: “**Participation, Empowerment, Sustainability, Multistrategic approach, Equity and Multisectoriality**”.[73] This is beyond the original objectives of this report.

Nevertheless, we were asked by the authorities to explore the feasibility of including health promotion in our monitoring tool. In the **exploratory phase** (described in the 2012 report), we reported that Nutbeam’s framework[74] appeared to be an interesting descriptive tool, in line with the Ottawa charter: in this framework, the health promotion indicators are classified in broad classes, ranking from most proximal indicators (health promotion actions) to final health and social outcomes (physical and social health). The previous exploratory phase concluded that **only a limited description of the health promotion situation could be performed within the framework of this report**, and that a true evaluation of health promotion would necessitate a **specific study**.

In this report, we present thus a partial description of health promotion, by means of 13 indicators, illustrating most categories of Nutbeam’s framework.[74] Although the most distal-from-action indicators (such as health outcomes or lifestyles) are easier to document, we also tried to describe more proximal indicators (such as health literacy). When possible, preference was given to indicators where the health system can be (at least partially) involved in the result.

Health outcomes

Three outcomes indicators were already presented in the health status section (HS-7 self-perceived health, HS-6 Healthy Life Years at age 65, HS-4 preventable mortality, Table 16). The other ten indicators are presented in Table 17.

The prevalence of obesity in adults is close to the EU-15 mean and has stabilized since the 2008 HIS. Again, regional disparities (in favour of Flanders) and a socioeconomic gradient are observed. Belgium ranks rather good for the prevalence of overweight in school-aged children and adolescents. However, this prevalence remains stable despite the efforts to promote healthy food and physical activity, which indicates that health promotion efforts could be intensified.

The HIV diagnostic rate is stable, which is not a satisfying result since this infection is perfectly preventable.

Lifestyles

The daily smoking prevalence is close to the EU-15 average. The prevalence of smoking is decreasing in both sexes, which is good news even if the proportion of daily smokers remains high.

Even in the absence of international benchmarking or national objectives, we can conclude that the level of physical activity is by far too low, mostly in women (and decreasing since 2008).

The hazardous alcohol consumption prevalence is not alarming, but the risky consumption (binge drinking) in young men is a matter of concern and has increased since 2008.

The daily smoking and physical activity levels show regional disparities (in favour of Flanders) and a typical socioeconomic gradient. The disparities in alcohol consumption are more complex, with a socioeconomic gradient in men and an opposite gradient in women.

Effective health services

The global medical record+ is a new module added to the global medical record managed by the GP to centralize the information of a patient. It includes a preventive part, to help the GP in the management of the preventive part of the care. The use of the global medical record + is relatively low but has improved over time.

Empowerment (health literacy)

Health literacy is a key outcome of health education, a crucial factor to improve health and a critical factor for empowerment.[75] An online survey conducted in 2012 gives a first insight of the magnitude of the problem of health literacy in Belgium. [76] It showed that more than 40% of the population has an insufficient health literacy.

Policy

Belgium ranks at an intermediate level on the Tobacco Control Scale, which internationally compares public policies to control the tobacco consumption.

Conclusion

None of the selected indicators on health promotion and lifestyle show favourable results, many show mediocre and several even poor results, such as the proportion of obesity in adults, the proportion of daily smokers, the rate of physical activity practice, the risky consumption (binge drinking) in young men and an insufficient health literacy.

Table 17 – Indicators on non-medical determinants of health and health promotion

ID - Indicator			Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-15 (mean)
Health outcomes									
HP-1	Obesity in adults (BMI ≥ 30) (% pop aged 18+)	🔴	13.7	2013	12.6	**16.1**	12.9	HIS	16.2 (1)
HP-2 ***NEW***	Overweight in adolescents (BMI exceeding normal weight limits (% pop aged 11, 13, 15)[a]	🟡	---	2010	Boys: 11.3[e] Girls: 10.3[e]	**Boys: 13.6**[e] Girls: 9.1[e]		HBSC	---
HP-3	Incidence of HIV (new diagnoses/100 000 pop)	🟡	All: 10 Belgian: 4	2013	All:4.6 BE:2.5	**All:6.5** **BE:3.9**	**All:20.4** **BE:10.2**	NSP HIV	7.6(2) [BE:10.8]
Lifestyles									
HP-4	Daily smokers (% pop aged 15+)	🔴+	18.9	2013	17.7	**21.5**	18.3	HIS	19.2(1)
HP-5	Hazardous alcohol drinking[b] (% pop aged 15+)	🟡	5.0	2013	4.7	5.2	**5.8**	HIS	----
HP-6	Binge drinking[c] (% pop aged 15+)	🔴-	8.5	2013	8.7	8.0	8.6	HIS	----
HP-7	Daily physical activity (at least 30 min) (% pop aged 18-64)	🔴	38.4	2013	42.3	**33.2**	**32.2**	HIS	----
Effective health services									
HP-8 ***NEW***	Global Medical Record + (% pop aged 45-75 with GMR)	🟡+	22	2011	21	21	**26**	RIZIV – INAMI	----
Health literacy (Empowerment)									
HP-9 ***NEW***	Health literacy (at least sufficient level) (% of pop aged 18+)	🔴	58.7	2011	61.9	**48.7**	52.5	CM-UCL[f]	53.5(3)
Policy									
HP-10	Tobacco Control Scale[d]	🟡	47/100	2013	---	---	---	ECL	---

Good (🟢), average (🟡) or poor (🔴) results, globally stable or trend not evaluated (empty), improving (+) or deteriorating (-).

