Interim Report

Cooperation with OECD in promoting efficiency in health care – Scoping paper on health system efficiency measurement

December 2016

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Cooperation with OECD in promoting efficiency in health care

Scoping paper on health system efficiency measurement

Interim Report (Substantive report)

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REFERENCE: No. VS/2015/0422 (DI150037)

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This document was produced with the financial assistance of the European Union Programme for Employment and Social Innovation "EaSI" (2014-2020, EC-OECD grant agreement No. VS/2015/0422). The opinions expressed and arguments employed herein do not necessarily reflect the official views of the OECD member countries or of the European Union.

INTERIM REPORT (SUBSTANTIVE REPORT)

Agreement	No. VS/2015/0422 (DI150037)
Title	Cooperation with OECD in Promoting Efficiency in Health Care
Reference period	1 October 2015 – 30 September 2016

In accordance with Article 3.2 of the General Conditions, this substantive report and the accompanying Interim Report on activities provide a complete account of all relevant aspects of the implementation of the Action for the period covered. This part provides the substantive report, that is, the scoping paper on the measurement of health system efficiency. Full financial details, including all expenses actually incurred by the Organisation, will be provided in the Financial Report which is being sent with this report.

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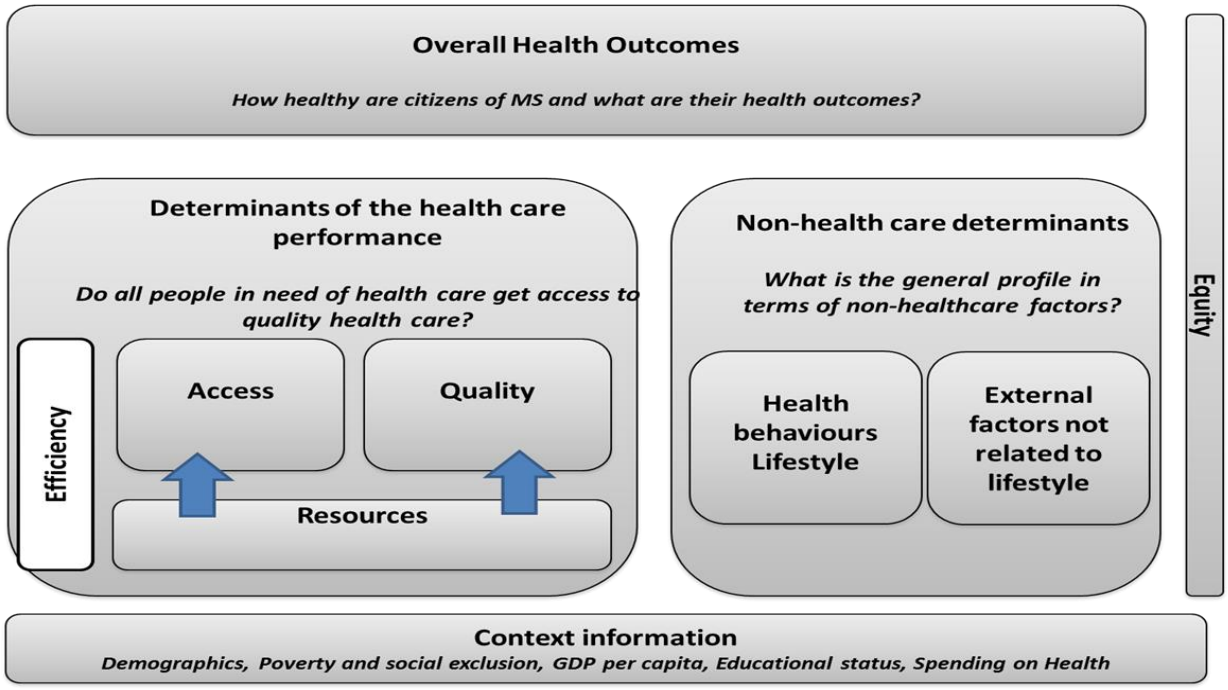
SCOPING PAPER ON HEALTH SYSTEM EFFICIENCY MEASUREMENT

General Introduction

Improving the efficiency of health systems is a key policy objective in most EU countries to reconcile growing demands for health care with limited public (and private) budgets. Achieving health system efficiency goals, together with equity goals, is an important cross-cutting dimension of the OECD health system performance assessment framework and the Joint Assessment Framework (JAF) on Health of the Indicator Sub-group of the Social Protection Committee of DG Employment (Figure 0.1).

Figure 0.1. Joint Assessment Framework on Health



Source: ISG, Social Protection Committee

Based on conventional economic theory, "efficiency" is the relationship between one or more inputs (or "factors of production") and one or more outputs. However, in the health sector, the measurement of efficiency is complicated by the fact that what really matters to "consumers" (patients) is not so much the health care "outputs" (e.g., consultations with doctors or different surgical procedures/treatments), but the "outcomes" of these activities (i.e., surviving and recovering from various health problems, and generally feeling better). While data on the outcomes of various health interventions are crucial to measure health system efficiency, they are generally less readily available than data on the outputs (activities of health systems. Moreover, when they are available, a clear attribution of the outcomes of various

health interventions to the "producers" of these services (i.e., health professionals) is not always straightforward because many other factors beyond the quality of the care provided may affect the ultimate health outcomes for patients, including the inherent uncertainties associated with many health interventions, and individual patient characteristics and behaviours. Efficiency has proven to be the most challenging dimension of health system performance to measure in many countries as well as in the JAF Health. As one leading health economist put it, *"the concept of "productivity" [or "efficiency"] is very simple in principle, but rather slippery to pin down in practice"* (Evans, 2010).

The main objectives of this scoping paper on the measurement of health system efficiency are to:

1. clarify some of the definitions, concepts and possible approaches to measuring the efficiency of health systems;

2. review indicators of health system efficiency that have been developed and used in different EU countries and for international comparisons at the EU and OECD level; and

3. identify data currently available across countries to measure and compare health system efficiency, and some of the most important data gaps to allow more complete comparisons of health system efficiency across EU and other OECD countries.

This scoping paper addresses a number of conceptual and practical questions, including:

1. Efficiency measures of what? Different types of efficiency measures may be useful to inform and guide decisions at various levels: national policy-makers, regional policy makers/managers, managers of health insurance or health care facilities, individual clinicians, and patients. What is the potential scope of efficiency measurement and at what level (system-wide level, sectoral level, disease-specific level)?

2. How to define and measure different types of efficiency? What is the difference (and potential overlap) between efficiency and productivity, between efficiency and effectiveness, between efficiency and quality? What are the main challenges and opportunities to link inputs, outputs and outcomes of health systems at different levels? What is the difference (and potential overlap) between "technical efficiency" (doing more with less) and "allocative efficiency" (doing the right things in the right place)?

3. What data are required to construct different measures of efficiency? What datasets are most available, in a comparable way, across countries, and what are the most important data gaps? How might we go about filling some of these key data gaps?

This scoping paper is structured around five chapters:

- Chapter 1 defines some of the key concepts and different approaches that can be used to measure the efficiency of health systems. It proposes: one general framework to measure health system efficiency; two broad types of efficiency indicators (technical efficiency and allocative efficiency); and 3) three possible levels of analyses (system-wide level, sub-sector level, disease-based level).

- Chapter 2 begins the discussion of health system efficiency measurement at the system-wide (macro) level. It reviews current the data available to measure the inputs and outcomes of health system at the system-wide level, and possible ways of linking these inputs and outcomes measures, along with the main limitations of such type of macro level analysis.

- Chapter 3 goes deeper into the analysis of health system efficiency measurement by looking at indicators that might be used to assess efficiency in different (sub)-sectors of health systems (meso

level). It focusses on reviewing current possibilities and limitations in measuring efficiency in hospital, primary care and the pharmaceutical sector (which together represents about 60% to 75% of all health spending on average across EU countries).

- Chapter 4 reviews progress and persisting challenges to using a disease-specific level analysis to measuring the efficiency of health systems, focussing on some of the leading causes of death in EU countries (such as cardiovascular diseases and cancer). In theory, one advantage of using a disease-specific approach is that it should be easier to measure the effectiveness or outcomes of various health interventions to treat a given disease. However, in practice, relevant outcomes measures are lacking most interventions/treatments and, where these exist, it is often difficult to link it with the specific inputs (or costs) that have been used to produce these services and outcomes.

- Chapter 5 finally looks at the issue of administrative efficiency. Administrative tasks must be carried out at all levels of health systems. Reducing the administrative burden and the financial resources that go into administration are often the first to be considered when spending in the health sector needs to be reduced. However, spending on administrative activities should not be seen as necessarily "bad": administration has its costs but also provides some benefits such as ensuring care quality and patient safety, although it remains a challenge to define and measure properly the outputs or outcomes of administrative work.

This scoping paper ends with an extensive annex providing some indicator documentation sheets related to a set of indicators that might be used to measure efficiency at different levels, based on the JAF Health template for indicators. These include both indicators for which data are currently available in all or most countries and may therefore already be used for regular reporting, and other indicators requiring further research and developmental (R&D) work.

One of the main conclusions of this scoping paper is that while a macro system-wide approach can provide an entry point in the measurement of efficiency, there is a need to go beyond that and to measure efficiency for different sub-sectors of health systems. The most promising approach for efficiency measurement in terms of relevance and feasibility of data collection is the sub-sectoral approach, which often can be combined with a disease-specific approach to look at how primary care or hospital care deals with specific diseases. Such a sub-sector approach should ideally be complemented with some measures of care coordination and integration across the various parts of the system to assess efficiency in dealing with the growing number of people living with one or more chronic conditions and complex health problems.

It is important to note that this report does not cover the measurement of efficiency in public health and prevention spending, nor does it cover efficiency in long-term care.

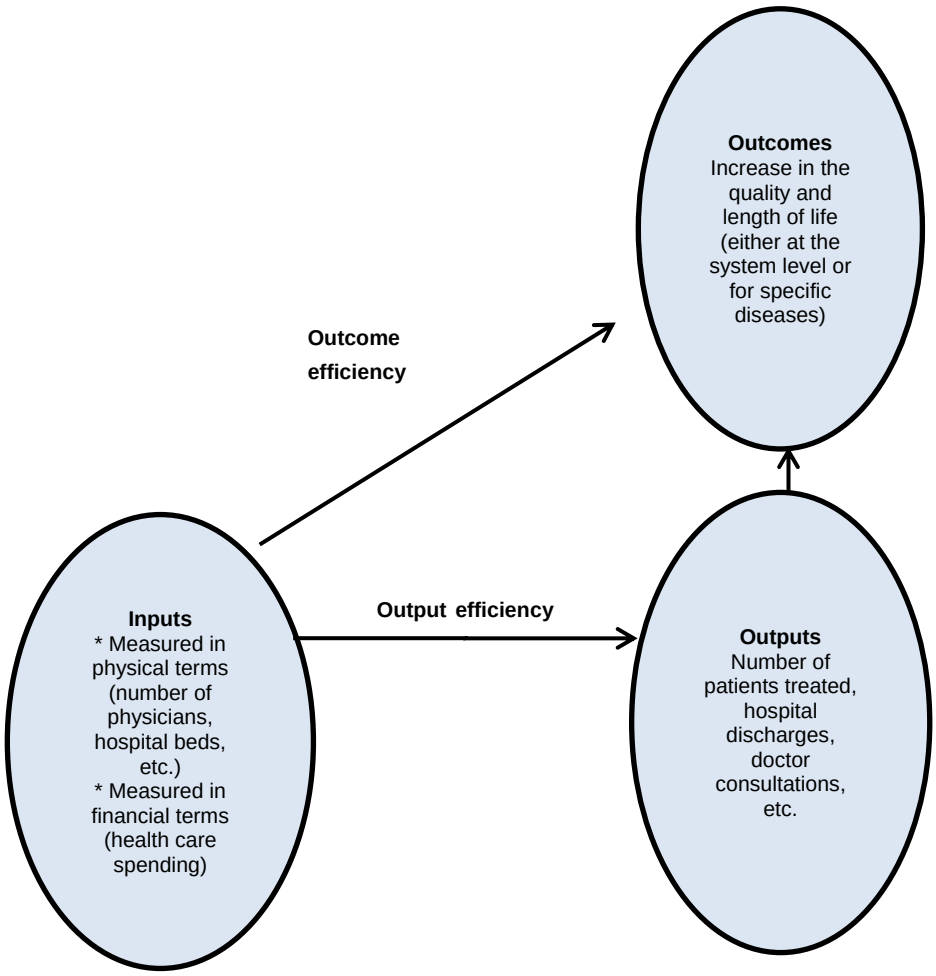
This scoping paper is the first step of a broader project which will lead to the preparation of a broader report based on the DG Employment Joint Assessment Framework (JAF) on Health including not only the efficiency dimension, but also the other dimensions in this JAF Health. A draft of this broader report is expected to be available by the end of 2017 with a final version released in the first half of 2018.

1. Defining and measuring health system efficiency

1.1 Defining efficiency in the health sector (one general framework)

Efficiency in health (care) systems is relatively easy to define in theory, but quite difficult to measure in practice. Based on conventional economic theory, "efficiency" is the relationship between one or more inputs (or "factors of production") and one or more outputs. However, in the health sector, the measurement of efficiency is complicated because what really matters to patients is not so much the health care "outputs" (e.g., consultations with doctors or different surgical procedures), but the "outcomes" of these activities (i.e., recovering from various diseases and injuries problems and generally feeling better with less pain and discomfort). It is therefore important to distinguish between two broad categories of efficiency measures in the health sector: output-based efficiency and outcome-based efficiency (Figure 1.1). When output-based indicators are used to measure efficiency, "efficiency" is equivalent to "productivity". When outcome-based measures are used to measure efficiency (in combination with cost as the input measure), "efficiency" is equivalent to "cost-effectiveness".

Figure 1.1 Links between health care inputs and outputs and outcomes



Source: OECD (2010), with minor adjustment

Box 1. **Another approach to measuring (in)efficiency in health systems: looking at wasteful and ineffective spending.**

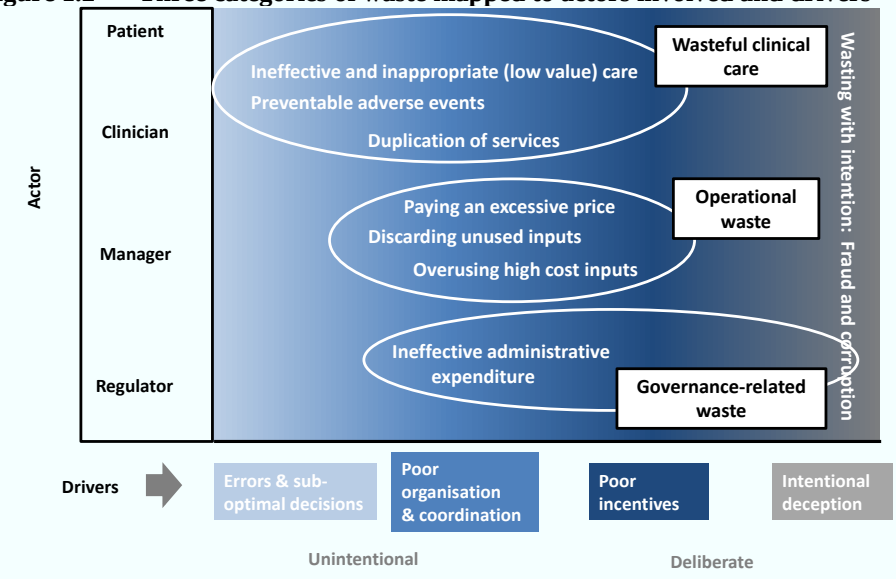
In a recent report, the OECD (2017) presented a complementary approach to analysing inefficiency in health systems. Starting from the troubling observation that around a fifth of health care system spending might be wasteful and ineffective, the report provides a comprehensive analysis of the problem and strategies put in place by countries to deal with it. The report pragmatically deems as "wasteful": i) services and processes that are either harmful or do not deliver benefits; and ii) costs that could be avoided by substituting cheaper alternatives with identical or better benefits. Linking actors (patients, clinicians, managers and regulators) to key drivers of waste (errors and suboptimal decisions, poor organisation and co-ordination, incentives misaligned with health care system goals, and intentional deception) helps to identify three main categories of wasteful spending:

- Wasteful clinical care covers avoidable instances when patients do not receive the right care. This includes duplicate services, preventable clinical adverse events (e.g., wrong-site surgery and many infections acquired during treatment) and low-value care (e.g., medically unnecessary caesarean sections or imaging).

- Operational waste occurs when care could be provided using fewer resources within the system while maintaining the benefits. Examples include situations where pharmaceuticals or medical devices are discarded unused or where lower prices could be obtained for the inputs purchased (for instance, by using generic drugs instead of originators). In other instances, costly inputs are used instead of less expensive ones, with no additional benefit to the patient. In practical terms, this is often the case when patients seek care in emergency departments, end up in the hospital due to preventable exacerbation of chronic disease symptoms that could have been treated at the primary care level, or cannot be released from a hospital in the absence of adequate follow-on care.

- Governance-related waste pertains to resources that do not directly contribute to patient care. This category comprises unneeded administrative procedures, as well as fraud, abuse and corruption, all of which divert resources from the pursuit of health care systems' goals.

Figure 1.2 Three categories of waste mapped to actors involved and drivers



Source: OECD (2017), Releasing Health Care System Resources: Tackling Ineffective Spending and Waste.

1.2 Two types of efficiency indicators

Two types of efficiency indicators can be distinguished:

- Technical efficiency ("doing more with less" or "doing the same at a lower cost"): Technical efficiency can be defined, in simple terms, as producing the greatest outputs or outcomes for a given level of inputs (either financial resources, or labour or physical/capital resources) or producing the same outputs or outcomes at a lower cost. Examples of technical efficiency indicators include the number of consultations per doctor in a given year or the number of operations per surgeon (or surgery unit).

- Allocative efficiency ("doing the right thing, at the right place"): Allocative efficiency refers to the allocation of resources (again either in financial terms or in labour or physical/capital terms) to achieve the greatest health outcomes at the least cost. Examples of allocative efficiency indicators include avoidable hospital admissions (as an indicator of the potential benefits to reallocate some resources from hospital to the primary care sector) which might results in better health outcomes at a lower cost, and the possible benefits of reallocating resources from care to prevention.

Although this distinction between technical efficiency and allocative efficiency is often made, the distinction is not always clear-cut. For instance, a move to day-case surgery performed outside hospital might either be considered as an indicator of technical efficiency or allocative efficiency.

1.3 Three possible levels of analysis for measuring efficiency

Efficiency in the health sector can be measured at three levels: 1) system-wide level; 2) sub-sector level; and 3) disease-based level. Each of these levels of analysis has its advantages and disadvantages, and requires more or less aggregated data on various inputs, outputs and/or outcomes. The rest of this section describes briefly some of the main advantages and limitations of these different levels of analysis, while the next three chapters provide more details on current possibilities and limitations of analysis at the system-wide level (chapter 2), sub-sector level (chapter 3) and disease-based level (chapter 4).

While it is convenient to distinguish these three levels of analysis, it should be kept in mind that these distinctions are not always clear-cut. For example, sub-sector analyses of primary care or hospital care often focus on how the system deals with specific diseases (e.g., diabetes, acute myocardial infarction/AMI, stroke). Also, system-wide level analysis, when it is based on a list of avoidable/amenable mortality, can also be disaggregated by specific causes of death. Some efficiency issues, such as administrative efficiency, also cut across these different levels of analysis (see chapter 5).

1.3.1 System-wide level

The main advantage of a system-wide level approach to measuring efficiency is that aggregate data are readily available in all countries on key indicators of inputs in financial terms (e.g., total health expenditure per capita) or in terms of human resources (e.g., total number of doctors and nurses), and there are also some broad indicators of population health status which might serve as health outcome measures (e.g., life expectancy).

However, there are two main disadvantages to system-wide level analysis of efficiency. First, a large body of literature shows that broad measures of population health such as life expectancy or healthy life expectancy are determined not so much by health spending or the number of doctors or nurses, but rather by a range of non-health care determinants (e.g., socio-economic determinants, lifestyle factors such as smoking, alcohol consumption, eating, physical inactivity, and the physical environment in which people live). Hence, there is a need to control for all (or at least the main) non-health care determinants to assess

the impact of health spending (or health human resources) on these broad measures of population health, which is often quite challenging because of data limitations. The second frequent disadvantage (or limitation) of a system-wide level analysis to measuring efficiency is that the results often do not provide much (if any) useful information to policymakers on which parts of the health system might be particularly inefficient and therefore what should be the priorities for action. One possible approach to overcome these two limitations is to use some indicators of amenable (treatable) mortality which has the advantage of focussing more on mortality that might be attributed to the timely provision of high-quality care and whose results can also be disaggregated by causes of death (which can be useful to identify possible priority areas).

1.3.2 Sub-sector level

The sub-sector approach has the advantage of focusing on more concrete and specific activities of health systems than the system-wide approach and might therefore more easily lead to sector-specific policy recommendations and actions.

Many efficiency analyses have focussed on the hospital sector because this sector still accounts for a large part of total health spending (about 30% on average across EU countries), and data on human resource inputs and on outputs tend to be more widely available (e.g., see for example Hussey et al., 2009, for a review of such studies). Frequently-used measures of hospital efficiency include reductions in average length of stay for different causes of hospitalisation and increases in the share of same-day surgeries for different surgical interventions. However, care needs to be taken in using data on average length of stay as an efficiency indicator because they may not adequately control for different case-mix of patients and do not always result in cost savings (e.g., in patients need to be re-admitted to hospital). Similarly, a growing number and share of same-day procedures may reflect growing technical efficiency in performing these procedures, but may not necessarily reflect the most cost-effective treatment options available.

Given the continued strong policy interest in promoting further efficiency gains in the hospital sector, the OECD has undertaken a number of activities to measure rigorously hospital performance and efficiency, including some pilot data collections to compare the cost related to selected conditions/treatments across different hospitals within the same country and across countries, and the quality and outcomes of care for certain conditions (such as AMI) at the hospital level (see section 3.1 in chapter 3 for more information).

Efficiency in the primary care sector can be measured by relating certain measures of inputs (either in terms of the availability of human resources like GPs or in terms of spending) to outputs (e.g., the number of consultations per doctor) or outcomes (measured either directly through measures of effective control of chronic diseases for example, or indirectly through avoidable hospital admissions for conditions that should normally be treated outside hospital). Chapter 3 (section 3.2) provides a description of some of the main challenges and possible options to improve the data on inputs, outputs and outcomes to enable a better assessment of primary care efficiency.

Pharmaceutical spending accounts for about 17% to 20% of overall health spending on average across EU countries, and many countries have implemented policies in recent years to control cost and improve efficiency in pharmaceutical spending. Substantial progress has been achieved in recent years in the data collection on the share of the generic market, in both volume and value (sales). The share of the generic market is often used as an indicator of efficiency in pharmaceutical spending, as generics are cheaper than on-patent drugs while providing the same health outcomes. In addition, recent work on prescribing quality under the OECD Health Care Quality Indicators project has started to provide additional comparative information on the quality and appropriateness of pharmaceutical prescribing, building on the initial work on the (over)prescription of antibiotics. Given the high costs related to the inappropriate use of pharmaceuticals, the OECD is planning to undertake further research and developmental (R&D) in 2017 to

better measure specific issues related either to the over-use of pharmaceutical drugs (e.g., polypharmacy) or under-use (adherence to prescribed drugs) (see section 3.3 in chapter 3).

One disadvantage of sub-sector level analysis is that this may neglect the need for greater cross-sectoral cooperation to address health care needs in certain geographic regions or for certain patient groups. A second possible disadvantage is that it often tends to focus more on care (treatment) than on prevention, particularly if the focus of the analysis is on the hospital sector. However, this potential bias can be mitigated by also looking at prevention activities in primary care or more broadly at the efficiency of public health interventions.

1.3.3 Disease-based level

A disease-specific approach to measuring efficiency has the advantage of possibly using more precise information on health outcomes related to specific diseases or treatments (measured most frequently in terms of survival rates, but also possibly in terms health-related quality of life measured for instance through patient-reported outcome measures, PROMs). However, it often faces the challenge of relating these health outcomes measures (where they exist) with specific information on inputs (e.g., expenditure by disease or treatment).

One recent example of a disease-based approach to measuring efficiency is the 2013 OECD report on cancer care (OECD, 2013). The exploratory analysis of efficiency in cancer care offered in this report described the relationship between a number of inputs (in terms of spending, but also human resources and technical resources), along with other cancer care system characteristics, with the outcome measure defined as cancer survival following diagnosis.

As it stands, there are however two main limitations with disease-based efficiency analysis: 1) complete and reliable information on inputs (notably costs) by disease is lacking in most countries (except in those few countries that carry out regular cost-of-illness studies); and 2) reliable health outcomes data are also missing for most diseases or treatments, with the notable exception of cancer.

The OECD has collected and published data on spending by disease for a dozen OECD countries, and the 2016 Eurostat HEDiC (Heath Expenditures by Disease and Conditions) project report supplemented this number with data from a further six EU countries. However, the most comparable and available data tends to be restricted to the hospital sector rather than providing a complete breakdown of spending needed for a thorough disease-based analysis.

Regarding health outcomes, the OECD Health Care Quality Indicators project continues to develop indicators of health outcomes related to the treatment of different diseases, such as heart attack and stroke, measured in terms of case-fatality rates. The OECD is also considering broadening the development of outcomes measures to non-fatal diseases through promoting the systematic development and use of patient-reported outcomes measures (PROMs), with the support and cooperation of the European Commission.

References

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Hussey, P.S. et al. (2009), "A Systematic Review of Health Care Efficiency Measures", *Health Services Research*, Vol. 44, No. 3, June.

OECD (2013), *Cancer Care: Assuring Quality to Improve Survival*, OECD Publishing.

OECD (2017), *Releasing Health Care System Resources: Tackling Ineffective Spending and Waste*, OECD Publishing.

2. System-wide level analysis

2.1 Introduction

System-wide level analysis of health system efficiency should be seen as a starting point only for analysing the efficiency of health systems, not as an end point. This is because such macro level analysis can only provide some crude estimates of efficiency, which often do not provide much (if any) useful information to policymakers on which parts of the health system might be particularly inefficient.

The main advantage of system-wide level analysis is that data are readily available in all countries on some aggregates measures of inputs (e.g., total health spending) and outcomes (e.g., life expectancy), which can easily be linked together to come up with some overall efficiency scores at the national level. The main problem or limitation with a system-wide analysis of health system efficiency is that often it does not control for the wide array of non-medical determinants of health that play a much greater in determining population health status than health care spending (or health human resources). For example, an upcoming OECD study has looked at a range of factors explaining the increase in life expectancy in OECD countries between 2000 and 2013. This study finds that only about one-third of the increase in life expectancy can be explained by increases in health spending; the other two-thirds are explained by factors such as income growth, reductions in some behavioural risk factors (such as tobacco smoking and alcohol consumption), and a reduction in air pollution. Hence, there is a need to control for all these non-health care determinants to assess the impact of health spending (or health human resources) when using such broad measures of population health, which is often not done in practice because of data limitations or because of the additional complexity this brings to the analysis.

One possible approach to overcome the issue that the main determinants of life expectancy (or healthy life expectancy) are not related per se to health (care) systems is to choose a more specific indicator of outcomes that may be more closely related to health care activities. The main such indicator is amenable (treatable) mortality, which is defined as "premature deaths that should not occur in the presence of effective and timely care" (Nolte and McKee, 2004). However, it is not easy to come up with a general agreement of which causes of death, and below what specific age threshold, may legitimately be considered to be amenable mortality that could be been avoided through better performing health care systems.

2.2 Inputs measures

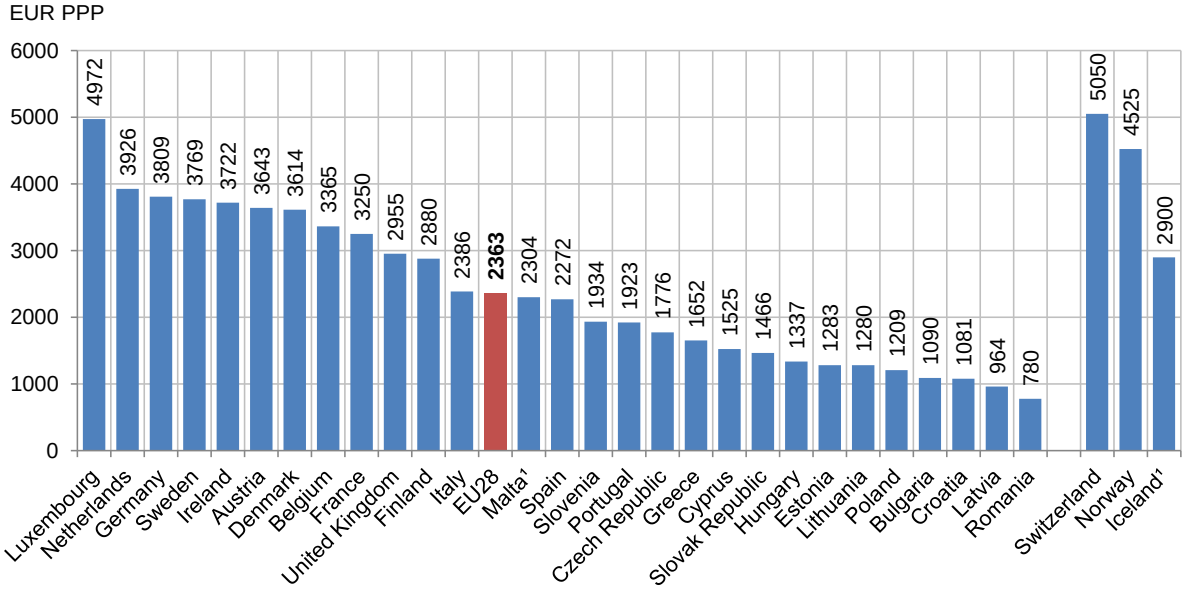
Two main inputs measures can be used for system-wide level analysis of health system efficiency:

- Total or current health expenditure (excluding capital investments) per capita
- Health human resources (e.g., number of doctors, nurses, other health workers) per capita

In both cases, these data are available in all EU countries, and the data is generally comparable.

Figure 2.1 shows that there are large variations in health spending per capita across EU and EFTA countries. It is not surprising that high-income countries such as Luxembourg, Switzerland and Norway are the European countries that spent the most on health in 2014, exceeding by a wide margin the EU average. At the other end of the scale, Romania, Latvia and several other countries spent less than half the EU average.

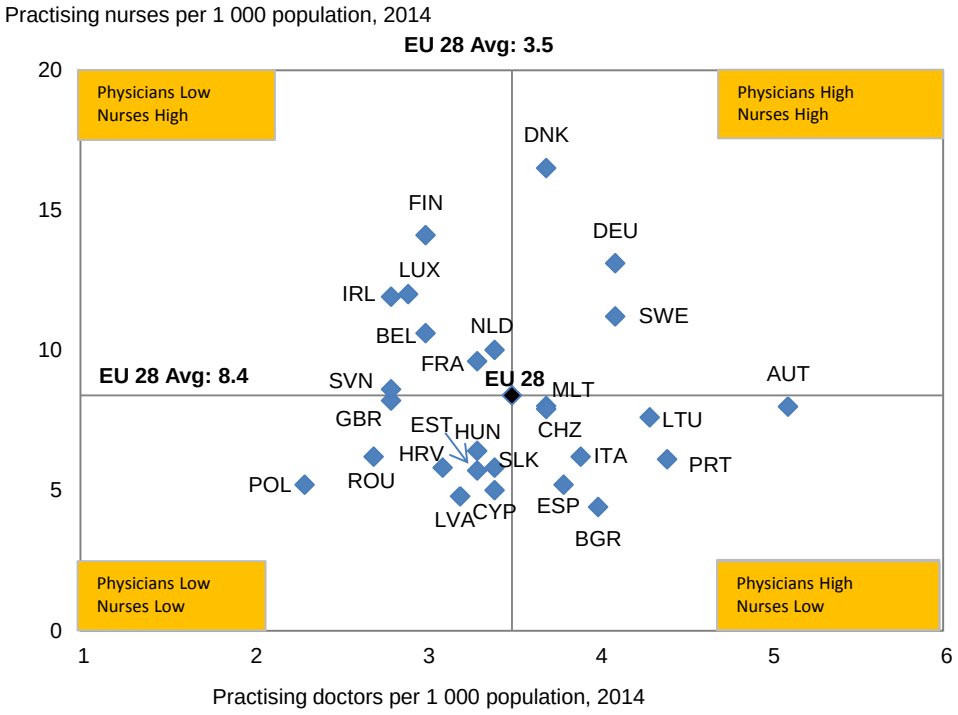
Figure 2.1 Health expenditure per capita, 2014



1. Includes investments.
Source: OECD Health Statistics 2016; Eurostat Database; WHO, Global Health Expenditure Database.

Data on health human resources also show that there are a lot of variations in the number of doctors and nurses per capita across EU countries (Figure 2.2).

Figure 2.2 Number of doctors and nurses per 1 000 population, EU countries, 2014

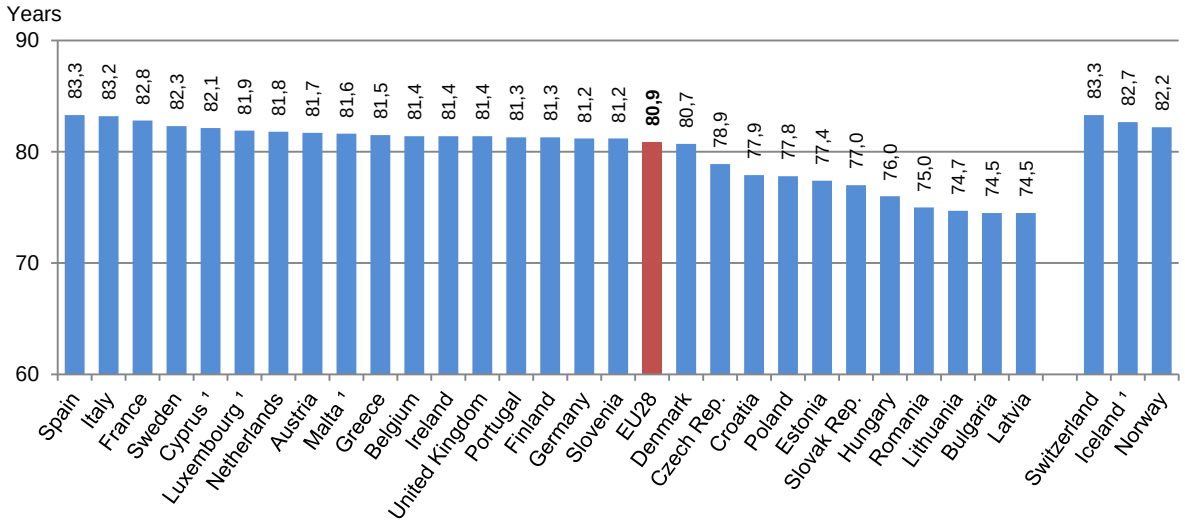


Source: OECD Health Statistics 2016; Eurostat database

2.3 Outcomes measures

The most frequently-used measure of health outcomes measure in system-wide analysis of health system efficiency is life expectancy at birth. Figure 2.3 shows that there was a gap of almost nine years in life expectancy between those countries in Western Europe with the highest life expectancy and those in Eastern Europe with the lowest life expectancy in 2014.

