Health at a Glance 2017

OECD INDICATORS

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Foreword

Health at a Glance 2017 *presents the latest comparable data and trends on key indicators of health outcomes and health systems across the 35 OECD member countries. These indicators shed light on the performance of health systems, with indicators reflecting health outcomes, non-medical determinants of health, the degree of access to care, the quality of care provided, and the financial and material resources devoted to health. For a subset of indicators, data are reported for partner countries, including Brazil, China, Colombia, Cost Rica, India, Indonesia, Lithuania, the Russian Federation and South Africa.*

The production of Health at a Glance *would not have been possible without the contribution of OECD Health Data National Correspondents, Health Accounts Experts, and Health Care Quality Indicators Experts from the 35 OECD countries. The OECD gratefully acknowledges their effort in supplying most of the data contained in this publication. The OECD also acknowledges the contribution of other international organisations, especially the World Health Organization and Eurostat, for sharing some of the data presented here, and the European Commission for supporting data development work.*

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Executive summary

Health at a Glance 2017 presents up-to-date cross-country comparisons of the health status of populations and health system performance in OECD and partner countries. Alongside indicator-by-indicator analysis, this edition offers snapshots and dashboard indicators that summarise the comparative performance of countries, and a special chapter on the main factors driving life expectancy gains.

Most OECD countries have universal health coverage systems which promote equitable access for needed health services. Quality of care has also generally improved, but this has come at a cost: health spending now accounts for about 9% of GDP on average. Investing in cost-effective health promotion interventions is one important way to improve value for money and reduce health inequities.

People in OECD countries are living longer, but the burden of mental illness and chronic disease is rising

- Life expectancy at birth is 80.6 years, on average, across OECD countries. Japan and Spain lead a group of 25 OECD countries with life expectancies over 80 years.
- Turkey, Korea and Chile have experienced the largest gains in life expectancy since 1970.
- Health spending contributes to longevity, but only explains part of the cross-country differences and gains in life expectancy over time. New regression estimates suggest healthier habits and wider social determinants of health are also key.
- Women can expect to live just over five years longer than men, while people with tertiary level education live around six years longer than those with the lowest level of education.
- Across the OECD, more than one in three deaths are caused by ischaemic heart disease, stroke or other circulatory diseases; one in four deaths are due to cancer.
- Mortality rates for circulatory diseases have fallen rapidly, with 50% fewer deaths due to ischaemic heart disease, on average, since 1990. Cancer mortality rates have also fallen, though less markedly, by 18% since 1990.

While smoking rates continue to decline, there has been little success in tackling obesity and harmful alcohol use, and air pollution is often neglected

- Smoking rates have decreased in most OECD countries, but 18% of adults still smoke daily. Rates are highest in Greece, Hungary and Turkey, and lowest in Mexico.
- Alcohol consumption in the OECD averaged 9 litres of pure alcohol per person per year, equivalent to almost 100 bottles of wine. This figure is driven by the sizeable share of heavy drinkers: 30% of men and 12% of women binge-drink at least once per month.
- In 13 OECD countries alcohol consumption has increased since 2000, most notably in Belgium, Iceland, Latvia and Poland.

- Since the late 1990s, obesity has risen quickly in many OECD countries, and more than doubled in Korea and Norway, albeit from low levels.
- 54% of adults in OECD countries today are overweight, including 19% who are obese. Obesity rates are higher than 30% in Hungary, Mexico, New Zealand and the United States.
- Among 15 year olds, 25% are overweight and only 15% do enough physical activity. Further, 12% smoke weekly and 22% have been drunk at least twice in their lives.
- In 21 countries, over 90% of people are exposed to unsafe levels of air pollution.

Most OECD countries have achieved universal or near-universal health coverage, but access to care needs to be improved

- Population coverage for a core set of services is 95% or higher in all but seven OECD countries and lowest in Greece, the United States and Poland.
- Out-of-pocket payments by households make up 20% of all health spending on average in the OECD, and over 40% in Latvia and Mexico.
- Cost concerns lead about 10% of people to skip consultations, while 7% do not purchase prescribed medicines. Poorer households are most affected.
- The number of physicians per 1000 people is much higher in capitals and other cities, with variation between areas most marked in the United States and the Netherlands.
- Waiting times for elective surgery are long in a number of countries, particularly Estonia, Poland and Chile.

Patient experiences and outcomes of care are improving, with lower mortality rates after a heart attack or stroke and higher survival rates for people with cancer

- Over 80% of patients report positive experiences in terms of their time spent with a doctor, easy-to-understand explanations and involvement in treatment decisions.
- Avoidable hospital admissions for chronic conditions have fallen in most OECD countries, indicating an improving quality of primary care.
- In terms of acute care, fewer people are dying following heart attack or stroke. Improvements are particularly striking among heart attack patients in Finland, and stroke patients in Australia.
- Timeliness of hip fracture surgery (a measure of patient safety) has improved in most countries, with over 80% occurring within two days of admission.
- Rates of obstetric trauma have remained relatively unchanged, with tearing of the perineum in 5.7% of instrument-assisted vaginal deliveries.
- Across the OECD, five-year survival rates for breast cancer were 85% and just over 60% for colon and rectal cancers, with survival rates improving in most countries over time.
- Childhood vaccinations are near universal in most OECD countries, though measles coverage has fallen slightly in Australia and Italy in recent years.

Having sufficient financial and material resources is critical to the functioning of a health system. These resources need to be used wisely to avoid ineffective spending

- Spending on health in the OECD was about USD 4 000 per person on average (adjusted for purchasing powers). The United States spends almost USD 10 000 per person.

- Health spending was 9% of GDP on average in the OECD, ranging from 4.3% in Turkey to 17.2% in the United States.
- In all countries except the United States, government schemes and compulsory health insurance are the main health care financing arrangements.
- Hospitals account for nearly 40% of health spending.
- Since 2000, the number of doctors and nurses has grown in nearly all OECD countries. There are about three nurses per doctor, with the nurse-to-doctor ratio highest in Japan, Finland and Denmark.
- Hospital beds per capita have fallen in all OECD countries except Korea and Turkey, linked to lower hospitalisation rates and increased day surgery.
- Increased use of generics in most OECD countries has generated cost-savings, though generics still represent less than 25% of the volume of pharmaceuticals sold in Luxembourg, Italy, Switzerland and Greece.
- Population ageing has increased the demand for long-term care, with spending increasing more than for any other type of health care.
- On average, 13% of people aged 50 and older provide weekly care for a dependent relative or friend; 60% of informal carers are women.

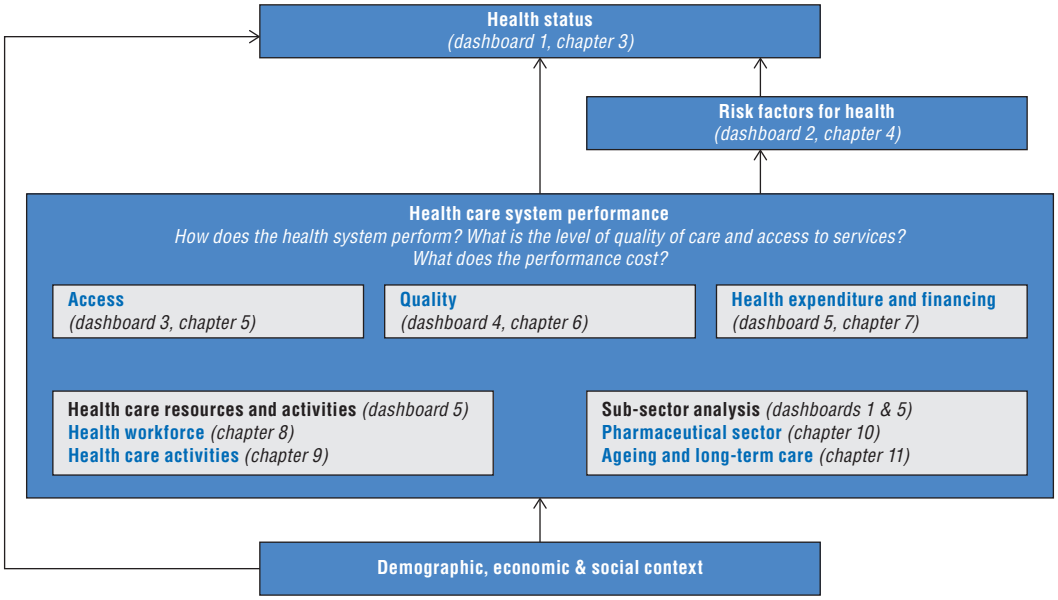
Reader's guide

Health at a Glance 2017 presents comparisons of key indicators for health and health system performance across the 35 OECD countries. Candidate and key partner countries are also included where possible (Brazil, China, Colombia, Costa Rica, India, Indonesia, Lithuania, the Russian Federation and South Africa). The data presented in this publication come from official national statistics, unless otherwise stated.

Structure of the publication

The general framework underlying this publication assesses the performance of health systems within the context of a broader view of public health (Figure 0.1). It is based on a framework that has been endorsed and updated for the OECD Health Care Quality Indicators project (see source to Figure 0.1). This framework recognises that the ultimate goal of health systems is to improve the health status of the population. Many factors influence health status, including those that fall outside health care systems, such as the physical environment in which people live, and individual lifestyles and behaviours. The demographic, economic and social context also affects the demand for and supply of health services, and ultimately health status.

Conceptual framework for health system performance assessment



Source: Adapted from Carinci, F. et al. (2015), "Towards Actionable International Comparisons of Health System Performance: Expert Revision of the OECD Framework and Quality Indicators", *International Journal for Quality in Health Care*, Vol. 27, No. 2, pp. 137-146.

At the same time, the performance of health care systems is clearly crucial. Core dimensions of performance include the degree of access to care and the quality of care provided. Performance measurement needs to take into account the financial resources required to achieve these access and quality goals. Health system performance also depends critically on the health workers providing services, and the goods and services at their disposal.

Health at a Glance 2017 compares OECD countries on each component of this general framework. It is structured around eleven chapters. The first two chapters offer an overview of health and health system performance. The next nine chapters then provide detailed country comparisons across a range of health indicators, including where possible time trend analysis.

In Chapter 1, a series of ***dashboards*** present the relative strengths and weaknesses of OECD countries' health systems, alongside OECD-wide summary data. These dashboards use a subset of the indicators that are presented in more detail in later chapters of the publication.

Chapter 2 provides a complementary ***thematic analysis*** on the determinants of health across OECD countries. It assesses the relative contributions of health systems vis-à-vis wider social factors to life expectancy.

Following these overview chapters, Chapter 3 on ***health status*** highlights variations across countries in life expectancy, the main causes of mortality and other measures of population health status. This chapter also includes measures of inequality in health status by education and income level for key indicators such as life expectancy and perceived health status.

Chapter 4 examines major ***risk factors for health***. The focus is on health-related lifestyles and behaviours, most of which can be modified by public health and prevention policies. These include the major risk factors for non-communicable diseases of smoking, alcohol and obesity, for children and adults. At the same time, healthy lifestyles are assessed in terms of nutrition and physical activity. Population exposure to air pollution is also analysed.

Chapter 5 on ***access to care*** presents a set of indicators related to financial access, geographic access and timely access (waiting times). This includes analysis of self-reported unmet needs for medical care. Overall measures of population coverage are also presented.

Chapter 6 assesses ***quality and outcomes of care*** in terms of clinical effectiveness, patient safety and the person responsiveness of care. The chapter seeks to reflect the lifecycle of care by presenting indicators related to preventive, primary, chronic and acute care. This includes analysis of patient experiences, prescribing practices, management of chronic conditions, acute care for heart attack and stroke, patient safety, mental health, cancer care and prevention of communicable diseases.

Chapter 7 on ***health expenditure and financing*** compares how much countries spend on health, both on a per capita basis and in relation to GDP. The chapter analyses how health care is paid for, through a mix of government funding, compulsory and voluntary health insurance and direct out-of-pocket payments by households. The breakdown of spending by health provider and by the type of health care provided is also examined.

Chapter 8 looks at the ***health workforce***, particularly the supply and remuneration of doctors and nurses. The chapter also presents data on the number of new graduates from medical and nursing education programmes. It features indicators on the international

migration of doctors and nurses, comparing countries in terms of their reliance on foreign-trained workers as well as trends over time.

Chapter 9 on ***health care activities*** describes some of the main characteristics of health service delivery. It starts with the number of consultations with doctors, often the "entry point" of patients to health care systems. Country comparisons on hospital discharges and lengths of stay, the utilisation rates of surgical procedures, and the increased use of ambulatory surgery for minor surgeries are also included.

Chapter 10 takes a closer look at the ***pharmaceutical sector***. Analysis of pharmaceutical spending gives a sense of the varying scale of the market in different countries. The number of pharmacists and pharmacies; consumption on certain high-volume drugs; and the use of generics and bio-similars are also compared. Finally, spending on research and development in the pharmaceutical sector is assessed.

Chapter 11 focuses on ***ageing and long-term care***. It assesses key factors affecting the current and future demand for long-term care. This includes demographic trends, and health status indicators for elderly populations, such as life expectancy and self-reported measures of health and disability at age 65. Dementia is compared across countries in terms of prevalence today and in the future, and in terms of indicators for quality of care. The recipients of long-term care and the formal and informal workers providing care for these people are also assessed, as are trends in long-term care expenditure in different countries.

Presentation of indicators

With the exception of the first two chapters, indicators covered in the rest of the publication are presented over two pages. The first page defines the indicator, provides a brief commentary highlighting key findings conveyed by the data, and signals any significant national variation from the definition which might affect data comparability. On the facing page is a set of figures. These typically show current levels of the indicator and, where possible, trends over time. Where an OECD average is included in a figure, it is the unweighted average of the OECD countries presented, unless otherwise specified. The number of countries included in this OECD average is indicated in the figure, and for charts showing more than one year this number refers to the latest year.

Data limitations

Limitations in data comparability are indicated both in the text (in the box related to "Definition and comparability") as well as in footnotes to figures.

Data sources

Readers interested in using the data presented in this publication for further analysis and research are encouraged to consult the full documentation of definitions, sources and methods presented in OECD Health Statistics on OECD.Stat (*http://stats.oecd.org/index.aspx*, then choose "Health"). More information on OECD Health Statistics is available at *http://www.oecd.org/health/health-data.htm*.

Population figures

The population figures used to calculate rates per capita throughout this publication come from Eurostat for European countries and from OECD data based on *UN Demographic Yearbook* and *UN World Population Prospects* (various editions) or national estimates for non-European OECD countries (data extracted as of early June 2017), and refer to mid-year

estimates. Population estimates are subject to revision, so they may differ from the latest population figures released by the national statistical offices of OECD member countries.