Bold results indicate regions with a relative risk higher than 1.2 (or lower than 0.83) when compared to the region with the best results.
HBSC = Health behaviour in school-aged children; ECL = European Cancer League; BMI = Body Mass Index; NSP HIV = National Surveillance Programme HIV.
[a] As defined by the standard definition for child overweight[77]; [b] Hazardous drinking is defined as average weekly alcohol consumption exceeding threshold considered harmful; [c] Binge drinking is defined as 6+ drinks at one occasion at least once a week; [d] Tobacco Control Scale quantifies the intensity of 6 policies considered by WHO as priorities for a comprehensive tobacco control programme. 100 means maximum score on the 6 policies; [e] Data shown by communities (and not by region); [f] Source: study of the Christian sickness funds and the Université catholique de Louvain.[76]
Sources of results for international comparison: (1) OECD Health Statistics 2015; (2) European Centre Disease and Control 2011; (3) EU Health literacy survey

12. EQUITY AND INEQUALITIES

12.1. Socioeconomic inequalities in health and use of health services

Socioeconomic (SE) health inequalities refer to systematic disparities in health indicators (mortality/morbidity/determinants/use of services), most often in favour of social groups already advantaged by their position on the social scale. The presence of SE health inequalities is consistent and has long been recognized.[78, 79] Tackling health inequalities is a priority for WHO[80] as well as for the European Union[81]. To assess progress towards reducing social health inequalities it is important to measure and monitor them.[82]

Measuring health inequalities requires defining the social groups, and quantifying the inequality of the health indicator with a synthetic inequality measure.

Box 6 – How did we measure socioeconomic inequalities?

How did we define social groups?

We have described the socioeconomic status (SES) with the educational level (EL)[h] (or sometimes with the household income quintile) for most indicators from the HIS or from the census, and with the reimbursement status of medical expenses for the administrative databases[i].

How did we measure inequalities?

In order to quantify the size of the inequalities, detailed values by SES were summarized into inequality indices.[83, 84]

In this work, we used the following ones:

For Life/Health Expectancy:

- The *absolute difference* in years between the lowest and the highest EL groups.
- The *Relative Concentration Inequality Indices (CII)*: the CII is obtained by adding the differences in life expectancy of each EL group as compared to the group with the highest EL, weighted by the size of each group, and divided by life expectancy.

For the indicators issued from the Health Interview Survey or from the administrative databases:

- The *absolute difference* in age-adjusted rates between the lowest and the highest EL groups.
- The *ratio* of age-adjusted rates between the lowest and the highest EL groups.
- The *Population Attributable Fraction (PAF):* that is the relative gain in health (or health determinant) rate that would be expected at population level if all groups experienced the rate of the more advantaged social group. It is computed as the difference between the overall rate in the population and the rate in the more advantaged group, divided by the overall rate in the population.

We present **only the indicators with a relative risk (RR) of at least 1.2** (or 0.83 when the gradient was reverse), meaning a relative excess of at least 20% in the lowest versus the highest EL.

h Defined according to the International Standard Classification of Education (ISCED), then grouped into 4 levels: low education (no diploma or primary school diploma), lower secondary education, higher secondary education and higher education.

i There are two reimbursement statutes: entitled to increased reimbursement of medical expenses or not.

Table 18 shows the major socioeconomic inequalities in health outcomes (life and health expectancies, self-perceived health). They are endpoint measures pointing out equality problems in the chain of health determinants.

Inequalities are also present in many indicators of lifestyle (smoking, obesity, hazardous drinking in men, physical activity), and in the participation in preventive interventions such as cancer screening.

Despite the measures taken to improve the financial accessibility of healthcare, the indicator “having delayed medical contacts for financial reasons” reveals important inequalities.

The observance of the guidelines in the follow-up of diabetic people treated with insulin also reveals some inequalities.

No inequality was observed for the other indicators related to healthcare and for which the reimbursement status was available.

Other indicators previously discussed in this report (but not presented in Table 18) also displayed socioeconomic inequalities, for instance: infant mortality (results available for Brussels and Flanders),[70,71] contacts with a dentist[14] and health literacy in the population.[76]

Limitations

For many indicators, data on the social position were not available, so the presence of inequalities could not be measured. For the indicators derived from administrative databases, the only available socioeconomic indicator (reimbursement status) presents many limitations (two classes only, only 15% people in the disadvantaged class, very sensitive to age, also includes increased reimbursement for physical handicaps). Some issues known to be related to social inequalities were not studied in this work, such as the waiting time for some interventions. Therefore, our conclusions for the dimension inequality are largely incomplete.

Conclusion

People of a lower socioeconomic status (measured by level of education or by eligibility for increased reimbursement of medical expenses) have, in comparison with the highest socioeconomic group: a worse health status (life expectancy, healthy life expectancy, infant mortality, obesity), unhealthier behaviours (diet, smoking, physical activity), a lower health literacy, less participation in cancer screening and poorer follow-up of patients suffering from diabetes.

Table 18 – Indicators of socioeconomic inequalities in health status, lifestyles and health services