Figure 2.3 Life expectancy at birth, EU and EFTA countries, 2014



1. Three-year average (2012-14).

Source: Eurostat Database

However, as already noted, life expectancy is affected by many other factors beyond health expenditure or health human resources. There is a need to account for all the other socioeconomic, physical environment and lifestyle factors that affect life expectancy to measure more precisely the efficiency of health spending in reducing mortality and prolonging lives.

Furthermore, the objective of health systems is not merely to save lives, but also to improve the health-related quality of life by addressing a wide range of health problems that may not necessarily result in death (e.g., arthritis, vision and hearing problems, back pain, etc.). A second option in terms of outcomes measures is to use an indicator of "healthy life expectancy" to try to take into account the broader objectives of health systems to improve not only the length of life but also the health-related quality of life. However, this indicator also suffers from the same limitation as life expectancy, as it is mainly driven by non-health care determinants that need to be controlled for.

A third option is to use a more precise measure of outcomes that may be more legitimately be attributed to health (care) system interventions, that is, amenable (or treatable) mortality. The indicator of amenable mortality (which has been developed over the past few decades) is designed to take into account premature deaths for a list of diseases for which effective health interventions are deemed to exist and might prevent deaths below a certain age threshold. The first step in the development of a list of amenable mortality is to select a list of causes of mortality that are deemed to be amenable to health care based on available evidence about the clinical effectiveness of existing medical interventions in treating different life-threatening conditions for people at different ages. However, it is not easy to come up with a general consensus on such a list of causes of death that could be avoided through effective and timely health care.

Even though the selection may be based on the best available evidence, there is inevitably a certain amount of judgement in coming up with a final list.[1]

The OECD has compared three lists of amenable mortality that have been developed and used by Nolte and McKee (2004, 2008, 2011), Eurostat (2014, which is the same as the ONS list) and CIHI / Statistics Canada (2012).

Table 1.1 shows the three lists of selected causes of deaths and age group cut-off points (thresholds), and highlights the differences between the lists (in italics). As expected, the lists have more commonalities than differences. The general age limit for "amenable" deaths is set in all three lists at 75 years. However, for some causes of death, a lower age cut-off is used in some lists (e.g., the Nolte and McKee list and the Eurostat list used a 49 year age threshold for mortality from diabetes, while the Canadian list uses the 74 years threshold but only count 50% of deaths from diabetes as being "amenable" to health care with the other half considered to be "preventable").

The main differences between the three lists are the following:

- The Eurostat list considers that all premature mortality due to ischemic heart diseases and cerebrovascular diseases is amenable to health care (and are also preventable), while the Canadian list considers that only half of these deaths are amenable (with the other half being preventable). The Nolte and McKee list is "in between", in that it considers that all deaths due to cerebrovascular diseases are amenable to health care, but only half of deaths due to ischemic heart diseases. Nolte and McKee justified the decision to only include half of IHD mortality on the grounds that there was good evidence suggesting that between 40% and 50% of the IHD decline in developed countries can be attributed to improvements in health care.

- There are also differences across the three lists regarding the inclusion of different types of cancer. For example, premature mortality from uterine cancer is considered as amenable before 75 in the Canadian list but only before 45 in the list by Nolte and McKee, while it is not considered as amenable to health care in the Eurostat list. On the other hand, the Eurostat list considers that all deaths before 75 caused by malignant melanoma skin cancer as amenable to health care, while the list by Nolte and McKee only considers non-melanoma skin cancer and the Canadian list does not include any form of skin cancer as amenable (they are all included in the "preventable" mortality list). Bladder and thyroid cancers are considered as amenable to care in the Eurostat and Canadian lists while they are not in the Nolte and McKee list.

- The Nolte and McKee list considers that all deaths from respiratory diseases under 15 years old are avoidable by appropriate and timely treatments. This limit of "under 15" was set as deaths from these causes after childhood are likely to reflect some other diseases process (Nolte and McKee, 2004). The Eurostat and Nolte and McKee lists consider deaths from influenza as amenable to health care, while the Canadian list considers it as being preventable (through vaccination). On the other hand, the Canadian list considers all upper respiratory infections as well a range of other respiratory diseases as amenable to health care whereas these are not included in the two other lists.

- The Nolte and McKee list and the Eurostat list consider deaths caused by diabetes to be amenable to health care only before the age of 50, while the Canadian list uses the general age limit of 75 but

1. The final report from the recent AMIEHS project in Europe (Avoidable Mortality in the EU towards better Indicators for the Effectiveness of Health Systems) illustrates the difficulty of coming up with a general consensus on the selection of causes of deaths that can be considered to be "avoidable/amenable". The experts involved in this project were only able to reach a broad consensus on three diseases that might be included in an avoidable/amenable mortality list (i.e., colorectal cancer, cervical cancer and stroke). However, a broader number of causes of death (14) passed the selection criteria, and an even greater number (45) were considered as possibly avoidable (AMIEHS, 2011).

considers that only half of mortality due to diabetes can be avoided by appropriate health care (with the other half being preventable).

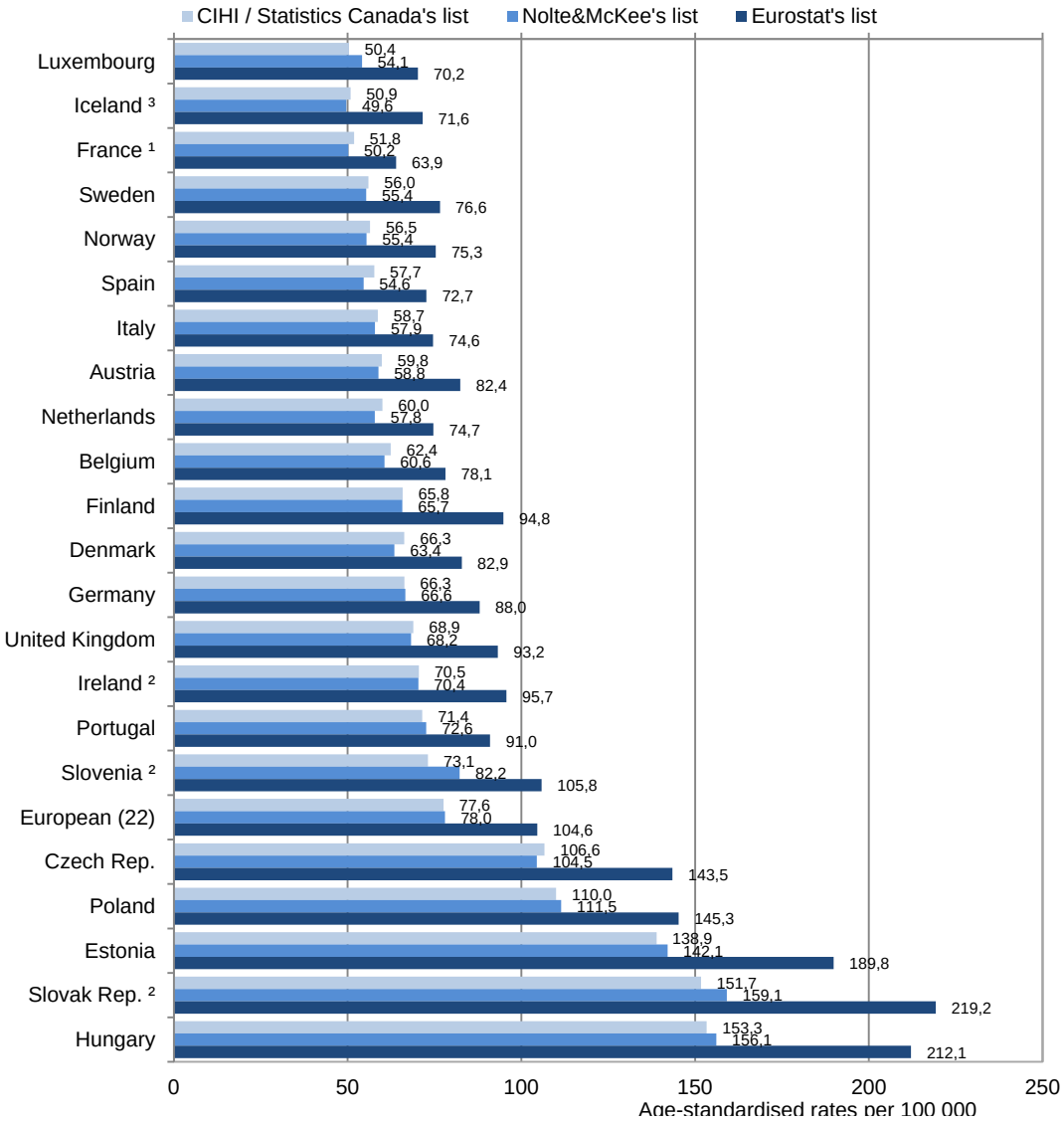
- There are also some differences in the inclusion of various infectious diseases. While the Nolte and McKee list focusses on a limited number of diseases in children under 14 and some vaccine-preventable diseases, the Eurostat and Canadian lists include a broader selection of infectious diseases. The Eurostat list considers also deaths from viral infections such as Hepatitis B and HIV/AIDS as amenable to health care, while the Nolte and McKee list and the Canadian list consider such deaths as preventable only.

Table 1.1 Main differences between three different amenable mortality lists

Nolte and McKee (2011)	CIHI / Statistics Canada (2012)	Eurostat (2014)
50% of IHD and 100% CVD	50% of IHD and CVD	100% of IHD and CVD
Uterine cancer <45	Uterine cancer <75	Not considered
Only non-melanoma skin cancer	Not considered	Melanoma skin cancer
Not considered	Bladder and thyroid cancer	Bladder and thyroid cancer
All respiratory diseases <15	Not considered	Not considered
Influenza	Not considered	Influenza
Not considered	Upper respiratory diseases	Not considered
Diabetes <50	50% Diabetes <75	Diabetes <50
Selection of diseases in children 14 + vaccine-preventable diseases	Broad selection of infectious diseases	Broad selection of infectious diseases
Not considered	Not considered	Hep C and HIV/AIDS

Figure 2.4 compares the results of these three lists of amenable mortality based on 2012 data, extracted from the WHO Mortality database, and age-standardised to the OECD population structure. On average across 22 European countries, the Eurostat list comes up with rates that are 34% higher than the two other lists. This is mainly due to the fact that it includes all IHD deaths (this alone explains two-thirds of the difference with the two other lists).

Figure 2.4 Amenable mortality in 22 European countries using the Canadian list, Nolte and McKee list and Eurostat list, 2012 (or latest year available)



Note: Countries are ranked according to the Canadian list.¹ Data refer to 2011 for France. ² Data refer to 2010 for Ireland, Slovak Rep. and Slovenia. ³ Data refer to 2009 for Iceland.
Source: WHO Mortality Database 2015, age-standardised based on the OECD population structure.

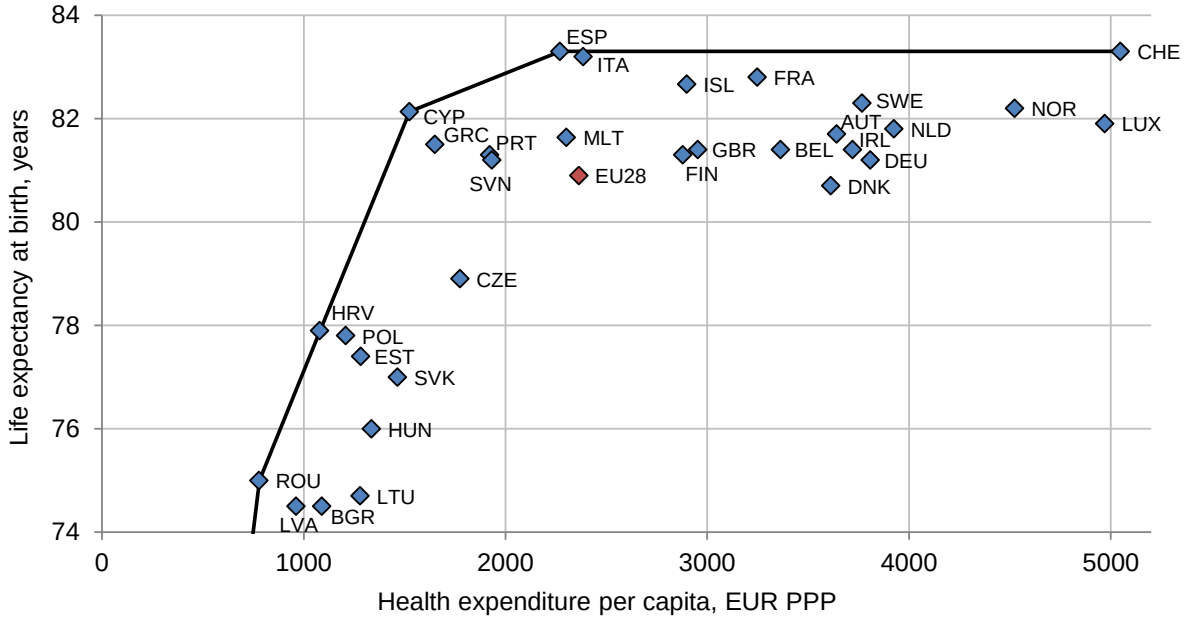
2.4 Relating inputs to outcomes measures to obtain efficiency estimates

Efficiency estimates can be obtained at a system-wide level by linking the data on inputs (usually health expenditure per capita) with the selected measure of health outcomes.

Such analysis is referred as data envelopment analysis (DEA) and produces so-called "efficiency frontiers". An efficient country is defined as one that cannot improve the outcome (e.g., life expectancy) without increasing inputs (e.g., health spending) or cannot reduce inputs (e.g., health spending) without compromising the outcome (e.g., life expectancy). By assumption, the "frontier" linking efficient countries defines "best practices" and potential efficiency gains for the less efficient countries are measured by their position (distance) relative to the "frontier" (or envelope) (OECD, 2010).

Figure 2.5 provides an illustration of such an "efficiency frontier" using health expenditure per capita as the input and life expectancy at birth as the outcome measure in 2014.

Figure 2.5 Linking health expenditure per capita and life expectancy ('efficiency frontier'), 2014

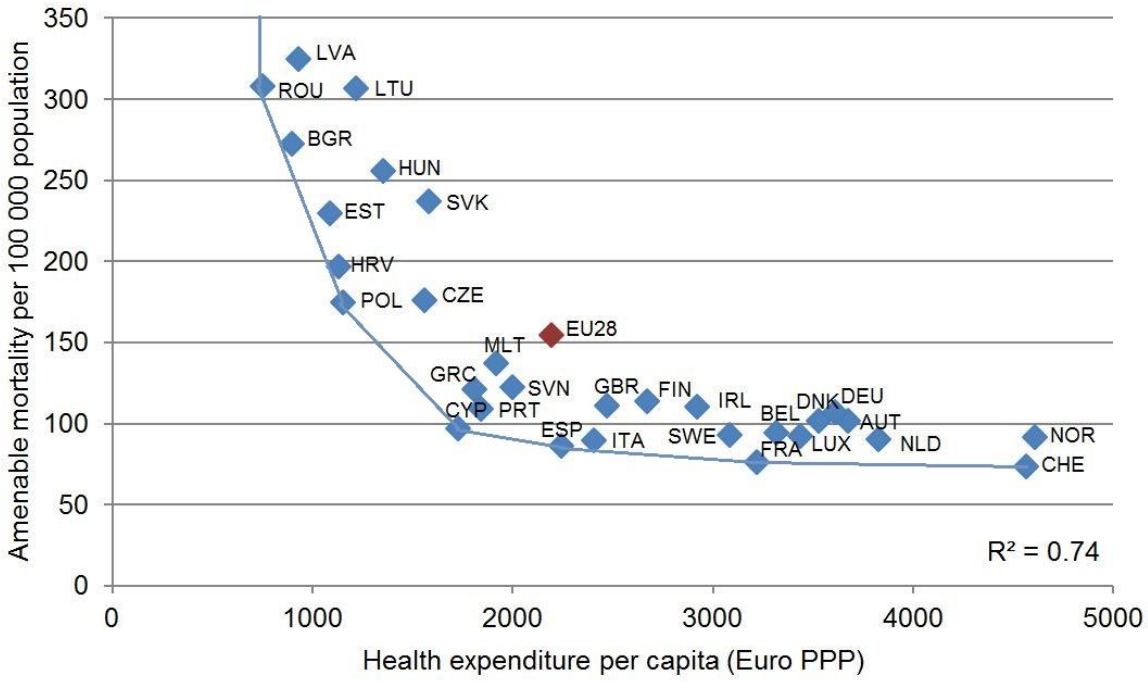


Source: OECD Health Statistics 2016; Eurostat Database.

Beyond the problems already noted that life expectancy is driven mainly by many other factors beyond health spending, another issue in linking health spending to life expectancy is whether or not to introduce any time lag between the level of health spending and life expectancy (and if so, on what basis should any such time lag be selected). Because life expectancy is mainly affected by non-medical determinants, it is not very sensitive to any short-term reduction or increase in health spending. Hence, one "mechanical" result of any significant reduction in health spending is to apparently increase the efficiency of this reduced spending in the immediate term (i.e., countries are getting closer to the 'frontier'), and vice versa for countries that decide to increase significantly their health spending (they will appear as being less efficient, moving away from the 'frontier').

It is also possible of course to produce the same type of DEA analysis and efficiency frontier using a more specific outcome such as amenable mortality, which in theory is less affected by non-health care determinants (Figure 2.6).

Figure 2.6 Linking health expenditure per capita and amenable mortality ('efficiency frontier'), 2012



Note: Current Eurostat data on amenable mortality only cover the period 2011-2013.

Source: OECD Health Statistics 2016; Eurostat Database.

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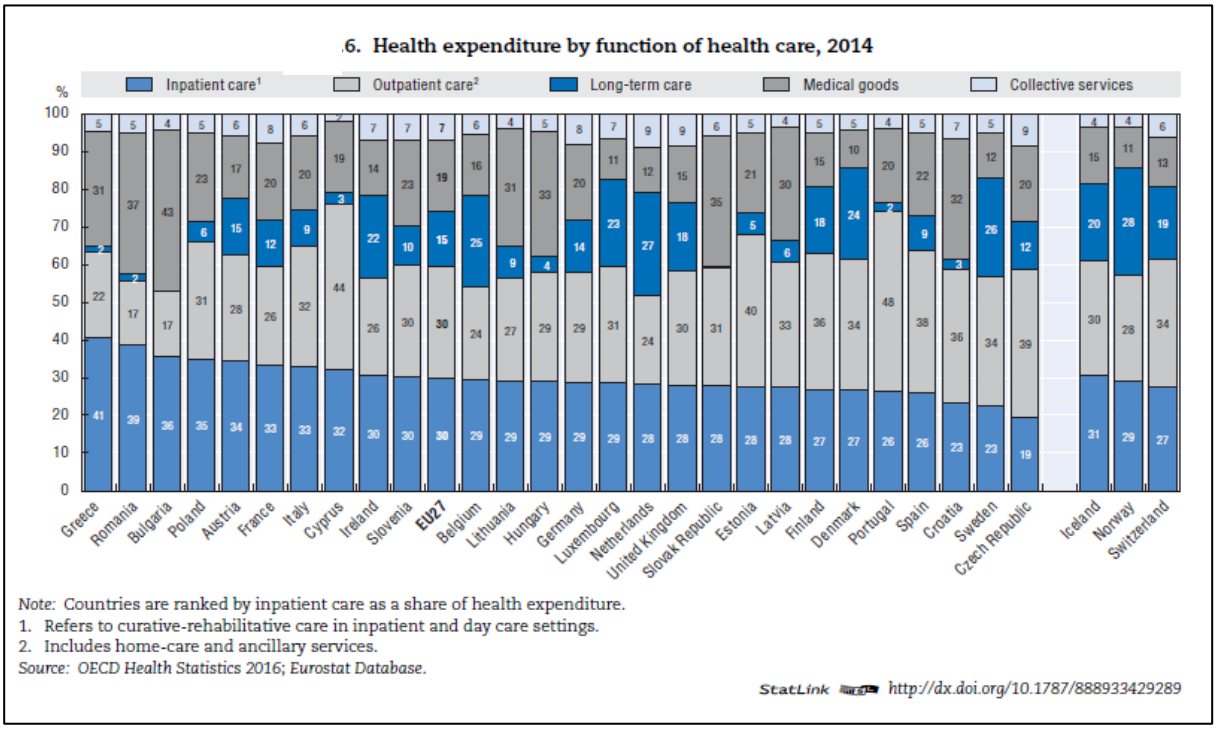
3. Sub-sector level analysis

Analysing health system efficiency at a sub-sector level has the advantage of assessing more concretely the various activities of health systems, including those in hospital (which accounts for about 30% of overall health spending on average across EU countries), primary care (accounting for about 10% to 20% of overall spending depending on how primary care is defined), pharmaceutical drugs (accounting for 17% to 20% of overall spending), long-term care (accounting for about 15% of spending on average), and prevention and administrative services (accounting for about 6% to 7% of spending on average) (Figure 3.1). This section focuses on measuring efficiency in the first three sub-sectors (hospital, primary car and pharmaceuticals). It does not address efficiency in long-term care spending nor in prevention, because these are beyond the scope of this scoping paper. Chapter 5 in this report discusses issues around the measurement of administrative efficiency.

Figure 3.1 Health Expenditure by function of care, 2014



Source: OECD Health Statistics 2016; Eurostat Database

3.1 Hospital efficiency

3.1.1 Introduction

While the role of hospitals within the broader health system continues to evolve and the systems and processes to provide hospital care are often complex, hospital services are relatively well defined. More robust information systems are more readily available in the hospital sector than other sectors of the health system. This enables the range of care provided by hospitals to be relatively well identified and reported, particularly admitted patient care.

Improving the efficiency of the hospital sector remains an important policy objective in EU countries, given the significant value and cost of services provided to the community. As already noted, around 30% of total health expenditure is accounted for by the hospital sector on average. But hospitals do not stand

alone in the health system. They can generate significant implications for 'downstream' expenditure in other related out-of-hospital care sectors (e.g. primary and community care). For example, early discharge of patients after surgery can require additional community care and support services to be provided to patients to enable them to recover and remain safely living in their home. Conversely, there are 'upstream' implications for the efficiency of hospitals from other care sectors. For example, pre-surgical preparation of patients in an outpatient setting can facilitate a shorter time in hospital before surgery.

The recent OECD report *'Releasing Healthcare System Resources: Tackling Ineffective Spending and Waste'* addresses key areas affecting health care efficiency, many of which being directly relevant for hospital efficiency including the impact of adverse events and administrative costs (OECD, 2017). There are clearly strategic approaches to clinical, operational and governance dimensions of hospitals that could be monitored and assessed over time to consider changes in hospital efficiency. However, at this time, international measures of such (in)efficiency are limited.

3.1.2 Key issues in measurement of inputs, outputs and outcomes

While significant methodological development has been achieved in health outcomes measures for hospital care, many of the efficiency indicators for hospital care that are commonly used to monitor and assess hospital performance are predominantly focussed on admitted patient care and on outputs measures. Some of the key issues with efficiency measurement for the hospital sector include:

1. **Costing Data:** While comparable national expenditure data exists for some countries, there is a paucity of internationally comparable data on the cost and quantity (volume) of inputs for specific hospital outputs. While admitted patient care is well specified through output-based classification systems, data on the costs of the inputs provided in producing these outputs is less well developed. Hospital systems still struggle with valid costing of specific outputs across hospitals that do not rely on broad allocation statistics. At a broader level, an enduring issue remains for academic hospitals around the identification of teaching and research costs and the appropriate allocation to overall patient care.

2. **Non-Admitted Care:** There are issues in the specification of non-admitted patient care outputs provided by hospitals. While outpatient cases can be counted at a national level in most countries, given the wide range of ambulatory services provided and the different scope and nature of the care, there still remain significant challenges in measurement of both outputs and related inputs. Increasingly hospitals are also providing care in the community through nursing outreach programmes, hospital in the home initiatives and visiting specialist clinics.

3. **Output Heterogeneity:** This relates to the difficulty of establishing broad measures of efficiency for hospitals given the wide range of outputs and associated inputs and the impact that patient characteristics can have on the cost and quality of specific outputs. Challenges remain in bringing together admitted and non-admitted care into unified metrics and enabling sufficient adjustment for differences in patient case mix to generate efficiency measures that fully and accurately represent hospital output.

4. **Quality and Outcomes:** The quality of care provided by hospitals varies and in most cases measures of hospital efficiency do not take accounts these differences. There is a risk that efficiency indicators can be construed as cost minimisation indicators in this context. For example, the reduction in the average length of stay for patients admitted after a heart attack does not provide definitive evidence that the efficiency of hospital care has improved for these patients. Without some measure of the outcomes for patients (e.g. mortality, re-admission, PROM), the measure of efficiency is incomplete.

5. **Attribution:** It is often difficult to link patient outcomes to the quality of hospital care. As indicated earlier, hospitals do not stand alone and care is provided in many care settings. Combined with non-health care factors, the services provided along the pathway of care can all contribute to the health outcomes of people. Persisting methodological issues remain in disentangling the contributions of different health services and developing measures that can be used to definitively attribute patient outcomes to hospital care. In many instances, the measures require detailed risk adjustment with access to detailed data, including clinical data not always available in administrative databases.

3.1.3 Existing data collections

Despite enduring challenges with hospital efficiency measurement, core measures of financial and non-financial inputs, outputs of hospital care and outcomes are now well recognised, and the OECD has established international data collections of key indicators in these three areas:

- *Inputs (cost and human and physical/technical resources)*

Expenditure:

  - inpatient, day case and outpatient care

Resources (human and physical/technical):

  - employment (total and by categories of workers)
  - hospital beds (total and by categories of hospital beds)
  - medical technology (e.g. MRI, CT and PET scanners)

- *Outputs (hospital activities)*
  - Discharges, bed days, average length of stay by diagnostic category
  - Utilisation of diagnostic technology (e.g. MRI, CT and PET exams)
  - Inpatient and same day discharges for selected procedures (e.g. tonsillectomy, cataract, CABG, PTCA)

- *Quality and outcomes (including effectiveness and safety)*
  - AMI 30-day case fatality rates
  - Stroke 30-day case fatality rates
  - Postoperative complications
  - Obstetric trauma

Box 2. **Developmental work on hospital cost estimates**

The OECD started in 2016 a pilot data collection to improve the measurement and reporting of hospital costs and length of stay for a selected set of conditions. The initial focus in on the following groups of conditions/treatments:

Inpatient: Acute myocardial infarction (with percutaneous transluminal coronary angioplasty (PTCA) or coronary artery bypass graft (CABG), acute stroke, hip replacement, knee replacement, hysterectomy, caesarean section, normal delivery.

Day surgery: Cataract surgery, knee arthroscopy.

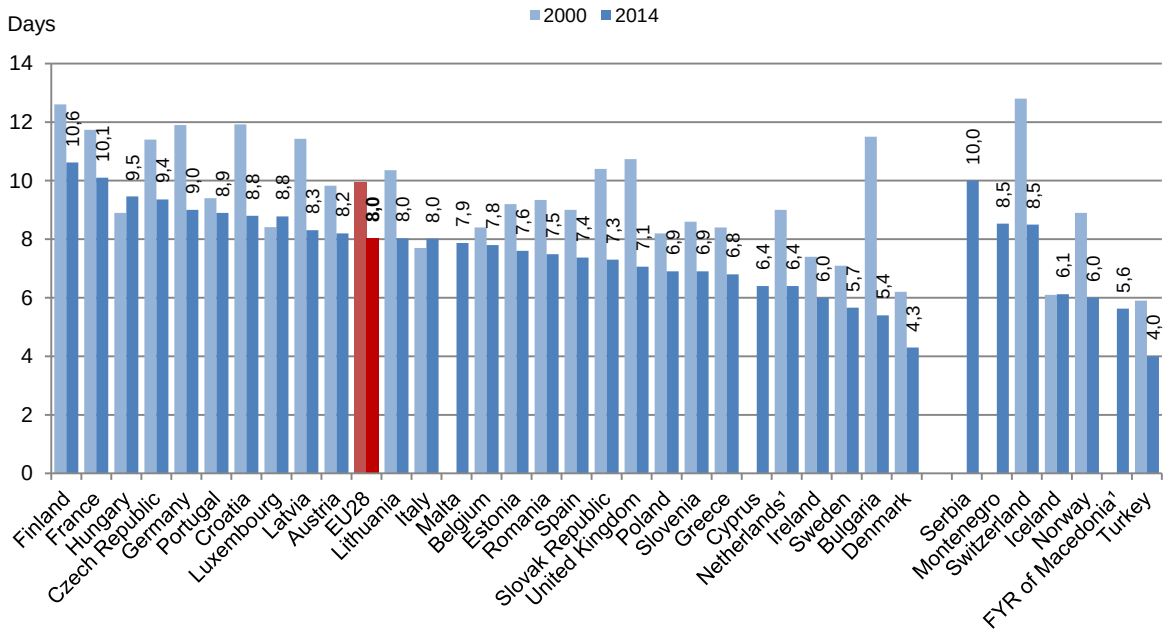
3.1.4 Core Indicators of hospital efficiency

The data currently collected by the OECD (in many cases through joint questionnaires with Eurostat and WHO-Europe) allows a number of indicators related to hospital efficiency to be explored. This section presents and discusses the small set of well-established indicators of hospital efficiency.

1. Length of Stay

The length a patient stays in hospital is relatively straightforward to measure and is broadly considered to indicate the relative resource use during a hospital admission, where a shorter length of stay for a certain condition is associated with lower resource use. Figure 3.2 shows that the average length of stay for all causes of hospitalisations has decreased in all EU countries, with the average coming down from about 10 days to 8 days, but there continues to be large variations across countries.

Figure 3.2 Average length of stay in hospital, 2000 and 2014 (or nearest year)



Source: OECD Health Statistics 2016; Eurostat Database (based on OECD/Eurostat/WHO-Europe Joint Questionnaire)

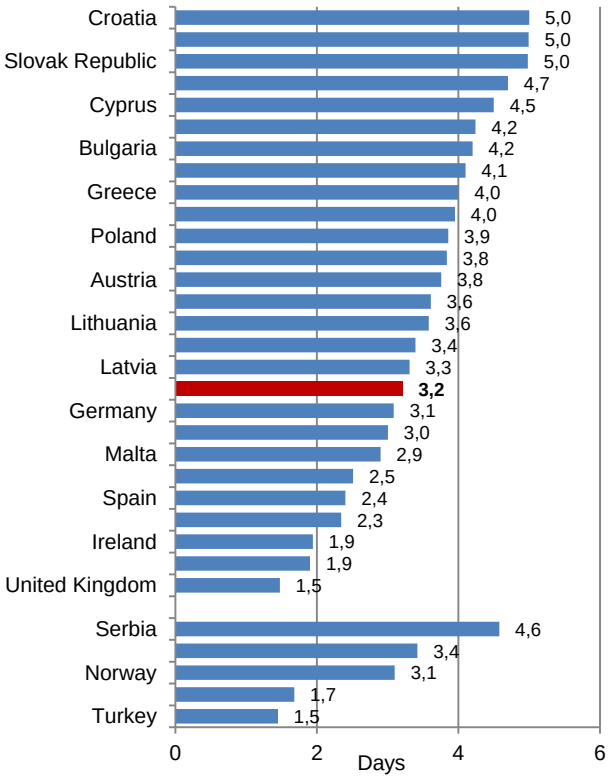
There are, however, some issues to consider when measuring and interpreting average length of stay for hospital care:

- Resource intensity: as the length of stay for admission is reduced, it is often the case that resource intensity per day increases and the marginal cost of additional days is reduced. In other words, a 50% reduction in length of stay does not necessarily result in a 50% reduction in cost, particularly where an expensive surgical procedure is involved.

- Casemix: the average length of stay can vary significantly for different conditions and within each condition by patient, given their age, sex and overall clinical condition on admission. To be able to compare ALOS across hospitals, regions and countries, it is important to assess and control for the differences in case mix. Two approaches exist:

    i. Select a specific condition to reduce the case mix effect (e.g. normal delivery). Figure 3.3 shows that the average length of stay for women related to a normal delivery varied in 2014 from less than 2 days in some countries to 5 days in others.