Note that some countries such as France, the United Kingdom and the United States have overseas colonies, protectorates or territories. These populations are generally excluded. The calculation of GDP per capita and other economic measures may, however, be based on a different population in these countries, depending on the data coverage.

OECD country ISO codes

Australia	AUS	Korea	KOR
Austria	AUT	Latvia	LVA
Belgium	BEL	Luxembourg	LUX
Canada	CAN	Mexico	MEX
Chile	CHL	Netherlands	NLD
Czech Republic	CZE	New Zealand	NZL
Denmark	DNK	Norway	NOR
Estonia	EST	Poland	POL
Finland	FIN	Portugal	PRT
France	FRA	Slovak Republic	SVK
Germany	DEU	Slovenia	SVN
Greece	GRC	Spain	ESP
Hungary	HUN	Sweden	SWE
Iceland	ISL	Switzerland	CHE
Ireland	IRL	Turkey	TUR
Israel	ISR	United Kingdom	GBR
Italy	ITA	United States	USA
Japan	JPN		

Partner country ISO codes

Brazil	BRA	Indonesia	IDN
China	CHN	Lithuania	LTU
Colombia	COL	Russian Federation	RUS
Costa Rica	CRI	South Africa	ZAF
India	IND		

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Chapter 1

Indicator overview: OECD snapshots and country dashboards

This chapter presents a set of selected indicators on health and health system performance, designed to shed light on how well OECD countries perform along five dimensions: health status, risk factors for health, access to care, quality and outcomes of care, and health care resources. These indicators, taken from the main chapters of the publication, are presented in the form of OECD snapshots *and* country dashboards. *The former illustrates time trends for the OECD as a whole, together with a snapshot of the latest available data (OECD average, top and bottom performers). The dashboards summarise how each country performs on all indicators compared to the OECD average.*

The selection of the indicators presented in this chapter was based on policy relevance, data availability and ease of interpretation. The selection and comparison of indicators is meant to capture relative strengths and weaknesses of countries to help identify possible areas for priority action, though not to identify which countries have the best health system overall.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

OECD snapshots and country dashboards

Policy makers in OECD countries have a keen interest to understand how well their health systems perform. A look at indicators contained in this publication shows that significant progress has already been achieved. People in OECD countries are living longer than ever before, with life expectancy at birth now exceeding 80 years on average, thanks to improvements in living conditions and educational attainments, but also to healthier lifestyles and progress in health care.

In most countries, universal health coverage provides financial protection against the cost of illness and promotes access to care for the whole population. Quality of care has also generally improved, as shown by the reduction in deaths after heart attacks and strokes, and the earlier detection and improved treatments for diseases such as diabetes and cancer. But these improvements have come at a cost: health spending now accounts for about 9% of GDP on average in OECD countries, and exceeds 10% in many countries. Higher health spending is not necessarily a problem when the benefits exceed the costs, but there is ample evidence of inequities and inefficiencies in health. There is also a need to achieve a better balance between spending on curative care and disease prevention.

Despite these improvements, important questions remain about how successful countries are in achieving good results on different dimensions of health system performance. For example, what are the main factors explaining differences in health status and life expectancy across OECD countries? Is the increase in the prevalence of certain risk factors, such as obesity, offsetting some of the gains from the reduction in other risk factors like smoking? To what extent can citizens benefit from adequate and timely access to care, and good financial protection against the costs of health care? What do we know about the quality and safety of care provided to people for a range of common health conditions? What are the financial, human and technical resources allocated to health systems in different countries?

Answering these questions is by no means an easy task, but the snapshots and dashboards presented in this chapter can help shed light on how well countries do in promoting the health of their population and on several dimensions of health system performance. They do not have the ambition of identifying which countries have the overall best health system; rather, they summarise some of the relative strengths and weaknesses of OECD countries on a selected set of indicators of health and health system performance. They can be useful to identify areas for priority action, but should be complemented by a more in-depth review of the data and factors influencing cross-country variations, presented in the main chapters of this publication.

This chapter presents five sets of indicators, which are discussed in full in the chapters in parentheses, highlighting how well countries fare in each of the following dimensions:

- Health status (Chapters 3 and 11)
- Risk factors for health (Chapter 4)
- Access to care (Chapter 5)
- Quality of care (Chapter 6)
- Health care resources (Chapters 7, 8 and 9)

For each of these dimensions, a set of 4-5 relevant indicators is presented in the form of *OECD snapshots* and *country dashboards*. These indicators are selected from the publication based on their policy relevance and importance as key factors to monitor in a health system, but also on data availability and interpretability. Therefore, indicators for which country coverage is highest are prioritised to improve comparability.

OECD snapshots, newly introduced, provide summary statistics for key indicators in the five dimensions listed above. They complement the country dashboards by visualising:

- the latest OECD average (for quick comparison with country figures in the dashboards)
- the distribution of top and bottom values (for a general sense of the dispersion surrounding each indicator)
- the overall OECD trend since 2005 (to highlight changes over time)

The snapshots complement the country dashboards, helping the reader make a first assessment of a country's performance vis-à-vis the OECD average and value range before delving into the more detailed indicator chapters of the publication.

Country dashboards, in the form of summary tables, compare a country's performance to one another and the OECD average. Countries are classified for each indicator into three colour-coded groups:

- Blue, when the country's performance is within close distance of the OECD average
- Green, when the country's performance is considerably better than the OECD average
- Red, when the country's performance is considerably worse than the OECD average

The only exception to this grouping is for the dashboard on health care resources (Table 1.5), where the indicators presented cannot be strictly classified as better or worse performance. For this reason, the colour coding in this dashboard uses a lighter and darker shade of blue to signal that a country is considerably below or above the OECD average. Values for each indicator are shown for all countries and for the OECD as a whole.

Methodology, interpretation and use

OECD snapshots

For each indicator, the OECD average, highest and lowest values for the latest available year are shown, corresponding to the data presented in the main chapters of the publication. The spark lines on the right show OECD-wide trends in recent years. These are calculated based on an unweighted mean of the data available for each year (data linearly interpolated when unavailable, for consistency regarding the number of countries used for the means). These spark lines are intended to give a broad overview of trends, given potential differences in methodology or country composition over time.

Country dashboards

The classification of countries as better, worse or within close distance of the OECD average is based on each indicator's standard deviation. This method is preferred to using a fixed percentage or fixed number of countries per category, since it reflects variation (how far a country is from the OECD average) in a dynamic way.

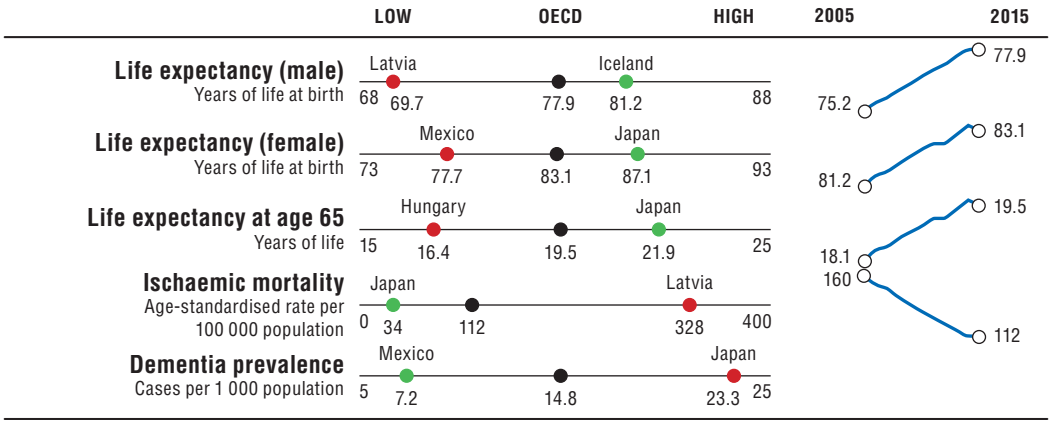
The standard deviation is a common statistical indicator of variation in a distribution, measuring how close values are to the central tendency. Countries are classified as "close to the OECD average" (blue) whenever the value for any indicator is within one standard deviation from the OECD mean for the latest year. In rare cases, particularly large outliers are excluded from the calculation of the standard deviation. These exceptions are noted under the relevant dashboards.

For a typical indicator, about 65% of the countries (23 countries) will be close to the OECD average, with the remaining 35% performing significantly better (green) or worse (red). When the number of countries that are close to the OECD average is higher (lower) than 23, it means that cross-country variation is relatively low (high) for that indicator. For example, indicators such as male life expectancy and alcohol consumption show that 28 countries are close to the OECD average, meaning that countries show relatively less variation compared to other indicators.

Health status

Life expectancy is a key indicator to understanding the overall health of a population. It therefore is the focus of this section, with three indicators reflecting gender and age-specific life expectancies. More specific indicators on ischaemic heart mortality and dementia prevalence are also shown, two major causes of mortality and morbidity today and in the future. Figure 1.1 provides a snapshot on health status across the OECD and Table 1.1 provides more detailed country comparisons.

Figure 1.1. **Snapshot on health status across the OECD**



Note: the Y-axis for OECD trends is standardised to have fixed height, based on the minimum and maximum values of the indicator. The high-low X-axis is standardised with constant distance from the OECD average whenever the indicator is not truncated at 0.

In general, Japan, France and Spain have the best overall health outcomes in terms of life expectancy and ischaemic heart mortality. Hungary, Latvia, Mexico and the Slovak Republic are consistently below the OECD average for these indicators. Across the OECD, life expectancy has increased steadily over time, though about half of the countries reported slight falls in life expectancy between 2014 and 2015. At the same time, some of the countries with the highest rates of dementia prevalence are the countries with longer life expectancies, such as Japan and Italy. Dementia prevalence also shows the greatest amount of variation across countries, amongst these indicators.

Important variations in ***life expectancy*** by gender and age exist. Women in Japan, Spain and France live much longer than the OECD average; while male life expectancy is particularly high in Iceland. Life expectancy at 65 is noticeably lower than the OECD average in 12 countries, and noticeably higher than the average in Japan, France and Spain. Life expectancy is affected by a range of factors within and beyond the health system. Higher health spending per capita is positively associated with life expectancy, though this relationship is less pronounced in countries with the highest health spending, such as Luxembourg, Norway, Switzerland and the United States. Differences in risky behaviours such as smoking and obesity, which have a major impact on health, can also partly explain cross-country variation and differences in life expectancies. Factors beyond the health system are also important determinants of health, including income, education and other socio-economic factors.

Ischaemic heart disease remains the highest cause of mortality in most OECD countries, though there has been an average decline of more than 50% since 1990. Mortality rates are considerably above the OECD average in five countries, and are highest in Latvia, the Slovak Republic and Hungary; whereas they are relatively low in Japan, Korea, France and the Netherlands.

The prevalence of ***dementia***, a variety of brain disorders of which Alzheimer's disease is the most common form, is a core indicator to monitor the health of ageing populations. Dementia prevalence is noticeably higher than the OECD average in seven countries and highest in Japan, Italy and Germany. Countries with younger populations typically have lower dementia prevalence, with Mexico, Turkey and the Slovak Republic having the lowest rates of dementia.

Table 1.1. **Dashboard on health status**

✓ Better than OECD average | ○ Close to OECD average | ✗ Worse than OECD average | – Missing data

	LIFE EXPECTANCY (M)		LIFE EXPECTANCY (F)		LIFE EXPECTANCY (65)		ISCHAEMIC MORTALITY		DEMENTIA PREVALENCE	
	Years of life at birth, males		Years of life at birth, females		Years of life at age 65, total		Age-standardised rate per 100 000 population		Cases per 1 000 population	
OECD	**77.9**		**83.1**		**19.5**		**112**		**14.8**	
Australia	80.4	○	84.5	○	20.9	○	85	○	14.2	○
Austria	78.8	○	83.7	○	19.7	○	131	○	18.0	○
Belgium	78.7	○	83.4	○	19.9	○	54	○	18.0	○
Canada	79.6	○	83.8	○	20.2	○	93	○	13.0	○
Chile	76.5	○	81.7	○	18.5	○	64	○	11.7	○
Czech Republic	75.7	○	81.6	○	17.7	✗	237	✗	10.4	✓
Denmark	78.8	○	82.7	○	19.4	○	60	○	16.4	○
Estonia	73.2	✗	82.2	○	18.1	✗	211	✗	14.7	○
Finland	78.7	○	84.4	○	20.1	○	147	○	18.5	○
France	79.2	○	85.5	✓	21.5	✓	39	✓	19.7	✗
Germany	78.3	○	83.1	○	19.5	○	106	○	20.2	✗
Greece	78.5	○	83.7	○	19.9	○	82	○	19.6	✗
Hungary	72.3	✗	79.0	✗	16.4	✗	288	✗	10.6	○
Iceland	81.2	✓	83.8	○	20.4	○	100	○	13.0	○
Ireland	79.6	○	83.4	○	19.7	○	127	○	11.5	○
Israel	80.1	○	84.1	○	20.2	○	64	○	10.5	○
Italy	80.3	○	84.9	○	20.6	○	84	○	22.5	✗
Japan	80.8	○	87.1	✓	21.9	✓	34	✓	23.3	✗
Korea	79.0	○	85.2	○	20.3	○	38	✓	9.6	✓
Latvia	69.7	✗	79.5	✗	16.6	✗	328	✗	14.6	○
Luxembourg	80.0	○	84.7	○	20.4	○	59	○	13.3	○
Mexico	72.3	✗	77.7	✗	17.7	✗	144	○	7.2	✓
Netherlands	79.9	○	83.2	○	19.8	○	46	✓	16.1	○
New Zealand	79.9	○	83.4	○	20.4	○	129	○	13.5	○
Norway	80.5	○	84.2	○	20.3	○	72	○	15.1	○
Poland	73.5	✗	81.6	○	17.9	✗	98	○	9.9	✓
Portugal	78.1	○	84.3	○	19.9	○	55	○	19.9	✗
Slovak Republic	73.1	✗	80.2	✗	16.9	✗	291	✗	8.3	✓
Slovenia	77.8	○	83.9	○	19.5	○	82	○	11.8	○
Spain	80.1	○	85.8	✓	21.0	✓	53	○	19.4	✗
Sweden	80.4	○	84.1	○	20.2	○	95	○	18.1	○
Switzerland	80.8	○	85.1	○	20.9	○	78	○	17.2	○
Turkey	75.3	○	80.7	✗	17.8	✗	146	○	8.0	✓
United Kingdom	79.2	○	82.8	○	19.7	○	98	○	17.1	○
United States	76.3	○	81.2	○	19.3	○	113	○	11.6	○

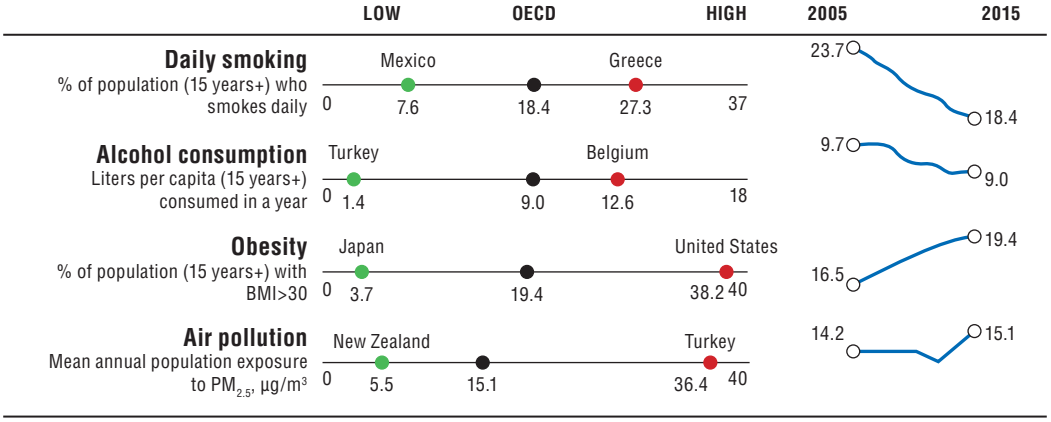
Note: All data refer to 2015 or nearest year, except for dementia prevalence, which refers to 2017. Indicators are taken from Chapter 3 (life expectancy, male and female; ischaemic mortality) and Chapter 11 (life expectancy at 65; dementia prevalence).