	Overall value	Value in lowest social group	Value in highest social group	Absolute difference (lowest vs highest SES)	Relative Risk (lowest vs highest SES)	Summary measure (CII or PAF)[d]
Health Status						
Life Expectancy at 25 in men, 2001 (years)[a]	51.4	47.6	55.0	-7.5	n.a.	3.7%
Life Expectancy at 25 in women, 2001 (years)[a]	57.1	54.0	59.9	-5.9	n.a.	1.4%
Healthy Life Years at 25 in men, 2001 (years)[a]	40.5	27.8	46.3	-18.6	n.a.	15.3%
Healthy Life Years at 25 in women, 2001 (years)[a]	40.4	28.9	47.1	-18.2	n.a.	16.6%
% of the population (aged 15+) rating their health as less than good[a]	19.0	38.7	13.5	25.2	2.87	-28.9%
Lifestyles and risk factors (HIS 2013)						
% of the population (aged 15+) reporting to smoke daily[a]	17.2	25.0	9.5	15.5	2.63	-44.8%
% of the male population (aged 15+) reporting to drink above 40g of ethanol daily[a]	4.4	7.1	3.6	3.5	1.97	-18.2%
% of adult population (aged 18+) being obese[a]	12.0	23.5	7.7	15.8	3.05	-35.8%
% the population (aged 18-64) reporting to practise at least 30 minutes of physical activity per day[a]	38.3	29.6	37.7	-8.1	0.79	-1.6%
Accessibility of care (HIS 2013)						
Delayed contacts with health services for financial reasons (% of households)[b]	8.0	19.0	3.0	16.0	6.33	-62.5%
Preventive care (EPS 2012)						
Lack of breast cancer screening (% women aged 50-69 who have not undergone a mammogram within the last two years)[c]	37.3	50.2	34.2	16.0	1.47	-8.3%
Lack of cervix cancer screening (% women aged 25-64 who have not undergone a Pap test within the last three years)[c]	46.4	58.4	44.3	14.1	1.32	-4.5%
Compliance to guidelines (EPS 2012)						
Proportion of adult diabetics (under insulin) not receiving regular retinal exams, test of serum creatinine and blood tests (% of patients)[c]	32.2	35.3	29.7	5.6	1.19	-7.8%

n.a. = not applicable;.CII = Concentration Inequality Index; PAF = Population Attributable Fraction.
[a] Based on four or five educational levels; [b] Based on five income levels; [c] Based on two reimbursement categories; [d] CII for life expectancy and healthy life years, PAF for all other indicators.

12.2. Contextual indicators of equity

Generally, equity refers to 'equality of something'. However, there is a large heterogeneity in the different approaches. Indeed, **vertical equity** is defined as the **unequal treatment of unequals** (for instance, tax systems which are organized so that everyone pays taxes based on ability to pay) while **horizontal equity** is defined as **equal treatment of equals** (for instance, the attempt to provide the same care to patients who have the same needs). Equity implies therefore some degree of solidarity between the richest and the poorest, between the healthy and the sick. In an attempt to reconcile solidarity and personal responsibility,[85] approaches have been proposed to define what should be equalized among individuals. Some propose to equalize resources,[86] while others prefer to equalize outcomes.[87] These theories offer interesting lines of thought and show how the definition of fairness and how to achieve it, are essentially normative issues and therefore philosophical issues.

Establishing equity indicators in the context of a report on the performance of a healthcare system requires an approach as neutral as possible and we can consider that the results we have observed reflect, at least implicitly, societal choices. In this chapter, we have evaluated the global equity of the healthcare system in an indirect (or contextual) way.

Progressivity and regressivity of financing of the healthcare system

The first contextual indicator of equity concerns the progressivity of financing of the healthcare system which translates equity before using the system. By progressivity we do not refer to patient cost sharing at the point of care (i.e. supplement, co-payment, coinsurance, non-reimbursable drugs, premiums to private insurance, etc.) but the way to finance the public system.

Financing is defined as:

- **progressive** (**regressive**) when the average rate of 'taxation' (considered in a broad sense) is increasing (decreasing) with the income;
- **proportional** when the average rate of taxation is constant.

We characterize the relative progressivity/regressivity of the most important sources of financing of the Belgian healthcare system. Globally, direct taxes are more progressive than social contributions which are in turn more progressive than indirect taxes. Simple ratios are computed to describe the progressivity/regressivity of financing for the period 2005-2010[j] (EQ-2 and EQ-3, Table 19). We do not evaluate the global redistribution effect of financing and the use of the healthcare system because such an evaluation implies the knowledge of individual data about consumption of care, all financing sources and the available income. These data are not all available for Belgium and a robust comparison with other countries is not possible due to lack of data. Wagstaff and van Doorslaer have contributed in a substantive way to the evaluation of the equity in financing and delivery of healthcare but, unfortunately, they do not mention Belgium in their work.[88] De Graeve et al. present some results for Belgium.[89]

The data show that the proportion of regressive financing resources has become higher between 2005 and 2010. Indeed, the ratio regressive receipts/progressive receipts was higher in 2010 with the amount of regressive receipts 3.5 times higher than the amount of progressive receipts (3.2 in 2005). Even if, on the other hand, progressive resources expressed as a percentage of total resources increased from 6.7 in 2005 to 7.5% in 2010, regressivity increases in general. From the combination of both indicators, we can deduce that regressive receipts increased from 21.6% (3.2 x 6.7%) of total receipts in 2005 to 26.5% (3.5 x 7.5%) in 2010.

j We limit the series of data to 2010 to take only final accounts into account.

The Gini coefficient, a measure of income inequality

A second contextual indicator of equity is the Gini coefficient which measures **income inequality** (EQ-1, Table 19). The Gini coefficient is equal to zero when the distribution of incomes among individuals or households is perfectly equal and equal to one when the distribution is completely unequal – one person owns the whole national income. Some authors have shown the association between income inequality and some indications of poor objective or subjective health.[90] The Gini coefficient is easy to interpret and to compute for Belgium and international organisations use it to characterize income inequality in an international perspective. It has been recommended by the WHO working group developing indicators for the "Health 2020 targets".[91]

The Belgian society is one of the most egalitarian if we compare the Gini coefficient before and after taxation and transfers (social allowances). Belgium is also one of the OECD countries with the largest redistribution (income inequality decreases with 48% after taxes and transfers; Belgium is the 8/35 countries with the lowest Gini after transfers). The high level of income redistribution and the more egalitarian distribution of disposable incomes is expected to be correlated with a better health of the Belgian population.