Figure 3.3 Average length of stay for normal delivery, 2014 (or nearest year)

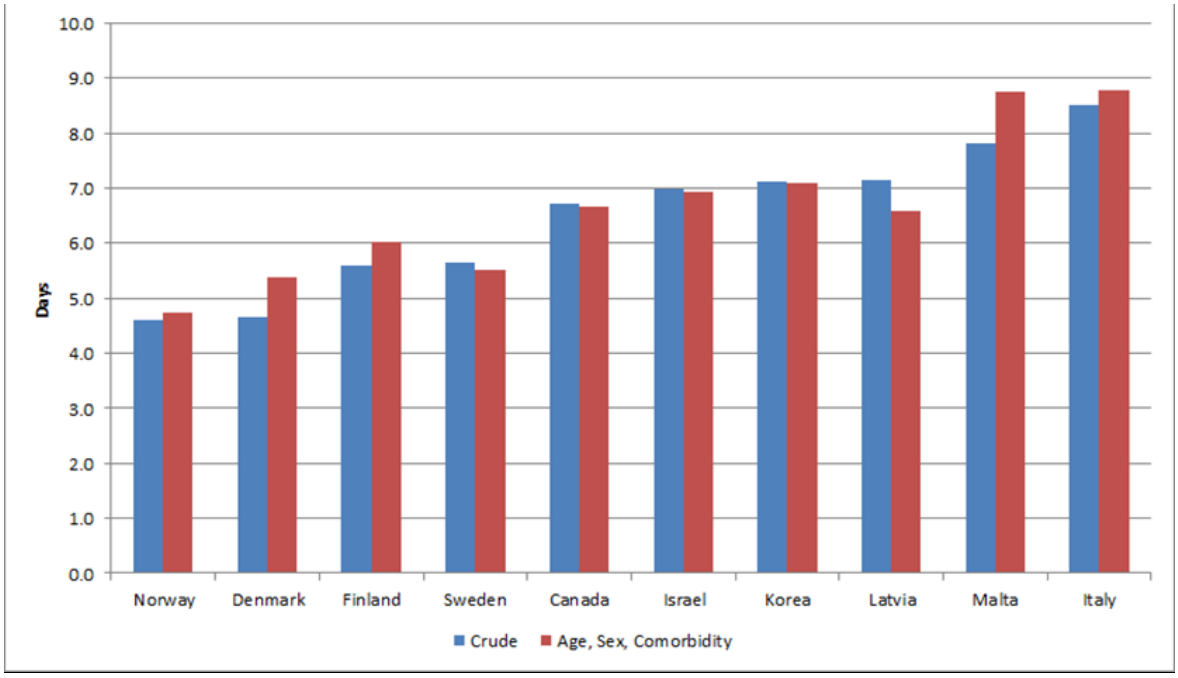


Source: OECD Health Statistics 2016; Eurostat Database

    ii. Adjust for case-mix through case mix standardisation (e.g. Relative Stay Index). Recent developmental work undertaken by the OECD on establishing international data at the hospital level on Acute Myocardial Infarction 30-day case fatality rates indicates that differences in patient mix (factors not attributable to the quality of patient care) can significantly impact on the average length of stay for people admitted after a heart attack (Figure 3.4).

Figure 3.4 Impact of Risk Standardisation on Length of Stay for AMI, selected OECD countries

Crude and Risk Standardised (age, sex, comorbidity) LOS admission-based including transfers



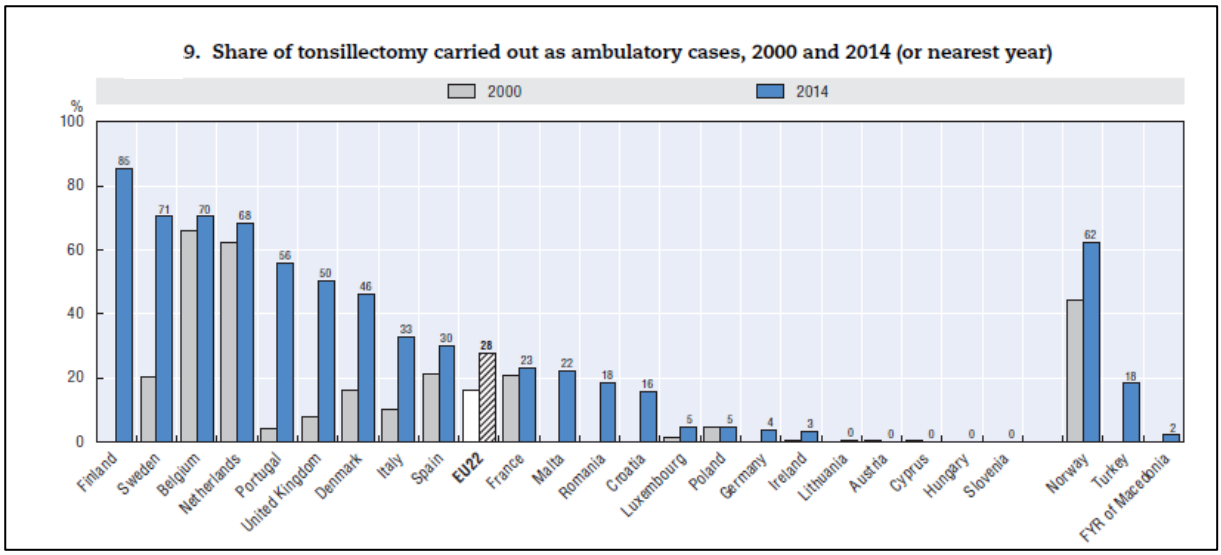
Source: OECD Hospital Performance project

– Quality: An important consideration, as with any efficiency measure, is to consider whether a reduction in the length of hospital stay impacts on the quality of care provided by the hospital, both in terms of clinical effectiveness and completeness of care. For example, there is a real risk that any hospital cost reductions are partially offset through increases in out-of-hospital services. In addition, there may be an increased risk of patients needing to come back to hospital for further care. The measurement of unplanned readmission in tandem with average length of stay is common practice in some countries.

2. Day Cases

Day cases are where a patient stays in hospital less than 24 hours and can be seen as an extension of the focus on shortening average length of stay to reduce hospital resource use. Through improvements in clinical practice, greater community care and utilisation of new technologies, procedures and care for some conditions that usually required multi-day stays in hospital in the past can now be provided without a patient staying overnight in hospital. For example, Figure 3.5 shows that in some countries, the vast majority of tonsillectomies is now performed on a day care basis, whereas in other countries, virtually all tonsillectomies continue to be performed with patients (usually children) staying at least one night in hospital.

Figure 3.5 Share of tonsillectomy performed on an ambulatory basis, 2000 and 2014 (or nearest year)



Source: OECD Health Statistics 2016; Eurostat Database

Two related variants on the measurement of hospital efficiency by looking at the length of stay in hospital can also be identified:

- *Day of Admission Surgery*: where patient being admitted for elective surgery receive their pre-surgical screening and tests in an ambulatory setting prior to admission and thereby enabling surgery on the day of admission (even though the patient may be in hospital for multiple days after the surgery).

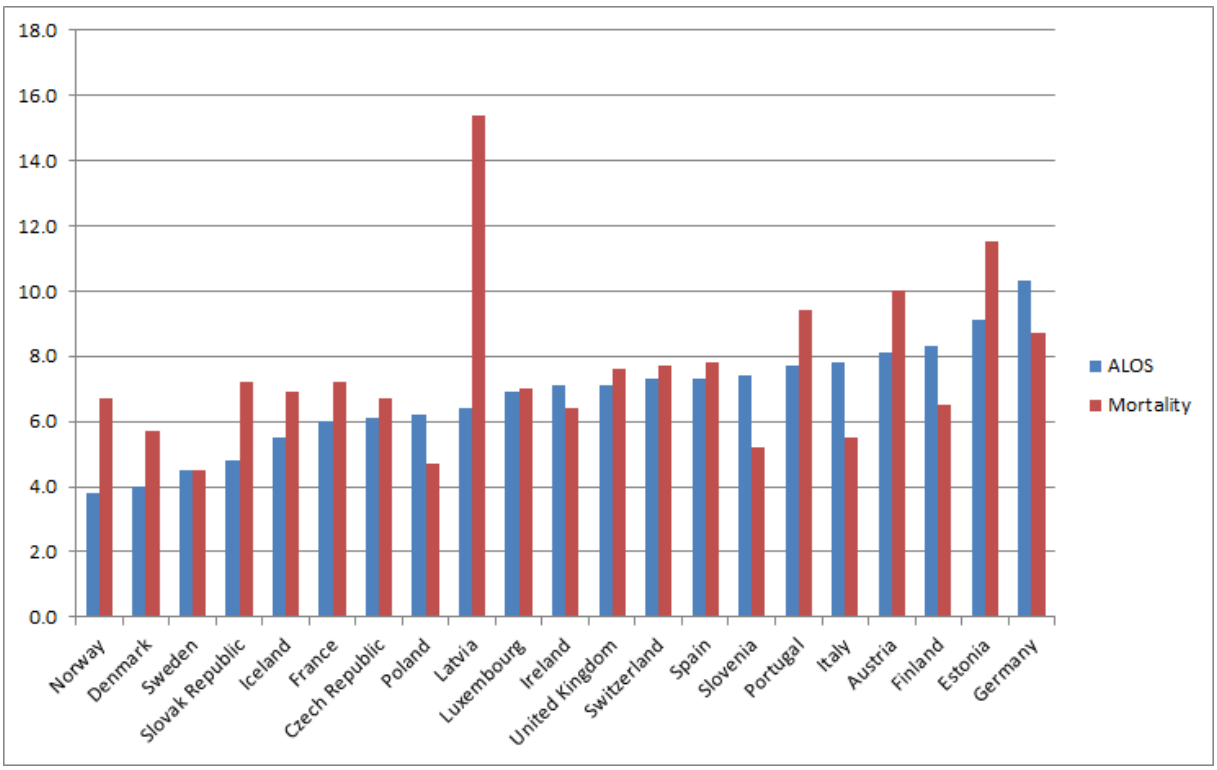
- *Hospital in the Home:* an extreme case to reducing the length of stay in hospital is to substitute hospital care for home care. Programmes have been established in some countries where hospitals provide equivalent hospital based care in the patients' home. While the evidence of direct cost reductions are not always conclusive, there are opportunities for cost/quality improvements in relation to patient experiences and outcomes (e.g. reduced acquired infection).

3. Outcomes measures (e.g., 30-day case fatality rates for acute conditions such as AMI)

The framework for hospital efficiency adopted by the OECD includes consideration of both hospital outputs and outcomes. By not taking into account care quality and patient outcomes in considering hospital efficiency, there is an assumption that cost reductions equate with improved efficiency.

OECD data on AMI 30-day case fatality rates and the average length of hospital stay for people admitted for an AMI reveals that outcomes of hospital care vary and they do not vary in line with the average time they spend in hospital, even after risk standardisation (Figure 3.6). Countries with similar ALOS can exhibit quite different 30-day case fatality rates (e.g. Austria and Finland) and similarly countries with similar outcomes exhibit quite different ALOS (e.g. Denmark and Italy).

Figure 3.6 Average length of hospital stay (days) and 30-day Case Fatality Rates for AMI, 2013



Source: OECD Hospital Performance project

3.1.5 Next steps to improve the measurement of hospital efficiency

In 2015 and 2016, the OECD has undertaken extensive methodological development and related pilot data collection work on hospital-level AMI case fatality rates. This work seeks to more fully understand the variations in outcomes from hospital care across countries and within countries, given that the variation across hospitals in a country can be equal or greater to that observed when comparing outcomes across countries at the national level. This work is being carried out in alignment with other OECD work focussed on establishing data on hospital-level cost estimates for specific outputs, including AMI admissions. The objective is to build capacity to bring inputs, outputs and outcomes measures together at both the hospital and national level to consider international hospital sector efficiency, and explore key drivers for reducing variations and improving overall hospital system performance. In the medium-term, the aim should be to be able to relate more closely input, output and outcome data to assess the efficiency of human resources in the hospital sector, at the hospital level, national level and for cross-country comparisons.

3.2 Primary care efficiency

3.2.1. Definition of primary care

Primary care is an important cornerstone of all health systems. Although there are different definitions of primary care, all have in common that it is defined as the first level of contact of the population with the health care system.

At a global level, the 1978 Alma-Ata declaration defined primary care as the "first level of contact for the population with the health care system, bringing health care as close as possible to where people live

and work. It should address the main health problems in the community, providing preventive, curative and rehabilitative services" (WHO, 1978). Primary care services range from educating the population about prevailing health problems, delivering maternal and child health, offering preventive services, and controlling diseases, to delivering appropriate treatment for common diseases and injuries that can be treated outside a hospital. The Alma-Ata declaration recognised that primary care goes beyond services provided by primary care physicians to encompass other health professionals such as nurses, midwives, auxiliaries, and community health workers.

At the European level, a 2010 report from the PHAMEU (Primary Health Care Activity Monitor for Europe) project defined primary care as "the first level of professional care where people present their health problems and where the majority of the population's curative and preventive health needs are satisfied" (Kringos et al., 2010). This report went on to say that primary care is expected to provide accessible, comprehensive care close to where patients live on a continuous basis, and to co-ordinate the care processes of patients across the health care system.

A 2014 independent expert panel advising the European Commission more recently adopted a definition of primary care as "the provision of universally accessible, person-centred, comprehensive health and community services provided by a team of professionals accountable for addressing a large majority of personal health needs. These services are delivered in a sustained partnership with patients and informal caregivers, in the context of family and community, and play a central role in the overall coordination and continuity of people's care" (Expert Panel on Effective Ways of Investing in Health, 2014).

3.2.2. Inputs measures

Primary care inputs include labour (human resources) and capital (primary care facilities, ICT and other equipment), and the financial resources to pay for these inputs.

Measuring primary care spending

National and international measurement of primary care spending needs to be based on some agreed-upon definition of the activities of the primary care sector and a mapping of this definition into an appropriate accounting framework. This section discusses these challenges and proposes one possible option to demarcate primary care spending from other health spending on the basis of the System of Health Accounts (OECD, Eurostat, WHO 2011)[2]. It also leaves the door open for other, possibly broader, definitions of primary care spending.

Despite the existence of a broad consensus about the general definition of primary care as being the first level of contact for the population with the health care system, there is less of a consensus when it comes to specifying a list of primary care services and distinguishing primary care providers from secondary care and other non-primary care providers. Some of the practical questions that arise include for instance: Should all prevention expenditure (including broad public health programmes) be included in primary care? Should pharmaceutical consumption in the community be included as primary care spending? What about ancillary services and dental care in the ambulatory sector? These are difficult questions which need to be addressed in measuring primary care spending. The second challenge is to translate a common operational definition of primary care into a regular data collection of health expenditure at the national level and international level. The obvious starting point would be to use as much as possible existing routine data collections. This, however, has repercussions on the choice of the definition. A very detailed

2. The OECD, Eurostat and WHO have jointly developed the System of Health Accounts 2011 (SHA) which serves as a common accounting framework for the definition and categorisation of health expenditure. This global standard proposes a tri-axial accounting approach classifying transactions used in the consumption of health care goods and services around the core dimension financing (who pays), provision (who provides the good or service) and function (what is the purpose of the good or service).

definition of primary care might not correspond to the existing categories used in the classifications to measure health spending or the definition of primary care may require a level of granularity of data that may not be available in many countries, thus limiting the applicability of the definition and comparability of data. Hence, for a meaningful and comparable measurement of primary care spending, a balance needs to be found between agreeing on a policy relevant definition and having a sufficient number of countries able to report data reasonably consistent with this definition on a regular basis.

Within the SHA framework, primary care was not initially defined as a separate category of providers or functions[3]. The most promising starting point to measure primary care spending is to use the two-dimensional functions by providers (HCxHP) table and identify those combinations of health care functions and health providers that constitute components of primary care.[4] Based on a preliminary mapping of the general definitions with the HC and HP classifications, different options to measure primary care spending within the routine SHA data submission can be identified and discussed.

A narrow definition could consist of outpatient curative and rehabilitative care (excluding specialist care and dental care), home-based curative and rehabilitative care, ancillary services, and preventive services if provided in an ambulatory setting. Such a definition may come closest to the general definition of primary care. It limits all primary care activities to ambulatory health providers. Hospitals are excluded because their main focus lies on secondary care[5]. Long-term care services provided in patients' homes or in outpatient settings are also excluded from this definition of primary care. The narrow definition requires, however, a high level of data granularity, notably the possibility to distinguish between general vs specialised outpatient care. Other possible broader definitions can also be considered either to reflect a broader conceptualisation/coverage of primary care activities or to overcome some of the specific data requirements to implement the narrow definition (see Table 3.1 for differences in reporting between the narrow definition and possible wider definitions).

3. The functional classification could have incorporated categories such as primary, secondary and tertiary care, but preference was given instead to a classification distinguishing categories of health care goods and services along the primary purpose (e.g., prevention, curative, rehabilitative, long-term) and its mode of provision (inpatient, outpatient, day case, home-based).

4. The question whether an activity is financed out of public budgets or by the patients themselves should not be the decisive factor to decide whether this activity should be an element of primary care or not. Nevertheless, the analysis to what extent primary care is financed from public sources is certainly relevant. However, this is difficult to assess with the proposed approach. This is due to the fact that health expenditure and financing data is collected in the JHAQ data submission as series of two-dimensional tables. Hence, a three-dimensional analysis (e.g. public spending for outpatient care in ambulatory clinics) is not directly feasible and can only be estimated.

5. The results from the 2012 OECD Health System Characteristics Survey confirm that outpatient department of hospitals play no significant role as a predominant or secondary organisational form in primary care delivery in any of the EU countries that responded to this survey. Moreover there are also accounting issues that justify an exclusion of hospitals from any primary care definition (for example, emergency hospital visits would not be separable from any potential primary care consultations in outpatient departments).

Table 3.1. Narrow and wider option to define primary care by health function and provider

		Health care **providers** (ICHA-HP)	HP.1	HP.2	HP.3	HP.3.1	HP.3.2	HP.3.3	HP.3.4	HP.3.5	HP.4	HP.5	HP.6	HP.7	HP.8	HP.9	HP.0	All HP
Health care **functions** (ICHA-HC)			Hospitals	Residential long-term care facilities	Providers of ambulatory health care	Medical practices	Dental practices	Other health care practitioners	Ambulatory health care centres	Providers of home health care services	Providers of ancillary services	Retailers and other providers of medical goods	Providers of preventive care	Providers of health care system administration and financing	Rest of economy	Rest of the world	Providers *unknown*	All providers
HC.1+HC.2		**Curative care and rehabilitative care**																
HC.1		**Curative care**																
HC.2		**Rehabilitative care**																
	HC.1.1+HC.2.1	Inpatient curative and rehabilitative care																
	HC.1.2+HC.2.2	Day curative and rehabilitative care																
	HC.1.3	Outpatient curative care																
		HC.1.3.1 General outpatient curative care																
		HC.1.3.2 Dental outpatient curative care																
		HC.1.3.3 Specialised outpatient curative care																
		HC.1.3.9 All other outpatient curative care n.e.c.																
	HC.2.3	Outpatient rehabilitative care																
	HC.1.4+HC.2.4	Home-based curative and rehabilitative care																
HC.3		**Long-term care (health)**																
HC.4		**Ancillary services (non-specified by function)**																
HC.5		**Medical goods (non-specified by function)**																
	HC.5.1	Pharmaceuticals and other medical non-durable goods																
	HC.5.2	Therapeutic appliances and other medical durable goods																
HC.6		**Preventive care**																
HC.7		**Governance and health system and financing administration**																
HC.0		**Other health care services *unknown***																
All HC		**All functions**																

Combinations of functions and prvodider included in primary care under the narrow scenario

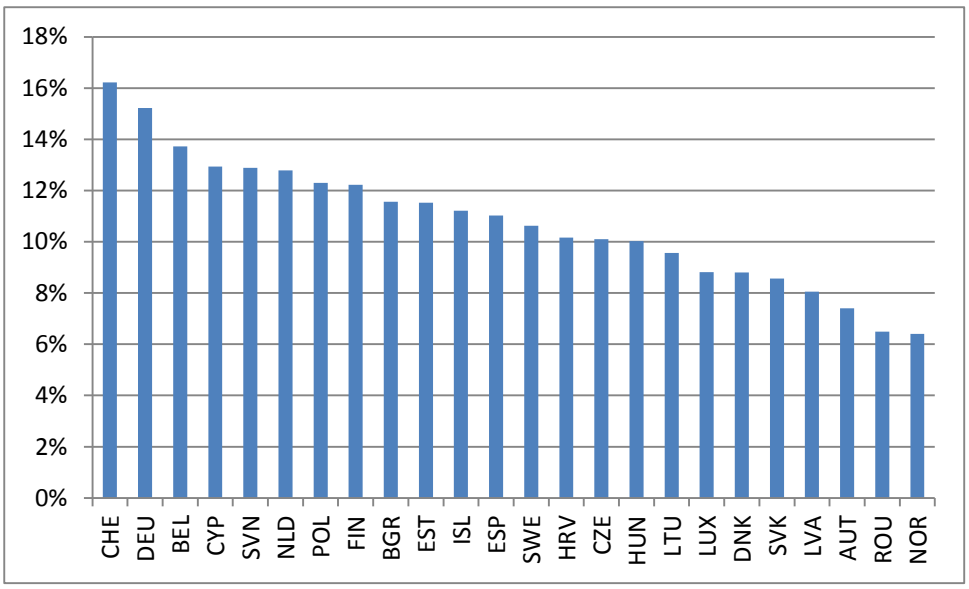
Combinations of functions and prvodider included in primary care under the wide scenario

Possible option to include pharmaceuticals

Based on the narrow definition of primary care spending, only 6 countries were able to report all the individual components for the year 2013, but another 18 EU and EFTA countries reported at least a sufficient number of the required spending items. However, in some cases an over- and underestimation of particular spending items may exist. Across the 24 European countries which appear to report at least the most important primary care components, spending for primary care averages around 11% of current health spending (unweighted average). This ranges from 6% in Norway and Romania to over 15% in Switzerland and Germany (Figure 3.7).

When analysing the components of primary care, general outpatient curative care is, as expected, the main spending item in nearly all countries, accounting for around two-thirds of all primary care spending on average. But the share of this spending component (in total primary care spending) can vary substantially across European countries. For example, in Switzerland nearly 90% of all primary care spending is reported as general outpatient curative care but this share only stands at 35% in Germany.

Figure 3.7. Primary care spending as share of current health spending, 2013

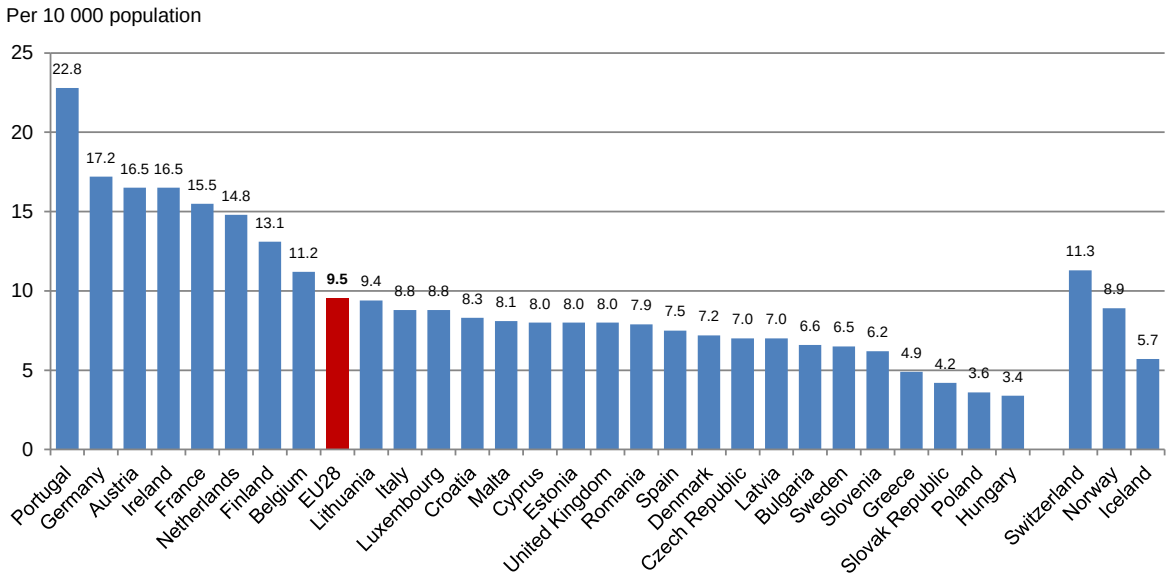


Source: OECD Health Statistics (2016)

Measuring labour and capital inputs in primary care

Labour is the most important and costly input in primary care delivery. Primary care providers include a wide range of health workers, including general practitioners, nurses or physician assistants (where they exist). The OECD/Eurostat/WHO-Europe Joint Questionnaire on non-monetary health care statistics collects data on the number of generalist medical practitioners, including a breakdown between general practitioners (GPs) and other generalist doctors (Figure 3.8). The availability of data at the international level on other primary care providers is much more limited, as there is often no readily available breakdown between those health workers (such as nurses) who work in primary care versus those who work in hospitals or nursing homes.

Figure 3.8. Generalist medical practitioners per 10 000 population, 2014 (or nearest year)



Note: The number for Portugal is a large overestimation as it includes all doctors licensed to practice.

Source: OECD Health Statistics 2016; Eurostat Database.

Capital inputs consist of infrastructure and equipment (IT, diagnostic machines, etc.) that are necessary to deliver primary care services. There is no comparable data at international level on the number of primary care clinics. However, data is available on some type of equipment in primary care, such as the adoption of eHealth and electronic health records (EHRs), and the supply of diagnostic machines. The annual OECD/Eurostat/WHO-Europe Joint Questionnaire collects data on the total number of MRI and CT scanners in each country, including a breakdown between those installed in primary care settings and in hospital. As it stands now, data according to this breakdown is available for 18 EU countries. The adoption of eHealth among general practitioners has been collected in 31 European countries in 2013[6]. These data were collected through a survey that was administered to more than 9 000 GPs in these 31 countries. Electronic health records and other IT-related indicators can also be used as indicators of outputs (rather than indicators of inputs) when measured in terms of utilisation (see Section 3.2.3).

3.2.3. Outputs measures

Outputs indicators include the volume of different services delivered by primary care providers. When these services relate to activities that are generally accepted as being appropriate and beneficial (e.g., immunisation for children or elderly people, early detection of cancer), the provision of these services can be interpreted as a measure of primary care quality.

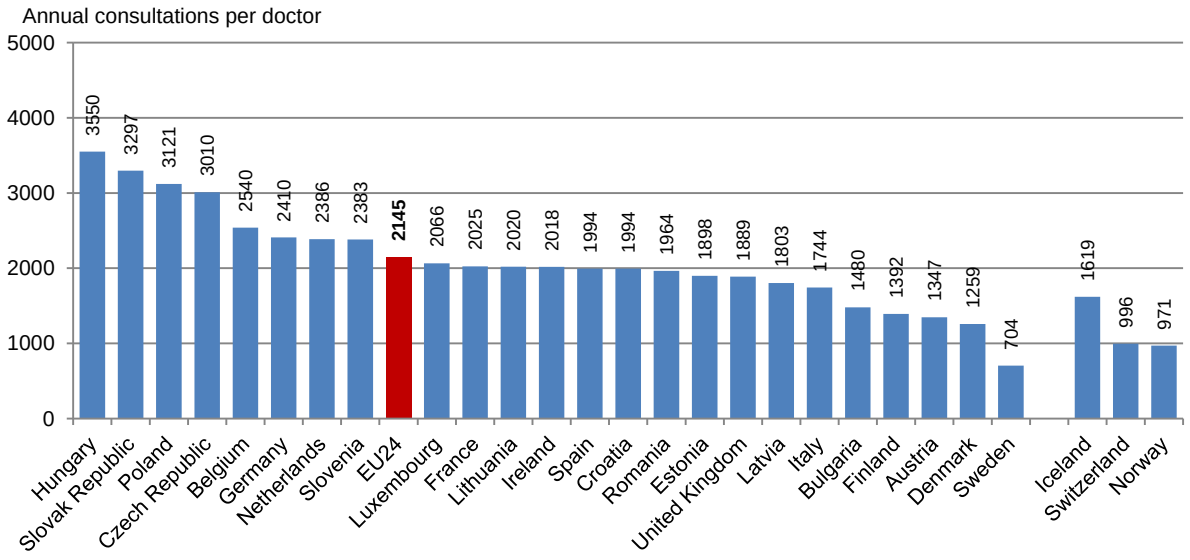
Volume of primary care activities

One of the main outputs of primary care systems is the number of visits to primary care providers. In 2014, there were an estimated 3.6 milliards of consultations with doctors across the 28 EU countries

6. E-Health covers a variety of digital applications, processes and platforms including: electronic health record systems, TeleHealth (remote medical consultation), smartphone 'apps', remote monitoring devices and biosensors, and computer algorithms and other analytical tools.

(including both consultations with generalists and specialists in outpatient settings). Using these data and the data on the number of doctors (including both generalists and specialists), it is possible to estimate the number of consultations per doctor per year (excluding inpatient consultations in hospitals or nursing homes). Figure 3.9 shows that the estimated number of consultations per doctor in 2014 varied from over 3 000 consultations in Hungary, the Slovak Republic, Poland and the Czech Republic, to less than 1 000 in Sweden, Norway and Switzerland. This indicator is a crude measure of the efficiency (or productivity) of doctors, as it excludes the work doctors do on hospital inpatients, administration and research. There are two other important caveats in using this output indicator to measure primary care efficiency. First, consultations with doctors refer to the number of contacts with physicians, including both generalists and specialists. Based on the current data collection in the OECD/Eurostat/WHO-Europe Joint Questionnaire, it is not possible to differentiate the number of contact with generalists from the number of contact with specialists. Second, the volume of consultations does not reflect the quality of these consultations. A high number of consultations may simply reflect consultations that are too short and of poor quality.

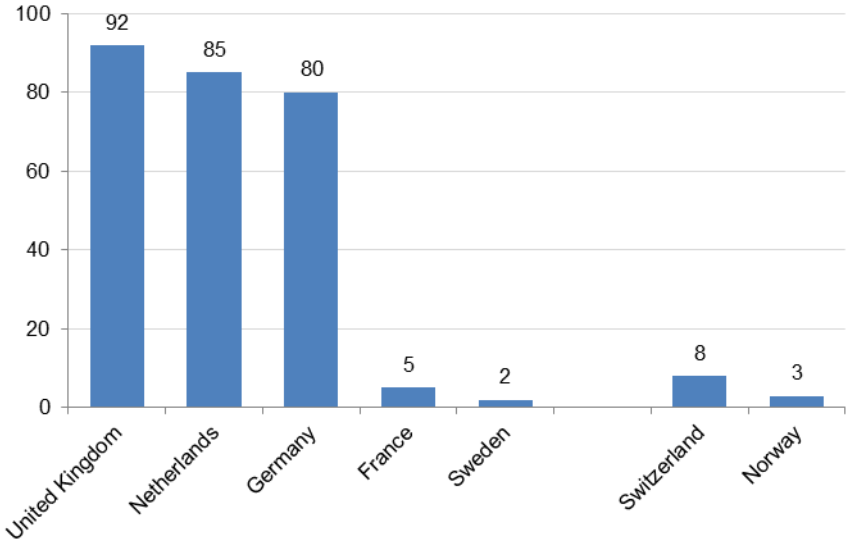
Figure 3.9 Estimated number of consultations per doctor, 2014 (or nearest year)



Source: OECD Health Statistics 2016; Eurostat Database.

Some data on the duration of consultations is available internationally but only for a limited number of countries. The 2015 Commonwealth Fund International Health Policy Survey of Primary Care Doctors collected data on the percentage of primary care doctors who report typically spending less than 15 minutes per consultation across 11 OECD countries, including 7 European countries. This share ranges from 80% or more in the United Kingdom, the Netherlands and Germany, to less than 10% in Sweden, Norway, France and Switzerland (Figure 3.10).

Figure 3.10. Percentage of primary care doctors spending less than 15 minutes with a patient



Source: The 2015 Commonwealth Fund International Health Policy Survey of Primary care Doctors

These measures on the number and duration of doctor consultations can also be complemented with measures of patient experience to get the patients' point of view on the quality of these consultations (see section below).

Quality of primary care (measure in terms of activities)

Some activities that are (or should be) delivered by primary care providers are generally considered to be appropriate and beneficial to prevent communicable and non-communicable diseases, to promote the early detection of health problems, or to properly manage people with chronic diseases. The extent to which these activities are carried out can therefore be interpreted as indicators of primary care quality.

Conceptually, primary care quality can be characterised along three different dimensions: i) appropriateness and comprehensiveness, ii) care continuity, and iii) care co-ordination (Pelone et al., 2013)[7].

Appropriateness and comprehensiveness is considered as a key function of primary care systems to meet the health care needs of patients and standards of care (Kringos et al., 2015). Appropriateness of care refers to care which, based on current evidence and clinical guidelines, are broadly accepted as being appropriate for designated population target groups (e.g., childhood immunisation, regular check of blood pressure or blood glucose for people with hypertension or diabetes, cancer screening for women or men in certain age groups). Comprehensiveness refers to the provision of care that is person- rather than disease-focused, including a wide range of services such as health promotion, early detection, and management of chronic diseases.

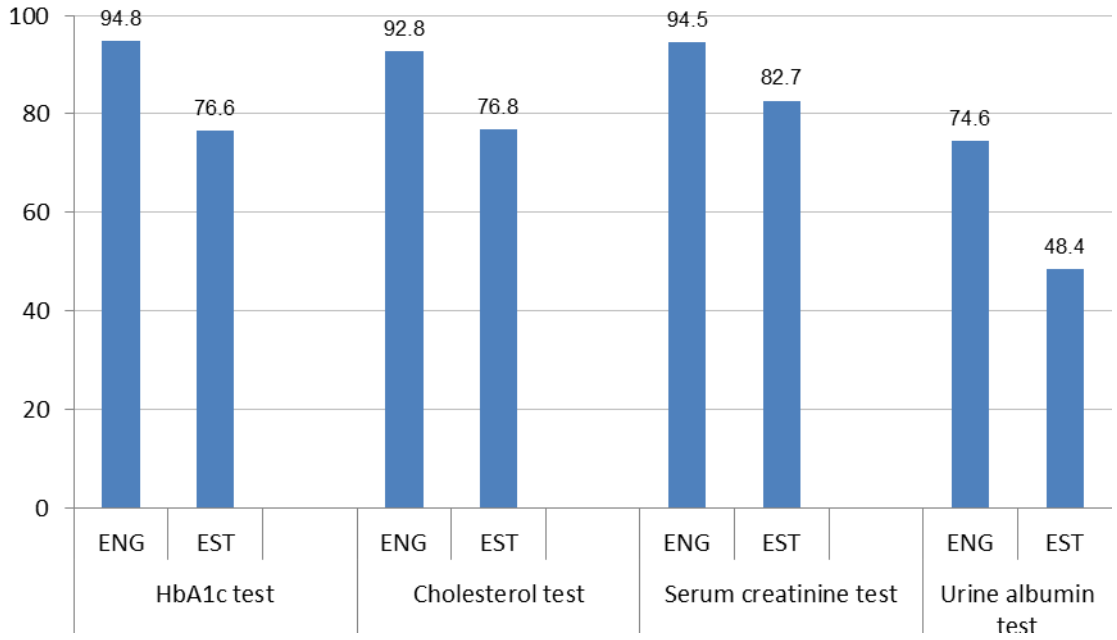
Data availability is generally good at the international level on some measures of appropriateness in primary care delivery, including data on childhood vaccination programme (through the WHO/UNICEF database) and for older people (through the OECD/Eurostat/WHO-Europe Joint Questionnaire), and for different types of cancer screening (through the OECD/Eurostat/WHO-Europe

7. Pelone et al. (2013) also consider accessibility as an important feature of primary care system.

Joint Questionnaire or through the European Health Interview Survey which is carried out once every five to six years).