Source: OECD Health Statistics 2017; OECD analysis of data from the World Alzheimer Report 2015 and the United Nations (for prevalence of dementia).

Risk factors for health

Smoking, alcohol consumption and obesity are three major risk factors for non-communicable diseases. Population exposure to air pollution is also a critical non-medical determinant of health. Figure 1.2 provides a snapshot on risk factors for health across the OECD and Table 1.2 provides more detailed country comparisons.

Figure 1.2. **Snapshot on risk factors for health across the OECD**



Note: The Y-axis for OECD trends is standardised to have fixed height, based on the minimum and maximum values of the indicator. The high-low X-axis is standardised with constant distance from the OECD average whenever the indicator is not truncated at 0. Air pollution shows data for 2005 and 2010 to 2015.

In general, Iceland, Norway and Sweden perform well across these indicators. ***Smoking*** rates are considerably below the OECD average in Mexico, Iceland, Sweden, the United States, Norway and Australia; whereas they are much higher in Greece, Turkey, Hungary, Austria and Latvia. Although most countries have managed to reduce smoking rates in recent decades, there is still significant progress to be made. Tobacco smoking has been estimated by the World Health Organization to kill 7 million people each year, yet, on average 18.5% of adults still report daily smoking across the OECD.

Excessive ***alcohol*** consumption is also a considerable health burden, associated to increased risk for a range of illnesses, including cancer, stroke, liver disease, as well as social problems, with an estimated 2.3 million deaths per year. Populations in Belgium, Austria and France consume considerably more litres per capita than the OECD average, while it is relatively low in Turkey, Israel, Mexico and Norway. Alcohol consumption has been fluctuating over the past 15 years, with a slight reduction across the OECD as a whole in average litres consumed (based on sales figures). Binge drinking is of particular concern in certain countries, notably Germany, Finland, Luxembourg and Denmark, and is more predominant among men.

Obesity is a major risk factor for many chronic diseases, including diabetes, cardiovascular diseases and cancer. Obesity rates have been increasing in recent decades in almost all OECD countries, with an average of 54% people overweight, of which 19% are obese. Obesity rates are considerably higher than the OECD average in five countries, with rates highest in the United States and Mexico. Obesity is lowest in Japan, Korea, Italy and Switzerland. The measure reported here is for obese adults based on both measured and self-reported data. Caution should be taken in comparing countries with reporting differences, since measured data is generally much higher (and more accurate).

Air pollution is a major environmental threat, with health links to lung cancer, respiratory and cardiovascular disease, low birth weight, dementia and other health problems. Population exposure to fine particulates (PM2.5) is particularly high in Turkey, Korea, Poland and Hungary. It is considerably below the OECD average in Australia, New Zealand, Sweden, Canada, Finland and Iceland. While the overall trend since 1990 has been downward, there have been some increases in population exposure to PM2.5 in more recent years.

Table 1.2. **Dashboard on risk factors for health**

✓ Better than OECD average ⊙ Close to OECD average ✗ Worse than OECD average – Missing data

	SMOKING		ALCOHOL		OBESITY		AIR POLLUTION	
	% of population who smokes daily		Liters per capita consumed in a year		% of population with BMI > 30		Mean annual exposure to PM2.5, mg/m3	
OECD	**18.4**		**9.0**		**19.4**		**15.1**	
Australia	12.4	✓	9.7	⊙	27.9	✗	5.9	✓
Austria	24.3	✗	12.3	✗	14.7	⊙	17.0	⊙
Belgium	18.9	⊙	12.6	✗	18.6	⊙	15.6	⊙
Canada	14.0	⊙	8.1	⊙	25.8	⊙	7.2	✓
Chile	–		7.2	⊙	–		20.9	⊙
Czech Republic	18.2	⊙	11.5	⊙	18.7	⊙	21.4	⊙
Denmark	17.0	⊙	9.4	⊙	14.9	⊙	11.0	⊙
Estonia	21.3	⊙	10.3	⊙	18.0	⊙	9.4	⊙
Finland	17.4	⊙	8.5	⊙	24.8	⊙	7.4	✓
France	22.4	⊙	11.9	✗	17.0	⊙	12.4	⊙
Germany	20.9	⊙	11.0	⊙	23.6	⊙	14.0	⊙
Greece	27.3	✗	7.5	⊙	17.0	⊙	13.5	⊙
Hungary	25.8	✗	10.9	⊙	30.0	✗	23.1	✗
Iceland	10.2	✓	7.5	⊙	19.0	⊙	7.8	✓
Ireland	19.0	⊙	10.9	⊙	23.0	⊙	9.8	⊙
Israel	19.6	⊙	2.6	✓	16.6	⊙	21.1	⊙
Italy	20.0	⊙	7.6	⊙	9.8	✓	19.9	⊙
Japan	18.2	⊙	7.2	⊙	3.7	✓	13.3	⊙
Korea	17.3	⊙	9.1	⊙	5.3	✓	28.7	✗
Latvia	24.1	✗	10.8	⊙	23.2	⊙	20.4	⊙
Luxembourg	14.9	⊙	11.1	⊙	22.6	⊙	16.6	⊙
Mexico	7.6	✓	5.2	✓	33.3	✗	20.2	⊙
Netherlands	19.0	⊙	8.0	⊙	12.8	⊙	14.6	⊙
New Zealand	14.2	⊙	8.9	⊙	31.6	✗	5.5	✓
Norway	12.0	✓	6.0	✓	12.0	✓	9.1	⊙
Poland	22.7	⊙	10.5	⊙	16.7	⊙	24.3	✗
Portugal	16.8	⊙	9.9	⊙	16.6	⊙	9.8	⊙
Slovak Republic	22.9	⊙	10.2	⊙	16.3	⊙	20.5	⊙
Slovenia	18.9	⊙	11.5	⊙	19.2	⊙	20.3	⊙
Spain	23.0	⊙	9.3	⊙	16.7	⊙	9.7	⊙
Sweden	11.2	✓	7.2	⊙	12.3	✓	6.2	✓
Switzerland	20.4	⊙	9.5	⊙	10.3	✓	12.9	⊙
Turkey	27.3	✗	1.4	✓	22.3	⊙	36.4	✗
United Kingdom	16.1	⊙	9.5	⊙	26.9	✗	12.4	⊙
United States	11.4	✓	8.8	⊙	38.2	✗	8.4	⊙

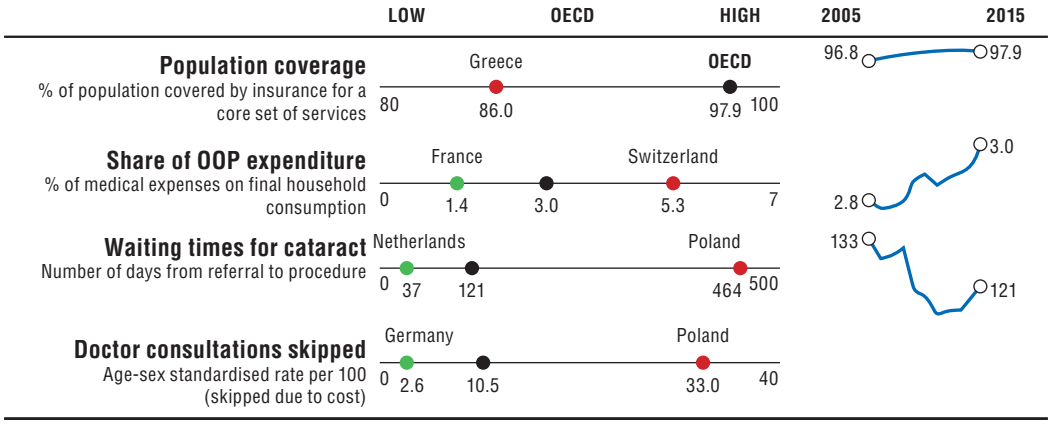
Note: All data refer to 2015 or nearest year. Indicators are taken from Chapter 4.
Obesity data reports a mix of measured and self-reported weights, with measured data often being higher and more accurate compared to self-reported weight. Chapter 4 details the country coverage for each measure.

Source: *OECD Health Statistics 2017*; World Development Indicators (for air pollution).

Access to care

Access to care is a critical measure of health system performance. Indicators presented here include population coverage, an overall measure of health care coverage, alongside indicators reflecting financial and timely access. The access to care chapter also includes geographic accessibility measures, not included here because of the complexity of cross-country comparisons. Figure 1.3 provides a snapshot on access to care across the OECD and Table 1.3 provides more detailed country comparisons.

Figure 1.3. **Snapshot on access to care across the OECD**



Note: the Y-axis for OECD trends is standardised to have fixed height, based on the minimum and maximum values of the indicator. The high-low X-axis is standardised with constant distance from the OECD average whenever the indicator is not truncated at 0.

In terms of ***population coverage***, most OECD countries have achieved universal (or near-universal) coverage of health care costs for a core set of services, except for six countries which remain considerably below the OECD average – Chile, Greece, Mexico, Poland, the Slovak Republic and the United States.

Population coverage, though, is not sufficient by itself. The degree of cost-sharing applied to those services also affects access to care. ***Out-of-pocket (OOP) expenditures*** and ***consultations skipped due to cost*** are two indicators measuring financial access, which is of particular concern for low-income population groups. OOP expenditures can create financial barriers to health care. Across the OECD, they have made up a slightly increasing share of household consumption over time, and are relatively high in Korea, Switzerland, Greece, Hungary, Mexico, Portugal and Chile. The rate of consultations skipped due to cost is particularly high in Poland, the United States and Switzerland (for the subset of 17 countries with comparable data).

Long ***waiting times*** are also an important barrier to access in many OECD countries. They are the result of a complex interaction between supply and demand of health services, with doctors playing a crucial role on both sides. Long waiting times for elective (non-emergency) surgery lead to patients suffering unnecessary pain and disability. Waiting times for cataract surgery, one of the most commonly reported indicators, are particularly high in Poland and Estonia (for the subset of 16 countries with comparable data), while numbers are very low for Canada, Italy and the Netherlands.

Table 1.3. **Dashboard on access to care**

✓ Better than OECD average | ○ Close to OECD average | ✗ Worse than OECD average | – Missing data

	POPULATION COVERAGE		SHARE OF OUT OF POCKET EXPENDITURE		WAITING TIMES FOR CATARACT SURGERY **		CONSULTATIONS SKIPPED DUE TO COST *	
	% of population covered by insurance		% of final household consumption		Number of days from referral to procedure		Age-sex standardised rate per 100 population	
OECD	**97.9**		**3.0**		**121**		**10.5**	
Australia	100	○	3.1	○	93	✓	16.2	○
Austria	99.9	○	3.0	○	–		–	
Belgium	99.0	○	3.2	○	–		–	
Canada	100	○	2.2	○	58	✓	6.6	○
Chile	92.1	✗	4.1	✗	103	○	–	
Czech Republic	100	○	2.3	○	–		–	
Denmark	100	○	2.6	○	87	✓	–	
Estonia	94.0	○	2.7	○	253	✗	9.7	○
Finland	100	○	3.0	○	103	○	–	
France	99.9	○	1.4	✓	–		8.5	○
Germany	100	○	1.8	✓	–		2.6	✓
Greece	86.0	✗	4.4	✗	–		–	
Hungary	95.0	○	4.4	✗	88	✓	–	
Iceland	100	○	3.1	○	–		–	
Ireland	100	○	2.5	○	–		–	
Israel	100	○	3.4	○	132	○	4.7	○
Italy	100	○	3.1	○	50	✓	4.8	○
Japan	100	○	2.6	○	–		–	
Korea	100	○	5.1	✗	–		–	
Latvia	–		3.9	✗	–		–	
Luxembourg	95.2	○	1.4	✓	–		–	
Mexico	92.3	✗	3.6	○	–		–	
Netherlands	99.9	○	2.4	○	37	✓	10.3	○
New Zealand	100	○	2.1	○	73	✓	14.5	○
Norway	100	○	2.9	○	117	○	5.9	○
Poland	91.0	✗	2.5	○	464	✗	33.0	✗
Portugal	100	○	3.8	✗	104	○	8.3	○
Slovak Republic	93.8	✗	2.4	○	–		–	
Slovenia	100	○	2.0	○	–		–	
Spain	99.8	○	3.7	○	105	○	2.8	✓
Sweden	100	○	3.3	○	–		3.9	✓
Switzerland	100	○	5.3	✗	–		20.9	✗
Turkey	98.4	○	–		–		–	
United Kingdom	100	○	1.5	✓	72	✓	4.2	✓
United States	90.9	✗	2.5	○	–		22.3	✗

* Poland is excluded from the standard deviation calculation. ** Estonia and Poland are excluded from the standard deviation calculation. The values for Australia and Canada are reported in median number of days, rather than mean.