Conclusion

The two contextual equity indicators (progressivity/regressivity of financing and income inequality) show that public financing of the healthcare system remains regressive even if the progressivity ratio becomes higher (the amount of regressive receipts is 3.5 times higher than the amount of progressive receipts), and that our redistribution system (taxes and transfers) makes our country one of the most egalitarian in the OECD.

These two results are not contradictory because society can organise a substantial income redistribution using a large system of transfers and taxes and finance a specific collective sector (i.e. the public healthcare system) using resources (taxation and contributions) that are to a larger extent regressive.

Table 19 – Contextual indicators of equity

(ID)	Indicator		Belgium	Year	Flanders	Wallonia	Brussels	Source	EU-27 (mean)
EQ-1	Income distribution in population (GINI coefficient)	**C**	0.259	2013	-	-	-	Statistics Belgium	0.306(1)
EQ-2	Degree of progressivity of financing healthcare (Ratio progressive receipts / total receipts, expressed as a %)	**C**	7.5[a]	2010	-	-	-	FOD – SPF Social Security + RIZIV – INAMI + National Bank of Belgium	-
EQ-3	Degree of regressivity of financing healthcare (Ratio regressive receipts / progressive receipts)	**C**	3.5[a]	2010	-	-	-	FOD – SPF Social Security + RIZIV – INAMI + National Bank of Belgium	-

[a] Based on final accounts.
Source of results for international comparison: (1) OECD Health Statistics 2015

13. CONCLUSIONS ON STRENGTHS AND WEAKNESSES OF THE BELGIAN HEALTH SYSTEM

Numerous positive developments are highlighted, as well as some issues for consideration.

High patient satisfaction and self-assessed health scores

From a patient's perspective, the assessment is quite positive: a large part (78%) of the Belgian population reports to be in good health, which is a better result than the EU-15 average. The Belgian population also reports to be satisfied with their contacts with the health system, especially in ambulatory care. However, a more balanced image appears when examining the whole set of indicators.

An accessible health system, but with relatively high out-of-pocket payments

Accessibility of the system is guaranteed by a universal insurance coverage and the existence of social safety nets (maximum billing, increased reimbursement of medical expenses). However, some concerns subsist: there is a high level of out-of-pocket payments (18% of total health expenditures, which is high compared to other European countries), and the share of households who report to have delayed contacts with health services for financial reasons is still 8%.

Quality of curative care is average, with signs of improvement

Most aspects of the quality of care are situated within the EU-15 average, with some better points, such as a low mortality from causes avoidable through the health system, and some weak points, such as indicators in the appropriateness of care (for instance prescription of antibiotics or medical imaging exams) and in safety as shown by nosocomial infections. However, a favourable evolution is observed in colorectal cancer survival, in the coordination of care for cancer patients and for diabetic patients using insulin, in avoidable admissions for diabetic patients, in AMI-case fatality rates and in MRSA infections in hospitals.

Health promotion, lifestyles and preventive care deserve more attention

Several indicators of health promotion and lifestyle show poor results, such as the stagnation of obesity in adults, the still high prevalence of daily smokers, the low rate of physical activity, risky alcohol consumption (binge drinking) in young men and insufficient health literacy in the population. The other indicators are within the EU-15 average.

In addition, preventive care does not always meets international targets: some infant vaccination coverage is still lower than the recommended immunization threshold, breast and cervix cancer screening coverage are suboptimal and not improving and influenza vaccination of the elderly is even diminishing. Moreover, a large share of the population has no regular contacts with a dentist.

Mental health and healthcare show worrying signals

The results of the mental health and healthcare indicators remain alarming. Suicide rates are still high. Past reform efforts in the psychiatric sector are not (yet) sufficiently visible. Hospitalisation rates in psychiatric wards continue to increase, as does the use of antidepressants. Waiting times for access to mental health centres are long, questioning the accessibility of mental health services.

Accessibility and quality of care in residential facilities for elderly patients

Quality of care in residential facilities for the elderly shows mixed results: MRSA carriage is decreasing, and the prevalence of pressure ulcers is relatively low. Points of concern are the accessibility of specialists, and the number of polymedicated elderly, with consequences for patient safety.

Accessibility and quality of care at the end of life

Quality of care at the end of life also shows mixed results: patients have improved access to palliative services, and aggressiveness of care at the end of life is relatively low. The hospital remains, however, the most common place of death.

The efficiency of the health system is improving, but there is still room for improvement

The health system is becoming more efficient in many aspects, as suggested by the increased use of low-cost medication, by the shift from classical (at least one night) to one-day surgical hospitalisations, and by a decrease in the length of stay for a normal delivery. However, also inefficiencies persist in different areas, as indicated by large unexplained geographic variation in some interventions or healthcare costs, over-use of investigations/equipment and inappropriate treatment in many domains of care.

Workforce: GPs quotas and nurses shortage

The indicators on current GP and nurse workforce availability question the Belgian capacity to cope with demographic changes (e.g. ageing population, higher prevalence of multiple chronic conditions). The proportion of (new) GPs among all specialties does not reach the quotas fixed by the Planning Commission, and the average age of practising GPs is growing faster than for other specialties. Although the number of nursing graduates has increased in the last years, the number of nurses per patient in the hospital is lower than in other countries.

Socioeconomic inequalities are large in health and determinants of health

Inequalities are present in many indicators of health status, of lifestyle (smoking, obesity, hazardous drinking in men, physical activity) and in preventive interventions like cancer screening. Despite the measures taken to improve the financial accessibility of healthcare, the indicator “having delayed contacts with health services for financial reasons” reveals important inequalities.

Regional disparities are documented

For many indicators in this report, minor to very large regional differences are observed, and deserve to be further explored.