More specific indicators related to whether people with chronic conditions are receiving recommended care or effective management for their conditions are, however, not readily available in most countries. Only a few countries collect direct measures of the quality of primary care services for patients with chronic conditions (e.g., diabetes, asthma), often linked with the implementation of pay-for-performance schemes. This is the case, for example, in Estonia and the United Kingdom in the area of diabetes care. In Estonia, the Quality Bonus Scheme, a pay-for-performance mechanism established in 2006, focuses (among other domains) on chronic disease management. Six indicators are considered for diabetes management, which are directly linked to clinical guidelines. In the same vein, the National Diabetes Audit (NDA) in the United Kingdom measures the effectiveness of diabetes care against NICE Clinical Guidelines and NICE Quality Standards. The objective is to assess whether people registered with diabetes receive the nine NICE key processes of diabetes care, and whether people registered with diabetes achieve NICE defined treatment targets for glucose control, blood pressure and blood cholesterol (Figure 3.11).

Figure 3.11. Percentage of diabetes patients receiving recommended care process in England and Estonia, 2013/2014



Source: 2013 Quality Bonus System in Estonia; 2013/2014 National Diabetes Audit in the United Kingdom

Beyond appropriateness, a possible indicator to support measurement of comprehensiveness would be around the involvement of primary care providers in health prevention and promotion. In their analysis of the efficiency of primary care in Europe, Pelone and colleagues (2013) used GPs involvement in preventive activities and in health counselling as a proxy measure to assess the comprehensiveness of primary care provision. This analysis used data from the PHAMEU project, which collected information on 94 primary care indicators in 27 EU Members States, as well as in Switzerland, Turkey, Norway, and Iceland in 2009/2010 (Kringos et al., 2010). More recent international data around health promotion and prevention are available through the OECD 2016 Health System Characteristics Survey. The results from this 2016 survey show that the degree of involvement of nurses or assistants working in primary care varies widely across the 20 EU countries that have responded to this survey so far for interventions such as: i) immunisation, ii) health promotion, iii) routine check of chronically ill patients (Table 1.2).

Table 1.2. Involvement of nurses and assistants in health promotion and prevention, 2016

	Do a large majority (>75%) of nurses or assistants independently provide immunisation?	Do a large majority (>75%) of nurses or assistants independently provide health promotion?	Do a large majority (>75%) of nurses or assistants independently provide routine checks of chronically ill patients?
Austria	No	No	No
Belgium	No	No	No
Czech Republic	Yes	No	No
Denmark	No	Yes	No
Estonia	Yes	Yes	Yes
Finland	Yes	Yes	Yes
France	No	Yes	No
Greece	No	Yes	Yes
Italy	No	No	No
Latvia	Yes	Yes	Yes
Lithuania	No	No	No
Luxembourg	No	No	No
Netherlands	Yes	Yes	Yes
Norway	No	Yes	No
Poland	Yes	Yes	Yes
Portugal	Yes	Yes	Yes
Slovenia	No	No	No
Spain	Yes	Yes	Yes
Sweden	Yes	Yes	Yes
United Kingdom	Yes	Yes	Yes

Source: OECD 2016 Health System Characteristics Survey

Coordination and continuity of care are two other important features of a strong primary care system. Care coordination reflects the way primary care providers coordinate the use of other levels of care. This encompasses co-ordination with other primary care providers, co-ordination with secondary care and co-ordination with public health services. Care continuity is a broader concept that is generally defined in terms of relational, informational and management continuity. Care coordination and care continuity rely on good information systems, both within primary care systems and between levels of care.

Good information systems include for example the use of electronic health records, use of e-prescribing or other ICT to inform decision making and increase access and quality of care while reducing errors.

The QUALICOPC project collected indicators around the use of computer in primary care practices and the main purposes of computer use (e.g., keeping records of consultations, sending referral letters to specialists, storing diagnostics test results, issuing drug prescription, sending prescription to pharmacy, etc.). The data was collected through a special survey administered to GPs in 31 European countries (27 EU Members States excluding France, plus Iceland, Norway, Switzerland, and Turkey) between 2011 and 2013 (6 328 GPs responded to the survey). The OECD 2016 Health System Characteristics Survey also collected indicators around the use of computer by primary care physicians and the main purposes of computer use. In addition, it collected information on whether primary care physicians offer patients the option to email them about a medical question or concern, and the option to view online, download, or transmit information from their medical record.

3.2.4. Outcomes measures

Less data are available to directly measure the outcomes of primary care services than there are to measure their activities. As it stands now, the main indicator of primary care outcomes is an indirect indicator of avoidable hospital admissions for a set of chronic diseases, which is collected through the OECD Health Care Quality Indicators questionnaire. More direct outcomes indicators might include measures of patient experience with primary care (such as whether a patient participates in decisions about their care, convenience of the care provided, and communication about care[8]). In addition, measures of outcomes of chronic diseases management may also be used as relevant indicators of primary care outcomes, but data as it stands now are only available in a few countries. There is therefore a need to encourage a growing number of countries to collect and regularly report data on these measures.

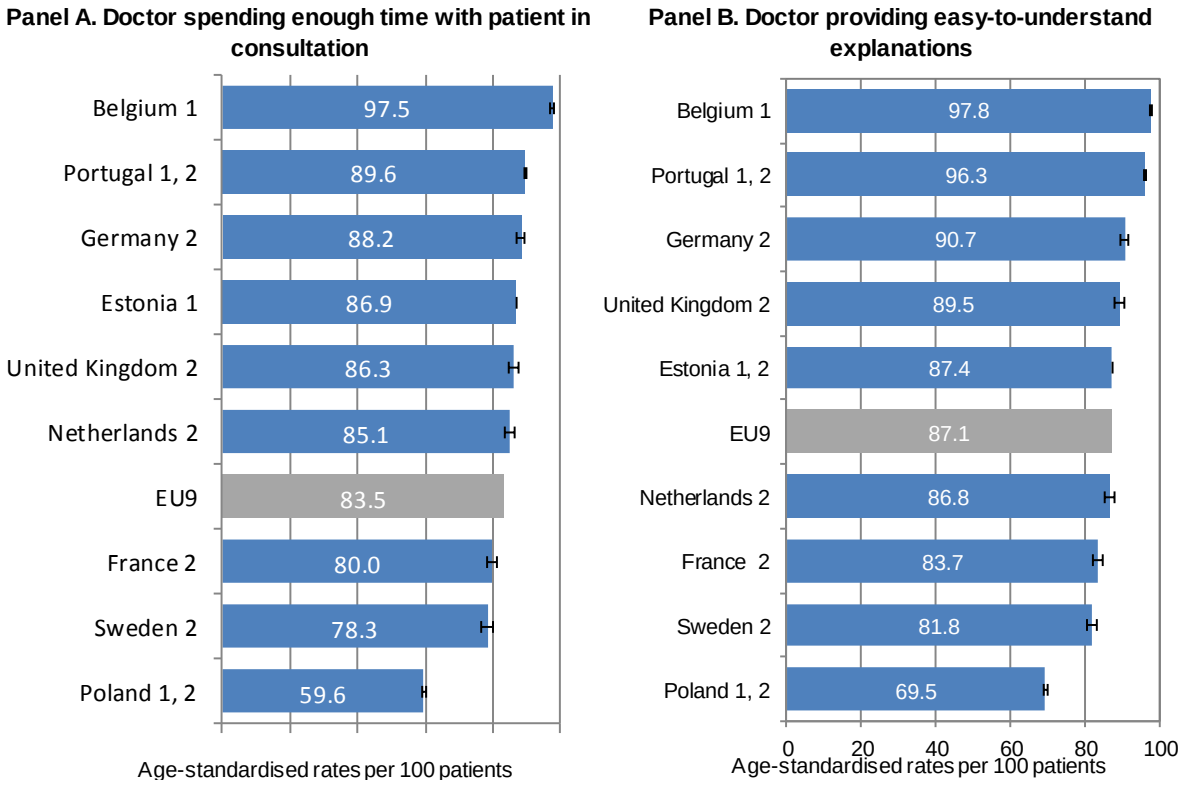
Direct outcome indicators

Patient-reported experience measures (PREMs) include the concepts of communication, shared decision-making and use of a patient-centred approach to provision of care, by respecting for example patient preferences. They capture patient experience with care such as being listened to and having concerns addressed; having a say in decisions about care; having management of health problems coordinated around individual needs; being accurately informed about to what to expect; being treated with dignity and respect. PREMs are an important marker of primary care performance from the point of view of those most concerned – patients themselves.

Countries are at varying points in terms of collecting PREMs. There is a strong need to develop and implement standardised patient reported indicators in a greater number of countries. Some international surveys (such as the Commonwealth Fund International Health Policy Survey) and national surveys (e.g., in the United Kingdom, Estonia, Poland, Portugal, Sweden) collect such PREMs to measure quality and responsiveness to patient needs and expectations in primary care. Figure 3.12 shows some of the results from the Commonwealth Fund International Health Policy Survey and national surveys on responses to questions such as whether patients thought that doctors spent enough time with them during consultations and whether doctors provided them with easy to understand explanations.

8. These indicators of patient-reported experience measures (PREMs) are also often considered as indicators of responsiveness.

Figure 3.12. Patient experience with ambulatory care, 2013 (or latest year)



Note: 95% confidence intervals represented by H.

1. National source. 2. Patient experience with their regular doctor.

Source: Commonwealth Fund International Health Policy Survey 2013 and other national surveys.

Measuring the (clinical) outcomes of chronic diseases management is another way to measure direct primary care outcomes. Such indicators are designed to reflect the effective management and control of patients with chronic diseases. Target achievement rates, for diabetes management for example, are usually linked to national guidelines and quality standards. A few countries have taken steps in recent years to collect such indicators on a systematic and regular basis. For example, the National Diabetes Audit in England, the National Diabetes Register in Sweden and the National Diabetes Observatory in Portugal collect target achievement rates for cholesterol, blood pressure and HbA1c among diabetes patients (see Annex). However, the availability of data across countries is fairly limited as it stands now and there are also comparability limitations because each country may set different targets.[9]

Indirect outcomes indicators

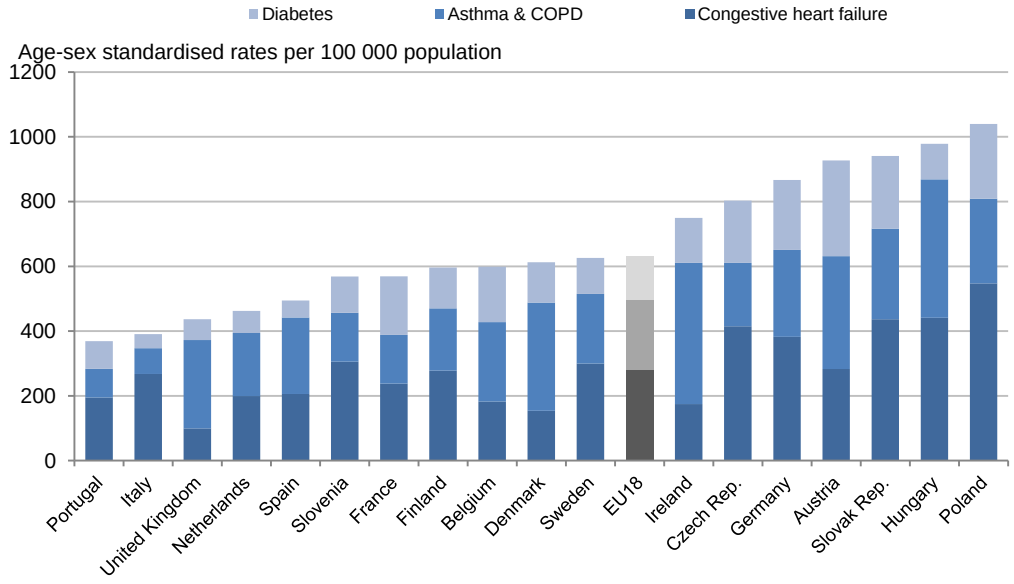
Indirect outcomes indicators of primary care include information from other parts of the health system (usually hospitals) which might be used to assess primary care quality and outcomes. These include: i) avoidable hospitalisation for ambulatory care sensitive conditions, and ii) unnecessary use of emergency department (ED) visits.

Ambulatory care sensitive conditions, such as asthma, chronic obstructive pulmonary disease (COPD), congestive heart failure, and diabetes, are conditions for which accessible and effective primary care can

9. For example, the target achievement for blood pressure is set at 140/80 in England, 140/85 in Sweden and 130/85 in Portugal.

generally reduce the risk of complications and prevent the need for hospitalisation (Purdy et al., 2009, 2012). The evidence base for effective treatment for these conditions is well established and much of it can be delivered at a primary care level. Therefore, a high performing primary care system should be able to avoid to a large extent any acute deterioration of the health status of people living with chronic conditions and prevent their admission to hospital. Potentially avoidable hospitalisations for these chronic conditions are thereby commonly used to measure primary care quality and efficiency. Based on the OECD Health Care Quality Indicators data collection, the rate of hospital admission for congestive heart failure, diabetes, asthma and COPD is two-times lower in some countries such as Portugal, Italy, the United Kingdom and the Netherlands compared to others such as Poland, Hungary, the Slovak Republic and Austria among the 18 EU countries for which data were provided (Figure 3.13).

Figure 3.13. Avoidable admissions for ambulatory care sensitive conditions, 2013 (or nearest year)

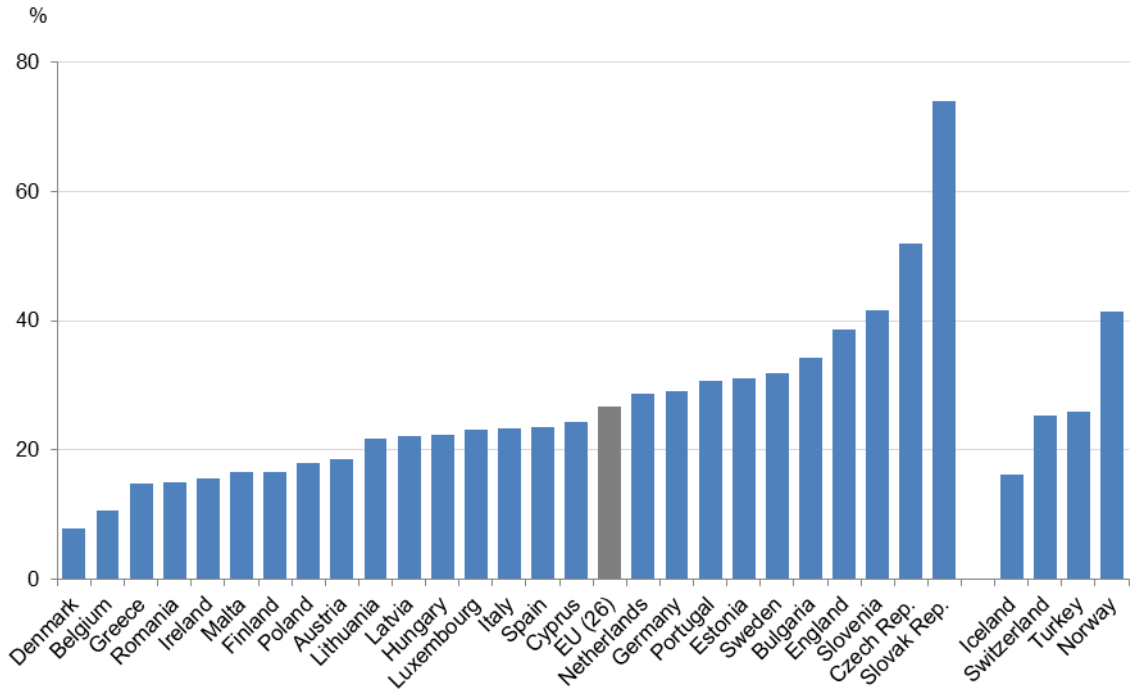


Source: OECD Health Statistics 2016.

Linking the number of these potentially avoidable hospital admissions and the average cost per admission would provide an estimate of the potential efficiency gains (in terms of savings) that might achieved by improving access and quality in primary care.

A significant proportion of ED visits in hospital are motivated by low urgency problems that in theory should not be addressed in emergency departments. Such unnecessary visits could have been avoided through greater access and better management of patients in primary care settings, whether by a primary care physician or a broader primary care clinical team. These ED visits can be costly and potentially harmful to the patient. They consume ED inputs and jeopardise the prompt treatment of more seriously ill patients. They also reduce the quality of care through prolonged waiting times and delayed diagnosis and treatment. Furthermore, they lead to overcrowding and disrupt patient flow within hospitals, which might adversely affect the quality of care. At the EU level, the QUALICOPC survey carried out between 2011 and 2013 collected the proportion of persons who visited an ED because primary care was not available (Figure 3.14). In a similar vein, the 2014 Commonwealth Fund International Health Policy Survey of Older Adults collected the proportion of elderly adults using ED for a condition that could have been treated by a regular doctor or place of care if available.

Figure 3.14. Proportion of patients who visited an emergency department because the primary care physician was not available, 2011-13



Source: van den Berg et al. (2016).

3.2.5. Relating inputs to outputs and outcomes measures: Previous efforts to measure primary care efficiency

The measurement of efficiency in primary care, as in other parts of the health system, requires linking the outputs and of outcomes of the interventions with the inputs (in terms of labour and capital inputs or the expenditure required to provide these services).

Data Envelopment Analysis (DEA) is one of the most common approaches used to try to measure primary care efficiency (Pelone et al., 2015). This approach consists of defining an efficiency frontier using inputs and outputs/outcomes, and then measuring the distance of each country in international analyses to this efficiency frontier. A country is deemed to be inefficient when another country with the same level of inputs generates more outputs and/or outcomes. Such method enables to control for a number of contextual factors that can affect the efficiency of primary care.

At the European level, the Primary Healthcare Activity Monitor for Europe (PHAMEU[10]) project relied on DEA analyses to measure the relative efficiency of primary care across more than 30 European countries. A country was defined as being efficient in delivering primary care if it used an optimal combination of structure (measured in terms of governance, economic conditions and workforce) and organisation of processes (measured in terms of comprehensiveness, access, continuity and coordination of care) to produce a given level of outcomes (measured in terms of quality).

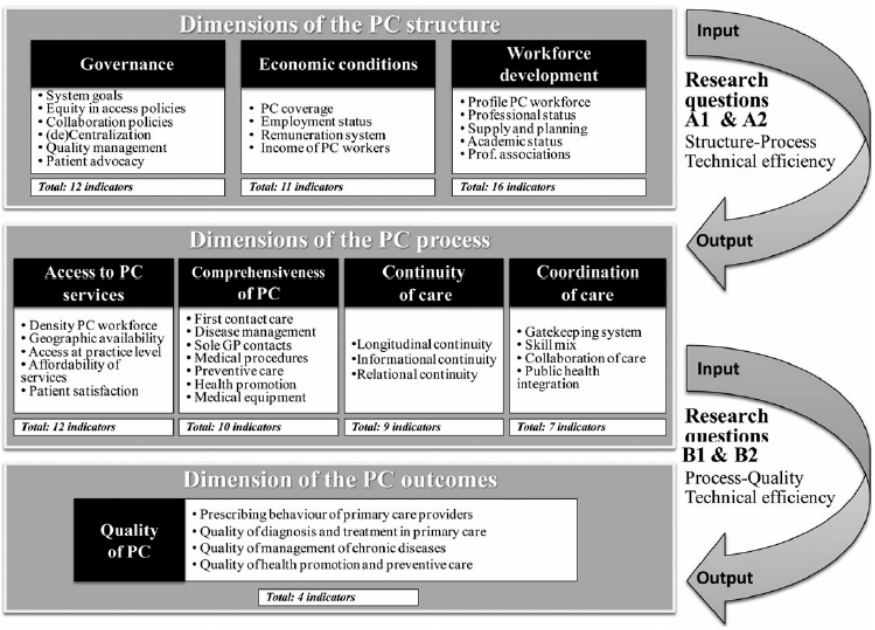
10. The PHAMEU project was carried out in 31 European countries in 2009/2010 to compare and analyse the key dimensions of primary care in a standardized way.

The PHAMEU project tried to respond to the two following questions (Figure 3.15):

- What is the optimal relationship between the structure of primary care (in term of governance, economic conditions and workforce development) and the primary care processes delivered (in terms of comprehensiveness, access, continuity and coordination of care);

- What is the optimal relationship between the process dimensions of primary care services delivery (in terms of comprehensiveness, access, continuity and coordination of care) and quality of care?

Figure 3.15. Study design to measure primary care efficiency across Europe



Two DEA were carried out to respond to these questions: i) considering the three structure dimensions as inputs and the four process dimensions as outputs, and ii) considering the four process dimensions as inputs and the quality of primary care as output.

These DEA analysis came up with some overall scores of efficiency across most of the European countries covered in this study, but some of the results were counter-intuitive and hard to explain (e.g., Italy and the United Kingdom were found to be the least efficient in converting the 'structure' dimension (inputs) into "processes" (outputs), and Austria and Portugal were found to be the least efficient in converting these "processes'(outputs) into quality). While such overall DEA scores may be appealing as it attempts to summarise a lot of disparate information, the reliability of the results depend heavily on the quality of the underlying data and the weights given to different indicators.

Given current limitations in data availability and comparability regarding the inputs, outputs and outcomes of primary care systems across EU countries, the main priority in the short term should be to improve the underlying data on these dimensions, before trying to come up with any overall efficiency score.

3.3 Pharmaceutical spending efficiency

3.3.1 Introduction

Pharmaceutical spending across OECD countries reached over €600 billion in 2013, accounting for about 20% of total health spending on average when spending in hospital is included.[11] After inpatient and outpatient care, pharmaceuticals represent the third largest expenditure item of health care spending. Policy makers have an interest in maximising the efficiency in the pharmaceutical sector given the size of these expenditure, the large public stake in its financing, as well as ensuring access to affordable medicines for all patients and providing incentives for future innovation.

The main purpose of this section is to review current indicators being used to measure efficiency in the pharmaceutical sector and to identify a possible set of additional indicators that might be developed to allow a more complete analysis of efficiency in that sector. The analysis highlights that there are currently a good set of "input indicators" (in terms of spending) and "output indicators" (volume of consumption) to measure at least partly the efficiency of the pharmaceutical sector. Outcome measures used for the entire health system can be used but what is lacking are outcome indicators specific to the pharmaceutical sector (health outcomes that could be unambiguously attributed to pharmaceutical treatments). Nine indicators can be considered to get some insight on (in)efficiency in the pharmaceutical sector. Five of these indicators are currently being measured and reported on a regular basis and four could be developed. These measures are:

- Pharmaceutical expenditure (financial input measure)
- Volume of consumption of specific drugs (output measure)
- Share of generics in market (efficiency indicator)
- Antibiotics consumption (quality measure -- overuse)
- Inappropriate prescribing of benzodiazepines among elderly people (quality measure -- overuse)
- Prices of pharmaceuticals (efficiency indicator – unit cost)
- Polypharmacy among elderly people (quality indicator – overuse)
- Adherence to treatment for chronic diseases- hypertension and diabetes (quality indicator – underuse)
- Doctors use of e-prescribing (quality/safety indicator)

3.3.2 Inputs and outputs measures (pharmaceutical expenditure and consumption)

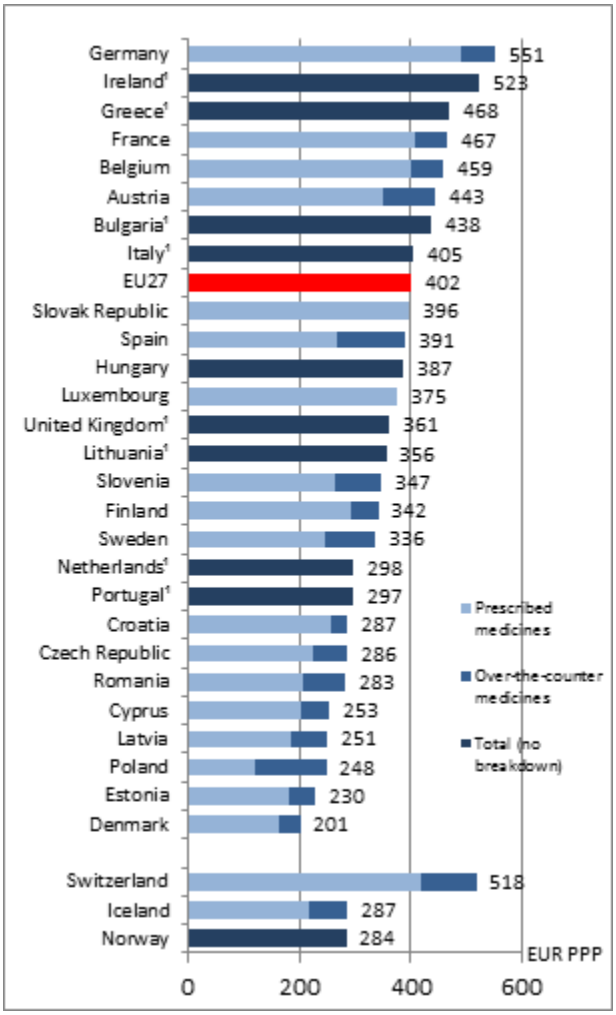
Pharmaceutical expenditure is usually the starting point to measure efficiency in the pharmaceutical sector. Pharmaceutical spending can be measured per capita, as a share of GDP or as a share of total health expenditure, considering also growth rates However, there are some comparability issues. According to SHA definitions, pharmaceutical spending includes medicines (prescription medicines and over-the-counter drugs) that are purchased in retail outlets. However, some countries do not report spending for

11. This estimate includes spending for pharmaceuticals for inpatient and outpatient care and was computed for a sample of OECD countries for which such data are available.

OTC drugs and more importantly, countries have different policies in terms of access to high-cost products, which are sometimes only available in hospitals. This means that in some countries, a large share of pharmaceutical spending is included in "spending for inpatient care" rather than in pharmaceutical spending.

Keeping these limitations in mind, the available data shows that pharmaceutical spending across EU countries in 2014 varied from over €500 per person in Germany and Ireland to less than 250 Euro in Denmark, Estonia and Poland (adjusted for purchasing power parities) (Figure 3.16)

Figure 3.16. Expenditure on pharmaceuticals per capita, 2014 (or nearest year)



1. Includes medical non-durables.

Source: OECD Health Statistics 2016; Eurostat Database.

These variations in pharmaceutical spending per capita across countries, reflecting differences in volume, patterns of consumption and pharmaceutical prices.

Pharmaceutical consumption (which can be used as output indicators) are generally available by therapeutic class (e.g. antibiotics, antihypertensive, antidepressant, cholesterol lowering, and antidiabetic drugs) and measured in defined daily dose per 1000 people per day or volume of prescriptions per capita. In general, pharmaceutical consumption continues to increase, driven partly by a growing demand for drugs to treat ageing-related and chronic diseases and by changes in clinical practice.

There are many reasons behind the use of these input/output indicators including data availability, easy and meaningful comparability over time and across countries as well as providing a rough estimate of production function of the sector. Monitoring pharmaceutical expenditure over time is useful when observations are considered in terms of the target of the policy and the population characteristics, specifically the proportion of elderly and chronically ill that can drive up pharmaceutical costs. In addition, many factors influence pharmaceutical consumption beyond obvious policy interventions, such as changing demographics, therapeutic advances, marketing campaigns, seasonal effects, changes in eligibility for insurance and the habits of health practitioners.

In terms of macro-efficiency, savings in pharmaceutical costs or reduction in consumption may be outweighed by increased utilisation of other health care services, which may in fact increase overall health care spending. Rising expenditures of themselves may not be a problem if they are accompanied by health gain. Pharmaceutical consumption and related spending can certainly improve health. Medicines cure diseases, improve or maintain health, and avoid exacerbations of existing conditions. This can result in fewer visits to the emergency departments, fewer surgeries, or delaying the need for long term care. The net effect is reduced overall costs and improved health outcomes. However, measuring health improvements that can be unambiguously attributable to the pharmaceutical expenditure and/or to consumption is difficult. Establishing causal relationships is complex because the pharmaceutical sector is only one of many quantitative and qualitative factors that contribute to health outcomes.

Hence, outcome measures to assess the efficiency in the pharmaceutical sector are lacking. Some outcome indicators that measure efficiency in the primary and secondary sector might be heavily influenced by the use of pharmaceuticals (e.g., the proper management of chronic diseases like asthma, diabetes and hypertension – see section 3.2).

In terms of measuring efficiency what is needed is the ability to measure indicators that influence the relationship between the spending on pharmaceuticals and the gain in health outcomes.

An alternative (or complementary) approach is to measure inefficiencies in the way pharmaceuticals are used and the cost related to this. The results from some studies suggest that that the avoidable costs can reach many billions of euros. For example, and the cost of inefficient use of pharmaceuticals was estimated at about €26 billion in France in 2011 (Schiltz, Babin, Peschet, Canteaux, & Canac, 2014).

3.3.3 Measuring efficiency in the pharmaceutical sector

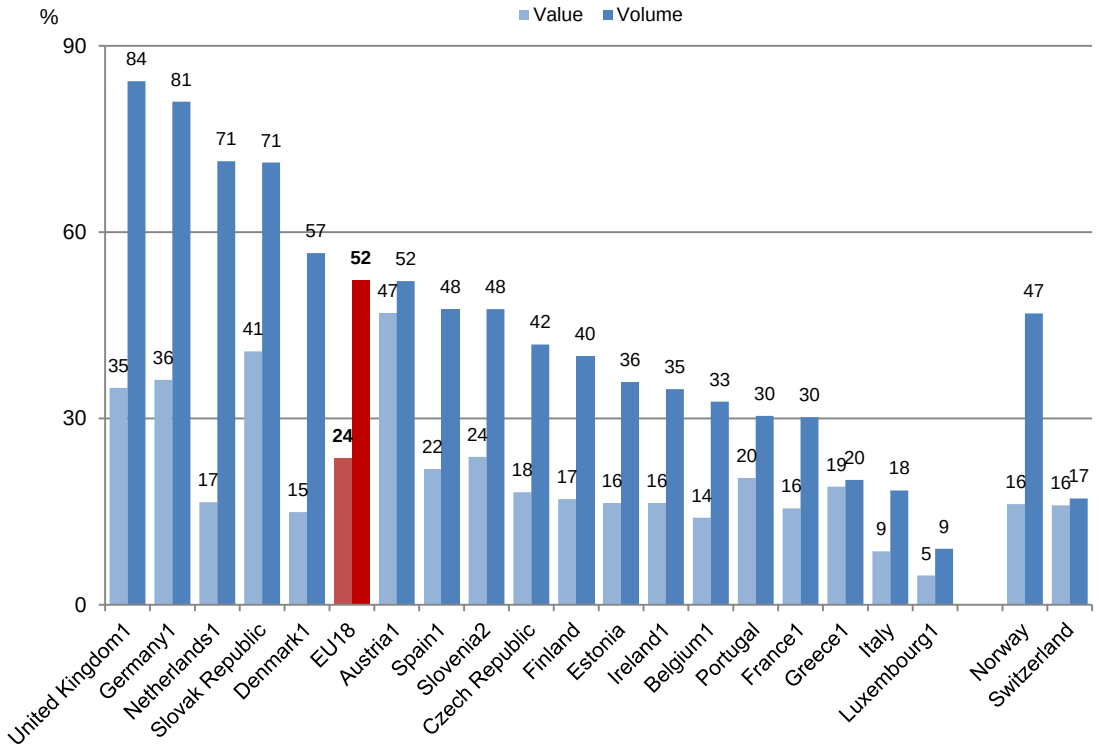
Efficiency in the pharmaceutical sector can be improved by two ways:

a) Reducing costs with no change to outputs and/or outcomes
b) Maximising outcomes with no change in spending.

a) Reducing costs with no change to outputs and/or outcomes

In the pharmaceutical sector, there are two main ways of reducing costs with no change to outputs/outcomes: firstly by increasing share of the generic market and secondly paying lower prices for patent and generic pharmaceuticals. Substituting expensive originator medicine with cheaper and therapeutically equivalent generics offers significant cost savings with no adverse health effects. In the United States, for instance, where the generic market is very dynamic, the price of a generic drug is on average 80 to 85% lower than that of the originator product (IMS, 2013). Hence, the existence of the generics markets allows the opportunity of increasing efficiency in pharmaceutical spending. In all European countries, the share of the generic market has increased in recent years, but there remain large variations across countries in the share of generics in volume and value (Figure 3.17).

Figure 3.17. Share of generics in the total pharmaceutical market, 2014 (or nearest year)



1. Reimbursed pharmaceutical market. 2. Community pharmaceutical market

Source: OECD Health Statistics 2016

Another mechanism to reduce expenditure on pharmaceuticals without compromising patient health outcomes is to reduce prices paid for medicines. Undertaking international comparisons of pharmaceutical prices allows comparisons to be made of prescription prices assessing the extent of pricing variation across countries as well as across time. This indicator would involve defining what a basket would look like and how to define the quantity and price.

b) Maximising outcomes with no change in spending

Health outcomes can be maximised by improving the way medicines are used. Inappropriate use of medicines is a significant source of inefficiencies in health systems. Desired treatment outcomes are not achieved when medicines are over-used, under-used or used inappropriately. When medicines are over-used, they generate costs above those required to achieve the desired treatment outcomes. In addition, they can lead to increased costs due to adverse effects (Foster et al., 2016). Similarly, when medicines are under-used (not prescribed where recommended or prescribed at too-low dosages), desired treatment outcomes are less likely to be achieved. Treatment failures may lead to repeated or prolonged treatment episodes (De Geest & Sabaté, 2003).

Overuse of medicines and especially certain classes of medicines in older adults or children is a result of inappropriate prescribing. Inappropriate prescribing encompasses the use of medicines that introduce a significant risk of an adverse drug-related event where there is evidence for an equally or more effective but lower-risk alternative therapy available for treating the same condition (Gallagher, Barry and O'Mahony, 2007). Inappropriate prescribing also includes the use of medicines at a higher frequency

and for longer than clinically indicated and the use of multiple medicines that have recognized drug–drug interactions and drug–disease interactions (Monégat et al., 2014; Sermet, Perronnin and Rococo, 2014).