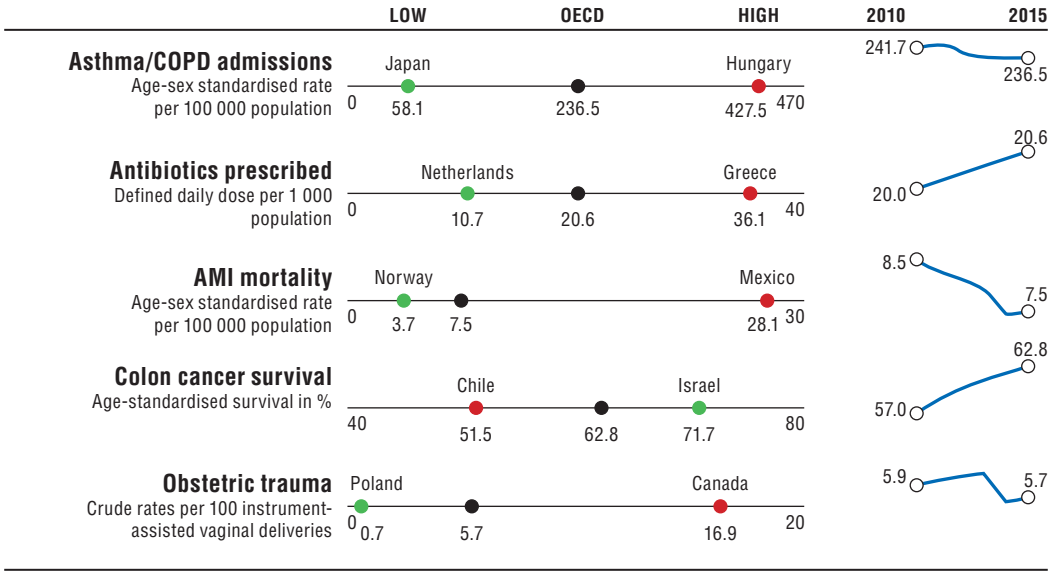
Note: Data on population coverage, share of OOP and waiting times refers to 2015, consultations skipped due to cost refer to 2016. Indicators are taken from Chapter 5.

Source: OECD Health Statistics 2017; Commonwealth Fund International Health Policy Survey 2016 and other national sources.

Quality and outcomes of care

Measures of the quality and outcomes of care should reflect appropriateness of care, clinical effectiveness, patient safety and the person responsiveness of care. The appropriateness of care is measured by antibiotics prescribed and asthma/COPD admissions as an indicator of avoidable admissions. 30-day mortality following acute myocardial infarction (AMI) and colon cancer survival are indicators of clinical effectiveness; obstetric trauma is a measure of patient safety. Figure 1.4 provides a snapshot on quality and outcome of care across the OECD and Table 1.4 provides more detailed country comparisons.

Figure 1.4. **Snapshot on quality and outcomes of care across the OECD**



Note: the Y-axis for OECD trends is standardised to have fixed height, based on the minimum and maximum values of the indicator. The high-low X-axis is standardised with constant distance from the OECD average whenever the indicator is not truncated at 0. Asthma/COPD admissions and antibiotics prescribed report 2011 as the baseline year. Obstetric trauma reports 2010.

Asthma and COPD admissions are conditions for which effective treatment at the primary care level is well established, but they vary significantly across countries. They are considerably higher than the OECD average in Hungary, Turkey, Ireland, Australia, New Zealand and Latvia; but much lower than the OECD average in Japan, Italy, Portugal, Mexico and Chile. The number of ***antibiotics prescribed*** is higher than the OECD average in Greece, France, Belgium and Italy. Antibiotic prescriptions are considerably below the OECD average in the Netherlands, Estonia, Sweden, Latvia and Austria. The number of antibiotics prescribed has increased slightly over time, with overuse of antibiotics not only a wasteful use of resources, but also responsible for increased antimicrobial resistance.

Mortality following acute myocardial infarction (admission-based) is a long-established indicator of the quality of acute care. It has been steadily declining since the 1970s in most countries, yet important cross-country differences still exist. Mexico shows very high mortality following AMI; rates are also relatively high in Latvia, Japan, Chile and Estonia. Eight countries have mortality rates considerably below the OECD average, with Norway, Australia and Denmark having the lowest rates.

Colon cancer survival rates vary relatively less than AMI, with only Israel and Korea performing better than the average, and five countries performing considerably worse, with Chile and Slovenia having the lowest rates.

Obstetric trauma (with instrument) is the most robust measure available for the dimension of patient safety. For the subset of 21 countries with comparable data, obstetric trauma is highest in Canada, followed by Sweden, Denmark and the United States. In contrast, rates of obstetric trauma are considerably lower than the OECD average in Poland, Israel, Italy, Slovenia and Portugal.

Table 1.4. **Dashboard on quality of care**

✓ Better than OECD average ⊙ Close to OECD average ✗ Worse than OECD average – Missing data

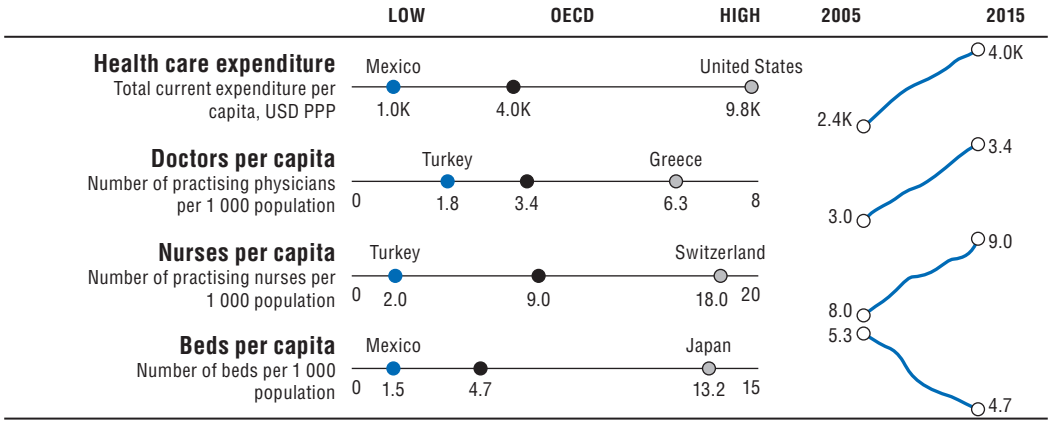
	ASTHMA AND COPD HOSPITAL ADMISSIONS		ANTIBIOTICS PRESCRIBED		ACUTE MYOCARDIAL INFARCTION MORTALITY*		COLON CANCER SURVIVAL		OBSTETRIC TRAUMA (INSTRUMENT) **	
	Age-sex standardised rate per 100 000 population		Defined daily dose per 1 000 population		Age-sex standardised rate per 100 000 population		Age-standardised survival rate in %		Crude rates per 100 vaginal deliveries	
OECD	**236**		**20.6**		**7.5**		**62.8**		**5.7**	
Australia	371	✗	23.4	⊙	4.0	✓	70.6	✓	7.2	⊙
Austria	330	⊙	14.0	✓	7.4	⊙	63.7	⊙	–	
Belgium	286	⊙	29.2	✗	7.0	⊙	67.8	⊙	3.4	⊙
Canada	247	⊙	20.8	⊙	5.1	✓	67.2	⊙	16.9	✗
Chile	99	✓	–		11.3	✗	51.5	✗	–	
Czech Republic	193	⊙	19.6	⊙	6.9	⊙	56.1	✗	–	
Denmark	333	⊙	16.1	⊙	4.0	✓	61.6	⊙	10.9	✗
Estonia	137	⊙	12.1	✓	10.6	✗	58.4	⊙	3.9	⊙
Finland	184	⊙	17.2	⊙	5.6	⊙	64.8	⊙	3.7	⊙
France	150	⊙	29.9	✗	5.6	⊙	63.7	⊙	–	
Germany	284	⊙	14.4	✓	7.7	⊙	64.8	⊙	6.4	⊙
Greece	–		36.1	✗	–		–		–	
Hungary	428	✗	17.0	⊙	–		–		–	
Iceland	223	⊙	19.9	⊙	5.9	⊙	68.2	⊙	–	
Ireland	411	✗	25.6	⊙	6.4	⊙	60.5	⊙	4.2	⊙
Israel	259	⊙	21.4	⊙	6.7	⊙	71.7	✓	1.9	✓
Italy	64	✓	27.5	✗	5.4	⊙	64.1	⊙	1.9	✓
Japan	58	✓	–		11.7	✗	67.8	⊙	–	
Korea	309	⊙	24.3	⊙	8.1	⊙	71.6	✓	–	
Latvia	341	✗	13.3	✓	13.4	✗	56.4	✗	–	
Luxembourg	186	⊙	26.3	⊙	7.3	⊙	–		–	
Mexico	96	✓	–		28.1	✗	–		–	
Netherlands	202	⊙	10.7	✓	5.4	⊙	63.0	⊙	3.2	⊙
New Zealand	363	✗	25.8	⊙	4.7	✓	64.0	⊙	8.5	⊙
Norway	261	⊙	15.8	⊙	3.7	✓	66.6	⊙	2.5	⊙
Poland	234	⊙	26.2	⊙	4.4	✓	52.8	✗	0.7	✓
Portugal	74	✓	21.3	⊙	7.9	⊙	60.9	⊙	2.5	✓
Slovak Republic	238	⊙	24.5	⊙	6.4	⊙	51.7	✗	–	
Slovenia	146	⊙	14.5	⊙	6.1	⊙	61.9	⊙	2.1	✓
Spain	234	⊙	21.6	⊙	7.9	⊙	63.3	⊙	4.8	⊙
Sweden	184	⊙	12.3	✓	4.2	✓	64.9	⊙	11.3	✗
Switzerland	138	⊙	–		5.1	✓	67.2	⊙	7.4	⊙
Turkey	414	✗	17.3	⊙	8.6	⊙	54.6	✗	–	
United Kingdom	303	⊙	20.1	⊙	7.1	⊙	60.0	⊙	6.8	⊙
United States	262	⊙	–		6.5	⊙	64.9	⊙	9.6	✗

Note: All data refer to 2015 or nearest year. Indicators are taken from Chapter 6.
* Mexico is excluded from the calculation of the standard deviation. ** Canada is excluded from the calculation of the standard deviation.
Source: OECD Health Statistics 2017.

Health care resources

Having sufficient health care resources is critical to the functioning of health systems. But higher resources do not automatically translate into better health outcomes – the effectiveness of spending is also important. Health care expenditure per capita is the most immediate summary measure of health care resources. The supply of health workers (doctors and nurses) and hospital beds are also reported, since higher health spending is not always closely related to these indicators. Figure 1.5 provides a snapshot on health care resources across the OECD and Table 1.5 provides more detailed country comparisons.

Figure 1.5. **Snapshot on health care resources across the OECD**



Note: the Y-axis for OECD trends is standardised to have fixed height, based on the minimum and maximum values of the indicator. The high-low X-axis is standardised with constant distance from the OECD average whenever the indicator is not truncated at 0.

In general, countries with higher health spending and higher numbers of health workers and other resources have better health outcomes, quality and access to care. However, the absolute number of resources invested is not a perfect predictor of better outcomes – efficient use of health resources is also critical.

In terms of overall ***health care expenditure***, the United States spends considerably more per person than any other country. Health care spending is also high in Switzerland, Luxembourg and Norway. Nine countries spend less than the OECD average, with health spending per capita lowest in Mexico, Turkey and Latvia. Health spending has been consistently growing in all countries over the past decades, other than a slowdown following the financial crisis. Looking at growth rates of spending as a share of GDP, in addition to absolute levels of spending, can give a better perspective on how much countries spend relative to the general economy.

A large part of health spending is translated into wages for the workforce. The number of doctors and nurses in a health system is therefore an important way of monitoring how resources are being used. The number of ***doctors per capita*** is relatively high in Greece, Austria, Portugal and Norway. Among these countries, Greece has one of the lowest numbers of nurses per capita, suggesting the potential to decrease the doctors to nurses ratio. This could generate significant cost savings in the long run. In contrast, Norway has one of the highest numbers of nurses (Austria and Portugal nurses per capita are close to the OECD average).

Nurses per capita are particularly high in Switzerland, Germany and Nordic countries. While the total number of nurses has grown more than doctors in absolute terms, both have grown at similar rates in recent years, at around 13%.

Hospitals also take an important share of health care resources, with ***hospital beds per capita*** a marker of the physical and technical resources available in a health system. Reductions in the number of beds in many OECD countries over the past years have been a voluntary effort to encourage a shift to day surgery and primary care. Nevertheless, the number of beds per capita remains particularly high in Japan and Korea.

Table 1.5. **Dashboard on health care resources**

Above OECD average | Close to OECD average | Below OECD average | – Missing data

	HEALTH CARE EXPENDITURE *		DOCTORS PER CAPITA		NURSES PER CAPITA		BEDS PER CAPITA **	
	Total spending per capita, USD PPP		Number of practising pysicians per 1 000 population		Number of practising nurses per 1 000 population		Number of beds per 1 000 population	
OECD	**4 003**		**3.4**		**9.0**		**4.7**	
Australia	4 708	Close	3.5	Close	11.5	Close	3.8	Close
Austria	5 227	Close	5.1	Above	8.1	Close	7.6	Above
Belgium	4 840	Close	3.0	Close	10.8	Close	6.2	Close
Canada	4 753	Close	2.7	Close	9.9	Close	2.6	Below
Chile	1 977	Below	2.1	Below	2.1	Below	2.1	Below
Czech Republic	2 544	Close	3.7	Close	8.0	Close	6.5	Above
Denmark	5 199	Close	3.7	Close	16.7	Above	2.5	Below
Estonia	1 989	Below	3.4	Close	6.0	Close	5.0	Close
Finland	4 062	Close	3.2	Close	14.7	Above	4.4	Close
France	4 600	Close	3.3	Close	9.9	Close	6.1	Close
Germany	5 551	Close	4.1	Close	13.3	Above	8.1	Above
Greece	2 223	Below	6.3	Above	3.2	Below	4.3	Close
Hungary	2 101	Below	3.1	Close	6.5	Close	7.0	Above
Iceland	4 376	Close	3.8	Close	15.5	Above	3.1	Close
Ireland	5 528	Close	2.9	Close	11.9	Close	3.0	Close
Israel	2 822	Close	3.4	Close	4.9	Close	3.0	Close
Italy	3 391	Close	3.8	Close	5.4	Close	3.2	Close
Japan	4 519	Close	2.4	Below	11.0	Close	13.2	Above
Korea	2 729	Close	2.2	Below	5.9	Close	11.5	Above
Latvia	1 466	Below	3.2	Close	4.7	Close	5.7	Close
Luxembourg	7 463	Above	2.9	Close	11.9	Close	4.8	Close
Mexico	1 080	Below	2.4	Below	2.8	Below	1.5	Below
Netherlands	5 385	Close	3.5	Close	10.5	Close	4.2	Close
New Zealand	3 590	Close	3.0	Close	10.3	Close	2.7	Below
Norway	6 647	Above	4.4	Above	17.3	Above	3.8	Close
Poland	1 798	Below	2.3	Below	5.2	Close	6.6	Above
Portugal	2 734	Close	4.6	Above	6.3	Close	3.4	Close
Slovak Republic	2 150	Below	3.5	Close	5.7	Close	5.8	Close
Slovenia	2 835	Close	2.8	Close	8.8	Close	4.5	Close
Spain	3 248	Close	3.9	Close	5.3	Close	3.0	Close
Sweden	5 488	Close	4.2	Close	11.1	Close	2.4	Below
Switzerland	7 919	Above	4.2	Close	18.0	Above	4.6	Close
Turkey	1 088	Below	1.8	Below	2.0	Below	2.7	Below
United Kingdom	4 192	Close	2.8	Close	7.9	Close	2.6	Below
United States	9 892	Above	2.6	Close	11.3	Close	2.8	Below

Note: All data refer to 2015 or nearest year, except for health care expenditure, which refers to 2016. Indicators are taken from Chapter 7 (health expenditure), Chapter 8 (doctors and nurses per capita) and Chapter 9 (beds per capita).