Total health expenditures stopped growing in 2012 and 2013

Total health expenditures represent 10.2% of our gross domestic product, and are mainly financed by the public sector (78%). Expenditures on health are slightly higher than the EU-15 average. Per capita health spending has remained unchanged in real terms for both 2012 and 2013 compared to 2011.

PART 3 – DISCUSSION

14. BELGIAN HSPA AND POLICY PROCESS

14.1. The Belgian HSPA in the policy process

The role of a HSPA project in the policymaking process is of utmost importance. A policy process traditionally consists of agenda setting (problem recognition and prioritising), policy formulation (proposal of solutions), decision making (choice of solution), policy implementation (putting solutions into practice) and policy evaluation (monitoring the results).[92]

Strong governance support

The Belgian HSPA project, of which HSPA reports are important regular milestones, has many connections with policymakers.

The following prerequisites to include HSPA into policymaking can be identified:

1. *Existence of a strong commitment at high level*
   On 18 March 2008, following a recommendation of the Tallinn Charter, a commitment was formulated in the Belgian governmental agreement on public health: “The performances of our health system (including quality) are to be assessed on the basis of measurable objectives.” This commitment – renewed by the following governments and supported by all heads of administrative bodies – was of great importance to put HSPA on the political agenda.
2. *Involvement of all health administrations*
   Belgian health authorities asked their health administration to contribute to and give feedback on the HSPA report. An inter-administration working group has been created to monitor the project. The ten administrations (federal and regional) related to health were involved in the process.

3. *Independent scientific body*
   An independent scientific group, composed of researchers of the Belgian Health Care Knowledge Centre (KCE), the Institute of Public Health (WIV – ISP) and the National Institute for Health and Disability Insurance (RIZIV – INAMI), has been put in charge of performing the assessment.
4. *Importance to capture needs, possible barriers and resistance*
   At the time of the first evaluation study (2009),[4] a survey was addressed to stakeholders to find out their expectations. They expressed the need for evaluation, accountability, international comparison and improvement. Several barriers and risks were identified: lack of culture of evaluation, resistance, and complexity. They especially feared that no follow-up HSPA report would be made and that no decisions would be taken based on the first report.
5. *Making the link between scientific bodies and policymakers*
   The inter-administration working group operates as a policy working group of the inter-ministerial conference (IMC) and reports to this conference. Its role is to fill the gap between scientific issues and policy issues to improve the health system, helping to translate evaluation into policy questions if needed. The role of the inter-administration working group has been crucial to insure continuity and to encourage actions.

Policymakers' responses after the 2012 HSPA report: lessons learned and suggestions for improvement from the policymakers

The 2012 report,[5] presenting a first full HSPA diagnosis, was an opportunity to enter into an improvement process. Concretely, the Ministers of Health called special attention for and monitoring of the warning signals shown in the report.

Several priorities for improvement have been identified by the inter-administration working group: these priorities are linked to health promotion (obesity, tobacco, alcohol), screening strategy (breast, colorectal), mental health (suicides, antidepressants), chronic care (quality of the follow-up), safety (exposure to medical radiation, antibiotics), policy to enhance the role of GPs (new graduates, patient registration) and accessibility (delay in seeking care for financial reasons).[93] These topics have been addressed to IMC working groups that were invited to analyse the results, define or improve the strategy of the health authority members of the working groups and set specific targets.[44] Most of the IMC working groups engaged in an improvement process in 2013-2014: the problems that were identified were recognized and accepted, some groups adapted their programme for the next year, proposed to monitor new indicators, and included specific targets for some of them (see Box 7). But, due to the time lag in data availability, none of the groups could show positive results in such a short period.

Box 7 – An example of targets set by the BAPCOC (2014-2019)

- **A decrease in total antibiotic consumption,** from more than 800 prescriptions per 1000 inhabitants per year today to 600 prescriptions by 2020 and 400 prescriptions by 2025;
- **A decrease in quinolones consumption,** from about 10% of the total antibiotic use today to 5% by 2018;
- **An increase in the ratio amoxicillin versus amoxicillin + clavulanic acid**, from about 50/50 today to 80/20 by 2018.

Several lessons could be learned from this experience, and two issues arising from the difficulty to translate HSPA into policymaking have been identified First, most of the IMC working groups had problems with some indicators which did not reflect their positive action in the domain, either because the indicator was too global or because it was not directly measuring specific actions. As a matter of fact, HSPA reports should remain a global evaluation (helicopter view) rather than be used to monitor the effect of specific programmes. In this view, it is sometimes difficult to use the same indicator for evaluation and monitoring. Performance indicators should indeed help to identify problematic topics, but these indicators are not always the best to monitor a situation and set targets. Second, some data were clearly outdated for diagnosis as well as for monitoring. This is inherent to the use of administrative data or registries. For international comparison, we sometimes had to rely on data from many years ago. Unavailability of recent data makes reporting at short intervals pointless.

Hereunder are different lessons learned from our experience with policy makers:[93]

- **Easy to understand**

  The data visualization and the presentation of comparisons must be attractive, understandable, standardized and adjusted to the different types of readers. Warning signals should facilitate the prioritising of needed actions and/or further studies. These were the objectives of the synoptic tables and their colour codes presented in this report.

- **Universal message but in tailored reporting**

  HSPA and quality indicators are firstly addressed to policymakers as a tool to align priorities and foster commitments to solve problems. However, some dimensions can be dedicated to specific actors. For example, while financial access is specifically a policymakers' issue, effectiveness and appropriateness issues also concern health professionals.

  As an example of monitoring tool addressed directly to health professionals, the extensive Belgian data collection on patient healthcare consumption and health professionals activity allows to send feedbacks, including benchmarking, to each health professional on his/her own activity. These feedbacks can be discussed within peer review committees to foster improvement.