Three of the proposed indicators measure overuse of medicines. Two are already routinely reported by the OECD: 'Antibiotics consumption' (using ECDC data) and 'inappropriate prescribing of benzodiazepines among elderly people' (although in this case the country coverage remains more limited - see the annex).

The third indicator measuring overuse is under development. The aim is to measure inappropriate polypharmacy among elderly people. Several countries currently measure these indicators routinely but the definitions differ between countries. Polypharmacy refers to the concurrent consumption of multiple drugs, generally more than five prescriptions. Excessive polypharmacy refers to concurrent consumption of more than ten prescriptions. The impact of polypharmacy on elderly populations is significant. It is associated with poor adherence, drug-drug interactions, medication errors and adverse drug reactions - including falls, hip fractures, confusion and delirium—accounting for a significant percentage of potentially preventable emergency room visits and hospitalisations (Monégat et al., 2014) (Gallagher et al., 2007).

Underuse or poor medication adherence is increasingly recognized as another significant source of waste and inefficiency in the health care system. Medication non adherence occurs when patients do not take their medicines appropriately or at all. Non adherence can result in costly complications that are often more expensive than the medicines and worsen health outcomes. Poor adherence often leads to preventable worsening of disease, posing serious and unnecessary health risks, particularly for patients with chronic illnesses. This leads to increased hospitalisation and death and is estimated to cost European governments 125 billion EUROs per year. Cost arising due to complications of poor compliance represents 14 % of total health expenditure in the United Kingdom (Iuga and Mcguire, 2014)."

The proposed indicator to measure underuse of medications is persistent pharmaceutical utilisation rates for two chronic conditions: hypertension and diabetes. There is no routine reporting of adherence or persistence measures in most countries. There are several different indicators that can be used for measuring adherence. A review of studies found that among patients with diabetes, hypertension, and dyslipidaemia, only 59% were adherent 80% of the time (Polonsky & Henry, 2016). In terms of costs, non-adherence for medicines for diabetes (25 billion USD/19 billion EUROs) and hypertension (419 billion USD/324 billion EUROs) have the biggest impact on avoidable costs in the United States (Aitken and Valkova, 2013). Disease complications account for an estimated 61 to 80 percent of Type 2 Diabetes-related costs, with 4 to 15 percent of costs linked to poor adherence and persistence (IMS Health, 2016). European and North American studies have estimated that around 50% of all patients using antihypertensive (AHT) drugs had discontinued their medicines within 6 months to four years (Simons, Ortiz, and Calcino, 2008). For diabetes medications studies have found 47% of patients discontinued therapy over a one year follow-up (Polonsky and Henry, 2016).

The last factor with the potential of improving health outcomes without increasing costs is doctor's use of e-prescribing. Electronic prescribing (or e-prescribing) is the electronic transmission of prescriptions or prescription-related information between a prescriber and a dispenser (Hahn and Lovett, 2014). E-prescribing improves the efficiency of the prescribing process and has the potential to save money. Currently, data for an indicator related to the percentage of primary care physicians reporting that they are able to electronically transfer prescriptions to a pharmacy is collected by the Commonwealth Fund for eleven OECD countries every three years (Osborn et al., 2015).

Health systems can improve efficiency by optimising performance in the pharmaceutical sector given the resources available within the confines of a fixed budget. The indicators proposed in the section allows assessment of inputs , outputs and efficiency measures in the pharmaceutical sector and whether there is variation across countries across the different indicators.

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4. Disease-based level analysis

4.1 Introduction

If health system inputs, either financial or physical, are to be linked to output and outcome measures then, on the face of it, this is best done at the level of disease, cutting across the whole health system. Recent OECD studies in areas such as cancer, cardio-vascular disease and diabetes have attempted to examine the links between inputs, outputs and outcomes (OECD, 2013; OECD, 2015). However, a number of significant challenges exist to implementing a disease-based approach to efficiency analysis at a national level and international level. First, while health outcomes data may be readily available for some diseases (e.g. cancer, notably because of the existence of cancer registries in most countries), they are still lacking for most diseases or treatments. Second, information on inputs related to different diseases (most notably costs) is also often scarce (except in the few countries that carry out expenditure by disease studies) or of insufficient detail. If, for example, aggregate health expenditures are taken as a proxy for spending on specific diseases, this doesn't take into account the different priorities and amount of resources that countries may allocate to various diseases.

4.2 Inputs measures (expenditure by disease)

Where health spending is broken down by disease, this gives useful information regarding the allocation of the available financial resources. However, on its own this doesn't provide any information about the effectiveness of different interventions or programmes that can be used to reduce the prevalence of diseases or treat them, or indicate whether the current allocation is optimal (allocative efficiency). Similarly, the expenditure allocated to any specific disease or group of diseases cannot on its own indicate the possible cost savings to be made by implementing, for example, particular prevention campaigns. Conversion of the opportunity cost—or the benefits forgone—of resources being devoted to disease treatment into expenditure savings involves a number of additional considerations (AIHW: Mathers et al., 1998). Expenditure by disease should therefore be seen as an input into further types of analyses such as cost-benefit or cost-effectiveness analysis.

The way that most disease expenditure studies are constructed highlights some of the limitations. A full assessment can only be made by performing an analysis in which costs for each disease and each provider are placed in the context of total health expenditure. This general approach yields consistency, good coverage, and avoids any double-counting of costs resulting in disease costs summing up to exceed total spending. This is more meaningful for policy purposes and, over time, can help understand which diseases are the drivers of health expenditure growth. However, for the analysis of specific diseases, a general approach to resource allocation is probably not as sensitive or accurate as a detailed analysis of actual costs incurred by patients with that disease (Rosen et al., 2013).

The most commonly applied approach allocates expenditures to particular diseases based on contacts or encounters with the health care system. While expenditures can be linked to output measures at a provider level, they are not readily compared to health outcomes (such as mortality and quality of life), which are typically measured at the person-level. For example, hospital expenditure data, based on a discharge database records, can distribute hospital spending, but it may not be possible to link multiple hospital stays (within or across hospitals) to one individual and, it is even more unlikely that the hospital discharge data can be linked to, for example, physician visit data. Therefore, while it may be possible to derive an average cost (expenditure) for a hospital encounter, physician visit, etc., ideally broken down by age group and gender, and other socioeconomic characteristics, it is problematic to estimate the cost-per-case of a particular disease. Another barrier is allocating spending where there is a lack of data giving patient-level diagnosis information, which is often the case for visits to general practitioners or pharmaceutical spending. In the latter case, pharmaceutical spending can be linked to the active ingredient, but modelling or mapping is required to link this to a single or multiple conditions.

This also raises issues around the treatment of comorbidities and sequelae. The normal practice is to attribute costs to a single diagnosis - the primary diagnosis - with co-morbidities ignored. However, the presence of certain chronic diseases may increase the treatment cost of the primary cause of the episode of care. It may be the case that the same person is given treatment for different diseases in the same period, involving separate accountable encounters (e.g., high blood pressure and rheumatic disease). Treatment can also be given for two diseases during the same hospital stay and this raises methodological problems. It is clear that many costs are generated by multiple diseases, especially at older ages. For example, a related study in Australia showed that for residential aged care expenditure, a "multiple-conditions" method for attributing expenditure by disease (which splits costs over all contributing diseases) led to significantly different distributions to disease than a "main-condition" method (AIHW: Mathers et al., 1998).

A person-level approach allocates an individual's total annual spending to their complete set of medical conditions. This tackles the problems of multiple chronic diseases, as expenditures for comorbidities and complications are better captured. There is a trade-off between advocating a methodology which can be applied across the board to enhance international comparisons and more 'accurate' modelling of actual costs which may be more appropriate for national and specific disease-based studies.

In summary, current studies provide the overall total costs (cost-per-capita) associated with a given disease, or a cost per contact (e.g. per hospital visit) as opposed to the cost-per-case of the disease. This is because the underlying data employed provide no information about overall prevalence of the disease, which for most diseases is not readily available.

The level of disease disaggregation is also of importance. The International Classification of Diseases is the standard system used to classify diseases, but at its most detailed level ICD-10 consists of up to 16 000 codes. For policy relevance and analyses, a balance is required between detailed disease classes and much broader groupings. For example, the ICD-10 chapter level consists of 21 broad disease categories, which might be too broad to link to outcome measures (Table 4.1). Also, while the use of the ICD is common in hospitals and for inpatient care, it is much rarer for outpatient providers, such as general practitioners or psychiatrists.

The Hospital Data Project (HDP) of the European Union Health Monitoring Programme established in 2007 the International Shortlist for Hospital Morbidity Tabulation (ISHMT). The list covers 130 disease groupings below the chapter headings of ICD-10. It is grouped by epidemiologically relevant groups where patients have similar problems and share similar patterns of treatment. One of the features of ISHMT, which might also be considered as a shortcoming, is that it was developed specifically for hospital procedures and inpatient cases. Therefore, diseases categories may be less relevant to other health care system components such as ambulatory care and pharmaceuticals. The selection should also be based on other criteria, such as diseases with high incidence or prevalence, high mortality rates and/or severity levels, as well policy-relevant diseases linked to public health and risk factors.

A survey of the disease expenditure accounts done to date shows that it is very common for countries to report disease-specific cost data at least at the ICD-10 chapter-level (infectious diseases, neoplasms etc.). In the hospital sector where detailed diagnosis data is more readily available, further breakdowns, for example according to the ISHMT, are more feasible.

Table 4.1. International statistical classification of diseases (ICD-10), 10th revision

ICD Chapter	Blocks	Description
I	A00-B99	Certain infectious and parasitic diseases
II	C00-D48	Neoplasms
III	D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism
IV	E00-E90	Endocrine, nutritional and metabolic diseases
V	F00-F99	Mental and behavioural disorders
VI	G00-G99	Diseases of the nervous system
VII	H00-H59	Diseases of the eye and adnexa
VIII	H60-H95	Diseases of the ear and mastoid process
IX	I00-I99	Diseases of the circulatory system
X	J00-J99	Diseases of the respiratory system
XI	K00-K93	Diseases of the digestive system
XII	L00-L99	Diseases of the skin and subcutaneous tissue
XIII	M00-M99	Diseases of the musculoskeletal system and connective tissue
XIV	N00-N99	Diseases of the genitourinary system
XV	O00-O99	Pregnancy, childbirth and the puerperium
XVI	P00-P96	Certain conditions originating in the perinatal period
XVII	Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities
XVIII	R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified
XIX	S00-T98	Injury, poisoning and certain other consequences of external causes
XX	V01-Y98	External causes of morbidity and mortality
XXI	Z00-Z99	Factors influencing health status and contact with health services
XXII	U00-U99	Codes for special purposes

Source: WHO

Given the number of limitations described, as well as the resources required to undertake a data-heavy exercise, the provision of spending by disease estimates across Europe remains a challenge. As a result of two projects (in 2008 and 2013), OECD has published data on spending by disease for eight European countries. The 2016 Eurostat HEDiC (Heath Expenditures by Disease and Conditions) project report supplemented this number with data from a further six EU countries. In terms of time series, many of these countries have produced these studies on a project rather than ongoing basis. A few countries, notably the Netherlands and Germany, have a more regular production cycle, publishing updated studies every three to five years. As discussed, the most comparable and available data tends to be restricted to the hospital sector rather than providing the system-wide breakdown of spending needed for a thorough disease-based analysis. In summary, the development and use of utilisation data and costing studies is required to widen the coverage, both in terms of countries and sectors of the health system.

4.3 Inputs measures (human and technical resources)

The number and density of specialist health care professionals can also be taken as input indicators for disease-based level analysis. Data is available for a number of physician categories, in both the medical and surgical domains, in addition to other categories of health care professionals (e.g. midwives and physiotherapists), and therefore can be linked to activity levels (e.g. hospital discharges by diagnostic category). However, current data collections are primarily restricted to categories of medical doctors, rather than taking into account other health care professionals also involved in the treatment process for certain diseases, beyond overall numbers of nurses and other care workers.

The Eurostat additional module under the Joint Questionnaire on Non-Monetary Health Care statistics contains a number of more specific categories of doctors covering more than 20 specialties (Table 4.2).

Table 4.2. Physicians by categories

General practitioners
General paediatricians
Obstetricians and gynaecologists
Psychiatrists
Cardiologists
Endocrinologists
Gastroenterologists
Respiratory medicine
Oncologists
Immunologists
Neurologists
Oto-rhino-laringologists
Radiologists
Microbiology-bacteriologists
Haematologists
Dermatologists
Pathologists
Occupational medicine
Neurological surgeons
Ophthalmologists
Orthopaedists
Thoracic surgeons
Vascular surgeons
Urologists
Accident and emergency medicine

Source: Eurostat additional module in the OECD/Eurostat/WHO-Europe Joint Questionnaire on non-monetary health care statistics.

The Joint Questionnaire also includes, as a common module, a data collection on the availability and use of a selected set of diagnostic and therapeutic technologies that are used to diagnose or treat different diseases. While some of these technologies are used to diagnose a wide range of diseases (e.g., CT, MRI and PET scanners), others are used more specifically to diagnose or treat particular diseases such as cancer[12].

4.4 Outputs and outcomes measures

The most readily available output measures for disease-based analysis are the number of patients admitted and discharged from hospitals for specific diseases. These data are available for inpatient and day cases in nearly all European countries. Beyond these hospital data, it is much more difficult to measure precisely the use of other health care services or pharmaceuticals directly attributable to specific diseases.

Relevant outcome measures vary depending on the diseases. For life-threatening diseases such as cancer, acute myocardial infarction (AMI) and stroke, survival or mortality-based indicators are obviously very relevant, but can also be complemented with health-related quality of life indicators, collected for instance through patient-reported outcome measures (PROMs).

As already noted, ICD-10 includes no less than 21 chapters and 16 000 different categories of diseases. Given this very large number of diseases, there is a need for practical reasons to focus on a limited number of diseases for the development and reporting of the outcomes measures. The selection criteria includes the relative importance of various diseases (e.g., in terms of mortality and/or morbidity) and the feasibility of collecting relevant outcomes measures.

12. The selection of these technologies was based mainly on the criteria of policy relevance and data availability in a large number of countries.

Cardiovascular disease and cancer are, by far, the two leading causes of death in EU and other OECD countries. Therefore, it makes sense to try to collect outcomes measures for these important diseases.

For cancer, survival estimates have been used for a long time as outcome measures for cancer care systems. Survival takes into account both the impact of early detection of cancer and the effectiveness of treatment. Starting in 2017, the OECD will start using cancer survival data from the CONCORD project which collects cancer registry data from 67 countries (including all EU countries except Hungary and Luxembourg). The survival data will be available for four types of cancers (breast, cervical, lung and acute lymphoblastic leukaemia in children) from 2000 onwards. In addition, the OECD currently evaluates ways to collect patient-reported outcome measures (PROMs) related to cancer care, in an internationally comparable manner.

For cardiovascular diseases, case-fatality rates following hospital admissions for acute myocardial infarction (AMI) and stroke have been used for a number of years as outcome measures reflecting the processes of care, such as timely transport of patients and effective medical interventions.

Other disease-specific data can be used as outcome measures for analysing the effectiveness of health systems in treating or managing other conditions. Avoidable hospital admission rates are collected for widely prevalent chronic conditions including asthma, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF) and diabetes. Such potentially avoidable hospital admissions can be interpreted as signals of shortcomings in access to high-quality primary care for people having these chronic diseases. The OECD is also planning to develop patient-reported outcome measures (PROMs) for other common diseases and interventions, such as joint replacement (e.g. hip and knee replacement).

4.5 Relating inputs to outputs and/or outcomes measures for efficiency measurement

In its 2013 cancer care report, the OECD has conducted some exploratory analysis examining the relation between health system characteristics (including health expenditure) and health outcomes (in terms of survival to various types of cancer). This analysis looked at the differences in five-year cancer survival for breast, cervical, colorectal and lung cancer in 31 OECD countries. It tried to explain these differences through health system characteristics related to the resources allocated to cancer care (which was peroxided by total current health expenditure, not cancer-specific spending, to increase the country coverage), the practice of cancer care and the governance of cancer care. It found that survival is strongly related to a country's wealth and the level of health spending, especially for lower-income countries. The relationship between resources and outcomes is weaker once a reasonable level of spending has been reached. The better-performing richer countries with better cancer survival outcomes appear to have established cancer policy priorities, implemented key elements of cancer control, introduced integrated care processes and actively worked on the delivery of cancer services (OECD, 2013).

The OECD also undertook another exploratory study for cardiovascular diseases (CVD) by examining the relationship between the use of health care resources (including expenditure relating to all hospital expenditure, not specific to CVD, to increase the country coverage) and medical equipment and improvements in the quality of acute care. This study found that across countries, improvements in the quality of CVD acute care were associated with higher hospital care expenditure and this was particularly true for AMI and ischemic stroke care. These results are consistent with the notion that resources allocated to acute care remain an important determinant of health care quality for CVD and other conditions (OECD, 2015).

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5. Administrative Efficiency

5.1 Introduction

Administrative tasks must be carried out at all levels of the health care system: at the "macro" level related to the financing, governance and organisation of the system as a whole, as well as at the provider level, where health care facilities and professionals must perform a number of administrative activities related to the organisation of health care delivery.

Reducing the administrative burden and the financial resources that go into administration are often the first to be considered when spending in the health sector needs to be reined in, while the more politically sensitive provision of frontline medical services remains frequently exempt from cuts. This was certainly true during the recent financial and economic crisis, when administrative spending was seen as a clear target for cost-saving measures in a number of countries (OECD, 2017).

However, spending on administrative activities should not be seen as "bad" per se: administration has its costs but provides core public health functions such as ensuring patient safety. And the range of administrative functions has multiplied over the years as important health policy objectives such as improving equity, access and efficiency came to the fore. For example, elaborate mechanisms are put in place to avoid risk-selection and meet the goal of universal health care coverage. Secular trends such as the increased autonomy of providers, which must be harnessed by proper mechanisms to ensure accountability, or innovations such as pay-for-performance (P4P) induce a higher administrative burden for providers and payers alike as they typically involve the reporting and analysis of additional data to evaluate progress towards improved quality of care (OECD and WHO, 2014). In fact, by increasing the efficiency and responsiveness of care delivery and patient safety, administrative efforts can even generate savings down the line. So a certain level of administration is both necessary and vital in any modern health care system. Indeed, the role of administration is likely to grow even more as countries implement strategies encouraging value for money in health care delivery, further complicating governance and financing activities (Mathauer and Nicolle, 2011).

5.2 Inputs measures

The only input for administrative tasks in the health sector for which international comparable data exist are the financial resources that go into health care administration and financing. There is no international data collection on physical inputs such as staff working in the administration of health insurance funds or Ministries of Health. Similarly, expenses for infrastructure and equipment used for administrative purposes in the health sector are also not collected systematically. However, the spending on administration should be a good proxy for the human resources and physical inputs used in the production of "administrative output".

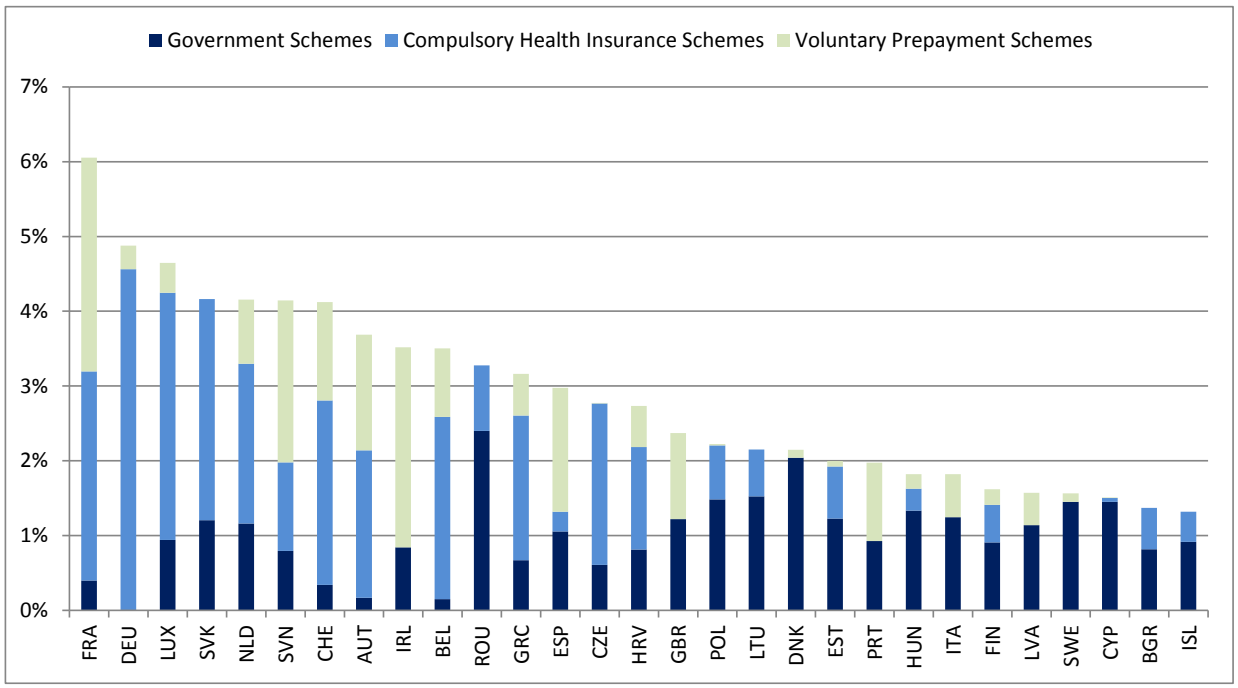
Data on administrative costs are available mainly at the system-wide level. At the sub-sector (or provider) level, no international comparable data collection on administrative costs exists. At that level, it is also more difficult to clearly demarcate activities that have a purely administrative purpose from those that have mixed administrative and clinical purpose, such as resources dedicated to the reporting of health care quality. Nevertheless, many countries have identified the need to reduce national variations in administrative costs of health providers, such as public hospitals as one important strategy for efficiency gains in the health systems (Department of Health, 2016).

For the analysis at the system-level, spending for governance, health system and financing administration is used as an input. This includes, for example, staff costs in Ministries and other oversight bodies for planning and strategic management, policy formulation, regulation and accreditation, and system monitoring. It also covers costs to perform financing functions, such as purchasing and contracting, claims processing, patient enrolment and the collection of revenues. These activities are carried out in

all health systems, but can differ substantially between systems with residence-based entitlements such as the NHS in England and multiple social health insurance funds as they exist in Germany and other countries. In the private sector, administrative costs also include brokerage fees and possible profits of insurance companies (OECD, Eurostat, WHO, 2011).

The resources that countries allocate to administrative activities at the system level vary substantially. While the average across EU and other OECD countries was around 3% of health spending in 2014, it was double that level in France and close to 5% in Germany and Luxembourg. On the other hand, some countries report administrative expenditures of less than half that level (Figure 5.1).

Figure 5.1. Administration as a share of current health expenditure by financing scheme, 2014 (or nearest year)



Note: Compulsory health insurance schemes predominantly refer to social health insurance (SHI) funds but can also refer to compulsory health insurance provided by private insurers. Voluntary prepayment schemes mainly refer to voluntary health insurance schemes.

Source: OECD Health Statistics (2016), http://dx.doi.org/10.1787/health-data-en.

The way that health care is financed in a country – whether mainly tax-based, by social health insurance (SHI) funds, or by private insurance – appears to play a major role in determining the overall share of administrative spending.

Figure 5.1 suggests that financing schemes organised around SHI funds or some kind of compulsory insurance generally feature higher administrative expenditure than those managed by general governments (covering both central and regional/state-level governments). Frequently offered by for-profit corporations, voluntary private insurance incurs a relatively high share of total administrative expenditure, albeit accounting for a comparably low share of overall health spending. Thus systems featuring a high proportion of health care financing via SHI funds and/or private insurance generally demonstrate a higher share of administrative spending overall.

Analysis of the existing data suggests that:

- There is little difference in administrative costs between tax-based systems with residence-based entitlement and single-payer insurance-based systems.

- Single-payer systems have lower administrative costs than multi-payer systems. This is mainly due to duplication of activities by separate insurers and reduced economies of scale by smaller insurers in handling of administrative workload.

- Multi-payer systems with free choice of insurer tend to have higher administrative costs than multi-payer systems with automatic affiliation. Patient choice may drive up administrative costs as it requires insurers to perform some activities which are not required under schemes which do not compete.

- Private insurance schemes have much higher administrative costs than any public schemes. On average, there is about a three-fold difference to public health schemes. In addition to limitations in economies of scale, the fact that private insurance may be offered by insurance corporations that are allowed to make a profit from their operations while SHI funds are typically not-for-profit entities explains much of the higher cost.

Table 5.1 displays the share of administrative costs of current health spending for the major financing schemes. Relating administrative costs to health spending per financing schemes gives an indication to what extent financial resources are diverted from patient care for each scheme. But such a comparison needs to be done with caution, in particular across schemes. Government schemes perform additional organisational activities that go beyond financing and ensuring coverage, such as handling accreditation of health professionals and hospital planning. The services benefit the entire system and not only those covered under a government scheme. In some countries, in particular those where health coverage is provided by social health insurance funds, administration may be the key function played by government schemes.

Table 5.1. Administration as a share of current health expenditure per financing scheme, 2014 (or nearest year)

	Government Schemes	Compulsory Health Insurance Schemes	Voluntary Private Insurance
Austria	1%	4%	32%
Belgium	1%	4%	21%
Czech Republic	5%	3%	3%
Denmark	2%	..	5%
Estonia	12%	1%	6%
Finland	1%	4%	7%
France	10%	4%	21%
Germany	..	6%	21%
Greece	2%	6%	15%
Hungary	14%	1%	8%
Iceland	2%	1%	..
Ireland	1%	..	20%
Italy	2%	..	37%
Latvia	2%	..	..
Luxembourg	11%	4%	..
Netherlands	24%	3%	14%
Norway	..	..	..
Poland	16%	1%	..
Portugal	1%	..	19%
Slovak Republic	30%	4%	..
Slovenia	23%	2%	15%
Spain	2%	5%	32%
Sweden	2%	..	20%
Switzerland	2%	5%	17%
United Kingdom	2%	..	32%
Bulgaria	9%	1%	..
Croatia	32%	2%	7%
Cyprus	3%	8%	..
Lithuania	15%	1%	..
Romania	16%	1%	..

Source: OECD Health Statistics (2016)

5.3 Outputs measures

Defining and measuring administrative outputs is very challenging. The ultimate output is at the system-level with the goal that a well-executed administration contributes to a functioning health system providing good access to high-quality and safe care for its population. At the sector level, outputs can be very difficult to grasp (e.g., improved quality of data due to introduced legal reporting obligations), can depend heavily on the schemes (e.g., output of a Ministry is different than from a voluntary private insurance) and the country-context (e.g., in some countries one output measure of Social Health Insurance Funds could be the medical claims reimbursed to patients, in other countries claims are directly settled between funds and providers). Beyond a basic count of the number of persons covered under various health financing schemes (which has its own limitations if only because the range and type of services covered may vary across schemes), there is no universally accepted list of measurable output indicators for administrative tasks.

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ANNEX: LIST OF INDICATOR DOCUMENTATION SHEETS

1. System-wide level analysis

1.1. Amenable mortality (adapted from current set of JAF Health Indicators)

Technical documentation sheet

Indicator	Amenable mortality
JAF Health code	H-8a
JAF Health dimension	Overall Health Outcomes
Policy relevance	The indicator is used to show the contribution health care makes to population health by including deaths from conditions that should not occur in the presence of effective and timely health care. It is a more relevant indicator for health system performance assessment than overall life expectancy or overall mortality, as it excludes deaths which are not deemed to be attributable to health (care) systems.
Agreed definition **(from Eurostat, based on ONS list)**	A death is considered to be amenable if, in the light of medical and technology at the time of death, all or most deaths from that cause could be avoided through good quality healthcare (ONS, 2011). The list of amenable deaths is calculated according to a list of ICD codes and specific age groups. The current Eurostat list was approved in 2013 by the Eurostat's Working Group of Public Health Statistics. [There are persisting issues regarding the definition of the amenable mortality list approved by Eurostat in 2013. The main issues and differences with other leading lists of amenable mortality (such as the Nolte and McKee list and the CIHI/Statistics Canada list) relate to: 1) the treatment of ischemic heart diseases and cerebrovascular diseases (whether 100% of these deaths should be considered to be both amenable to health care and preventable): 2) the inclusion/exclusion of certain types of cancer; and 3) the inclusion/exclusion of some infectious diseases (Hepatitis B and HIV).]
Calculation method (incl. practical implementation, e.g. question in surveys)	Number of deaths of residents considered to be amenable.[13] Standardized death rates are calculated based on the European Standard population.
Breakdowns	Sex
Data source(s)	Eurostat, Causes of death data collection and demographic data
Relevant survey questions and answers	N/A
Data periodicity	Annual
Data availability (countries * time, incl. EU aggregates)	2013: all 28 MS + NO, CH, Iceland; EU28 aggregate calculated
Sustainability of the data collection	Causes of death data collection is based on EC regulation 328/2011, first reference year: 2011, and is thus compulsory for countries.
Methodological issues (including comparability across countries and over time)	Data is only available from 2011 onwards as it stands.

[13] The Eurostat list is also published here: http://ec.europa.eu/eurostat/cache/metadata/Annexes/hlth_cdeath_esms_an4.pdf

Table with latest data

Amenable mortality, rates per 100 000 population, 2011 to 2013

	2011	2012	2013
European Union (28 countries)	125.18	122.87	119.48
Belgium	96.01	94.28	94.06
Bulgaria	254.5	272.33	249.42
Czech Republic	178.29	175.63	175.61
Denmark	104.9	101.29	93.91
Germany	109.26	106.62	106.75
Estonia	231.62	229.16	218.51
Ireland	114.82	110.36	106.02
Greece	116.8	120.53	113.64
Spain	88.27	86.06	82.86
France	76.07	74.15	72.84
Croatia	205.4	196.44	187.3
Italy	90.56	89.63	85.03
Cyprus	94.95	96.39	83.3
Latvia	337.49	324.71	320.43
Lithuania	313.9	306.69	297.74
Luxembourg	95.19	91.57	102.7
Hungary	261.53	255.78	244.98
Malta	143.27	136.61	113.54
Netherlands	90.82	89.96	86.48
Austria	103.73	101.46	101.26
Poland	179.07	174.53	166.82
Portugal	111.74	108.46	103.48
Romania	312.34	307.83	295.85
Slovenia	125.31	122	118.24
Slovakia	237.92	236.57	237.34
Finland	117.43	113.26	107.03
Sweden	95.95	92.77	92.58
United Kingdom	114.12	110.75	108.08
Norway	94.92	91.19	86.5
Switzerland	76.59	73.3	70.38

Source: Eurostat database

2. Sectoral level analysis

2.1. Hospital care

2.1.1 Hospital expenditure (per capita and as a share of current health expenditure)

Technical documentation sheet

Indicator	Hospital expenditure (per capita and as a share of current health expenditure)
Health dimension	Hospital expenditure - Financial inputs
Policy relevance	Improving the efficiency of the hospital sector remains an important policy objective in EU countries, given the significant value and cost of services provided to the community. Around 30% of total health expenditure is allocated to the hospital sector on average.
Agreed definition	Spending on hospital care is defined in the provider classification (ICHA-HP) of the International Classification of Health Accounts (ICHA-HC). It refers to curative-rehabilitative care in inpatient and day care settings.
Calculation method (incl. practical implementation, e.g. question in surveys)	Spending from the provider classification is divided by the total population (to calculate spending per capita) and current health expenditure (to calculate its share of current health spending).
Breakdowns	
Data source(s)	Eurostat/OECD/WHO, Joint Health Accounts Questionnaire
Relevant survey questions and answers	N/A
Data periodicity	Annual data
Data availability	2014: 28 MS + Norway, Switzerland, Iceland
Methodological issues (including comparability across countries and over time)	

Table with latest data

Spending on hospital care as share of current health expenditure, 2010 and 2014

	Year	
Country	*2010*	*2014*
Greece	38.1	40.7
Romania	40.4	38.6
Bulgaria (2012, 2014)	35.6	35.5
Poland	35.9	35.0
Austria	34.9	34.3
France	33.4	33.2
Italy		33.1
Cyprus	33.0	32.2
Ireland		30.5
Slovenia	32.0	30.0
EU	**30.5**	**29.6**
Belgium	29.9	29.4
Lithuania	31.6	29.2
Hungary	26.0	28.9
Germany	28.4	28.7
Luxembourg	26.6	28.6
Netherlands	30.3	28.1
United Kingdom		28.0
Slovak Republic	20.4	27.9
Estonia	28.6	27.6
Latvia	32.0	27.6
Finland	26.4	26.8
Denmark	29.2	26.8
Portugal	23.6	26.3
Spain	25.0	26.0
Croatia (2011, 2014)	30.8	23.2
Sweden	29.0	22.7
Czech Republic	31.6	19.5
Iceland	29.7	30.6
Norway	30.2	28.9
Switzerland	27.8	27.5

Note: Countries are ranked from highest share to lowest share in 2014

Source: OECD Health Statistics 2016; Eurostat database

2.1.2 Hospital employment (head counts and FTEs)

Technical documentation sheet

Indicator	**Hospital employment (head counts and FTEs) per 1 000 population**
Health dimension	Hospital care – Labor inputs
Policy relevance	Hospital care requires an adequate number and mix of health care providers to deliver services to patients in the various hospital departments.
Agreed definition	Number of persons employed (**head counts**), and number of full-time equivalent (**FTE**) persons employed in general and specialised hospitals. Self-employed are included. Inclusion - Service contracts with non-employed health professionals on treatment of hospital patients (head counts).
Calculation method (incl. practical implementation, e.g. question in surveys)	Number of people working in hospital in head counts and FTEs. Three methods are proposed to convert head counts into FTE data, and national correspondents have the flexibility to choose one of these methods to do the calculation, depending on the availability of data on actual/usual or contractual hours of work.
Breakdowns	By categories of workers (doctors, nurses and midwives, associate professional nurses and health care assistants)
Data source(s)	OECD/Eurostat/WHO-Europe Joint Questionnaire
Relevant survey questions and answers	N/A
Data periodicity	Annual data
Data availability (countries * time, incl. EU aggregates)	2014: 24 MS + Iceland, Norway, Switzerland for head counts; About 15 MS + Iceland, Norway, Switzerland for FTEs
Methodological issues (including comparability across countries and over time)	Data is available from 2005 onwards. The availability and comparability of FTE data is limited by the availability of specific information on working hours to do accurate FTE conversion.