* United States is excluded from the standard deviation calculation. ** Japan and Korea are excluded from the standard deviation calculation. For Ireland, private hospitals beds are excluded.

Source: *OECD Health Statistics 2017*.

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Chapter 2

What has driven life expectancy gains in recent decades? A cross-country analysis of OECD member states

Countries with higher national income and health spending tend to have longer life expectancies. But these factors can only account for a part of life expectancy differences across countries. This chapter analyses the factors contributing to health status, including a closer assessment of the determinants of health that go beyond the health system. It shows that on average, a 10% increase in health spending per capita is associated with a gain of 3.5 months of life expectancy. The same rate of improvement in healthier lifestyles (10%) is associated with a gain of 2.6 months of life expectancy. Wider social determinants are also important: a 10% increase in income per capita is associated with a gain of 2.2 months of life expectancy, and a 10% increase in primary education coverage with 3.2 months. For income, minimum absolute levels are particularly critical to protecting people's health.

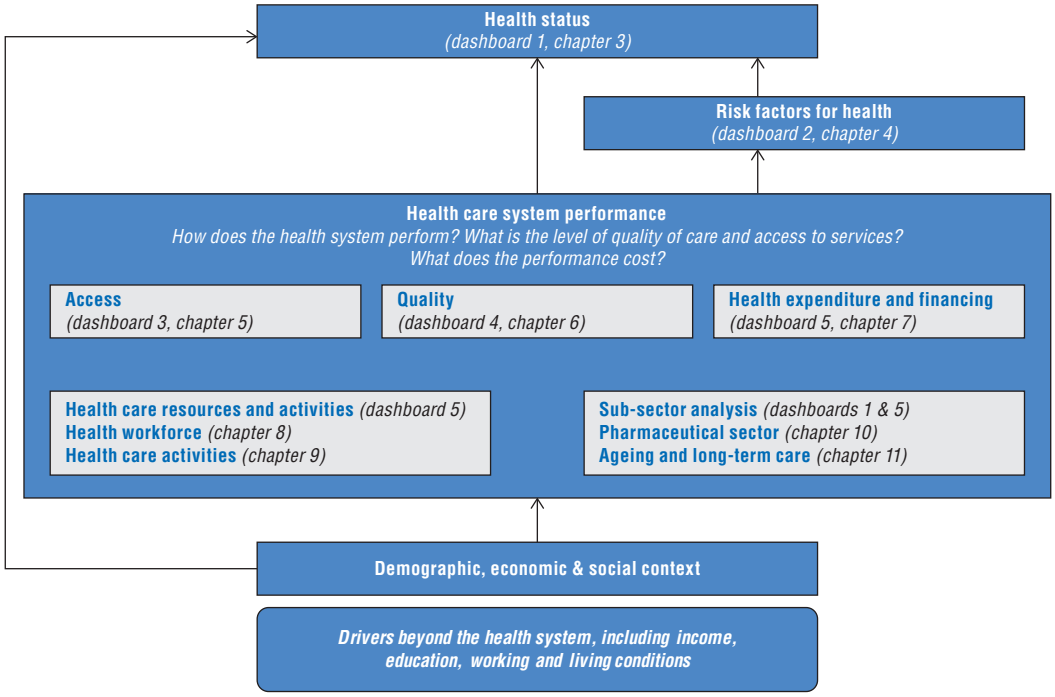
The main policy implication emerging from this analysis is the significant opportunities for health improvement from coordinated action across ministries responsible for education, the environment, income and social protection, alongside health ministries. This includes inter-sectoral action to address health-related behaviours. Collaboration with the private sector will also be important, especially with employers in relation to working conditions.

Introduction

Life expectancy has risen steadily in most OECD countries, increasing over ten years on average since 1970. Mortality rates from the main causes of death, cardiovascular diseases and cancer, have generally fallen. Today, countries with higher national income and health spending tend to have longer life expectancies. But these factors can only account for a part of life expectancy differences across countries. Furthermore, life expectancy varies across population groups. For example, life expectancy is lower amongst individuals with lower levels of education across all OECD countries (Murtin et al., 2017).

This chapter explores the determinants of life expectancy gains in OECD countries. These include drivers beyond the health system – the demographic, economic and social context – alongside health system factors. Such analysis complements subsequent chapters in this Health at a Glance edition, which focus predominantly on cross-country comparisons of health care system performance. Referring back to the conceptual framework underpinning Health at a Glance, this chapter analyses the factors contributing to health status, including a closer assessment of the determinants of health that go beyond the health system (Figure 2.1).

Figure 2.1. **Determinants of health and the *Health at a Glance* conceptual framework**



Analysis is based on country-level data for the time period 1995-2015, and covers all 35 OECD member states. Empirical findings are complemented by an assessment of the mechanisms by which drivers within and beyond the health system affect health.

Understanding the determinants of health

Health outcomes depend on investments both within and beyond the health system

Biological endowment and health service availability are not sufficient to explain differences in individuals' health. But a growing body of evidence has demonstrated that an individual's health also depends on factors that go beyond the medical care received (Marmot and Wilkinson, 2006; WHO, 2008). Some of these factors can still be influenced by health systems directly, through public health and prevention measures. In particular, non-medical determinants related to lifestyle choices are important. These include major risk factors such as smoking, alcohol and unhealthy diet, and conversely health-seeking activities such as physical activity.

But broader social determinants of health also matter. Income, education, working and living conditions are all also important factors. Having a sufficient income allows people to purchase essential goods and services that sustain or improve health, such as nutritious food and shelter; though higher income can also involve longer work hours and greater stress (Fuchs, 2004). The more educated, as well as often being richer, may be better informed about health-seeking activities (Mackenbach et al., 2008). Unemployment and poor working conditions adversely affect mental health, and certain occupations carry a greater risk of injury (Bassanini and Caroli, 2014). Living in an unsanitary, unsafe or polluted environment also increases the risk of illness or death (Gibson et al., 2011; Deguen and Zmirou-Navier, 2010).

The social determinants of health are closely inter-linked. Indeed, this makes it hard to empirically disentangle the individual effects of different factors on health (Fuchs, 2004). But what is evident is that these factors will, in general, reinforce each other. For example, the better educated are also likely to be richer, live in healthier environments, and be less likely to smoke. Further, some researchers argue that large income differences not only cause health inequalities, but may also be detrimental to population health (Pickett and Wilkinson, 2015). Finally, health inequalities are likely to persist over the life cycle and across generations, with early life circumstances influencing future health and economic prospects.

Further, despite the fact that most OECD countries have achieved universal health coverage, individuals from the most disadvantaged groups tend to have worse access to health services. For example, some individuals may be unaware or unwilling to use the full range of health services available to them. Quality of care may be worse in more socially deprived areas; co-payments and other direct payments by users without effective exemption mechanisms will disproportionately affect the poor (OECD, 2014, 2015a).

Studies using aggregated data highlight the contribution of socio-economic factors to health

A range of studies have estimated an empirical 'health production function' using aggregated data. Such analyses have been used to assess the contribution of health spending, socio-economic and other factors on population health.[1]

In general, health spending, income and education have significant beneficial impacts on population health (Berger and Messer, 2002; OECD, 2010; Heijink et al., 2013; Moreno-Serra and Smith, 2015); with pollution and lifestyle factors (particularly smoking and alcohol consumption) typically having significant adverse effects (Shaw, 2005; Blázquez-Fernádez et al., 2013). Far fewer studies have incorporated variables reflecting unemployment, occupational category or income inequality, and when included they have had more mixed results (Or, 2000; Lin, 2009).

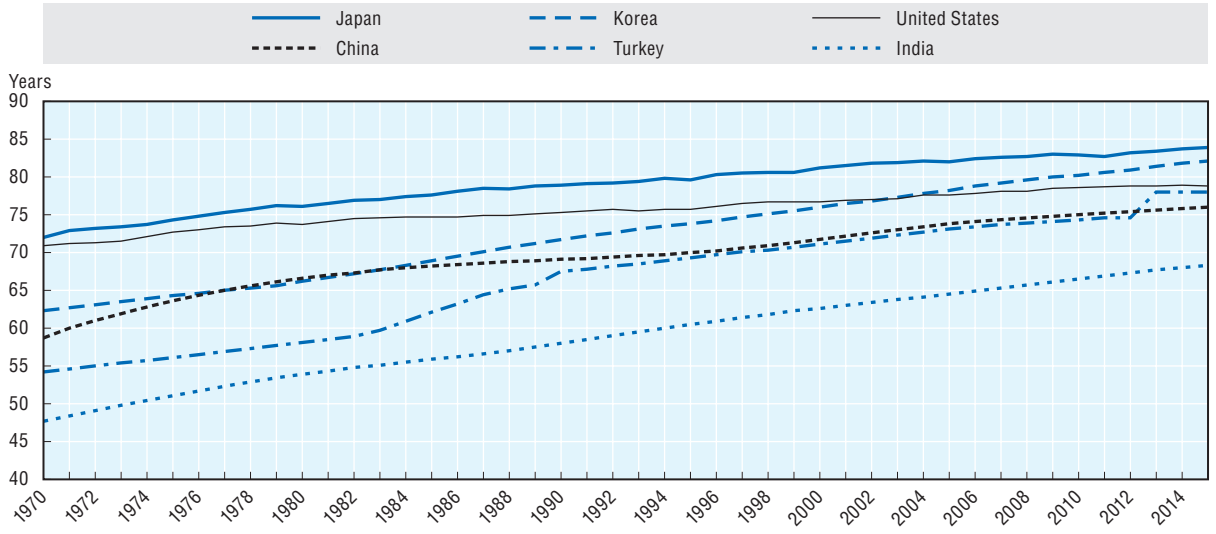
Note that health spending and income have typically had a stronger impact on reducing avoidable mortality or infant mortality than on increasing life expectancy (Heijink et al., 2013; Nixon and Ulmann, 2006). Dynamic factors may also be important. For example, temporary economic downturns have shown more mixed effects on health outcomes, worsening mental health but also potentially reducing mortality through reduced traffic fatalities and possibly lower pollution (Ruhm, 2012; van Gool and Pearson, 2014; Laliotis et al., 2016). More generally, differences in the countries analysed explains variability in the impact of different factors on health outcomes.

Gains in life expectancy over time reflect increased health spending, healthier lifestyles and improving socio-economic conditions

All OECD and partner countries have experienced gains in life expectancy over time, but the rate of increase varies markedly across countries

Life expectancy at birth increased in all the countries analysed. Gains have been particularly rapid in Turkey, India, Korea and China, countries which have had sustained periods of economic growth alongside improved health care coverage (Figure 2.2). In the United States and Mexico, gains have been more modest. There has also been slower progress in South Africa (due mainly to the epidemic of HIV/AIDS), Lithuania and the Russian Federation (due mainly to the impact of the economic transition in the 1990s and a rise in risk increasing behaviors among men). Life expectancy at birth is currently the highest in Japan, at 83.9 years.

Figure 2.2. **Trends in life expectancy at birth, selected countries, 1970-2015**



Source: OECD Health Statistics 2017.

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Increased health care spending had a strong positive impact on life expectancy, but wider social determinants are also important

New analysis provides estimates of the relative contribution of health systems and healthy lifestyles vis-à-vis socio-economic, and environmental factors across OECD countries. This analysis uses the latest cross-country data and follows best methodological practices (Box 2.1). Life expectancy gains from 1995 to 2015 are assessed. Data on explanatory factors were lagged by five years (i.e. using data from 1990 to 2010) to account for the delayed effects on health.

Box 2.1. **Data and methods**

The analysis assessed the relative contribution of factors within and beyond the health system to life expectancy gains between 1995 and 2015 in all 35 OECD countries. Macro-level panel data from OECD Health Statistics and the World Bank Databank was used.

An empirical health production function was developed, taking the following general form:

$$LE_{i,t} = \alpha_i + \beta_1 W_{i,t-5} + \beta_2 X_{i,t-5} + \beta_3 Y_{i,t-5} + \beta_4 Z_{i,t-5} + e_{i,t}$$

where $LE_{i,t}$ is the life expectancy at birth for country *i* in year *t*; α the country effect; and *e* is the error term. Explanatory variables are 5-year lagged in order to capture the delayed effects of key determinants on life expectancy, with variable selection based on key determinants identified in the literature. Lags of 5 years were chosen to strike a balance between accounting for delayed effects on health and maintaining a sufficient number of observations for the time-series analysis.

W is a vector of health system variables in year *t*-5 (*health care spending*, including both curative and preventive care, measured by total health expenditure expressed in per capita constant USD PPP; *financial protection* using the share of out-of-pocket spending in total health expenditure as a proxy). *X* is a vector of lifestyle factors in year *t*-5 (prevalence of daily *smokers*; *alcohol* consumption in litres per capita; *healthy diet*, measured by the share of the population consuming vegetables daily). *Y* is a vector of income and other socio-economic variables in year *t*-5 (*income* measured by GDP per capita at constant USD PPP, net of total health expenditure; *education* measured as the share of the population attaining above primary school education; and the long-term *unemployment* rate). *Z* is an environmental variable in year *t*-5 (*air pollution* measured by the share of the population exposed to fine particulates PM2.5).

A Cobb-Douglas production function is used, where all variables are expressed in logarithmic form. The general econometric specification is a GLS model with country fixed effects, country-specific autocorrelation structures for errors, a correction for heteroscedasticity, and lagged explanatory variables. Data gaps in specific years were addressed using linear interpolation. Further empirical models are examined in a related working paper (James et al., forthcoming). Although the analysis follows best methodological practice, associations between life expectancy and explanatory variables do not guarantee causality.