- **Address concrete recommendations**

  To improve the usefulness of the report concrete actionable recommendations are needed. The IMC working group plays an important role in making these concrete recommendations to policymakers and pointing out priorities (including on data collection).

- **Explicit health objectives**

  The formulation of health(-related) objectives is essential to compare them with actual measures in the next HSPA reports. This is discussed in the next section.

14.2. Health system targets

The large majority of the evaluations in this report relies on international benchmarking, positioning Belgium amongst the EU-15 countries. Nevertheless, some results can be good when compared to other countries, whilst they fail to meet the country objective. Moreover, interpreting the results of international comparison of performance is still under debate:[12] there are many pitfalls, such as methodological and contextual variations, making meaningful comparisons difficult. A much better option is to confront results to available targets.

Setting public health objectives, or health targets, has internationally become a necessary prerequisite to guide health policymaking and to prioritise investments in the health sector.[94] Targets are necessary to monitor the health system performance, as references to compare the indicators results. They also allow to prioritise actionable measures. Finally, they increase public accountability. An OECD survey among 29 countries showed that most countries currently have public health objectives. At the time of the survey, Belgium was among the few exceptions.[94]

At the federal level, we have no tradition (yet) of working with health targets as a constitutive part of a long-term strategy for healthcare policymaking. At the Flemish level, health targets for preventive healthcare were first defined in 1998.[95] A recent evaluation of the first ten years of this target-based approach concluded that health targets "can lead to a more transparent policy for prevention, enable better health policy processes and create more synergy among organizations in the field of prevention, health promotion and beyond."[96] The European Observatory on Health Systems and Policies made several recommendations about various dimensions of target setting and monitoring that can help to improve health system performance.[97-99] The recent report on the reform of the Belgian hospital payment system also explicitly recommended the definition of health objectives and targets.[100]

15. CONCLUSION

This report presents the third evaluation of the performance of the Belgian health system, building on a former feasibility study and on the 2012 Report. By means of 106 indicators, it provides a broad picture of the performance of the health system. The indicators provide warning signals with respect to the status of the health system in terms of accessibility, quality, efficiency, sustainability and equity. In some cases, policymakers may already be aware of the problems, and have already commissioned additional analyses to know which actions to take. In other cases, these signals are new to policymakers, and will thus require further in-depth analysis. In any case, the comprehensive and structured way indicators are presented intends to facilitate the prioritising of needed actions and/or further studies.

The ultimate goal of the health system is to contribute to improve the health of citizens living in Belgium. We believe this report is a valuable tool to help attaining this goal.

The following warning signals have been identified in the 2015 performance report (see Box 8).

Box 8 – Warning signals from the 2015 performance report

In the domain of preventive care, there are simple and effective preventive interventions for which coverage is too low:

- Vaccination against influenza for the 65+ years old is below WHO targets and is decreasing.
- The coverage rates of breast and cervical cancer screening in the target groups are relatively low and stagnate. Coverage of colorectal cancer screening is also low, but improving. Moreover, the coverage of organised breast cancer screening is too low to be efficient. Screening of women aged 40 to 49 is high, while women of this age group do not belong to the breast cancer screening target group.
- Only half of the population has regular contacts with a dentist.

Financial accessibility can be measured by the amount of out-of-pocket payments by patients. Measured in per capita terms, OOP payments are much larger in Belgium than the European average, and are also increasing over time. This questions the financial protection of patients with regard to their health expenses. However, because some concerns have been expressed on the reliability of the Belgian data on out-of-pocket payments in international databases, more detailed analyses should be performed on this aspect.

With regard to the quality of care, for several indicators there is room for improvement, namely in the areas of appropriateness, safety and continuity of care:

- The choice of antibiotics that are prescribed in first instance does not adequately meet the recommendations and shows no signs of improvement over the course of time (except in children).

- The percentage of diabetic patients that are followed up in line with the recommendations is too low, due to lower than recommended ophthalmologist consultations. This can also point to problems in accessibility for some specialities and/or poor coordination of care for chronic patients. Results are especially low for diabetic patients who are using oral antidiabetics.
- Exposure to radiation of medical origin is high, especially from non-appropriate medical exams. A slight improvement can been seen, however, since 2011, despite no improvement on spine CT examination.
- The prevalence of nosocomial infections in hospitals is too high in comparison with what would be expected based on the case-mix of hospitalised patients.
- The mean number of patients per professional nurse in acute hospitals is amongst the highest in Europe, which can have adverse effects on the quality of care.
- The rate of caesarean sections is lower than EU-average but higher than WHO recommendations and the proportion of caesarean sections after a complication-free pregnancy varies greatly from hospital to hospital.

In the domain of mental health and mental healthcare:

- The high burden of suicide is challenging, mainly in men: suicide ranks as the first cause of male premature mortality in terms of Potential Years of Life Lost.
- Waiting times for a first contact in ambulatory mental health centres are long, pointing out problems in the accessibility and provision of mental health services.
- 13.4% of the adult Belgian population has at least one prescription for antidepressants per year. Yet, the duration of the antidepressant therapy is lower than the recommended duration in nearly half of the cases.
- A high percentage (15.4%) of older patients (65+ years old) with prescribed antidepressants, receive prescriptions for anticholinergic antidepressants, known for their side-effects in this population (e.g. falls).

In the domain of long-term care, several indicators show poor results for

- The percentage of adult diabetics (using insulin) with appropriate follow-up is low for patients in residential care, because visits to the ophthalmologist are less frequent. This questions the coordination of care for elderly patients in residential settings.
- Excessive polymedication is a known issue for the elderly patient population, and has implications in terms of safety of care.
- The use of antidepressants is also very common in this specific population, and may question the appropriateness of the prescription.

In the domain of care at the end of life:

- The percentage of people dying at their usual place of residence (home or in residential care) is low and shows no improvement.