Table with latest data

Hospital employment in head counts, per 1 000 population, 2005 - 2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	11.73	11.96	12.07	12.30	12.52	12.70	12.91	13.05	13.11	13.27
Belgium	16.96	17.31	17.18	17.56	18.06	18.15	18.11	18.25	18.26	..
Bulgaria	..	..	..	8.61	8.81	9.02	9.17	9.29	9.51	9.74
Croatia	..	..	..	9.46	9.61	9.68	9.97	10.29	10.12	10.46
Cyprus	..	..	..	..	..	..	..	..	..	..
Czech Republic	13.18	13.11	13.08	13.02	13.37	13.44	13.38	13.40	13.33	13.33
Denmark	19.52	19.79	20.15	20.30	20.80	20.57	20.18	20.18	20.42	..
Estonia[1]	..	13.73	14.07	14.45	14.00	13.90	14.06	14.65	10.49	10.51
Finland	17.46	17.72	17.68	17.84	17.75	17.90	17.85	17.80	..	..
France[1]	19.47	19.56	19.51	19.48	20.79	20.95	19.75	19.87	19.76	19.63
Germany	14.28	14.32	14.39	14.58	14.86	15.09	15.27	15.75	15.93	16.04
Greece	10.04	10.08	10.01	10.06	10.31	10.04	10.03	9.62	9.21	8.90
Hungary	..	10.27	9.04	9.42	9.05	9.91	10.45	9.99	10.79	10.60
Iceland	..	..	20.80	20.72	19.51	18.95	18.92	19.00	19.03	19.42
Ireland	13.39	13.49	13.64	13.24	12.84	12.50	12.31	12.06	11.95	12.24
Italy	11.04	10.92	11.12	11.07	11.07	11.08	10.95	10.73	10.62	..
Latvia	..	..	..	..	..	..	..	10.36	10.43	10.86
Lithuania	13.07	13.22	13.29	13.95	13.83	13.94	14.50	14.72	14.69	14.92
Luxembourg	13.85	14.01	..	..	..	..	..	..	..	..
Malta	..	..	15.17	..	16.02	16.28	16.77	17.74	18.39	20.35
Netherlands	14.72	15.35	15.72	16.30	16.83	17.04	17.21	17.33	17.19	17.18
Norway[1]	23.40	23.10	22.75	21.91	23.38	23.13	22.83	21.75	21.53	21.35
Poland	..	..	..	..	..	..	..	..	..	..
Portugal	11.27	11.11	11.33	11.38	11.67	12.06	11.35	11.52	11.53	11.38
Romania	6.24	6.55	7.42	7.39	7.29	7.37	7.09	7.55	7.64	7.79
Slovak Republic	..	..	..	..	..	..	..	..	..	..
Slovenia	9.72	9.79	9.87	9.91	9.99	10.06	10.11	10.27	9.98	10.44
Spain	10.63	10.88	11.20	11.42	11.56	11.71	11.56	11.33	11.30	11.58
Sweden	..	..	..	..	..	..	..	..	..	..
Switzerland[1]	22.41	22.83	23.16	23.34	24.15	22.41	22.98	23.18	23.58	23.92
United Kingdom	..	..	..	..	21.06	21.29	20.45	21.22	21.27	20.59

1. Break in series.

Source: OECD Health Statistics 2016 and Eurostat Database (based on OECD/Eurostat/WHO-Europe Joint Questionnaire on non-monetary health care statistics)

2.1.3 Average length of stay in hospital

Technical documentation sheet

Indicator	**Average length of stay in hospital (all causes and for specific conditions)**
Health dimension	Hospital care - Efficiency
Policy relevance	The average length of stay in hospitals is often regarded as an indicator of efficiency. All other things being equal, a shorter stay will reduce the cost per discharge and shift care from inpatient to less expensive post-acute settings. However, shorter stays tend to be more service intensive and more costly per day. Too short a length of stay may also cause adverse effects on health outcomes, or reduce the comfort and recovery of the patient. If this leads to a greater readmission rate, costs per episode of illness may fall only slightly, or even rise.
Current definition	**Average length of stay** (ALOS) is calculated by dividing the number of bed-days by the number of discharges during the year. Inclusion - ALOS in all hospitals, including general hospitals (HP.1.1), mental health hospitals (HP.1.2) and other specialised hospitals (HP.1.3) - ALOS for healthy newborns Exclusion - Day cases
Calculation method (incl. practical implementation, e.g. question in surveys)	Average length of stay is generally calculated by the number of bed-days by inpatients divided by the number of of discharges (or admissions) during the year.
Breakdowns	By 158 causes of hospitalization (based on the ISHMT list)
Data source(s)	OECD/Eurostat/WHO-Europe Joint Questionnaire
Relevant survey questions and answers	
Data periodicity	Annual data
Data availability	2014 (or nearest year): 28 MS + Iceland, Norway, Switzerland
Methodological issues (including comparability across countries and over time)	Data is available from 2005 onwards. The main comparability limitation is that some countries are excluding discharged and average length of stay of healthy babies born in hospital, resulting in a slight over-estimation of average length of stay compared with the other countries that include them.

Table with latest data

Average length of stay in hospital, all causes, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	8.0	7.9	7.9	7.9	7.8	7.9	7.8	7.9	8.1	8.2
Belgium	8.0	7.9	7.8	8.1	8.2	8.1	8.0	7.9	7.8	..
Bulgaria	8.1	7.5	7.2	6.8	6.5	6.1	6.0	5.8	5.6	5.4
Croatia	10.3	9.9	9.9	9.6	9.7	9.5	9.3	9.1	8.9	8.8
Cyprus	..	..	..	..	..	..	..	6.0	6.1	6.4
Czech Republic	10.6	10.5	10.3	10.0	10.0	9.9	9.8	9.5	9.4	9.4
Denmark	5.4	5.3	5.2	5.2	4.8	4.6	4.5	4.4	4.3	..
Estonia[1]	7.8	7.8	7.9	7.8	7.7	7.6	7.7	7.9	7.5	7.6
Finland	12.7	12.8	13.1	12.6	12.7	11.8	11.4	11.2	10.8	10.6
France	11.4	11.2	11.2	10.9	10.5	10.2	10.1	10.1	10.1	..
Germany	10.2	10.1	10.1	9.8	9.7	9.5	9.3	9.2	9.1	9.0
Greece	7.6	7.3	6.9	6.6	6.7	6.6	6.8	..	..	..
Hungary	8.7	8.7	9.0	9.2	9.2	9.5	9.5	9.6	9.3	9.5
Iceland	5.4	5.5	5.9	5.8	5.8	5.6	5.6	5.8	5.9	6.1
Ireland[1]	8.0	7.7	7.4	7.7	6.7	6.6	6.4	6.2	6.0	6.0
Italy	7.6	7.7	7.8	7.8	7.8	7.9	8.0	8.0	7.9	8.0
Latvia	10.0	9.7	9.4	9.5	8.5	8.5	8.4	8.3	8.3	8.3
Lithuania	9.2	9.0	8.8	8.5	8.1	8.1	8.3	8.0	7.9	8.0
Luxembourg	8.8	8.5	8.8	8.9	9.2	9.3	8.8	8.7	8.8	8.8
Malta[1]	..	5.3	4.8	4.9	6.6	6.8	7.6	7.8	8.6	7.9
Netherlands	..	10.8	..	..	..	..	..	..	..	..
Norway	8.0	7.7	7.6	7.3	7.0	6.8	6.5	6.2	6.1	6.0
Poland	8.2	8.0	7.8	7.9	7.7	7.6	7.4	7.1	7.0	6.9
Portugal	8.7	8.6	8.5	8.4	8.6	8.7	8.7	9.0	8.9	8.9
Romania	8.0	7.9	7.7	7.7	7.5	7.4	7.5	7.5	7.4	7.5
Slovak Republic	9.0	8.8	8.6	8.5	8.3	8.2	8.0	7.5	..	7.3
Slovenia[1]	7.1	7.1	6.8	6.9	6.9	6.7	7.3	7.5	6.8	6.9
Spain	8.5	8.3	8.2	8.1	8.0	7.9	7.7	7.6	7.6	7.4
Sweden	6.6	6.6	6.5	6.5	6.4	6.1	5.9	5.8	5.8	5.7
Switzerland[1]	11.7	11.3	10.9	10.7	10.5	9.5	9.3	8.8	8.7	8.5
United Kingdom	8.9	8.6	8.0	8.0	7.8	7.7	7.3	7.2	7.2	7.1

1. Break in series.

Source: OECD Health Statistics 2016 and Eurostat Database (based on OECD/Eurostat/WHO-Europe Joint Questionnaire on non-monetary health care statistics)

2.1.4 Ambulatory surgery

Technical documentation sheet

Indicator	**Share of ambulatory surgery (specific interventions)**
Health dimension	Hospital care – Efficiency
Policy relevance	Same-day surgery, by definition, shortens the length of stay in hospital and can help reduce hospital resource use and cost. Through improvements in clinical practice and new technologies (notably less invasive surgical interventions and better anaesthetics) and greater community care, procedures that used to require multi-days stays in hospital in the past can now be provided without the patient staying overnight in hospital. While the rise in same-day surgeries can help reduce hospital cost, there is also a need to take into account any additional cost related to post-acute care and community health services following these interventions.
Agreed definition	Surgical procedures are medical interventions involving an incision with instruments usually performed in an operating theatre and normally involving anaesthesia and/or respiratory assistance. Surgical procedures can be performed either as inpatient cases, day cases or, in certain instances, as outpatient cases.
Calculation method (incl. practical implementation, e.g. question in surveys)	The method to count procedures should be based on a count of the number of patients who have received a given procedure or a count of only one code per procedure category for each patient, in order to avoid double-counting procedures for which more than one code may be used in certain national classification systems. (For example, if a percutaneous coronary intervention with a coronary stenting is recorded as two separate codes, it should be reported as only one patient/procedure.)
Breakdowns	N/A
Data source(s)	OECD/Eurostat/WHO-Europe Joint Questionnaire
Relevant survey questions and answers	
Data periodicity	Annual data
Data availability	2014 : 26 MS + Iceland, Norway, Switzerland
Methodological issues (including comparability across countries and over time)	The availability of data on outpatient cases (non-admitted patients) is more limited. To the extent that some of the surgical procedures in some countries may be performed with a formal admission to the hospital (or a clinic), this may under-estimate the number and share of same-day surgeries.

Table with latest data

Share of cataract surgeries carried out as ambulatory cases, 2005 to 2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	4.5	6.6	10.5	17.6	23.9	32.8	45.6	56.8	66.6	71.5
Belgium	90.8	92.0	92.4	93.1	93.7	94.2	94.4	94.6	95.0	..
Bulgaria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Croatia	..	..	..	..	..	..	..	14.0	10.5	17.6
Cyprus	1.0	0.7	0.8	1.1	0.4	0.6	..	..	1.7	51.0
Czech Republic	..	..	56.5	62.6	78.9	90.4	92.1	93.7	95.6	95.1
Denmark	96.8	97.2	97.4	97.4	98.0	98.2	98.0	98.4	98.4	98.4
Estonia	96.9	98.8	99.1	99.1	99.2	99.5	99.5	99.4	99.4	99.3
Finland	95.5	97.2	98.2	98.6	98.5	98.7	98.7	98.7	98.6	98.6
France	54.3	58.8	62.9	70.0	78.0	80.1	82.6	84.7	87.1	88.9
Germany	..	..	..	..	..	78.8	79.7	80.4	81.0	81.3
Greece	..	..	..	..	..	..	..	..	..	..
Hungary	0.2	2.2	11.8	20.4	23.9	28.4	35.3	42.9	48.4	50.3
Iceland	93.9	94.1	90.9	93.6	..	..	..	..	..	..
Ireland	53.9	55.2	59.3	69.1	77.8	88.0	88.9	91.3	92.5	93.4
Italy[1]	80.7	81.7	83.0	84.7	82.3	82.6	92.8	94.0	96.1	96.3
Latvia	..	..	..	..	..	..	..	..	..	..
Lithuania	..	..	..	..	..	24.9	29.0	33.1	35.1	41.0
Luxembourg	34.7	34.2	35.2	38.2	40.4	48.5	53.7	63.2	69.1	73.7
Malta	..	..	..	..	..	..	..	..	87.0	87.2
Netherlands	96.6	97.2	97.8	98.2	98.6	98.8	..	..	..	..
Norway	93.6	94.2	95.2	96.9	96.8	..	..	96.2	..	..
Poland	6.7	8.0	10.0	12.4	14.3	17.3	24.5	26.3	26.8	30.9
Portugal	52.6	60.2	68.1	83.0	91.6	92.5	92.5	93.4	94.7	95.8
Romania	..	..	..	..	0.3	0.5	0.5	4.1	2.9	13.8
Slovak Republic	..	..	..	..	14.3	16.8	28.8	41.2	47.5	58.8
Slovenia	44.4	37.0	26.9	59.2	85.6	90.4	96.6	97.3	97.5	97.7
Spain	88.9	91.2	93.0	94.3	95.3	95.9	96.6	97.2	97.6	97.9
Sweden	97.1	96.6	96.9	97.1	97.4	97.8	97.8	98.0	98.4	98.2
Switzerland	72.1	77.0	77.6	77.2	..	..	..	..	..	..
United Kingdom	95.0	96.2	96.8	97.1	97.5	97.9	98.2	98.2	98.3	98.5

1. Break in series.

Source: OECD Health Statistics 2016 and Eurostat Database (based on OECD/Eurostat/WHO-Europe Joint Questionnaire on non-monetary health care statistics)

2.1.5 In-hospital mortality following AMI (Acute Myocardial Infarction)

Technical documentation sheet

Indicator	In hospital mortality following AMI (AMI 30 day mortality in-hospital)
JAF Health code	Q-11
JAF Health dimension	Hospital care (or disease-based care) -- Quality/Outcomes
Policy relevance	Mortality due to coronary heart disease has declined substantially since 1970s, and this reduction can be partly attributed to better treatments. Studies have shown that greater compliance with treatment optimization guidelines improves health outcomes. The 30-day AMI case-fatality rate is a good indicator of acute care quality. The indicator reflects the processes of care, such as timely transport of patients and effective medical interventions.
Agreed definition	The number of people who die within 30 days of being admitted to hospital with AMI, where death occurs at the same hospital as the initial AMI admission, as a proportion of all hospital admissions for AMI in a specified year, standardized for age and gender.
Calculation method (incl. practical implementation, e.g. question in surveys)	**Coverage**: Patients aged 45 and older. **Numerator**: Number of deaths from all causes in the same hospital that occurred within 30 days of hospital admission with primary diagnosis of AMI **Denominator**: Number of admissions to hospital with primary diagnosis of AMI (ICD codes are available). The data are age- and sex- standardized.
Major breakdowns	N/A
Data source(s)	Acute care administrative/morbidity databases or registers (collected by OECD Health Care Quality Indicators questionnaire).
Relevant survey questions and answers	N/A
Data periodicity	Annual data (collected every two years).
Data availability (countries * time, incl. EU aggregates)	22 MS, (no data for BG, EL, HR, CY, LT, RO) + Iceland, Norway, Switzerland (2014 and 2015 will be available in 2017)
Sustainability of the data collection	Sustainable: derived from routinely collected data.
Methodological issues (including comparability across countries and over time)	Countries differ in their ability to track fatalities across the health care system and to link fatalities to a particular hospital admission. Some can link patient fatalities across hospitals and out of hospitals, whereas others can only link fatalities if they occur in the same hospital as the initial admission. The OECD therefore collects two different AMI and stroke mortality indicators (admission-based and patient-based). The patient-based indicator, which tracks patients across hospitals and out of hospitals, is a more robust indicator, but the admission-based indicator continues to be used because more countries are able to report it.

Table with latest data

AMI 30 day (in-hospital) mortality, population aged over 45, admission-based data, 2015-2013

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Austria	14.2	13.8	13.2	12.0	12.3	11.8	10.6	9.9	10.0
Belgium	10.4	9.2	8.5	8.4	7.6	8.0	7.3	..	..
Czech Republic	..	..	8.8	..	7.5	..	6.8	..	6.7
Denmark	..	8.8	8.5	7.1	7.4	6.8	6.3	6.3	5.7
Estonia	..	..	..	..	..	..	..	11.2	11.5
Finland	9.0	8.6	8.7	8.3	8.4	7.6	7.0	7.1	6.5
France	7.9	..	..	..	6.4	6.2	..	7.1	7.2
Germany	11.1	10.8	10.6	10.3	10.3	9.6	8.9	..	8.7
Hungary	17.0	15.8	15.2	14.1	13.9	..	..	..	..
Ireland	10.3	9.3	9.3	9.1	7.5	7.5	6.8	6.8	6.4
Italy	7.4	6.9	6.7	6.4	6.1	5.8	5.8	5.8	5.5
Latvia	..	..	..	14.4	14.8	..	..	..	15.4
Luxembourg	9.7	9.2	8.6	7.3	7.0	7.3	7.0	7.0	..
Malta	..	..	..	..	..	..	..	..	9.5
Netherlands	11.6	11.3	10.7	8.9	8.6	8.5	7.6	..	..
Poland	8.9	7.6	7.1	6.1	5.8	5.7	5.2	4.9	4.7
Portugal	12.6	11.6	10.9	10.1	..	..	8.4	..	9.4
Slovak Republic	..	..	11.8	..	9.0	8.1	7.6	7.2	..
Slovenia	..	..	..	..	7.4	6.6	7.0	6.4	5.2
Spain	10.5	9.9	9.7	9.4	8.8	8.8	8.5	8.1	7.8
Sweden	6.4	5.9	5.3	5.3	4.7	4.8	4.5	4.5	4.5
United Kingdom	..	..	..	9.4	8.7	8.4	8.4	7.9	7.6
Iceland	6.8	6.0	6.2	6.1	6.5	6.1	6.3	6.9	..
Norway	7.2	6.3	5.9	5.6	4.7	4.1	4.5	7.4	6.7
Switzerland	9.1	7.4	8.0	7.5	..	5.9	..	7.7	..

Note: The data has been age and sex standardised based on the 2010 OECD population structure

Source: OECD Health Statistics 2016

2.1.6 In-hospital mortality following stroke

Technical documentation sheet

Indicator	**In-hospital mortality following stroke** **(Ischaemic stroke 30 day mortality (in-hospital))**
JAF Health code	Q-12
JAF Health dimension	Hospital care (or disease-based care) -- Quality/Outcomes
Policy relevance	The standardised case-fatality rates within 30 days of admission for ischemic stroke are a good indicator of the quality of acute care received by patients. Clinical trials have demonstrated clear benefits of thrombolytic treatment for ischemic stroke as well as receiving care in dedicated stroke units to facilitate timely and aggressive diagnosis and therapy for stroke victims.
Agreed definition	The number of people who die within 30 days of being admitted to hospital with ischaemic stroke, where death occurs in the same hospital as the initial stroke admission, as a proportion of all hospital admissions for ischaemic stroke in a specified year, standardized for age and gender.
Calculation method (incl. practical implementation, e.g. question in surveys)	**Coverage**: Patients aged 45 and older. **Numerator**: Number of deaths from all causes in the same hospital that occurred within 30 days of hospital admission with primary diagnosis of ischemic stroke **Denominator**: Number of admissions to hospital with a primary diagnosis of ischemic stroke (ICD codes are available). The data are age- and sex-standardized.
Major breakdowns	N/A
Data source(s)	Acute care administrative / morbidity databases or registers (collected by OECD Health Care Quality Indicators questionnaire)..
Relevant survey questions and answers	N/A
Data periodicity	Annual data (collected every two years).
Data availability (countries * time, incl. EU aggregates)	21 MS (no data for BG, EL, HR, CY, LT, PL, RO) + Iceland, Norway, Switzerland
Sustainability of the data collection	Sustainable: derived from routinely collected data.
Methodological issues (including comparability across countries and over time)	Countries differ in their ability to track fatalities across the health care system, and to link fatalities to a particular hospital admission. Some can link patient fatalities across hospitals and out of hospitals, whereas others can only link fatalities if they occur in the same hospital as the initial admission. The OECD therefore collects two different AMI and stroke mortality indicators (admission-based and patient-based). The patient-based indicator, which tracks patients across hospitals and out of hospitals, is a more robust indicator than the admission-based indicator, but the admission-based indicator continues to be used because more countries are able to report it.

Table with latest data

ischemic stroke 30 day (in-hospital) mortality, people aged over 45, Admission-based data, 2005-2013

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Country									
Austria	8.2	8.3	7.3	7.5	7.3	6.9	6.8	6.5	6.4
Belgium	9.3	9.0	9.1	8.8	9.2	9.2	9.3	..	..
Czech Republic	..	..	11.8	..	11.0	..	9.5	..	9.6
Denmark	..	11.6	11.6	10.6	11.1	10.2	10.0	9.1	9.1
Estonia	..	..	..	..	..	15.7	14.8	13.1	13.0
Finland	6.2	5.7	6.0	5.8	5.5	5.5	5.4	5.5	5.1
France	10.6	..	..	..	8.5	8.5	..	8.2	7.9
Germany	8.8	8.1	7.6	7.5	7.8	6.9	6.7	..	6.4
Hungary	11.9	11.1	11.5	10.9	9.6	..	..	..	..
Ireland	12.3	11.2	11.9	11.6	10.1	11.1	9.9	9.7	9.7
Italy	7.6	7.1	6.9	7.0	6.8	6.5	6.5	6.5	6.2
Latvia	..	..	..	19.2	19.0	..	..	18.0	18.4
Luxembourg	10.2	9.7	9.6	8.8	8.9	9.9	9.9	9.1	..
Malta	..	..	..	..	..	..	..	..	12.2
Netherlands	10.1	9.4	9.5	8.9	8.3	7.7	7.1	..	..
Portugal	12.1	11.5	11.3	10.9	..	..	10.5	..	10.2
Slovak Republic	..	..	13.4	..	12.1	11.4	11.0	10.8	..
Slovenia	..	..	..	..	15.6	13.7	12.8	13.2	..
Spain	12.1	11.4	11.4	11.0	10.6	10.5	10.2	10.2	9.7
Sweden	7.3	7.4	7.3	7.1	6.8	6.7	6.4	6.0	6.4
United Kingdom	..	..	..	14.8	12.9	11.7	10.4	10.0	9.2
Iceland	9.7	9.1	9.2	8.5	8.8	8.0	8.0	8.0	..
Norway	7.1	6.5	6.6	6.0	5.9	5.5	5.3	5.6	5.4
Switzerland	8.7	8.3	8.1	7.9	..	7.0	..	6.9	..

Note: The data has been age and sex standardised based on the 2010 OECD population structure

Source: OECD Health Statistics 2016

2.2. Primary care

2.2.1 Primary care spending (per capita and as a share of current health expenditure)

Technical documentation sheet

Indicator	Primary care spending (per capita and as a share of current health expenditure)
Health dimension	Primary care - Financial inputs
Policy relevance	Primary care is typically the first point of contact for patients with health systems and is thus an important cornerstone of health systems. Strengthening primary care has been identified as a policy priority to improve health outcomes and to make health service delivery more efficient. Better care coordination at the primary care level can avoid costly hospitalisation while also improving patient experiences and outcomes. The indicator measures how much of current health spending countries devote to primary care
Proposed definition (a narrow definition which can be expanded)	Spending on primary care is defined by combining the functional classification of the International Classification of Health Accounts (ICHA-HC) with the provider classification (ICHA-HP). The proposed narrow definition includes outpatient curative and rehabilitative care [excluding specialist care and dental care] (HC131 and HC139), home-based curative and rehabilitative care (HC1424), ancillary services (HC4) and preventive services (HC6) if provided in an ambulatory setting (HP3).
Calculation method (incl. practical implementation, e.g. question in surveys)	Spending for defined combinations of the functional and provider classifications is summed up and divided by the total population (to calculate spending per capita) and current health expenditure (to calculate its share of health spending).
Breakdowns	Outpatient curative and rehabilitative care [excluding specialist care and dental care] (HC131 and HC139), home-based curative and rehabilitative care (HC1424), ancillary services (HC4) and preventive services (HC6) if provided in an ambulatory setting (HP3).
Data source(s)	Eurostat/OECD/WHO, Joint Health Accounts Questionnaire
Relevant survey questions and answers	N/A
Data periodicity	Annual data
Data availability	2014: 21 MS+ Iceland, Norway, Switzerland
Methodological issues (including comparability across countries and over time)	A number of countries do not report data on the required level of detail, in particular being able to separate general care from specialist care. Only care in the ambulatory sector is considered as primary care. In the case that countries have dedicated primary care facilities in hospitals, these will not be considered.

Table with latest data

Spending on primary care as share of current health expenditure, 2010 to 2014

	2010	2011	2012	2013	2014
Austria	8%	7%	7%	7%	7%
Belgium	13%	13%	14%	14%	14%
Bulgaria				12%	11%
Croatia		11%	10%	10%	11%
Cyprus	13%	13%	13%	13%	13%
Czech Republic	8%	8%	8%	10%	9%
Denmark	8%	8%	8%	9%	9%
Estonia	13%	12%	13%	12%	10%
Finland	12%	11%	12%	12%	13%
Germany	15%	15%	15%	15%	15%
Hungary	8%	8%	9%	10%	8%
Iceland	12%	12%	11%	11%	11%
Luxembourg	12%	10% (b)	11%	9%	9%
Latvia	10%	8%	8%	8%	8%
Lithuania	10%	10%	9%	10%	9%
Netherlands	13%	13%	13%	13%	13%
Norway	10%	6% (b)	6%	6%	
Poland	12%	12%	12%	12%	13%
Romania	5%	5%	6%	6%	6%
Slovak Republic	8%	9%	9%	9%	6%
Slovenia	13%	13%	13%	13%	14%
Spain	12%	11%	11%	11%	11%
Sweden		10%	10%	11%	11%
Switzerland	16%	16%	16%	16%	17%

Source: OECD Health Statistics 2016

2.2.2 Generalist medical practitioners per 1 000 population

Technical documentation sheet

Indicator	**Generalist medical practitioners per 1 000 population**
Health dimension	Primary care – Labor inputs
Policy relevance	Access to primary care requires an adequate number of primary care providers, including general practitioners.
Agreed definition	Generalist medical practitioners are defined as doctors who do not limit their practice to certain disease categories or methods of treatment, and may assume responsibility for the provision of continuing and comprehensive medical care to individuals, families and communities. The definition includes general practitioners (including family doctors) and other generalist medical practitioners working in the ambulatory sector or in hospital. It also includes medical interns or residents specialising in general practice or without any area of specialization yet. It excludes paediatricians, obstetricians and gynaecologists, specialist physicians (internal medicine), psychiatrists, and feldschers.
Calculation method (incl. practical implementation, e.g. question in surveys)	Number of general practitioners and other generalist medical practitioners, in head count.
Breakdowns	General practitioners versus other generalist medical practitioners
Data source(s)	OECD/Eurostat/WHO-Europe Joint Questionnaire
Relevant survey questions and answers	N/A
Data periodicity	Annual data
Data availability (countries * time, incl. EU aggregates)	2014 (or nearest year): 28 MS + Norway, Iceland, Switzerland
Methodological issues (including comparability across countries and over time)	Data is available from 2005 onwards and is generally comparable across countries.

Table with latest data

Generalist medical practitioners per 1 000 population, 2005 - 2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	1.47	1.51	1.53	1.53	1.56	1.58	1.60	1.62	1.64	1.65
Belgium	1.18	1.18	1.16	1.15	1.14	1.12	1.11	1.11	1.12	1.12
Bulgaria	0.73	0.72	0.71	0.66	0.69	0.67	0.67	0.70	0.66	0.66
Croatia[1]	0.67	0.66	0.67	0.67	0.74	0.76	0.75	0.79	0.78	0.83
Cyprus	..	..	..	..	..	..	..	..	..	0.80
Czech Republic	0.73	0.72	0.71	0.71	0.71	0.70	0.70	0.70	0.70	..
Denmark	0.69	0.69	0.69	0.71	0.71	0.71	0.71	0.72	0.72	..
Estonia[1]	0.80	0.82	0.85	0.86	0.83	0.83	0.85	0.82	0.79	0.80
Finland	1.01	1.02	1.01	1.03	1.02	1.19	1.23	1.22	1.26	1.31
France	1.65	1.64	1.63	1.62	1.60	1.59	1.56	1.56	1.55	1.55
Germany	1.46	1.47	1.48	1.50	1.52	1.57	1.60	1.64	1.69	1.72
Greece[1]	0.26	0.25	0.32	0.28	0.28	0.30	0.30	0.31	0.32	0.49
Hungary	..	..	..	..	0.35	0.34	..	..	..	..
Iceland	0.60	0.60	0.60	0.59	0.58	0.57	0.58	0.57	0.58	0.57
Ireland[1]	2.92	2.97	3.12	3.22	2.68	2.74	2.48	2.47	2.35	1.65
Italy	..	..	..	..	0.96	..	..	0.91	0.89	0.88
Latvia	0.58	0.59	0.60	0.61	0.61	0.63	0.64	0.66	0.67	0.70
Lithuania[1]	0.70	0.74	0.77	0.74	0.75	0.77	0.88	0.90	0.92	0.94
Luxembourg	0.78	0.77	0.82	0.81	0.79	0.82	0.82	0.83	0.86	0.88
Malta	..	..	..	0.72	0.66	0.67	0.76	0.80	0.80	0.81
Netherlands	1.17	1.21	1.20	1.24	1.26	1.25	1.40	1.44	1.46	1.48
Norway[1]	0.78	0.81	0.82	0.82	0.80	0.83	0.84	0.86	0.87	0.89
Poland	..	..	..	0.45	0.44	0.46	0.38	0.33	0.34	0.36
Portugal[2]	1.69	1.72	1.78	1.85	1.91	2.00	2.08	2.10	2.17	2.28
Romania[1]	0.67	0.82	0.79	0.86	0.83	0.85	0.83	0.83	0.80	0.79
Slovak Republic	..	..	0.42	..	..	..	..	..	..	..
Slovenia	0.48	0.48	0.50	0.49	0.50	0.51	0.53	0.55	0.58	0.62
Spain	0.71	0.72	0.70	0.73	0.73	0.74	0.74	0.75	0.75	0.75
Sweden	0.59	0.61	0.62	0.62	0.63	0.63	0.63	0.64	0.65	..
Switzerland[1]	0.52	0.52	0.53	0.60	0.60	0.61	1.06	1.08	1.11	1.13
United Kingdom	0.72	0.72	0.73	0.75	0.79	0.79	0.81	0.80	0.80	0.80

Note: 1. Break in series. 2. In Portugal, the data are over-estimated as they include all doctors licensed to practice.

Source: OECD Health Statistics 2016 and Eurostat Database (based on OECD/Eurostat/WHO-Europe Joint Questionnaire).

2.2.3 Number of consultations per doctor

Technical documentation sheet

Indicator	Number of consultations per doctor
Health dimension	Primary care - Labor productivity/efficiency (relation of outputs to inputs)
Policy relevance	Consultations with doctors are one of the main activities in primary care. The number of consultations per doctor may be influenced by demand factors (the health care needs of the population), the supply of doctors, methods of payments (salary, capitation, fee-for-services), the organization of health services (e.g., whether GPs play a gatekeeping function to more specialized care) and the role of other providers of primary care (e.g., nurses, physician assistants, pharmacists). Ensuring that people have easy access to primary care providers is an important policy goal in all countries
Current definition	Consultations with doctors refer to the number of contacts with physicians. The current definition includes consultations/visits with generalists and specialist medical practitioners, at the physician's office, in the patient's home, in outpatient departments in hospital and primary care centers. It excludes telephone and email contacts, visits for prescribed laboratory tests, visits to perform prescribed and scheduled treatment procedures and consultations during an inpatient stay or a day care treatment.
Calculation method (incl. practical implementation, e.g. question in surveys)	The number of consultation with doctor refers to the average number of consultation with a physician per person per year. The data come mainly from administrative sources, although in some countries (Ireland, Italy, the Netherlands, Spain, Switzerland and the United Kingdom) the data come from health interview surveys. The number of consultations is then divided by the overall number of doctors (including both generalists and specialists).
Breakdowns	N/A
Data source(s)	OECD/Eurostat/WHO-Europe Joint Questionnaire
Relevant survey questions and answers	The data for some countries come from national health interview surveys.
Data periodicity	Annual data (except in those countries where it comes from surveys that may not be conducted every year)
Data availability	2014 (or nearest year): 25 MS + Iceland, Norway, Switzerland
Methodological issues (including comparability across countries and over time)	Data is available from 2005 onwards. There are variations across countries in the coverage of different types of consultations, notably in outpatient departments of hospitals. Data from administrative sources tend to be higher than those from surveys because of problems with recall and non-response rates. In Hungary, the data include consultations for diagnostic exams, such as CT and MRI scans (resulting in an over-estimation). The data for the Netherlands exclude contacts for maternal and child care. The data for Portugal exclude visits to private practitioners, while those for the United Kingdom exclude consultations with specialists outside hospital outpatient departments. In Germany, the data include only the number of cases of physicians' treatment according to reimbursement regulations under the Social Health Insurance Scheme (a case only counts the first contact over a three-month period, even if the patient consults a doctor more often, leading to an underestimation). Telephone contacts are included in a few countries (e.g. Spain and the United Kingdom).