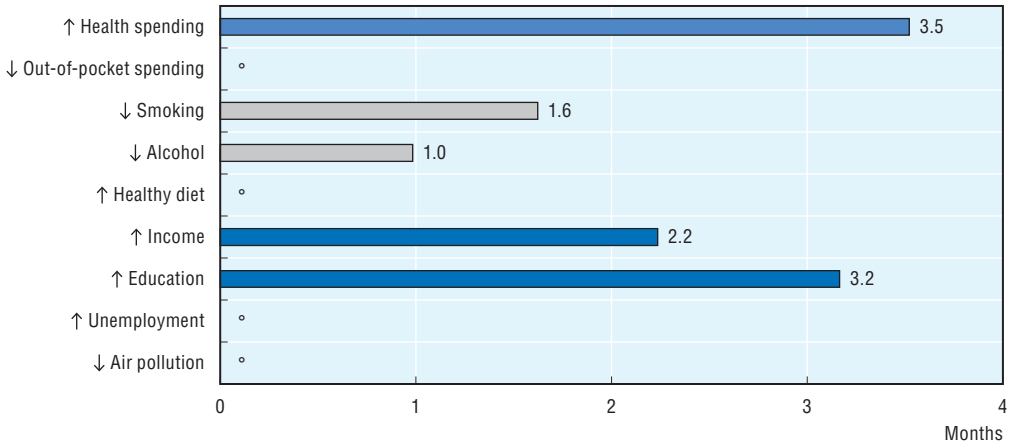
Results from this analysis show that increased health spending, healthier lifestyles, higher incomes and better education coverage over time have positive and statistically significant associations with life expectancy gains (Figure 2.3). In particular, a 10% increase in health spending per capita (in real terms) is associated with a gain of 3.5 months of life expectancy. The same rate of improvement in healthier lifestyles (10%) is associated with

a gain of 2.6 months of life expectancy (fewer smokers with 1.6 months, decreased alcohol use with 1.0 month). Wider social determinants also matter. A 10% increase in income per capita (in real terms) is associated with a gain of 2.2 months of life expectancy, and a 10% increase in primary education coverage with 3.2 months.

The share of out-of-pocket spending in total health spending did not have a significant association with life expectancy gains, mainly because of its very small reduction over the time period studied. Healthy diet had a positive but not significant association with life expectancy. This may be explained by the very limited improvements to people's diet over time, and the difficulty to capture nutritional effects at the macro level. The association between long-term unemployment rates and life expectancy was also not significant.[2] More surprisingly, air pollution was also not significantly associated with life expectancy gains, despite there being clear evidence elsewhere of the adverse effects of air pollution on health (OECD 2016). This result reflects the long lag in time before air pollution affects a person's health, and also the relatively small decreases in air pollution over time in many OECD countries. These results are explored further in a related working paper (James et al., forthcoming).

Figure 2.3. **Life expectancy gains associated with a 10% change in the main determinants of health**

Analysis based on 35 OECD countries for the time period 1995-2015



Note: ◦ stands for a contribution near zero.

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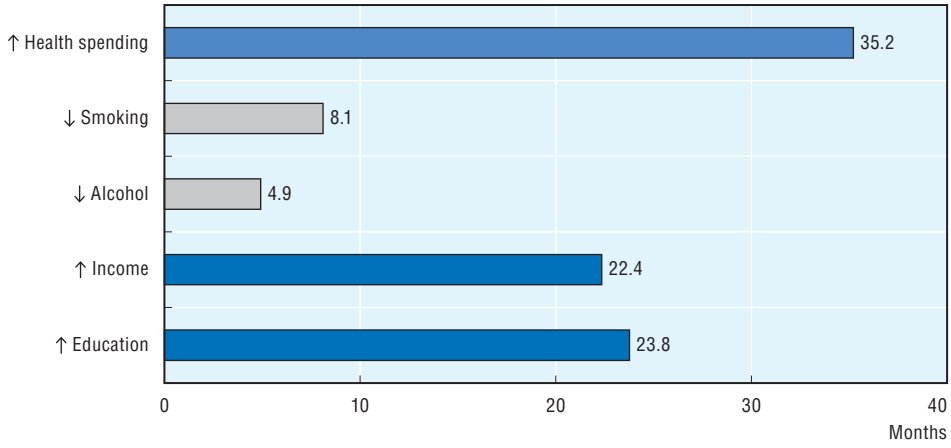
While the effect on life expectancy of a 10% change in the main determinants of health is useful for comparative purposes, in practice larger changes may be feasible, leading to larger life expectancy gains. For example, if smoking rates and alcohol consumption could be halved, together these could lead to a gain of 13 months of life expectancy. Figure 2.4 illustrates the impact of more ambitious changes for selected factors, notably a doubling of health spending and income, primary education coverage reaching 100%, and more marked improvements in healthy lifestyles (a halving of smoking rates and alcohol consumption).

The actual evolution in the main determinants of health over the past 20 years has often been much more substantial than the 10% change used in Figure 2.3. From a policy perspective, this is relevant because it means the positive impacts on life expectancy can be substantial – given the right investments within and beyond the health system.

Figure 2.4. **Life expectancy gains from more substantial changes in the main determinants of health**

Analysis based on 35 OECD countries for the time period 1995-2015



Note: Figures represent the gains in life expectancy that could be expected with doubling health spending, doubling income, reaching 100% of tertiary education, and halving smoking and alcohol use. Unemployment, healthy diet, out-of-pocket spending and air pollution are excluded because they were not statistically significant.

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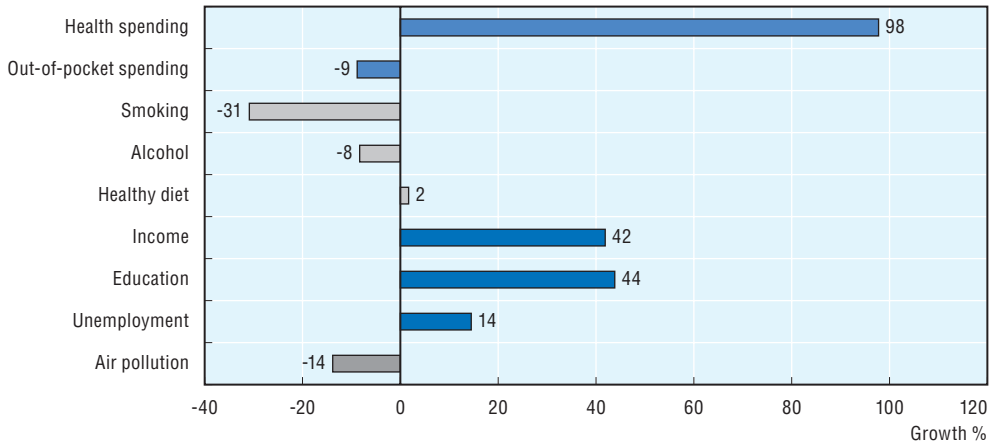
Figure 2.5 shows the percentage change of these determinants of health between 1990 and 2010. For example, while a 10% increase health spending is associated with a gain of 3.5 months of life expectancy, health spending actually grew by 98% from 1990 to 2010 (from USD PPP 1 624 in 1990 to USD PPP 3 212 in 2010 in constant terms). Income increased by 42% over the same time period, and education coverage by 44%. Improvements in healthy lifestyles have been less marked: smoking rates were reduced by 31%, but alcohol use only fell by 8% and the rate of daily vegetable consumption only increased by 2% from 1990 to 2010.

Figure 2.5. **Evolution of the main determinants of life expectancy: OECD 1990 to 2010**



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As a result of the evolution of these determinants over time, health spending has been the major contributing factor to gains in life expectancy over the last two decades, followed by education then income (Table 2.1). The contributions of lifestyle factors (smoking, alcohol,

healthy diet) have been smaller, largely because there have been smaller improvements in these factors over the time period studied. Table 2.1 also shows regression coefficients and values for 1990 and 2010, alongside the relative contributions of each of these determinants of life expectancy.

Table 2.1. **Determinants of life expectancy gains over time: regression coefficients, relative contributions, 1990 and 2010 values**

Explanatory variables	Regression coefficient	Contribution to life expectancy (months)	1990 value	2010 value
Health system factors				
Health expenditure (per capita in constant USD PPP)	+ 0.039*	42.4	1 624	3 212
Out-of-pocket spending (as % of health expenditure)	ns	ns	22	20
Lifestyle factors				
Smoking (% daily smokers)	- 0.018*	5	30.3	21
Alcohol (litres of pure alcohol per capita)	- 0.011*	0.4	10.1	9.2
Healthy diet (% daily consumers of vegetables)	ns	ns	64.2	65.3
Income and other socio-economic factors				
Income (GDP per capita in constant USD PPP)	+ 0.025*	13.4	22 479	31 900
Education (% with above primary education)	+ 0.035*	15.1	57	82
Unemployment (% long-term unemployed)	ns	ns	3.2	3.6
Environmental factors				
Air pollution (% of population exposed to PM2.5)	ns	ns	75.7	65.2

Note: * statistically significant at the 5% level, 'ns' means not significant. Regression based on 718 observations across 35 countries. The sum of the contributions and the residual (not shown here) is equal to the total gain of life years over the studied period.

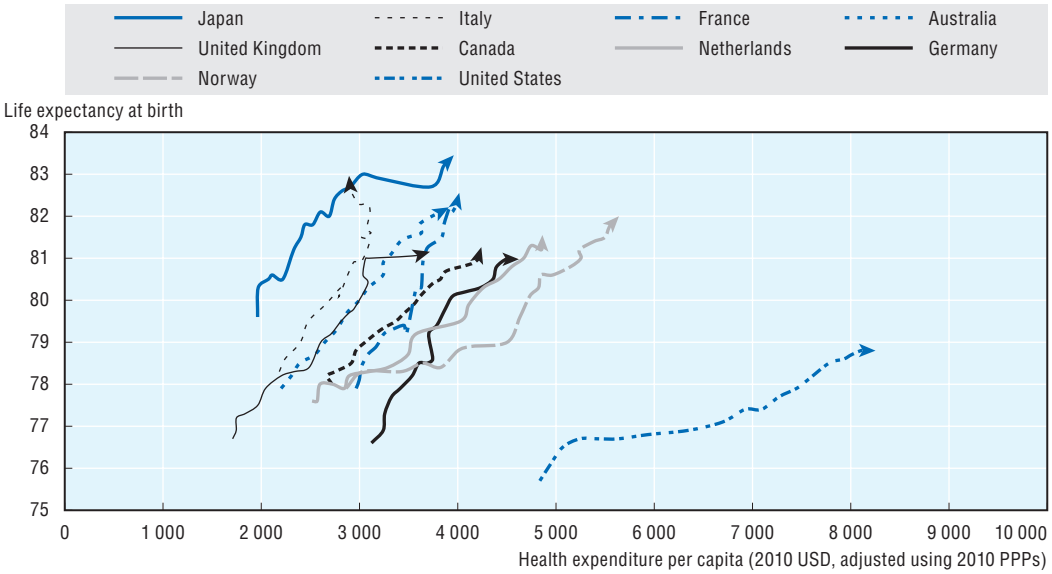
Supplementary analyses were carried out to test a range of common econometric specification issues, as well as alternative explanatory variables. These analyses showed consistent results (see James et al., forthcoming). Additional analysis adding OECD partner countries to the sample shows some differences in the determinants of health by a country's level of economic development. For high-income countries, health care spending has been the main driver of life expectancy gains, whereas income was the main driver in emerging economies. This analysis, though, was limited by data only being available for a shorter time period.

Most OECD countries have steadily increased health care spending in recent decades, but accompanying gains in life expectancy vary markedly across countries

While empirical analysis showed that health care spending has made a marked contribution to life expectancy gains across OECD countries as a whole, there are important cross-country differences. These are illustrated in Figure 2.6, which shows the trajectories of life expectancy gains alongside increase in health expenditure since 1995 for selected high-income countries.

In all OECD countries, both life expectancy and health spending have been increasing over time. But these rates of increase vary significantly across countries. The notable outlier is the United States, where health spending has increased far more rapidly over time than in other OECD countries, yet life expectancy gains have been smaller. On the other hand, life expectancy at birth in Japan has reached almost 84 years, but health expenditure per capita is less than half of the United States.

Figure 2.6. **Life expectancy gains and increased health spending, selected high-income countries, 1995-2015**



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These varying trajectories for health expenditure and life expectancy across countries over time suggest the critical role healthy lifestyles and the wider social determinants of health have in increasing life expectancy. But these trajectories also point to the importance of improving value for money in health systems. This includes placing greater emphasis on health promotion and other highly cost-effective interventions, but also eliminating ineffective spending and waste (see OECD, 2017 for an in-depth discussion).

Unpacking the mechanisms by which socio-economic factors and a person's living environment affect health is essential for policy

The empirical results presented offer insights on the strength and relative contribution of different determinants of health. This section complements the macro-level analysis by assessing exactly how socio-economic factors and a person's living environment affect health and health-seeking behaviours, drawing on insights from more micro-level evidence.

The nature of income trajectories matter

The positive association between income and health is an important general finding. But examining how different income trajectories influence health status offers further guidance for policymakers. A first observation is the *importance of minimum absolute levels of income*. Whereas low income and poverty has a clear detrimental effect on health, health differences between individuals with average or high income are far less pronounced (Deaton, 2003). In other words, there is a non-linear relationship between income and health.

Second, *whilst current income matters, long-term income has a much greater impact on health*. That is, it takes time for higher (lower) incomes to have a beneficial (adverse) effect on health. For example, studies in the United Kingdom concluded that persistent poverty carries a much greater health risk than occasional episodes, and income level appears more important than income change (Benzeval and Judge, 2001; Contoyannis et al., 2004).

Third, *income reductions generally seem to have a larger impact on health than income gains*, irrespective of whether they are temporary or more permanent (O'Donnell et al., 2013).

For example, McInerney et al. (2013) found that wealth losses following the 2008 global financial crisis led to increased depression and use of antidepressants in the United States. In contrast, they observed no health improvements from wealth gains in the same study sample. In Sweden, self-assessed health responded to decreases in income to a greater extent than to income gains over time (Miething and Aberg-Yngwe, 2014). Similarly, most (but not all) studies of sudden wealth gains from inheritance, the stock market and lotteries find limited or no evidence of associated improvements in health status (O'Donnell et al., 2013).

Indeed, income payments can trigger adverse health events in some circumstances, probably reflecting an increase in more risky behaviours. For example, Dobkin and Puller (2007) found elevated drug-related admissions and within-hospital mortality in California for recipients of federal disability payments around the time of payment. Evans and Moore (2011) found increased risks of traffic accidents and heart attacks immediately after social security payments, wage payments for military personnel, tax rebates and dividend payments.

Unemployment worsens mental and physical health; employment conditions are also important

As discussed earlier, macro-level studies of unemployment on health find mixed effects. In contrast, micro-level studies more consistently find that *being unemployed adversely affects both mental and physical health*. For example, a meta-analysis of studies using individual data found that unemployment is associated with a 63% higher risk of mortality after controlling for age and other control factors (Roelfs et al., 2011), although this may partly reflect pre-existing health conditions. Unemployment also affects mental health. In Australia, Canada and the United Kingdom, evidence from panel data shows that changing from employment to unemployment significantly increased mental distress (Llena-Nozal, 2009).