On the availability of workforce in general medicine:

- General medicine is a key part of the health system. Therefore it is worrying that the average age of general practitioners continues to increase, and that the quotas for general practitioners laid down by the Planning Commission have not been filled for several years now. If this situation remains the case, it may very quickly lead to problems for the functioning of primary care.

On the health status of the population:

- Premature mortality is relatively high in Belgium. This is more the case for causes of death preventable through public health policies than for causes amenable to the health system. In particular, Belgium ranks very high for premature mortality due to suicide, lung cancer and road accidents.
- Despite the effort in prevention campaigns, the obesity prevalence in adult people stagnates, while the number of people engaging in physical activity seems to be relatively low, mainly in women.
- Binge drinking in young men (aged 15-24) is worrying. The health literacy level is thought to be rather low but more research is needed.

Socioeconomic inequalities:

- People of a lower socioeconomic status (measured by level of education or by eligibility for increased reimbursement of medical expenses) have, in comparison with the highest socioeconomic group: a worse health status (life expectancy, healthy life expectancy, infant mortality, obesity), unhealthier behaviours (diet, smoking, physical activity), a lower health literacy, a lower participation in cancer screening, and poorer follow-up of patients suffering from diabetes and a higher level of unmet needs for financial reasons.

Regional differences:

- Regional disparities are also observed for many indicators.

RECOMMENDATIONS[k]

***Recommendation 1 to policymakers:* define measurable health objectives**

The concept of performance is implicitly linked to the attainment of objectives, most of which are currently lacking in Belgium. In the absence of quantifiable objectives, this report describes the current situation and trends in Belgium, compares these where possible with international targets and benchmarks. However, this approach presents some shortcomings: the confrontation with country-specific objectives would give this report an important added value to support the agenda setting. Policymakers should therefore define health (system) objectives that are measurable, set deadlines by which these objectives should be attained, and appoint accountable organisations. Quantified targets should be proposed along with specific objectives.

***Recommendation 2 to policymakers:* be aware of the warning signals and tackle the problems**

One objective of the performance report is to inform policymakers on areas that require attention. The concerned institutions and bodies are advised to take the warning signals (described in Box 8) into account for their agenda setting.

***Recommendation 3 to health administrations:* continue to improve the integration of health information systems**

The data quality and timeliness are essential for the relevance of the indicators.

***To the attention of the FOD – SPF Public Health*:**

- **Continue efforts started on the integration of several health information sources, according to eHealth Action Plan 2013-2018.**
- **Use a Unique Patient Identifier (UPI) allowing linkage of RHM — MZG and RPM —-MPG with mortality data from the Crossroads Bank for Social Security (Kruispuntbank van de sociale zekerheid – Banque Carrefour Sécurité Sociale). The UPI allows to follow-up patients after discharge through the entire health system. Linkage with mortality data and follow-up after discharge would allow the computation of a number of international quality indicators, which cannot be computed for the moment.**
- **Accelerate access to administrative databases (for instance, reduce the delay in access to the Minimum Hospital Data).**

[k] The KCE has sole responsibility for the recommendations.

To the attention of the FOD – SPF Public Health, RIZIV – INAMI and WIV – ISP:

- **Continue the efforts to transmit updated information to international organisations (OECD, Eurostat, WHO).**

APPENDIX

APPENDIX 1. LIST OF INDICATORS

P-1	Polio, diphtheria, tetanus and pertussis vaccination in children (%, 3th/4th dose)
P-2	Measles vaccination in children (%, 1th/2th dose)
P-3	Hepatitis B vaccination in children (%, 3th/4th dose)
P-4	Influenza vaccination (% pop aged 65+)
P-5	Incidence of measles (new cases/million pop)
P-6	Breast cancer screening (% women aged 50-69)
P-7	Breast cancer screening - organized programme (% women aged 50-69)
P-8	Cervix cancer screening (% women aged 25-64)
P-9	Colorectal cancer screening (FOBT) (% pop aged 50-75)
P-10	Breast cancer screening outside age target group (% women aged 40-49)
P-11	No regular contacts with dentist (% pop aged 3+)
A-1	Health insurance status of the population (% of population)
A-2	Out-of-pocket payments (% of total health expenditures)
A-3	Out-of-pocket payments (in US $ PPP/capita)
A-4	Self-reported delayed contacts with health services for financial reasons (% of households)
A-5	Practising physicians (/1000 population)
A-6	Practising nurses (/1000 population)
A-7	Number of nurse vacancies
A-8	Patient-to-nurse ratio
A-9	Waiting time of more than two weeks to get an appointment with a specialist (% of population asking an appointment)
QE-1	Asthma hospital admissions in adults (/100 000 pop)
QE-2	Complication of diabetes hospital admissions in adults (/100 000 pop)
QE-3	Breast cancer 5-year relative survival rate (%)
QE-4	Colorectal cancer 5-year relative survival rate (%)
QE-5	Case-fatality within 30 days after admission for AMI (pop aged 45+, admission-based, %)
QE-6	Case-fatality within 30 days after admission for ischemic stroke (pop aged 45+, admission-based, %)
QA-1	Proportion of adult diabetics with appropriate follow-up (% of diabetic patients under insulin)
QA-2	Proportion of adult diabetics with appropriate follow-up (% of diabetic patients under oral antidiabetics only, aged 50+)
QA-3	Use of antibiotics (total DDD/1000 pop/day)
QA-4	Use of antibiotics at least once in the year (% of population)
QA-5	Use of antibiotics of second intention (% total DDD antibiotics)
QA-6	Medical radiation exposure due to non-appropriate medical imaging (mSv/capita/year)
QA-7	Caesarean sections (/100 live births)