Table with latest data

Estimated annual number of consultations per doctor, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	1552	1506	1499	1499	1471	1439	1425	1389	1363	1347
Belgium	2508	2460	2478	2568	2598	2534	2540	..	..	..
Bulgaria	..	..	..	..	..	..	..	..	..	1480
Croatia	2688	2465	2328	2174	2318	2120	2061	2290	2004	1994
Cyprus	792	797	754	765	804	799	787	809	739	639
Czech Republic	3705	3637	3525	3206	3132	3059	3052	3021	3010	..
Denmark	1360	1330	1323	1317	1300	1284	1324	1285	1259	..
Estonia	2003	2011	2025	1975	1920	1881	1943	1919	1950	1898
Finland	1633	1603	1562	1581	1486	1439	1407	1397	1392	..
France	..	..	..	..	..	..	2215	2173	2068	2025
Germany	2386	2299	2323	2429	2542	2666	2549	2458	2454	2410
Greece	..	..	..	..	..	..	..	..	..	..
Hungary[1]	4638	4216	3853	3656	3939	4044	3989	3820	3646	3551
Iceland	1799	1748	1799	1757	1754	1699	1741	1657	1663	1619
Ireland[2]	..	..	..	..	..	..	..	..	..	2018
Italy	..	..	..	..	..	..	..	..	1744	..
Latvia	1790	1849	1909	1918	1871	1899	2010	2226	1943	1803
Lithuania	1882	1794	1854	1881	1868	1849	1879	1896	1894	2020
Luxembourg	2353	2263	2236	2246	2256	2131	2212	2155	2102	2066
Malta	..	..	..	..	..	..	..	..	..	..
Netherlands	1994	2004	2040	2056	1950	2227	2107	1906	1871	..
Norway	..	976	975	974	988	997	1051	1040	975	971
Poland	2947	3029	3104	3146	3133	3018	3073	3134	3168	3121
Portugal	..	..	..	..	..	..	..	..	..	..
Romania	2179	2277	2239	2200	2184	1994	1891	1877	1816	1964
Slovak Republic[1]	3721	3279	3541	3592	3511	3453	3327	3329	3244	3297
Slovenia	..	2794	2809	2790	2739	2633	2606	2479	2472	2383
Spain	..	2235	..	..	2085	..	1930	..	1994	..
Sweden	795	775	758	773	759	745	757	717	704	..
Switzerland	..	..	..	..	..	..	..	996	..	..
United Kingdom	2095	2092	2022	2307	1889	..	..	..	..	..

Notes: 1. Break in series. 2. Data refer to 2015.

Source: OECD Health Statistics 2016 and Eurostat Database (based on OECD/Eurostat/WHO-Europe Joint Questionnaire).

2.2.4 Duration of consultations with doctor

Technical documentation sheet

Indicator	**Duration of consultations with doctor**
Health dimension	Primary care activities – Output indicator
Policy relevance	The duration of consultations with a primary care provider is a relevant indicator to complement the information on the sheer volume of consultations. A high number of consultations may simply reflect consultations that are too short and of poor quality.
Current definition (from the Commonwealth Fund International Health Policy Survey)	The indicator reports the percentage of primary care physicians spending i) less than 15 minutes with a patient, ii) 15 to less than 25 minutes, iii) 25 minutes or more.
Calculation method (incl. practical implementation, e.g. question in surveys)	The data was collected through the Commonwealth Fund International Health Policy Survey from representative samples of primary care physicians in 11 countries (including 7 European countries and 4 non-European countries) in 2015. The following question is asked to primary care doctor: "On average, how much time are you able to spend with a patient during a routine/appointment or visit?"
Breakdowns	N/A
Data source(s)	Commonwealth Fund International Health Policy Survey of Primary Care Doctors
Relevant survey questions and answers	As noted above, the question asked to primary care doctor is the following: "On average, how much time are you able to spend with a patient during a routine/appointment or visit? Possible answers include: i) Less than 15 minutes, ii) 15 to less than 25 minutes, and iii) 25 minutes or more.
Data periodicity	Once every three years.
Data availability	2015: 5 MS + Norway, Switzerland
Methodological issues (including comparability across countries and over time)	Data is only available for 2015 (the 2009 and 2012 waves of the Commonwealth Fund Survey did not include any questions on the duration of consultations).

Table with latest data

Percentage of primary care doctors spending less than 15 minutes, 15 to less than 25 minutes, and 25 minutes or more with a patient, 2015

2015	Less than 15 minutes	15 to less than 25 minutes	25 minutes or more	Non response
France	5	72	21	2
Germany	80	16	2	2
Netherlands	85	14	0	1
Norway	3	84	10	2
Sweden	2	49	48	1
Switzerland	8	68	24	0
United Kingdom	92	8	0	0

Source: Commonwealth Fund International Health Policy Survey of Primary Care Doctors (2015)

2.2.5 Vaccination against infectious diseases among children

Technical documentation sheet

Indicator	**Vaccination against measles and other infectious diseases, children around aged 1**
JAF Health dimension	Primary care activities – Output indicator (with a "quality" component)
Policy relevance	Young children are vulnerable to various infectious diseases, many of which can be effectively prevented or treated. Immunization is one the most successful public health initiative. Childhood vaccination coverage, such as vaccination against measles and other infectious diseases, is therefore a key element of assessing the quality of primary care systems in preventing these diseases.
Agreed definition	Vaccination rates against measles and other infectious diseases reflect the percentage of children who receive the vaccination in the recommended timeframe.
Calculation method (incl. practical implementation, e.g. question in surveys)	Percentage of children around aged 1 who has received at least one dose of measles containing vaccine in a given year. The age of first dose or complete immunisation differs across countries due to different immunization schedules. The indicator includes the vaccination coverage of children in countries recommending the first dose of measles vaccine after age 1.
Breakdowns	N/A
Data source(s)	WHO/UNICEF
Relevant survey questions and answers	N/A
Data periodicity	Annual data
Data availability	2014 (or nearest year): 28 MS + Norway, Switzerland, Iceland
Methodological issues (including comparability across countries and over time)	Data is available from 2005 onwards.

Table with latest data

Vaccination rates against measles, children aged around 1, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	75	80	79	83	76	76	76	76	76	76
Belgium	88	92	92	93	95	95	95	96	96	96
Bulgaria	96	96	96	96	96	97	95	94	95	93
Croatia	96	95	96	98	95	96	96	95	94	94
Cyprus	86	87	87	87	87	87	87	86	86	86
Czech Republic	97	97	98	97	98	98	98	98	99	99
Denmark	95	90	89	87	84	85	87	90	89	90
Estonia	96	96	96	95	95	95	94	94	94	93
Finland	97	97	98	97	98	98	97	97	97	97
France	87	89	90	89	89	89	89	90	89	90
Germany	96	96	97	97	97	97	97	97	97	97
Greece	96	98	99	99	99	99	99	99	99	97
Hungary	99	99	99	99	99	99	99	99	99	99
Iceland	90	95	95	96	92	93	94	90	91	90
Ireland	84	86	87	89	90	90	92	92	92	93
Italy	87	88	90	90	90	91	90	90	90	86
Latvia	98	98	95	96	92	95	92	90	96	95
Lithuania	97	97	97	97	96	96	94	93	93	93
Luxembourg	95	95	96	96	96	96	96	99	99	99
Malta	86	94	79	78	82	73	84	93	99	98
Netherlands	96	95	96	96	96	96	96	96	96	96
Norway	90	92	92	93	93	93	93	94	93	94
Poland	98	99	98	98	98	98	98	98	98	98
Portugal	93	97	95	97	95	96	97	97	98	98
Romania	97	95	97	96	96	95	93	94	92	89
Slovak Republic	98	98	99	99	99	98	98	99	98	97
Slovenia	94	96	96	96	95	95	96	95	94	94
Spain	97	97	97	98	98	95	97	97	95	96
Sweden	96	97	96	96	97	97	97	97	97	97
Switzerland	87	87	87	92	92	92	93	93	93	93
United Kingdom	82	85	86	86	86	89	90	92	93	93

Source: *WHO/UNICEF*

2.2.6 Influenza vaccination for older people

Technical documentation sheet

Indicator	Influenza vaccination coverage, population aged 65 and over
Health dimension	Primary care activities – Output indicator (with a "quality" component)
Policy relevance	Influenza is a common infectious disease affecting 5-10% of adults each year. Epidemics of influenza place high demands on health systems, by increasing medical visits, hospitalisations, and medication usage including antibiotics. Vaccination has proven to be effective in reducing the burden of influenza and is usually managed at the primary care level. Older people are at a higher risk to get influenza and related complications that might lead to more hospitalisations or even deaths. Both WHO and EU have set a goal of 75% vaccination coverage against influenza among people aged 65 and over. Influenza vaccination for older people is a relevant indicator for assessing the quality of primary care in preventing this infectious disease.
Agreed definition	Influenza vaccination rate refers to the share of people aged 65 and older who have received an annual influenza vaccination.
Calculation method (incl. practical implementation, e.g. question in surveys)	Number of people aged 65 and over who have been immunised against influenza (or "flu") during the last 12 months divided by all the population aged 65 and over. The last 12 months cover the last influenza season or calendar year.
Breakdowns	N/A
Data source(s)	OECD/Eurostat/WHO-Europe Joint Questionnaire, and European Health Interview Survey (once every five to six years)
Relevant survey questions and answers	N/A
Data periodicity	Annual data
Data availability	2014 (or nearest year): 27 MS + Norway, Iceland
Methodological issues (including comparability across countries and over time)	Data is available from 2005 onwards. The main limitation in terms of data comparability arises from the use of different data sources, whether survey or programme, which are susceptible to different types of errors and biases. For example, data from population surveys may reflect some variation due to recall errors and irregularity of administration.

Table with latest data

Influenza vaccination coverage, population aged 65 and over, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	..	36.1	..	..	..	..	..	..	..	20.3
Belgium	..	..	..	65	..	..	..	..	58	..
Bulgaria				4.8						
Croatia	40.0	44.0	40.0	46.0	39.0	34.0	30.0	23.0	21.0	19.0
Cyprus			40.8							32.4
Czech Republic	..	..	..	22.1	..	..	..	..	..	..
Denmark	34	33.4	39.3	51	48.5	45.6	45.8	43.1	45.6	43
Estonia	..	..	..	1	1.4	1	0.9	0.9	1.1	1.4
Finland	52	46	48.4	51	46	40.3	38.5	36.4	41	40
France	63.5	63.4	63.9	64.8	63.9	56.2	55.2	53.1	51.9	48.5
Germany	63	60	56	..	61.1	56.1	..	58.6	..	..
Greece	..	..	..	..	41.4	..	..	..	..	..
Hungary	37.1	34	34.2	37.8	31.6	29.5	29.8	28.5	36.7	31.2
Ireland	63	60.6	61.7	70.1	53.8	63.8	56.3	56.9	59.4	60.2
Iceland	:	:	:	:	:	:	:	:	:	41.0
Italy	66.6	68.3	66.6	64.9	66.2	65.6	60.2	62.7	54.2	55.4
Latvia	..	..	3.1	2.1	2.5	1.1	2	1.7	3.1	2.8
Lithuania	1.8	1.6	12.5	23.6	21.7	17.3	18.5	19.4	19.8	21.1
Luxembourg	54.3	51.3	53	53.7	53.3	47.3	46.4	44.7	43.3	41.8
Netherlands	77	75	78	77	74	..	..	73.5	68.8	72
Norway	:	:	:	:	43.9	7.7	14.1	11.4	20.8	26.9
Poland	..	..	..	..	12.1	..	..	..	..	..
Portugal	41.6	50.4	51	53.3	52.2	48.3	43.4	44.9	49.9	50.9
Romania		17.0	54.0	48.7	27.7	18.7	9.1	14.8	8.8	7.3
Slovak Republic	29.3	25.7	33.4	35.5	30.5	23.8	21.9	15.4	15.6	14.1
Slovenia	35	28	26	26	22	18	16	17	13	11
Spain	70.1	67.6	62.3	65.4	65.7	56.9	57.7	57	56.4	56.2
Sweden	61	57	58	65.8	44	55.2	46.1	44.3	45.8	49.7
Switzerland	59.0	61.0	56.0	:	:	46.0	:	:	:	:
United Kingdom	75	75.1	73.2	73.6	72.3	72.8	74	73.5	73.3	72.8

Source: OECD Health Statistics 2016 and Eurostat database

2.2.7 Patient-reported experience measures

Technical documentation sheet

Indicator	Patient-reported experience measures with primary care
Health dimension	Primary care activities – Outcomes (quality and responsiveness from the patient perspective)
Policy relevance	Patient-reported experience measures (PREMs) with primary care are an important marker of the outcomes, quality and responsiveness of primary care services from the point of view of those most concerned – patients themselves.
Current definitions (from Commonwealth Fund International Health Policy Survey and OECD module on patient experience)	Questions on patient-reported experience measures in primary care can address various issues, including: • patients reporting that their (regular) doctor spends enough time with patient in consultation • patients reporting that their (regular) doctor provides easy to understand explanations • patients reporting having being involved in decisions about care or treatment
Calculation method (incl. practical implementation, e.g. question in surveys)	Percentage of survey respondents responding positively (or negatively) to the various questions about their experience Rates can be age-sex standardized to remove the effect of different population structures across countries.
Breakdowns	N/A
Data source(s)	Commonwealth Fund International Health Policy Survey, National surveys
Relevant survey questions and answers	Patient experience modules include questions such as: Would you say your (regular) doctor: • Spend enough time with you • Explain things in a way that is easy to understand • Involve you as much as you want to be in decisions about your care and treatment
Data periodicity	Once every three years (for Commonwealth Fund International Health Policy Survey)
Data availability (countries * time, incl. EU aggregates)	2013 (or nearest year): 9 to 10 MS + Norway, Switzerland
Methodological issues (including comparability across countries and over time)	Data from the Commonwealth Fund International Health Policy Survey is available from 2010, and the survey is conducted only about once every three years.

Table with latest data

Doctor spending enough time with patient in consultation , 2010-2015

	2010	2013	2015
Belgium 1	..	97.5	..
Estonia 1	..	86.9	..
France 2	85.4.	80.0	..
Germany 2	92.5	88.2	..
Netherlands 2	91.5	85.1	..
Norway	78.0	79.6	
Poland 1, 2	64.0	59.6	..
Portugal 1, 2	..	..	89.6
Sweden 2	74.0	78.3	..
Switzerland	91.3	83.6	
United Kingdom 2	88.6	86.3	..

Regular doctor providing easy-to-understand explanations, 2010-2015

	2010	2013	2015
Country			
Belgium 1	..	97.8	..
Estonia 1, 2	..	87.4	..
France 2	89.0	83.7	..
Germany 2	94.7	90.7	..
Netherlands 2	96.0	86.8	..
Norway	88.7	84.1	
Poland1, 2	66.7	69.5	..
Portugal 1, 2	..	..	96.3
Sweden 2	81.4	81.8	..
Switzerland	95.3	81.9	
United Kingdom 2	89.6	89.5	..

Regular doctor involving patient in decisions about care and treatment, 2010-2015

	2010	2011	2013	2015
Belgium 1	..	95.1	..	..
Estonia 1, 2	..	67.4	..	..
France 2	82.9	..	78.8	..
Germany 2	87.9	..	87.7	..
Netherlands2	89.2	..	83.9	..
Norway	85.4		83.3	
Poland 1, 2	50.2	..	47.9	..
Portugal 1	..	..	90.9..	90.9
Spain 1, 2	..	62.1	..	..
Sweden 2	74.1	..	80.5	..
Switzerland	89.6		81.4	
United Kingdom 2	91.0	..	88.0	..

1. National sources. 2. Data refer to patient experiences with regular doctor. Note: The data has been age/sex standardised based on the OECD 2010 population structure. Sources: Commonwealth Fund International Health Policy Survey and National surveys

2.2.8. Diabetes management outcomes

Technical documentation sheet

Indicator	**Target achievement rates for diabetes management (cholesterol, blood pressure and HbA1c)**
Health dimension	Primary care activities -- Outcomes
Policy relevance	The effective control of patient with chronic diseases in primary care is an important policy priority to prevent any complications and avoidable hospitalisations. Target achievement rates for diabetes management, for example, have been developed in many countries and linked to national guidelines and quality standards. In the area of diabetes care, target achievement rates for cholesterol, blood pressure and HbA1c are the most common outcomes indicators.
Agreed definition	No agreed common definition between Member States yet.
Calculation method (incl. practical implementation, e.g. question in surveys)	Achievement rates are calculated among patients registered with diabetes.
Breakdowns	N/A
Data source(s)	• United Kingdom: 2014 National Diabetes Audit; • Sweden: 2013 Annual report of the National Diabetes Register • Portugal: 2012 Annual report of the National Diabetes Observatory
Relevant survey questions and answers	N/A
Data periodicity	N/A
Data availability (countries * time, incl. EU aggregates)	2014 (or nearest year): 3 MS
Methodological issues (including comparability across countries and over time)	The availability of data is fairly limited as it stands now and there are also comparability issues because each country may set different targets. The target achievement for blood pressure for example is set at 140/80 in England, 140/85 in Sweden and 130/85 in Portugal.

Table with latest data

Target achievement rates for cholesterol, blood pressure and HbA1c among diabetes patients, 2013 (or nearest year)

Target achievement rates	Countries	Year	Value
HbA1c	United Kingdom	2014	48.0
	Portugal	2011	40.7
	Sweden	2013	22.9
Blood pressure	United Kingdom	2014	75.3
	Sweden	2013	69.1
	Portugal	2011	35.7
Cholesterol	United Kingdom	2014	74.4
	Sweden	2013	58.5
	Portugal	2011	43.7

Note: The specific targets are not the same in each country.

Source: 2014 National Diabetes Audit (UK), 2013 Annual report of the National Diabetes Register (Sweden), and 2012 Annual report of the National Diabetes Observatory (Portugal).

2.2.9 Avoidable admission for respiratory diseases (asthma and COPD), diabetes and congestive heart failure

Technical documentation sheet

Indicator	**Avoidable admissions for asthma and COPD**
Health dimension	Primary care - outcomes (indirect)
Policy relevance	Effective management of chronic diseases such as asthma and COPD is well established and much of it can be delivered at a primary care level. Therefore, a high performing primary care system should be able to avoid to a large extent acute deterioration in people living with asthma/COPD and prevent their admission to hospital. High hospital admission rates for these conditions signal some shortcomings in access to high-quality primary care. Linking the cost of admission for asthma and COPD to the hospital admission rates can also provide an indicator of potential savings that could be achieved by strengthening primary care systems.
Agreed definition	Rate of hospital admissions for asthma and COPD per 100,000 population for the population aged 15 and over (standardized for age and sex).
Calculation method (incl. practical implementation, e.g. question in surveys)	**Coverage:** Population aged 15 and older . **Numerator:** All non-maternal /non-neonatal hospital admissions with a principal diagnosis code of asthma and COPD in a specified year; **Exclude:** • Cases transferring from another acute care institution • Cases with Major Diagnostic Category (MDC) 14 or specified pregnancy, childbirth, and puerperium codes • Cases with MDC 15 or specified Newborn and other neonates codes • Cases with cystic fibrosis and anomalies of the respiratory system diagnosis code in any field • Cases that are same day/day only admissions **Denominator:** all the population aged 15 and over
Breakdowns	N/A
Data source(s)	OECD Health Care Quality Indicators (HCQI) questionnaire (based on hospital databases or registers).
Relevant survey questions and answers	N/A
Data periodicity	Annual
Data availability	2013 (or nearest year): 22 MS + Norway, Iceland, and Switzerland
Methodological issues (including comparability across countries and over time)	Comparability of data is affected by differences in coding practices among countries and by the definition of an admission. Hospital admission rate can also be affected by differences in disease prevalence across countries.

Table with latest data

Asthma and COPD hospital admission, rate per 100 000 population aged 15 and over, 2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Austria	398.0	396.6	367.9	385.4	379.3	385.2	384.7	371.2	358.4	348.4
Belgium	304.9	318.6	291.5	306.4	261.1	258.1	247.3	245.3	..	..
Czech Republic	..	..	..	..	..	196.5	..	180.7	..	196.1
Denmark	..	..	377.5	365.7	355.2	339.3	346.9	344.7	349.1	334.1
Estonia	..	..	..	..	..	..	347.3	335.9	358.1	343.6
Finland	..	..	..	277.9	259.3	235.9	218.6	211.2	212.6	192.5
France	..	..	..	..	..	..	123.7	129.8	144.7	150.2
Germany	..	..	..	216.7	..	233.7	..	231.4	..	268.0
Hungary	571.7	555.5	521.9	412.3	426.5	461.0	463.8	451.7	427.5	..
Iceland	307.6	275.7	266.9	271.9	274.3	..	..	..	226.7	..
Ireland	382.2	434.4	445.1	460.4	459.9	427.3	399.0	404.5	439.9	436.2
Italy	211.9	211.0	176.7	164.7	149.5	134.9	120.8	103.6	93.6	79.5
Latvia	..	..	..	349.9	337.1	298.5	223.3	271.4	272.6	257.0
Luxembourg	246.1	225.6	214.1	207.9	212.9	205.2	201.0	192.9	190.7	..
Malta										232.8
Netherlands	..	..	188.2	193.4	189.6	192.0	198.0	194.7	..	..
Norway	..	..	..	291.8	..	281.4	232.6	238.7	241.2	247.3
Poland	..	379.8	365.8	357.4	315.5	302.5	266.0	268.5	261.7	261.2
Portugal	..	..	..	118.8	..	91.7	..	86.5	..	88.5
Slovak Republic	..	..	..	..	..	374.2	390.5	335.5	279.6	..
Slovenia	..	..	..	..	..	161.8	157.3	151.3	151.2	150.8
Spain	272.6	298.2	262.7	298.3	281.8	276.1	258.5	256.4	253.7	236.0
Sweden	..	..	..	204.1	210.5	207.5	214.4	213.3	220.2	215.1
Switzerland	..	..	137.7	..	128.3	..	125.3	..	114.0	..
United Kingdom	..	..	333.2	310.8	331.7	304.5	313.1	280.7	292.1	273.2

Source: OECD Health Statistics 2016

Technical documentation sheet

Indicator	Avoidable admission for congestive heart failure (CHF)
Health dimension	Primary care - outcomes (indirect)
Policy relevance	Effective management of chronic diseases such as congestive heart failure (CHF) is well established and much of it can be delivered at a primary care level. Therefore, a high performing primary care system should be able to avoid to a large extent acute deterioration in people living with CHF and prevent their admission to hospital. High hospital admission rates for these conditions signal some shortcomings in access to high-quality primary care. Linking the cost of admission for CHF to the hospital admission rates can also provide an indicator of potential savings that could be achieved by strengthening primary care systems.
Agreed definition	Rate of hospital admissions for CHF per 100,000 population for the population aged 15 and over (standardized for age and sex).
Calculation method (incl. practical implementation, e.g. question in surveys)	**Coverage:** Population aged 15 and older (5 year age group). **Numerator:** All non-maternal/non-neonatal hospital admissions with principal diagnosis code of CHF in a specified year. **Exclude:** • Cases transferring from another acute care institution • Cases with cardiac procedure codes in any field • Cases with Major Diagnostic Category (MDC) 14 or specified pregnancy, childbirth, and puerperium codes in any field • Cases with MDC 15 or specified Newborn and other neonates codes in any field • Cases that are same day/day only admissions **Denominator:** Population count.
Breakdowns	N/A
Data source(s)	OECD Health Care Quality Indicators (HCQI) questionnaire (based on hospital databases or registers).
Relevant survey questions and answers	N/A
Data periodicity	Annual
Data availability	2013: 18 MS + Norway, Iceland, and Switzerland
Methodological issues (including comparability across countries and over time)	Comparability of data is affected by differences in coding practices among countries and by the definition of an admission. Hospital admission rate can also be affected by differences in disease prevalence across countries.

Table with latest data

Congestive heart failure hospital admission, rate per 100 000 population aged 15 and over, 2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Austria	370.4	356.7	361.2	354.6	347.3	315.8	303.2	287.4	288.7	282.9
Belgium	226.5	233.2	229.6	224.5	187.9	183.2	189.5	182.7	..	..
Czech Republic	..	..	..	..	..	363.3	..	377.6	..	414.8
Denmark	..	..	171.5	170.8	170.6	171.2	170.9	164.9	153.9	153.8
Finland	..	..	..	335.2	319.6	314.0	318.5	309.6	300.3	277.8
France	..	..	..	258.8	..	..	252.9	..	236.5	238.2
Germany	..	..	..	380.7	..	384.1	..	374.4	..	382.4
Hungary	672.8	633.0	639.5	500.4	452.0	418.6	488.9	467.1	441.3	..
Iceland	189.4	184.5	187.6	189.1	194.0	..	..	..	197.1	..
Ireland	228.5	216.8	212.6	208.9	197.4	196.0	192.1	168.4	176.1	174.5
Italy	333.9	335.6	336.5	319.8	311.0	303.1	306.4	291.0	284.5	267.8
Malta										347.0
Netherlands	..	..	205.3	206.4	201.1	209.5	208.4	199.4	..	..
Norway	..	..	..	181.2	..	194.4	172.5	161.8	172.4	175.0
Poland	..	439.3	494.8	495.6	548.1	612.2	581.4	580.2	559.4	547.5
Portugal	..	..	..	190.4	..	177.2	..	169.3	..	194.8
Slovak Republic	..	..	..	..	..	413.6	418.5	411.1	436.6	..
Slovenia	..	..	..	..	..	296.4	306.1	303.5	312.2	305.6
Spain	147.7	161.5	164.0	185.5	188.7	191.7	202.4	207.6	209.8	206.0
Sweden	..	..	..	303.5	309.2	308.9	313.0	307.4	304.5	299.9
Switzerland	..	..	168.8	..	173.3	..	176.7	..	174.4	..
United Kingdom	..	..	..	..	..	..	..	99.9	98.4	99.4

Source: OECD Health Statistics 2016

Indicator	Avoidable admission for diabetes
JAF Health dimension	Indirect outcomes indicator of primary care
Policy relevance	Effective management of chronic diseases such as diabetes is well established and much of it can be delivered at a primary care level. Therefore, a high performing primary care system should be able to avoid to a large extent acute deterioration in people living with diabetes and prevent their admission to hospital. High hospital admission rates for these conditions signal some shortcomings in access to high-quality primary care. Linking the cost of admission for diabetes to the hospital admission rates can also provide an indicator of potential savings that could be achieved by strengthening primary care systems.
Agreed definition	Rate of hospital admissions for diabetes per 100,000 population for the population aged 15 and over (standardized for age and sex).
Calculation method (incl. practical implementation, e.g. question in surveys)	**Coverage:** Population aged 15 and older (5 year age group). **Numerator:** All non-maternal/non-neonatal hospital admissions with a principal diagnosis code of diabetes **Exclude:** • Cases transferring from another acute care institution • Cases with Major Diagnostic Category (MDC) 14 or specified pregnancy, childbirth, and puerperium codes in any field • Cases with MDC 15 or specified Newborn and other neonates codes in any field • Cases that are same day/day only admissions **Denominator**: Population count.
Breakdowns	N/A
Data source(s)	OECD Health Care Quality Indicators (HCQI) questionnaire (based on hospital databases or registers).
Relevant survey questions and answers	N/A
Data periodicity	Annual
Data availability	2013: 27 MS + Norway, Iceland, and Switzerland
Methodological issues (including comparability across countries and over time)	Comparability of data is affected by differences in coding practices among countries and by the definition of an admission. Hospital admission rate can also be affected by differences in disease prevalence across countries.

Table with latest data

Diabetes hospital admission, rate per 100 000 population aged 15 and over, 2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Austria	490.9	475.3	460.2	434.0	420.3	369.8	357.0	336.8	311.0	296.0
Belgium	198.2	190.1	193.3	191.8	177.3	176.5	173.0	171.0	..	..
Czech Republic	..	..	..	..	..	262.7	..	221.1	..	192.1
Denmark	..	..	169.5	168.3	159.8	159.3	149.4	136.2	130.4	124.6
Finland	..	..	..	202.7	182.6	162.3	152.0	138.1	134.9	125.8
France	..	..	..	..	..	..	194.8	197.3	194.0	180.6
Germany	..	..	..	231.2	..	219.2	..	217.2	..	216.3
Hungary	217.2	212.0	230.5	161.4	151.5	142.5	133.7	123.3	109.9	..
Iceland	60.8	60.6	60.0	61.9	44.9	..	..	..	55.1	..
Ireland	127.6	173.3	180.8	183.9	171.8	160.5	151.6	141.9	144.0	138.6
Italy	84.3	81.5	77.2	71.6	68.1	62.6	57.4	52.1	48.2	43.5
Latvia	..	..	..	..	..	..	..	125.6	127.5	131.2
Luxembourg	206.7	207.8	218.7	218.2	202.9	181.5	168.8	168.0	168.4	..
Malta										134.7
Netherlands	..	..	75.1	69.5	69.9	69.0	73.2	68.3	..	..
Norway	..	..	..	98.2	..	95.4	86.9	78.8	79.1	76.4
Poland	..	201.3	207.9	203.2	218.6	256.9	246.8	237.6	232.2	231.0
Portugal	..	..	..	126.1	..	101.2	..	88.7	..	85.7
Slovak Republic	..	..	..	..	..	..	..	..	224.8	..
Slovenia	..	..	..	..	..	109.9	103.5	109.5	105.0	112.3
Spain	70.2	70.0	69.6	69.5	66.4	64.4	63.2	59.9	56.1	52.3
Sweden	..	..	..	148.4	141.9	133.8	141.8	128.6	118.4	111.2
Switzerland					66.8		70.0		43.9	
United Kingdom	..	..	..	..	..	..	..	66.3	65.8	64.3

Source: OECD Health Statistics 2016

2.3. Pharmaceutical sector

2.3.1 Pharmaceutical expenditure

Technical documentation sheet

Indicator	Pharmaceutical expenditure
JAF Health dimension	Pharmaceutical expenditure
Policy relevance	This indicator allows assessment of variations across countries and trends over time in pharmaceutical expenditure. Differences in pharmaceutical expenditure can reflect differences in the volume and structure consumption and in prices.
Agreed definition	Expenditure on pharmaceuticals per capita
Calculation method (incl. practical implementation, e.g. question in surveys)	Total expenditure on pharmaceuticals per population
Breakdowns	
Data source(s)	Joint Health Accounts Questionnaire OECD/Eurostat/WHO
Relevant survey questions and answers	
Data periodicity	Annual data
Data availability (countries * time, incl. EU aggregates)	27 MS + Iceland, Norway, SwitzerlandData is available since 2000
Sustainability of the data collection	
Methodological issues (including comparability across countries and over time)	Pharmaceutical expenditure covers spending on prescription medicines and self-medication, often referred to as over-the-counter products. In some countries, other medical non-durable goods are also included. It also includes pharmacists' remuneration when the latter is separate from the price of medicines. Total pharmaceutical spending refers in most countries to "net" spending, i.e. adjusted for possible rebates payable by manufacturers, wholesalers or pharmacies. Pharmaceuticals consumed in hospitals and other health care settings as part of an inpatient or day case treatment are excluded.

Expenditure on pharmaceuticals (incl. other medical non-durables) per capita, 2005-2014

EUR PPP (current prices, current PPPs)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	371	388	411	421	388	400	410	428	430	453
Belgium	428	| 422	448	454	457	472	484	474	467	464
Bulgaria	202	227	233	258	..	..	..	375	408	438
Croatia	..	..	..	..	..	..	352	364	377	316
Cyprus	274	281	292	308	300	| 291	291	285	258	257
Czech Republic	306	289	290	282	329	293	308	330	308	304
Denmark	222	242	260	253	243	256	234	224	220	| 242
Estonia	165	184	194	217	199	209	209	230	232	241
Finland	346	330	350	366	352	350	351	359	358	354
France	456	| 459	478	473	471	481	485	477	475	488
Germany	426	429	456	469	474	499	487	503	512	551
Greece	427	487	556	..	| 668	662	662	517	506	468
Hungary	364	381	360	371	376	| 414	453	420	392	404
Ireland	401	443	484	499	502	518	491	496	| 533	523
Italy	423	443	447	451	437	444	443	435	431	| 405
Latvia	156	180	237	188	192	211	214	222	252	| 259
Lithuania	238	246	256	267	270	279	288	337	338	356
Luxembourg	435	458	476	474	471	472	| 405	416	417	419
Malta	..	..	..	..	..	..	..	..	..	..
Netherlands	322	331	360	354	341	349	351	317	300	298
Poland	201	207	214	223	235	249	256	246	| 250	252
Portugal	385	397	411	404	393	389	356	319	293	297
Romania	124	130	146	167	162	178	220	227	261	286
Slovak Republic	305	328	368	392	410	427	406	401	406	| 396
Slovenia	339	347	338	346	350	358	361	381	383	360
Spain	370	382	397	404	404	406	398	388	408	407
Sweden	331	348	364	371	360	359	361	373	364	364
United Kingdom	..	..	..	..	..	..	..	..	348	361
Iceland	398	379	370	413	427	411	| 391	383	373	365
Norway	326	325	319	309	292	306	333	336	334	340
Switzerland	357	360	382	391	395	| 466	485	530	536	543

| Break in series

Source: OECD Health Statistics 2016.

2.3.2 Share of generic market

Technical documentation sheet

Indicator	Share of generic market
JAF Health dimension	Efficiency in pharmaceutical spending
Policy relevance	The development of generic markets provides a good opportunity to increase efficiency in pharmaceutical spending. It allows substituting expensive originator medicine with cheaper and therapeutically equivalent generics offering significant cost savings with no adverse health effects.
Agreed definition	Share of generics in the total pharmaceutical market
Calculation method (incl. practical implementation, e.g. question in surveys)	Percentage of total volume that is for generics. Data are collected as a share expressed in volume or value (sales. Volumes can be expressed in DDDs or as a number of packages/boxes or standard units.
Breakdowns	
Data source(s)	OECD Health Data questionnaire
Relevant survey questions and answers	
Data periodicity	Annual
Data availability (countries * time, incl. EU aggregates)	18 MS + Norway, Switzerland
Sustainability of the data collection	
Methodological issues (including comparability across countries and over time)	While the data collection aims to cover the whole pharmaceutical market; many countries provide data covering only the community pharmaceutical market or the reimbursed pharmaceutical market.