Employment conditions also matter. Working longer hours are harmful to health, raising general stress levels but also increasing the risk of stroke and coronary heart disease (Kivimaki et al., 2015). In extreme cases, it may raise the risk of major accidents (Harrington, 2001). Choice over working hours has also been shown to be crucial, irrespective of the number of hours worked (Bassanini and Caroli, 2014). Other aspects of job quality are also important. Exposure to hazardous substances and risk of injury is typically concentrated amongst low-skilled menial labour (Clougherty et al., 2013). Job insecurity and job dissatisfaction has also been shown to adversely affect health (Caroli and Godard, 2014; Datta Gupta and Kristensen, 2008).

Education encourages healthier lifestyles

Better educated individuals and their offspring are healthier, independent of income and employment-related effects. A large part of this difference has been attributed to healthier lifestyles. In particular, *the more educated are typically better informed about the risks and benefits of different behaviours, but also more likely to process and act upon this information*. For example, people with lower education levels are more likely to smoke, be obese, have less well-balanced diets and be less physically active (Mackenbach et al., 2008; Cutler and Lleras-Muney, 2010). The evidence on alcohol, however, is more mixed. A recent OECD report found that in general better educated women were more likely to drink excessively, though the opposite held true for men (OECD, 2015b). At the same time, alcohol-related harm is more prevalent among less educated and low-income groups, partly because of multiple comorbidities (coexisting risk factors) and lower access to health care.

The better educated are also *more knowledgeable about exactly which health services are available* to them, with consequently greater use of certain services. This is particularly noticeable in terms of use of preventive health services and specialist consultations (OECD, 2006). Further, *education may improve self-management* (and therefore the efficacy) of medical treatment, particularly for chronic diseases (Goldman and Smith, 2002).

Disadvantaged population groups are more likely to experience inadequate living conditions, and adverse health effects from pollution

Air pollution was not significantly associated with life expectancy changes in the empirical analysis presented earlier, principally due to there being rather small decreases in air pollution over time in many OECD countries and because of the lagged effects of air pollution on health. Nevertheless, air pollution is a major health concern, linked to respiratory diseases, lung cancer and cardiovascular diseases.

The level of *pollution* varies greatly across different neighbourhoods, with consequent effects on health. A review found that poorer and less educated populations often (but not always) lived in areas with worse air pollution, but also were far more likely to experience negative health effects from air pollutants (Deguen and Zmirou-Navier, 2010). The authors posit this reflects a greater susceptibility because of factors such as higher prevalence of chronic conditions and greater long-term exposure to pollutants. More generally, children and the elderly are particularly vulnerable to air pollution.

Alongside pollution, other aspects of a person's living environment also impact upon their health. *Poor housing conditions* and certain *neighbourhood characteristics* such as the risk of crime have frequently been shown to adversely affect health (Gibson et al., 2011). Households with low-incomes and many ethnic minorities are more likely to experience these inadequate living conditions. Policies targeting better housing infrastructure (home visits, removal of hazards) and rental assistance policies, have had positive health effects (Bambra et al., 2010).

Conclusion

Empirical results demonstrate that while life expectancy depends on factors both within and beyond the health system, health spending has been a major driver of life expectancy gains in recent decades. In particular, a 10% increase in health spending per capita (in real terms) is associated with a gain of 3.5 months of life expectancy. Given the notable evolution in health spending in the last 20 years, higher health spending is associated with 42.4 months of life expectancy gains in this time period.

Education and income have also made significant contributions to life expectancy gains. A 10% increase in education coverage is associated with a gain of 3.2 months of life expectancy, and a 10% increase in income per capita with 2.2 months. The same rate of improvement in healthier lifestyles (10%) is associated with a gain of 2.6 months of life expectancy (fewer smokers with 1.6 months, decreased alcohol use with 1 month). Other factors – out-of-pocket spending, healthy diet, unemployment, air pollution – had smaller effects at the aggregate level. For some of these factors, notably air pollution and healthy diet, this may reflect long time lags before they affect an individual's health.

These empirical results provide a useful aggregate picture of the relative importance of investments within and beyond the health system. Looking forward, future analysis using such macro-level data could include variables that proxy health policies and institutional characteristics, and sub-national analysis.

It is important, though, to reiterate that observed associations between life expectancy and explanatory factors at this macro-level does not guarantee causality. Indeed, it is important to recognise two-way causality, as ill-health worsens productivity, hinders job prospects, and adversely affects human capital development. For this reason, a review of more micro-level evidence was also undertaken. Such evidence was generally consistent with the macro-level analysis, while also providing further precision on the mechanisms by which different socio-economic factors and a person's living environment affect health. For example, the empirical results showed that income has a strong positive association with life expectancy. Micro-level evidence adds to this by demonstrating that the nature of income trajectories matter: persistent poverty has particularly adverse health effects, and falls in income have a larger impact on health than income gains.

Taken together, the main policy implication emerging from this analysis is the significant opportunities for health improvement from coordinated action across ministries responsible for education, the environment, income and social protection, alongside health ministries. This includes inter-sectoral action to address health-related behaviours. In this regard, the WHO Health in All Policies (HiAP) framework provides countries with an approach that systematically accounts for the health implications of public policies across sectors (WHO, 2013). Collaboration with the private sector will also be important, especially with employers in relation to working conditions. Particular attention should be paid to early childhood, since early life circumstances are crucial to future health and economic prospects, as well as to shaping health-related behaviours later in life. Such policies can help reduce health inequalities and achieve better health outcomes for all.

Notes

1. The studies referenced in the text are based on a systematic review of the literature, based on studies from 1995 or later that included OECD and/or BRIICS countries. Note that such econometric analyses face some common methodological issues, including two-way causality and delayed effects of certain factors on health outcomes. James et al. (forthcoming) explores these methodological issues in more detail.
2. A positive association with life expectancy is consistent with other country-level studies that have typically shown decreases in mortality (as well as morbidity) during economic downturns, when unemployment levels are higher (Ruhm, 2012). However, much of the observed correlation between unemployment and life expectancy in these studies has been explained by fewer traffic accidents and lower pollution (particularly as decreases in deaths have been concentrated among the elderly), rather than unemployment per se (Miller et al., 2009; van Gool and Pearson, 2014). Moreover, auxiliary regressions with interaction terms between unemployment and country dummies showed large variability in the sign and strength of this coefficient across countries.

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STAINLESS

3. HEALTH STATUS

Life expectancy at birth

Life expectancy by sex and education level

Main causes of mortality

Mortality from circulatory diseases

Mortality from cancer

Infant health

Mental health

Perceived health status

Cancer incidence

Diabetes prevalence

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Life expectancy at birth

Life expectancy at birth was on average 80.6 years across OECD countries in 2015 (Figure 3.1). There have been substantial gains in life expectancy over time, with life expectancy at birth on average ten years higher today than it was in 1970. A number of countries reported slight falls in life expectancy between 2014 and 2015, though preliminary data for 2016 suggest these reductions were temporary.

Among OECD countries, Turkey, Korea and Chile have experienced the largest gains since 1970, with increases of 24, 20 and 17 years respectively. Gains in longevity over time can be attributed to a number of factors within and beyond the health system. These include rising incomes, better education, healthier lifestyles and progress in health care (see Chapter 2 for further analysis). Indeed, each of these countries has experienced rapid economic growth alongside expanded health care coverage in recent decades.

Although the life expectancy in partner countries such as India, Indonesia, Brazil and China remains well below the OECD average, these countries have also achieved considerable gains in longevity over the past decades, with the level converging rapidly towards the OECD average. There has been less progress in South Africa (due mainly to the epidemic of HIV/AIDS), Lithuania and the Russian Federation (due mainly to the impact of the economic transition in the 1990s and a rise in risky health behaviours among men).

Japan, Spain and Switzerland lead a large group of 25 OECD countries in which life expectancy at birth now exceeds 80 years. A second group, including the United States, Chile and a number of central and eastern European countries, has a life expectancy between 75 and 80 years.

Among OECD countries, Latvia and Mexico had the lowest life expectancy in 2015, at around 75 years. Since 2000, life expectancy in Mexico has increased more slowly than in other OECD countries, with a gain of just over a year compared with an average gain of more than three years across OECD countries. Slow progress in life expectancy in Mexico is due to a number of factors, including harmful health-related behaviours such as poor nutrition and high obesity rates, increasing mortality rates from diabetes and a lack of progress in reducing mortality from circulatory diseases, high death rates from road traffic accidents and homicides, as well as persistent barriers of access to quality care.

In the United States, gains in life expectancy over the past few decades have also been more modest than in most other OECD countries. While life expectancy in the United States used to be one year *above* the OECD average in 1970, it is now almost two years *below* the average. Many factors can explain these lower gains in life expectancy, including: 1) the highly fragmented nature of the US health system, with relatively few resources devoted to public health and primary care, and a large share of the population uninsured; 2) health-related behaviours, including greater obesity rates, higher consumption of prescription and illegal drugs, more deaths from road traffic accidents and higher homicide rates; and 3) higher rates of poverty and income inequality than in most other OECD countries (National Research Council and Institute of Medicine, 2013).

Higher national income (as measured by GDP per capita) is generally associated with higher life expectancy at birth, although the relationship is less pronounced at the highest levels of national income (Figure 3.2). There are also notable differences in life expectancy between countries with similar income per capita. For example, Japan and Spain have higher, and Luxembourg, the United States and the Russian Federation lower, life expectancies than would be predicted by their GDP per capita alone.

Figure 3.3 shows the relationship between life expectancy at birth and health spending per capita across OECD, candidate and partner countries. Higher health spending per capita is generally associated with higher life expectancy at birth, although this relationship tends to be less pronounced in countries with the highest health spending per capita. Japan, Spain and Korea stand out as having relatively high life expectancies, and the United States and the Russian Federation relatively low life expectancies, given their levels of health spending.

Definition and comparability

Life expectancy at birth measures how long, on average, people would live based on a given set of age-specific death rates. However, the actual age-specific death rates of any particular birth cohort cannot be known in advance. If age-specific death rates are falling (as has been the case over the past decades), actual life spans will be higher than life expectancy calculated with current death rates.

The methodology used to calculate life expectancy can vary slightly between countries. This can change a country's estimates by a fraction of a year.

Life expectancy at birth for the total population is calculated by the OECD Secretariat for all OECD countries, using the unweighted average of life expectancy of men and women.

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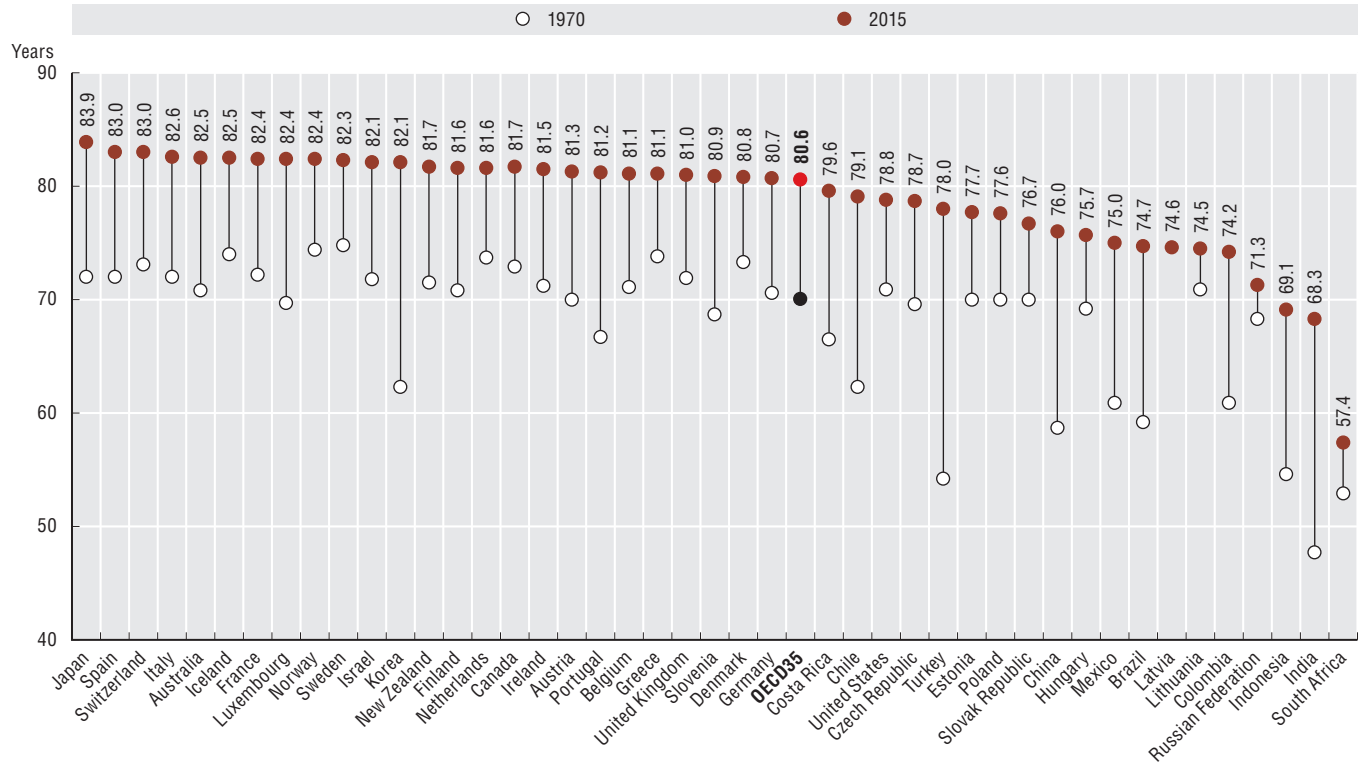
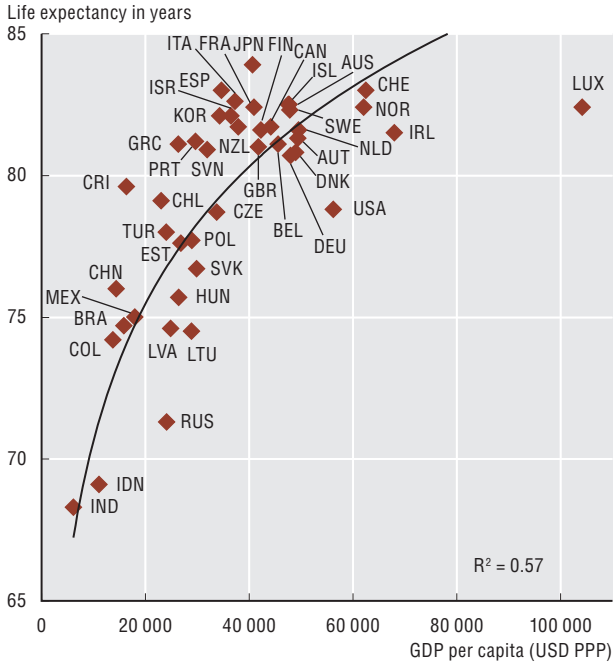
3.1. Life expectancy at birth, 1970 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602234