QS-1	Prevalence of hospital-acquired infections (% of patients hospitalised)
QS-2	Incidence of hospital-acquired MRSA infections (/1000 hospital stays)
QS-3	Incidence of post-operative pulmonary embolism or deep vein thrombosis, after hip or knee replacement (/100 000 hip or knee surgery discharges)
QS-4	Incidence of post-operative sepsis after abdominal surgery (/100 000 abdominal surgery discharges)
QS-5	Prevalence of hospital-acquired cat II-IV pressure ulcers (% of patients hospitalised)
QS-6	Polymedication (5 or more different medicines within last 24 hours) (% pop aged 65+)
QS-7	Excessive polymedication (9 or more different medicines within last 24 hours) (% pop aged 65+)
QC-1	Coverage of global medical record (% of pop with at least one contact with their GP within three years)
QC-2	Usual Provider Continuity index ≥ 0.75
QC-3	GP encounter within 7 days after hospital discharge (% patients 65+)
QC-4	Proportion of adult diabetics (under insulin) with a convention/passport/care trajectory (% of patients)
QC-5	Proportion of adult diabetics (under oral antidiabetic only) with a convention/passport/care trajectory (% of patients, 50+)
QC-6	Patients with cancer discussed at the multidisciplinary team meeting (%)
QP-1	Doctor spending enough time with patients during the consultation (% of respondents, contact with GP/SP)
QP-2	Doctor providing easy-to-understand explanation (% of respondents, contact with GP/SP)
QP-3	Doctor giving opportunity to ask questions or raise concerns (% of respondents, contact with GP/SP)
QP-4	Doctor involving patients in decisions about care and/or treatments (% of respondents, contact with GP/SP)
MH-1	Deaths due to suicide (/100 000 pop)
MH-2	Practising psychiatrists (/1000 pop)
MH-3	Waiting time longer than 1 month for first contact in ambulatory mental health centre (% of pop with contact in ambulatory mental health centre)
MH-4	Rate of involuntary committals in psychiatric hospital wards (/10 000 pop)
MH-5	ER visits for social, mental or psychic reason (% of admission in ER in general hospitals)
MH-6	Use of antidepressants (total DDD/1000 pop/day)
MH-7	Use of antidepressants (% of adult population, at least once in the year)
MH-8	Percentage of patients with short-term duration (< 3 months) of antidepressants treatment (% of pop under antidepressant)
MH-9	Patients (65+ years old) prescribed antidepressants with anticholinergic effect (%)
MH-10	Number of hospitalisation days in psychiatric hospital wards (/1000 pop)
LT-1	Long-term care in residential facility (% pop aged 65+)
LT-2	Long-term home nursing care (% pop aged 65+)
LT-3	Informal carers (% of pop aged 15+)
LT-4	Fall incident during the last 12 months (% pop aged 65+)
LT-5	Prevalence of pressure ulcers (grade II-IV) in home for the elderly (% of residents)
LT-6	Prevalence of MRSA carriage in residential facility (% of residents)
EOL-1	Patients who received palliative care (% of terminal cancer patients who died in the year)
EOL-2	Patients who died within one week after start of palliative care (% of terminal cancer patients who received palliative care and died in the year)
EOL-3	Patients who received chemotherapy in the last 14 days of life (% of terminal cancer patients who died in the year)
EOL-4	Death at usual place of residence (home or in residential care) (% of terminal cancer patients who died in the year)
E-1	One-day surgical admissions (% of surgical admissions)

E-2	Length of stay normal delivery (mean, days)
E-3	Use of low-cost medication (% of total ambulatory DDDs)
S-1	Total Health Expenditures (% GDP)
S-2	Total Health Expenditures (€/capita)
S-3	Total Health Expenditures (% financed by public sector)
S-4	Medical graduates (/100 000 population)
S-5	Medical graduates becoming GP (% of those with medical specialisation)
S-6	Mean age of practising GPs (in FTE, years)
S-7	Physicians aged 55+ (% of those practising)
S-8	Nursing graduates (/100 000 population)
S-9	Nursing students following the bachelor track (% of new graduates)
S-10	Nurses aged 50+ (% of those practising)
S-11	Curative care bed-days (number/capita)
S-12	W.A.I.T indicator for innovative medicines (in days)
S-13	GPs using an electronic medical file (% of practising GPs)
HS-1	Life expectancy at birth (years)
HS-2	Premature mortality (potential years of life lost before 70 years old/100 000 pop, age-adjusted)
HS-3	Amenable mortality (rate/100 000 pop, age-adjusted)
HS-4	Preventable mortality (rate/100.000 pop, age-adjusted)
HS-5	Infant mortality (deaths/1000 live births)
HS-6	Healthy Life Years at age 65 (years)
HS-7	Self-perceived health (% pop 15+ in good or very good health)
HP-1	Obesity in adults (BMI ≥ 30) (% pop aged 18+)
HP-2	Overweight in adolescents (BMI exceeding normal weight limits),(% pop aged 11, 13, 15)
HP-3	Incidence of HIV (new diagnoses/100 000 pop)
HP-4	Daily smokers (% pop aged 15+)
HP-5	Hazardous alcohol drinking (% pop aged 15+)
HP-6	Binge drinking (% pop aged 15+)
HP-7	Daily physical activity per day (at least 30 min) (% pop aged 18-64)
HP-8	Global Medical Record + (% pop aged 45-75 with GMR)
HP-9	Health literacy (at least sufficient level) (% of pop aged 18+)
HP-10	Tobacco Control Scale
EQ-1	Income distribution in population (GINI coefficient)
EQ-2	Degree of progressivity of financing healthcare (Ratio progressive receipts / total receipts, expressed as a %)
EQ-3	Degree of regressivity of financing healthcare (Ratio regressive receipts / progressive receipts)

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COLOPHON

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