Share of generics in pharmaceutical market, in value and in volume, 2005-2014

In value

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria [1]	29.9	32.6	34.1	36.1	37.1	40.2	40.8	41	45.5	46.9
Belgium [1]	8.3	9.9	10.3	10.2	11.4	12.1	12.4	13.2	13.6	14
Czech Republic	13.9	14.7	15.7	16.2	16.3	16.5	17	18.4	19.4	18.1
Denmark [1]	..	..	13.6	11.5	11.9	14	14	14.4	14.6	14.9
Estonia	..	15	14.1	14.4	15.8	18	17.7	18	17	16.4
Finland	..	..	12	12	15	14	15	16	17	17
France [1]	7.4	8.3	9.3	9.4	10.5	11.4	10.9	13.9	15.5	..
Germany [1]	34.6	35.9	36.4	36.8	35.9	34.7	35.3	36.7	37	36.2
Greece [1]	..	..	..	..	..	..	..	18.6	18.5	19
Ireland [1]	..	..	..	7.3	7.4	8.1	8.9	12.6	15.8	16.4
Italy	3.4	3.9	4.3	5	4.9	5.6	6.2	7.2	8.1	8.6
Luxembourg [1]	..	..	..	3.2	3.7	3.5	3.3	3.6	3.9	4.7
Netherlands [1]	20.4	22	21.3	15.3	11.7	10.9	10.3	12	16.2	16.5
Portugal	12.6	15.2	17.8	18.6	17.8	19.1	18.2	16.5	19.7	20.4
Slovak Republic	46	45.5	44	42.6	42.8	43.3	43.5	44.7	41.3	40.8
Slovenia [2]	..	..	..	..	25.3	25.4	25.4	24.8	24.4	23.8
Spain [1]	7.4	8.5	9.2	9.2	9.4	10.9	14.7	18.4	21	21.8
United Kingdom [1]	24.9	27.8	27.3	24.5	26.4	27.6	27.6	31.9	33.4	34.9
Norway	12.5	13.3	13.7	14.8	15.5	16.4	16.5	17	16.8	16.2
Switzerland	8	11.5	11.4	11.6	11.6	12.4	12.8	14.3	15.5	16

Share of generics in pharmaceutical market, in value and in volume, 2005-2014 (cont.)

In volume

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria [1]	36.8	39.1	40.2	42.1	43	46.1	46.9	48.5	50.4	52.1
Belgium [1]	17.1	21.3	22.3	23.3	24.6	26.4	27.7	29.8	31.3	32.7
Czech Republic	20.9	23.3	25.7	28.1	29.5	31.7	34.5	38.2	39.6	41.9
Denmark [1]	..	..	35.6	38.3	42.9	46.4	49.5	52.3	54.3	56.6
Estonia	..	31.2	30.4	31.2	32.3	33.9	35.2	35.7	35.4	35.9
Finland	..	..	34	35	39	34	36	39	40	40
France [1]	14.9	17.5	19.5	21.7	23.6	24.3	23	26.4	30.2	..
Germany [1]	59.3	63.6	67.6	70.8	72.4	73.7	76.3	78.2	79.5	81
Greece [1]	..	..	..	..	..	..	..	18.5	18.2	20.1
Ireland [1]	..	..	..	16.7	16.8	17.9	17.7	23.2	28.8	34.7
Italy	7	8.1	8.3	10.2	10.8	12.4	13.9	16.3	17.6	18.4
Luxembourg [1]	..	..	..	7.8	9	8.4	8.1	7.8	7.7	9
Netherlands [1]	49.8	53.7	54.1	56.2	57	60.6	63.3	66.7	69.7	71.4
Portugal	7.9	9.7	11.7	13.6	15.9	18.3	21.6	25	29.6	30.4
Slovak Republic	72.1	71.3	70.2	70.5	69.4	69	69.9	71.1	71.7	71.2
Slovenia [2]	..	..	..	..	41.6	41.7	42.9	45	45.5	47.6
Spain [1]	14.1	16.7	20.9	21.8	23.8	27.4	34.2	39.7	46.5	47.6
United Kingdom [1]	73.6	68.5	70.8	71.5	72.5	73.6	75	80.5	83.4	84.3
Norway	32.6	34.9	36.5	38.5	39.4	41.5	41.5	42.8	45.1	46.9
Switzerland	7.6	11.3	11.6	12	12.2	13.2	14	15.6	16.5	17.1

1. Reimbursed pharmaceutical market. 2. Community pharmacy market

Source: OECD Health Statistics 2016.

2.3.3 Antibiotic consumption

Technical documentation sheet

Indicator	Antibiotic consumption
JAF Health dimension	Quality in pharmaceutical prescribing (overuse)
Policy relevance	Antibiotics should be prescribed only where there is an evidence-based need, to reduce the risk of resistant bacteria. There is strong evidence that most of the antibiotics prescribed for the treatment of infections like respiratory tract infections, are unnecessary, as these common infections are largely due to viruses that are not susceptible to antibiotics.
Agreed definition	Overall volume of antibiotics prescribed, measured in defined daily doses (DDDs) per 1 000 population, per day
Calculation method (incl. practical implementation, e.g. question in surveys)	The denominator comprises only the population held in the national prescribing database, rather than the general population.
Breakdowns	
Data source(s)	*ECDC 2016* and *OECD Health Statistics 2016*
Relevant survey questions and answers	
Data periodicity	Annual
Data availability (countries * time, incl. EU aggregates)	28 MS + Iceland, Norway
Sustainability of the data collection	
Methodological issues (including comparability across countries and over time)	Data for Luxembourg and Slovenia exclude drugs prescribed in hospitals, non-reimbursed drugs and OTC drugs. Data for Sweden exclude OTC drugs and drugs administered in hospitals

Antibiotic consumption, defined daily dosage per 1 000 population per day, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	..	..	..	..	..	14.3	13.6	13.1	13.6	12.7
Belgium	24.2	24	25.4	27.7	28.5	28.2	28.7	29.4	29.2	28
Czech Republic	19.8	18	19.1	19.5	19.5	19	19.8	19.2	21	21
Denmark	16.5	17	18	17.8	17.8	18.8	19.5	18.5	18.7	18.2
Estonia	13.7	13.9	14.5	14.4	13.2	13	14.1	13.9	13.7	13.9
Finland	18.1	17.4	18.3	17.8	17.9	18.5	20.1	22	20.9	20.7
France	28.9	27.9	28.6	28.1	29.6	28.2	28.7	29.7	30.1	29
Germany	13.3	12.5	13.3	13.5	14.2	14	13.9	14.8	15.7	14.6
Greece	34.7	41	43.1	45.3	38.6	39.4	34.9	..	18	18.1
Hungary	19.5	17.2	15.5	15.2	16	15.3	14.5	13.5	13.7	14.1
Ireland	20.5	21.2	22.9	22.5	20.8	20.3	22.6	23	23.8	23.1
Italy	28.4	28.6	29.8	30.9	31	29.6	30.2	29.3	30.1	29.1
Latvia	12.5	11.5	12.4	11.4	10.9	11.8	12.8	13	13.5	12.6
Lithuania	..	22.7	24.1	25.1	19.5	17.7	19	16.2	18.5	16
Luxembourg	26.3	25.1	27.2	27.1	28.2	28.6	27.8	27.9	28.1	26.3
Netherlands	9.7	10	10.4	10.6	10.5	10.4	10.5	10.4	10.1	9.7
Poland	19.6	..	22.2	20.7	23.6	21	21.9	22.6	23.3	22.8
Portugal	26.6	25	25.6	25.6	25.2	22.5	22.4	22.1	22.2	21.6
Slovak Republic	25.1	22.5	24.8	23.4	26.3	24.5	23.7	21.9	25.9	24.8
Slovenia	16.3	14.7	15.9	14.9	14.3	14.4	14.4	14	14.5	14.2
Spain	19.3	18.7	19.9	19.8	19.7	20.3	20.9	19.4	19.5	22.2
Sweden	16.5	16.9	17.3	16.8	15.8	15.7	15.7	15.5	14.7	14.1
United Kingdom	15.4	15.3	16.5	17	17.3	18.7	18.8	19.4	19.5	19.7
Iceland	23.2	20	23	22.7	21.5	22.2	22.3	22.3	21.7	21.2
Norway	18.1	19	19.6	19.7	19.3	19.6	20.5	20.9	19.6	19.2

| Break in series

Source: European Centre for Disease Prevention and Control 2016 and OECD Health Statistics 2016.

2.3.4 Benzodiazepine prescription among elderly people

Technical documentation sheet

Indicator	Benzodiazepine prescription among elderly people
JAF Health dimension	Quality in pharmaceutical prescribing (overuse)
Policy relevance	Benzodiazepines are often prescribed for elderly patients for anxiety and sleep disorders, despite the risk of adverse side effects such as fatigue, dizziness and confusion. A large body of evidence suggests that the use of benzodiazepines in elderly people is associated with higher risks of developing such adverse effects.
Agreed definition	Elderly people prescribed long-term benzodiazepines or related drugs
Calculation method (incl. practical implementation, e.g. question in surveys)	Numerator: Number of people aged over 65 prescribed more than 365 DDDs of benzodiazepines in a given year Denominator: The population aged over 65 held in the national prescribing database (rather than the general population)
Breakdowns	
Data source(s)	OECD Health Care Quality Indicators questionnaire
Relevant survey questions and answers	
Data periodicity	Annual
Data availability (countries * time, incl. EU aggregates)	8 MS + Norway
Sustainability of the data collection	
Methodological issues (including comparability across countries and over time)	

Elderly patients receiving long-term prescriptions of benzodiazepines and related drugs, 2005 to 2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Denmark	51.2	47	43.1	37.6	28.6	25.2	23.4	21.7	20	..
Finland	..	..	..	..	..	..	..	..	10.7	..
Ireland	..	..	..	..	..	..	..	..	..	62.6
Netherlands	..	..	..	..	..	..	6.5	7	6.9	..
Portugal	..	..	..	..	..	..	..	62.6	..	..
Slovak Republic	..	..	..	..	..	..	..	17.7	..	..
Slovenia	..	..	..	..	..	..	..	..	20.5	..
Sweden	..	34.9	35.8	35.9	35.8	35.9	35.7	35.4	36	..
Norway	..	..	..	..	..	..	..	50	..	..

Source: *OECD Health Statistics 2016*

2.3.5 Polypharmacy among elderly

Technical documentation sheet

Indicator	Polypharmacy among elderly
JAF Health dimension	Quality in pharmaceutical prescribing (overuse)
Policy relevance	Polypharmacy refers to the concurrent consumption of multiple drugs. Studies have linked polypharmacy to noncompliance with prescriptions, higher costs, the risk of harmful drug-drug interactions and drug-induced admission to hospital.
Agreed definition	Proportion of population aged over 65 years of age who concurrently take 5 (or 10) or more medicines.
Calculation method (incl. practical implementation, e.g. question in surveys)	Numerator: Number of people aged over 65 with more than 5 (or 10) prescribed medicines concurrently Denominator: Number of people aged over 65
Breakdowns	
Data source(s)	OECD pilot data collection in 2017
Relevant survey questions and answers	
Data periodicity	
Data availability (countries * time, incl. EU aggregates)	Data is likely to be available in most countries, although it may be based on different definitions and different age groups. For example: France: 33% among people aged 75 and over (10 or more medicines) Sweden: 12% among people aged 80 and over (10 or more medicines)
Sustainability of the data collection	
Methodological issues (including comparability across countries and over time)	The specific definition of polypharmacy may vary across countries (e.g., a minimum of 5 or 10 pharmaceutical drugs). The specific age groups may also vary.

2.3.6 Adherence

Technical documentation sheet

Indicator	**Adherence to pharmaceutical prescriptions**
JAF Health dimension	Quality in pharmaceutical prescribing (under-use)
Policy relevance	Poor medication adherence is increasingly recognized as another significant source of inefficiency. Medication non adherence occurs when patients do not take their medicines appropriately or at all. Non adherence can result in costly complications that are often more expensive than the medicines and worsen health outcomes. Poor adherence often leads to preventable worsening of disease, posing serious and unnecessary health risks, particularly for patients with chronic illnesses. This leads to increased hospitalisation and death. It is estimated to cost European governments €125 billion per year.
Agreed definition	Proportion of newly prescribed patients dispensed one prescription only for – antihypertensive medication - diabetes medication
Calculation method (incl. practical implementation, e.g. question in surveys)	
Breakdowns	
Data source(s)	OECD pilot data collection in 2017
Relevant survey questions and answers	
Data periodicity	
Data availability (countries * time, incl. EU aggregates)	[To be pilot tested in 2017]
Sustainability of the data collection	
Methodological issues (including comparability across countries and over time)	

3. Disease expenditure

3.1. Health expenditure by disease

Technical documentation sheet

Indicator	Health expenditure by disease category	
JAF Health dimension	Disease-based level – Financial inputs	
Policy relevance	Information on how much countries spend for the treatment for different diseases can be important for policy planning and health system performance assessment. It reflects existing morbidity in a country and can point to differences in treatment costs between diseases.	
Agreed definition	Current health expenditure is defined in the System of Health Accounts 2011 and by International Classifications of Health Accounts (ICHA). Diagnostic categories correspond to the 21 chapter of the 10th version of the International Classification of Diseases (ICD-10).	
Calculation method (incl. practical implementation, e.g. question in surveys)	A top-down approach is used such that the sum of spending allocated to all disease categories is equal to current health expenditure. To calculate spending by disease categories for each homogeneous health spending component (function or provider) appropriate data sources need to be found that allow for such a split. Current health expenditure per diagnostic category is then divided by current health expenditure to produce the share of spending by disease.	
Breakdowns	Sex, 21 age groups, 3 main functions (inpatient curative care, outpatient curative care, medical goods)	
Data source(s)	Eurostat: Health Expenditures by Diseases and Conditions (HEDIC); OECD data collection under the Project on Health expenditure by disease, age and gender	
Relevant survey questions and answers		
Data periodicity	Infrequent - typically every 2-5 years.	
Data availability (countries * time, incl. EU aggregates)	BGR: 2012, 2013 CZE: 2009, 2011, 2012, 2013 DEU: 2008, 2012, 2013 GRC: 2012, 2013 LVA: 2013 LTU: 2012, 2013, 2014	HUN: 2006, 2013 NLD; 2007, 2011, 2013 SVN: 2006, 2012, 2013 FIN: 2012, 2013 SWE: 2012
Sustainability of the data collection	Not currently part of a regular data collection	
Methodological issues (including comparability across countries and over time)	International data comparability depends on two factors: first the accuracy to measure current health expenditure and its components; and second what data sources are available and the methodology applied to allocate health spending into diagnostic categories. This can result in different shares of non-allocated spending which will affect the comparability between countries.	

Expenditure by ICD chapter as share of current health expenditure, 2013 (or nearest year)

ICD	Description	BGR[1]	CZE[2]	DEU	GRC	LVA	LTU	HUN	NLD	SVN	FIN	SWE[3]
I	Infectious	2.0	2.3	1.9	1.5	3.0	3.5	2.4	1.4	2.2	2.1	2.0
II	Neoplasms	8.4	10.0	8.4	12.5	8.0	9.7	13.1	7.7	9.3	11.9	7.4
III	Blood	0.6	1.1	0.8	1.9	1.1	1.2	2.0	0.7	1.1	1.0	0.7
IV	Endocrine	2.9	5.8	5.0	9.2	4.0	4.5	7.9	3.8	3.0	5.1	3.4
V	Mental	2.2	5.3	11.1	7.4	10.7	6.6	6.8	24.8	8.3	11.6	9.8
VI	Nervous	2.3	4.0	3.5	2.9	4.2	4.1	4.7	8.3	4.1	5.7	2.6
VII	Eye	3.0	3.5	1.8	2.4	5.4	3.8	2.1	:	4.4	1.8	1.9
VIII	Ear	1.1	0.6	1.3	0.4	2.3	1.2	1.1	:	0.9	0.9	1.1
IX	Circulatory	22.5	17.2	13.8	16.9	19.2	23.5	16.6	12.9	12.8	15.3	10.4
X	Respiratory	7.4	6.7	6.4	5.5	6.8	8.2	7.2	4.8	5.4	6.2	4.8
XI	Digestive	19.4	11.6	14.0	10.4	8.5	9.5	7.0	9.0	9.8	8.8	15.8
XII	Skin	1.6	1.5	1.4	0.6	1.4	2.2	1.8	1.6	1.6	1.4	1.9
XIII	Musculoskeletal	5.0	7.5	11.7	7.5	7.2	6.5	8.5	8.3	7.9	7.3	8.1
XIV	Genitourinary	8.1	6.4	4.2	6.5	5.2	4.4	4.7	4.1	5.4	4.0	3.4
XV	Pregnancy	3.1	1.1	1.8	3.4	3.3	2.7	1.6	2.7	1.8	2.4	2.2
XVI	Perinatal	0.4	0.9	0.3	0.9	0.7	1.1	0.7	0.2	0.5	1.1	1.0
XVII	Congenital	0.6	0.4	0.4	0.3	0.6	1.0	0.5	0.4	0.8	0.9	0.8
XVIII	Symptoms	0.6	3.8	5.1	4.2	0.2	0.8	3.0	5.8	4.5	3.5	6.2
XIX	Injury	:	4.3	4.4	2.9	6.5	5.3	3.8	3.6	6.8	6.1	6.8
XX	External	2.6	0.1	:	0.2	0.1	:	0.2	:	0.0	0.0	0.0
XXI	Factors	6.1	6.0	2.7	2.6	1.9	0.3	4.3	:	9.5	2.8	9.7
XXII	Special	0.0	0.0	0.0	0.0	2.6	0.8	2.1	:	0.0	0.0	0.0
Total		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Not allocated		32.1	10.0	2.1	11	2.6	0.8	2.1	15.1	:	:	12.9

Source: Health Expenditure by Diseases and Conditions, 2016 Edition, Eurostat.
Ann.: The percentages are standardized on the sum of the allocated health expenditures in each country.
(1) structure refers to total inpatient and outpatient expenditures for 2013.
(2) expenditures for GPs and households-financed care were not completely allocated and are therefore not fully included.
(3) 2012 instead of 2013
(:) not available

3.2 Physicians by specialty

Technical documentation sheet

Indicator	Physicians by category
JAF Health dimension	Disease-based level – Inputs (Human resources)
Policy relevance	The number of doctors and other health care professionals specialized in various areas is a very important resource (input) that needs to be taken into account in assessing the efficiency of health service delivery for specific diseases. If there are too few doctors or other health care professionals, timely access to services might suffer.
Agreed definition	The number of practising (or professionally active) physicians by category, including physicians in training. http://ec.europa.eu/eurostat/cache/metadata/Annexes/hlth_res_esms_an2.pdf
Calculation method (incl. practical implementation, e.g. question in surveys)	Numbers of physicians by category per 100 000 population.
Breakdowns	• Obstetricians and gynaecologists • Psychiatrists • Medical group of specialists: Cardiologists; Endocrinologists; Gastroenterologists; Respiratory medicine; Oncologists; Immunologists; Neurologists; Oto-rhino-laringologists; Radiologists; Microbiology-bacteriologists; Haematologists; Dermatologists; • Surgical group of specialists: General surgeons; Neurological surgeons; Ophthalmologists; Orthopaedists; Thoracic surgeons; Vascular surgeons; Urologists; Accident and emergency medicine.
Data source(s)	Eurostat additional module in the OECD/Eurostat/WHO-Europe Joint Questionnaire on non-monetary health care statistics
Relevant survey questions and answers	
Data periodicity	Annual
Data availability (countries * time, incl. EU aggregates)	2013 data available for 25 out of 28 EU countries.
Sustainability of the data collection	

Indicator	Physicians by category
Methodological issues (including comparability across countries and over time)	In some cases, the data reported refers to professionally active physicians or all physicians licensed to practice, resulting in some over-estimation. The following criteria are suggested to avoid any double counting of doctors who may have more than one specialty: 1) the predominant (main) area of practice of doctors; or 2) the last specialty for which doctors have received registration.

Physicians by medical speciality, per 100 000 population, 2013

	Gynaecologists and obstetricians	Psychiatrists	Cardiology	Endocrinology	Gastroenterology	Respiratory medicine	Oncology	Immunology	Neurology	Otorhinolaryngology	Microbiology-bacteriology	Haematology	Dermatology	Pathology	Neurological surgery	Ophthalmology	Orthopaedics	Thoracic surgery	Vascular surgery	Urology	Accident and emergency medicine
BEL	12	17	9	2	6	4	4	4	4	6	3	1	6	3	2	9	9	:	:	3	3
BGR	19	8	17	6	7	7	1	4	16	7	6	5	5	5	2	9	11	1	2	11	13
CZE	25	15	8	0	4	6	3	6	15	10	3	5	8	5	2	12	11	2	1	8	8
DNK	10	18	7	4	3	3	3	5	6	6	1	2	3	3	2	6	13	1	1	5	0
DEU	20	22	8	1	4	3	3	1	7	7	1	1	6	2	2	8	19	2	2	9	0
EST	22	17	11	3	3	7	4	4	10	8	0	3	6	4	2	11	10	1	3	5	9
IRL	7	19	4	2	3	3	4	2	2	2	2	2	2	6	1	6	5	1	0	3	4
GRC	26	17	28	6	7	14	2	4	7	12	29	4	11	30	3	19	21	3	2	15	2
ESP	12	10	7	3	6	5	5	5	5	5	5	5	3	3	2	8	16	2	2	6	25
FRA	12	23	10	3	5	4	1	4	3	5	4	1	6	2	1	9	5	1	1	4	:
HRV	18	15	:	:	:	2	:	:	9	6	4	3	5	6	2	9	5	:	:	4	3
ITA	20	18	22	4	6	6	7	4	11	7	2	6	7	2	1	11	15	2	3	13	7
CYP	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
LVA	21	16	7	3	3	5	3	2	11	7	1	2	6	2	2	11	8	1	1	4	7
LTU	25	22	17	6	5	9	2	4	17	11	1	3	7	5	3	13	0	3	2	10	16
LUX	16	21	10	1	4	4	0	3	6	7	0	0	7	0	3	11	10	1	1	5	0
HUN	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
MLT	13	9	4	3	2	3	1	2	3	4	2	3	3	4	1	7	8	1	1	5	6
NLD	9	22	8	:	4	5	:	2	7	4	2	:	4	3	1	5	6	1	:	3	3
AUT	21	16	0	0	0	5	0	0	12	8	1	1	9	4	2	11	11	0	0	7	13
POL	13	9	11	2	2	4	3	5	8	5	0	1	3	1	1	7	8	1	1	3	2
PRT	16	11	9	2	5	5	2	6	4	6	0	2	3	11	2	9	10	1	2	7	0
ROU	12	10	7	3	3	6	3	3	7	5	:	1	5	4	2	6	6	1	1	5	7
SVN	17	12	0	:	1	2	2	1	5	4	1	2	3	3	1	7	5	0	1	3	4
SVK	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
FIN	14	24	4	1	2	4	3	2	9	6	1	1	4	3	1	9	9	2	1	4	1
SWE	14	23	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
GBR	12	19	5	2	4	4	4	2	3	3	1	3	4	4	1	5	11	2	0	5	12
ISL	14	21	9	5	6	5	5	8	7	6	2	3	5	8	2	10	10	2	2	6	5
NOR	11	23	6	1	3	3	3	3	6	6	1	1	3	4	1	7	10	1	2	3	:
CHE	20	49	10	2	4	3	4	5	6	6	2	2	6	3	2	12	11	0	1	6	0

Source: Eurostat database.

3.3 Cancer survival (updated from current JAF Health indicator)

Technical documentation sheet

Indicator	Age-standardised 5-year net survival for cancer
JAF Health code	*[To be added by DG EMPL]*
JAF Health dimension	Quality/Outcomes (disease-based level)
Policy relevance	Cancer survival is one of the key measures of the effectiveness of cancer care systems, taking into account both early detection and the effectiveness of treatment.
Agreed definition	5-year net survival is the probability that cancer patients would survive 5 years after diagnosis after controlling for competing risks of deaths and accounting for higher risks in the elderly.
Calculation method (incl. practical implementation, e.g. question in surveys)	**Coverage**: Cancer patients. Method: Pohar Perme (non-parametric, unbiased estimator) Life tables: all-cause mortality rates by age, sex, (race), geographical area (country, state, region) and single calendar year Age-standardisation (based on International Cancer Survival Standard (ICSS) weights)
Major breakdowns	By cancer (breast, cervical, lung, and leukaemia in children)
Data source(s)	CONCORD Global Surveillance of Cancer Survival
Relevant survey questions and answers	N/A
Data periodicity	Three CONCORD Studies have been conducted since 2008.
Data availability (countries * time, incl. EU aggregates)	Net survival data are available from 2000 for most EU countries (except Hungary and Luxembourg)
Sustainability of the data collection	
Methodological issues (including comparability across countries and over time)	Data for some countries (France, Germany, Italy, Romania and Spain) are not national data.

Illustration of 5-year net survival from breast cancer, European and non-European countries, 1995-99 to 2005-09

***Figure 2:* Global distribution of age-standardised 5-year net survival for women diagnosed with breast cancer during 1995–99, 2000–04, and 2005–09, by continent and country**
Age-standardised 5-year net survival estimates for other cancers are presented in the appendix (pp 141–51). Survival estimates for every country are ranked from highest to lowest within every continent; for ease of reference, the ranking for 2005–09 is used for 1995–99 and 2000–04. Error bars represent 95% CIs. Grey bars represent African countries; red bars represent America (Central and South); light green bars represent America (North); purple bars represent Asian countries; blue bars represent European countries; and dark green bars represent Oceania. *100% coverage of the national population. †National estimate not age-standardised. §National estimate flagged as less reliable because the only estimate or estimates available are from a registry or registries in this category.

Source: Allemani, C. et al (2015), « Global surveillance of cancer survival 1995–2009: analysis of individual data for 25 676 887 patients from 279 population-based registries in 67 countries (CONCORD-2)", The Lancet, Vol. 385, pg. 977–1010 http://dx.doi.org/10.1016/S0140-6736(14)62038-9

4. Administration

4.1 Administrative expenditure

Technical documentation sheet

Indicator	**Administrative Expenditure as share of current health spending**
JAF Health dimension	Administrative expenditure
Policy relevance	Health system administration is an important auxiliary function in any health system. It includes functions such as governance and administration of health financing. Administrative activities are vital in all health systems to support system goals such as patient safety, quality and access. The indicator measures the share of current health spending that is spend on administration of the health system and administration of health financing.
Agreed definition	Spending on health systems administration is used as defined in category HC7 as "Governance, and health system and financing administration" in the functional classification in the International Classifications of Health Accounts (ICHA-HC). This excludes all administrative activities that take place at the level of the health care provider. Current health spending is used as defined in the ICHA-HC.
Calculation method (incl. practical implementation, e.g. question in surveys)	Total spending on administration (HC7) is divided by current health spending.
Breakdowns	N/A
Data source(s)	Eurostat/OECD/WHO, Joint Health Accounts Questionnaire
Relevant survey questions and answers	N/A
Data periodicity	Annual data
Data availability (countries * time, incl. EU aggregates)	2014: 27 MS (with the exception of Malta) + Iceland, Norway, Switzerland

Indicator	Administrative Expenditure as share of current health spending
Sustainability of the data collection	Data collection on health spending and financing is based on Commission Regulation (EU) 359/2015, first reference year: 2014, and is thus compulsory for countries.
Methodological issues (including comparability across countries and over time)	Albeit improvement has been made in recent years, comparability on data for spending on health administration is limited for a number of reasons: underestimation of spending by governance agencies of all different layers of government (central, regional and local) due to lack of data overestimation of administrative spending that should methodologically be considered as spending on prevention due to inclusion of agencies concerned with public health issues differences in cost items (e.g. depreciation) considered administrative spending valuation of administrative expenditure of private health insurance as the sum of costs instead of following the recommended accounting practice of including profits and brokerage fees general differences in the use of data sources [1]. For a number of countries there are breaks in the time series due to the implementation of the SHA 2011

1. OECD (2013), "Guidelines to Improve Estimates of Expenditure on Health Administration and Health Insurance", http://www.oecd.org/health/health-systems/Improving-Estimates-of-Spending-on-Administration.pdf.

Administrative Expenditure as a share of current health expenditure, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	3.7	3.5	3.5	3.7	3.6	3.5	3.5	3.6	3.7	3.7
Belgium	4.5	4.7 (b)	4.1	4.4	3.7	3.7	3.7	3.5	3.5	3.5
Bulgaria	1.6	1.5	1.2	1.0	1.4	1.3	2.0	1.7	1.4	1.4
Croatia	..	..	..	..	..	..	2.3	2.5	2.9	2.7 (p)
Cyprus	3.5	3.5	3.7	3.6	3.7	1.3 (b)	1.5	1.5	1.6	1.5
Czech Republic	3.2	3.2	3.4	3.5	3.1	3.2	3.1	3.0	3.0	2.8
Denmark	1.1	1.1	1.4	1.2	1.2	1.2	1.2	2.2	2.1	2.1 (b)
Estonia	3.4	2.7	2.6	2.3	2.2	2.3	2.4	2.1	1.9	2.0
Finland	2.4	2.5	2.2	2.2	1.9	1.8	1.6	1.6	1.5	1.6
France	6.6	6.1 (b)	6.0	6.0	6.0	6.0	6.1	6.1	6.1	6.1
Germany	5.7	5.5	5.4	5.3	5.3	5.4	5.4	5.2	5.1	4.9
Greece	..	..	..	..	1.9	1.7	2.1	2.5	2.6	3.2
Hungary	1.1	1.2	1.3	1.3	1.2	1.7	1.6	1.7	1.8	1.8
Iceland	2.0 (d)	1.7 (d)	2.0 (d)	1.8 (d)	1.9 (d)	2.2 (d)	2.0 (d)	1.6 (d)	1.6 (d)	1.3 (d)
Ireland	..	..	..	..	..	..	..	..	3.0	3.5
Italy	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.3	1.3	1.8 (b)
Latvia	6.0	6.1	4.0	5.5	3.3	3.2	2.9	2.6	2.4	1.6 (b)
Lithuania	1.7	1.5	2.0	3.1	2.0	2.1	2.0	2.0	1.8	2.2
Luxembourg	1.5	1.6	1.6	1.6	1.6	1.6	4.9 (b)	4.6	4.8 (p)	4.6 (p)
Netherlands	4.7	4.9	4.9	4.5	4.3	4.1	4.3	4.1	4.1	4.2
Norway	0.9	0.8	0.8	0.8	0.9	0.7	0.5	0.6	0.6	0.6 (p)
Poland	1.6	1.5	2.1	1.7	1.4	1.4	1.7	1.2	2.6 (b)	2.2
Portugal	1.6	1.8	1.8	1.8	1.7	1.9	2.0	2.0	2.0	2.0
Romania	3.4	6.4	6.4	2.8	1.8	2.0	1.9	1.7	3.8	3.3
Slovak Republic	4.1	4.1	3.8	4.3	3.6	3.7	3.5	3.3	3.4	4.2 (b)
Slovenia	3.5	4.3	4.9	4.1	4.3	3.4	3.4	3.7	3.9	4.1
Spain	3.3	3.4	3.5	3.2	3.2	2.9	3.2	3.3	3.1	3.0
Sweden	1.1	1.1	1.3	1.3	1.5	1.5	1.3	1.4	1.4	1.6 (p)
Switzerland	4.9	5.0	5.0	5.0	5.0	4.7 (b)	4.6	4.3	4.2	4.1
United Kingdom	..	..	..	..	..	..	..	..	2.5	2.4

Source: Health Statistics 2016.

4.2 Administrative expenditure per financing scheme

Technical documentation sheet

Indicator	**Administrative Expenditure as share of current health spending per financing scheme**
JAF Health dimension	Administrative expenditure
Policy relevance	Health system administration is an important auxiliary function in any health system. It includes functions such as governance and administration of health financing. Administrative activities are vital in all health systems to support system goals such as patient safety, quality and access. The indicators measure for each financing scheme separately the share of spending for administrative of the health system and administration and of health financing in current health spending. Comparing the indicators within and across countries shows the extent of the financial resource devoted to administrative functions.
Agreed definition	Spending on health systems administration is used as defined in category HC7 as "Governance, and health system and financing administration" in the functional classification in the International Classifications of Health Accounts (ICHA-HC). This excludes all administrative activities that take place at the level of the health care provider. Current health spending is used as defined in the ICHA-HC. Government schemes (HF11), compulsory contributory health insurance schemes (HF12) and voluntary health insurance schemes (HF21) are used as defined in the corresponding categories in the financing classification of the ICHA-HF.
Calculation method (incl. practical implementation, e.g. question in surveys)	For each of the three financing schemes (HF11, HF12 and HF21) spending on administration (HC7) is divided by current health spending.
Breakdowns	N/A
Data source(s)	Eurostat/OECD/WHO, Joint Health Accounts Questionnaire

Indicator	**Administrative Expenditure as share of current health spending per financing scheme**
Relevant survey questions and answers	N/A
Data periodicity	Annual data
Data availability (countries * time, incl. EU aggregates)	2014: 27 MS (with the exception of Malta) + Iceland, Norway, Switzerland.
Sustainability of the data collection	Data collection on health spending and financing is based on Commission Regulation (EU) 359/2015, first reference year: 2014, and is thus compulsory for countries.
Methodological issues (including comparability across countries and over time)	Albeit improvement has been made in recent years, comparability on data for spending on health administration is limited for a number of reasons: underestimation of spending by governance agencies of all different layers of government (central, regional and local) due to lack of data overestimation of administrative spending that should methodologically be considered as spending on prevention due to inclusion of agencies concerned with public health issues differences in cost items (e.g. depreciation) considered administrative spending valuation of administrative expenditure of private health insurance as the sum of costs instead of following the recommended accounting practice of including profits and brokerage fees general differences in the use of data sources [1]. For a number of countries there are breaks in the time series due to the implementation of the SHA 2011.

1. OECD (2013), "Guidelines to Improve Estimates of Expenditure on Health Administration and Health Insurance", http://www.oecd.org/health/health-systems/Improving-Estimates-of-Spending-on-Administration.pdf.

Administrative expenditure as a share of current health expenditure per financing scheme, 2014

	Government Schemes	Compulsory Health Insurance Schemes	Voluntary Private Insurance
Austria	1%	4%	32%
Belgium	1%	4%	21%
Czech Republic	5%	3%	3%
Denmark	2%	..	5%
Estonia	12%	1%	6%
Finland	1%	4%	7%
France	10%	4%	21%
Germany	..	6%	21%
Greece	2%	6%	15%
Hungary	14%	1%	8%
Iceland	2%	1%	..
Ireland	1%	..	20%
Italy	2%	..	37%
Latvia	2%	..	..
Luxembourg	11%	4%	
Netherlands	24%	3%	14%
Norway		..	..
Poland	16%	1%	
Portugal	1%	..	19%
Slovak Republic	30%	4%	..
Slovenia	23%	2%	15%
Spain	2%	5%	32%
Sweden	2%	..	20%
Switzerland	2%	5%	17%
United Kingdom	2%	..	32%
Bulgaria	9%	1%	..
Croatia	32%	2%	7%
Cyprus	3%	8%	
Lithuania	15%	1%	..
Romania	16%	1%	..

Source: OECD Health Statistics 2016