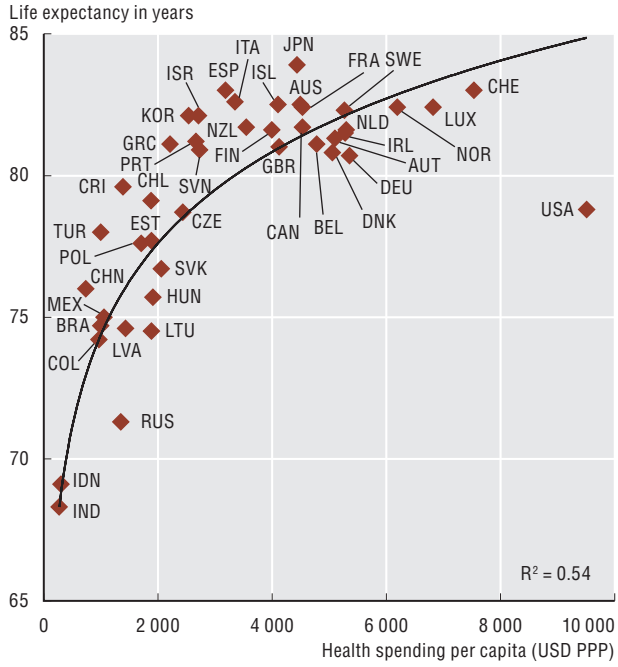
3.2. Life expectancy at birth and GDP per capita, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602253

3.3. Life expectancy at birth and health spending per capita, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602272

Life expectancy by sex and education level

There remain large gaps in life expectancy between women and men in all OECD countries. On average across OECD countries, life expectancy at birth for women was 83.1 years in 2015, compared with 77.9 years for men, a gap of 5.2 years (Figure 3.4). The gender gap in life expectancy increased substantially in many OECD countries during the 1970s and early 1980s to reach a peak of almost seven years in the mid-1980s, but it has narrowed since, reflecting higher gains in life expectancy among men than women. This can be attributed at least partly to narrowing of differences in risk-increasing behaviours such as smoking, accompanied by sharp reductions in mortality rates from circulatory diseases among men.

In 2015, life expectancy for women in OECD countries ranged from less than 80 years in Hungary, Latvia and Mexico to more than 85 years in Japan, Spain, France, Korea and Switzerland. Life expectancy for men ranged from less than 75 years in Latvia, Mexico, Hungary, the Slovak Republic, Estonia and Poland to over 80 years in Iceland, Japan, Switzerland, Norway, Australia, Sweden, Italy, Israel and Spain.

Among OECD countries, the gender gap in life expectancy is relatively narrow in Iceland, the Netherlands, New Zealand, the United Kingdom, Norway, Sweden, Ireland and Denmark (a gap of less than four years), but much larger in Latvia (around ten years) Estonia (around nine years), Poland (around eight years), the Slovak Republic and Hungary (around seven years). In this latter group of countries, gains in life expectancy of men over the past few decades have been much more modest than in other countries. For partner countries, the gender gap is also large in the Russian Federation, Lithuania and Colombia (seven years or more), and small in China (around three years).

Life expectancy in OECD countries varies by socio-economic status as measured, for instance, by education level (Figure 3.5). A higher education level not only provides the means to improve the socio-economic conditions in which people live and work, but may also promote the adoption of healthier lifestyles and facilitate access to appropriate health care.

On average among 25 OECD countries for which recent data are available, people with the highest level of education can expect to live around six years longer than people with the lowest level of education at age 30 (53.4 versus 47.8 years). These differences in life expectancy by education level are particularly pronounced for men, with an average gap of seven years. Differences are especially pronounced in central and eastern European countries (Slovak Republic, Estonia, Poland, Hungary, Latvia and the Czech Republic), where the life expectancy gap between higher and lower educated men is more than ten years. This is largely explained by older people in these countries having lower levels of education, and the greater prevalence of risk factors among men, such as tobacco and alcohol use. In other countries such as Turkey, Sweden and Canada, inequalities are less pronounced. Differences in lifespan between people with low and high education have been estimated to account for about 10% of overall inequalities in ages at death (Murtin et al., 2017).

Definition and comparability

Life expectancy at birth measures how long, on average, people would live based on a given set of age-specific death rates. However, the actual age-specific death rates of any particular birth cohort cannot be known in advance. If age-specific death rates are falling (as has been the case over the past decades), actual life spans will be higher than life expectancy calculated with current death rates. Data for life expectancy at birth comes from Eurostat for EU countries, and from national sources elsewhere. The methodology used to calculate life expectancy can vary slightly between countries. This can change a country's estimates by a fraction of a year.

Data for life expectancy by education level come from national suveys provided for the OECD Health Data questionnaire for Israel, Mexico and the Netherlands; from the OECD Statistics Directorate project (see Murtin et al. below) for Australia, Austria, Belgium, Canada, France, Latvia, the United Kingdom and the United States; and from Eurostat for the remaining 14 European countries shown in Chart 3.5.

To calculate life expectancies by education level, detailed data on deaths by sex, age and education level are needed. However, not all countries have information on education as part of their deaths data. In such cases, data linkage to another source (e.g. a census) which does have information on education may be required (Corsini, 2010). Note further that data disaggregated by education are only available for a subset of the population for Belgium, the Czech Republic and Norway, and that there are more missing data on education among the deceased than the population at large. In these three countries, the large share of the deceased population with missing education (above 40%) could affect the accuracy of results.

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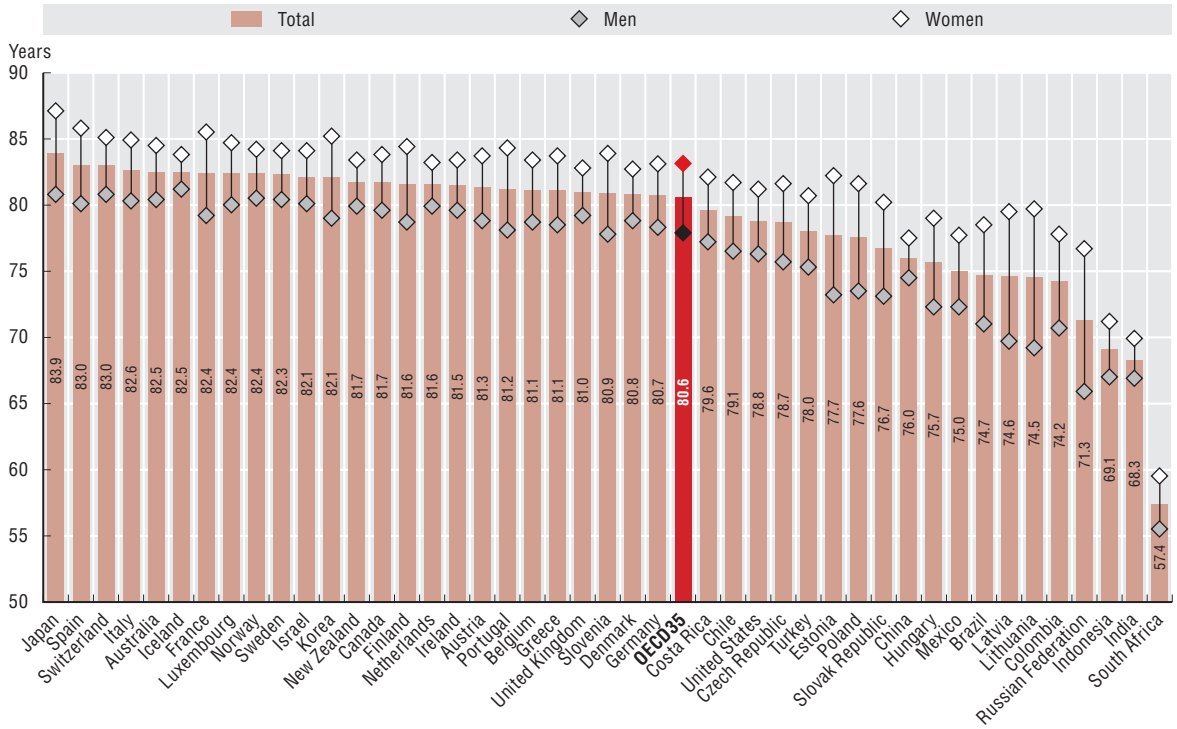
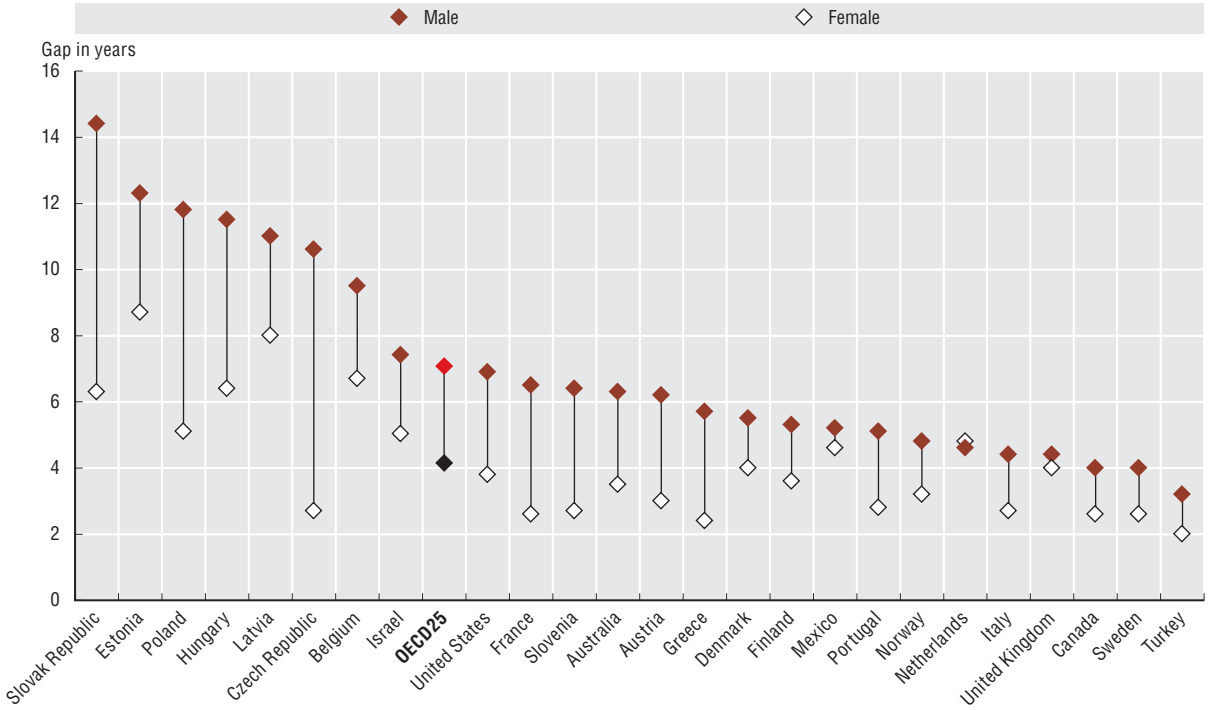
3.4. Life expectancy at birth by sex, 2015 (or nearest year)



Note: Countries are ranked in descending order of life expectancy for the whole population.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602291

3.5. Gap in life expectancy at age 30 between highest and lowest education level, by sex, 2015 (or nearest year)



Note: The figures show the gap in the expected years of life remaining at age 30 between adults with the highest level ("tertiary education") and the lowest level ("below upper secondary education") of education.
Source: Eurostat database complemented with OECD Statistics Directorate data and national data for Israel, Mexico and the Netherlands.

StatLink http://dx.doi.org/10.1787/888933602310

Main causes of mortality

Over 10 million people died in 2015 across OECD countries, which equates to an average of 793 deaths per 100 000 population. Diseases of the circulatory system and cancer are the two leading causes of death in most countries. Across the OECD, more than one in three deaths were caused by ischaemic heart diseases, stroke or other circulatory diseases; and one in four deaths were related to cancer.

Two factors can explain certain commonalities in causes of death across OECD and partner countries. First, population ageing is important since the main causes of death change with age. Among younger adults, cancer-related deaths occur more frequently than many other causes. After age 50, deaths due to diseases of the circulatory system rise steadily, and become one of the major causes of death after age 80, along with dementia. Second is the epidemiological transition from communicable to non-communicable diseases, which has already taken place in high-income countries and is rapidly occurring in many middle-income countries (GBD, 2013).

Variation across OECD and partner countries is substantial. All-cause mortality rates (age-standardised) ranged from 583 deaths per 100 000 population in Japan to over 1 000 deaths per 100 000 in Hungary, Latvia, Lithuania, the Russian Federation and the Slovak Republic in 2015 (Figure 3.6). Looking at specific causes, diseases of the circulatory system were the main cause of mortality in most OECD countries. They caused over 600 deaths per 100 000 population in Latvia and Lithuania, and 869 deaths per 100 000 in the Russian Federation. Japan and France had the lowest rates, at 152 and 164 deaths per 100 000 population respectively. Diet, smoking and alcohol consumption play important roles in these diseases, as does access to treatment.

Variations in cancer-related deaths was less substantial but still significant, ranging from 123 to 286 deaths per 100 000 in 2015. Other causes of death were particularly important in specific countries. For example, respiratory system diseases (predominantly chronic obstructive pulmonary diseases) caused over 100 deaths per 100 000 in Ireland, the United Kingdom, Brazil and Colombia. External causes (predominantly assault, accidents and intentional self-harm) accounted for over 80 deaths per 100 000 in Brazil, Latvia, Lithuania, South Africa and the Russian Federation. HIV-AIDS caused more than 50 deaths per 100 000 population in South Africa.

The main causes of death also differ by gender (Figure 3.7). For example, dementia is a more important cause of death for women than for men. In contrast, the rates of lung cancer and accident-related deaths were higher for men than for women. A body of evidence suggests that alongside intrinsic gender differences, women are more likely to choose healthy behaviours (Gore et al., 2011).

It is also worth noting that the main causes of death diverge between socio-economic groups. Social disparities are generally larger for the most preventable diseases, as deaths are amenable to medical intervention, behaviour change and injury prevention (Mackenbach et al., 2015).

Definition and comparability

Mortality rates are based on numbers of deaths registered in a country in a year divided by the size of the corresponding population. The rates have been directly age-standardised to the 2010 OECD population (available at *http://oe.cd/mortality*) to remove variations arising from differences in age structures across countries and over time. The source is the *WHO Mortality Database*.

Deaths from all causes are classified to ICD-10, Codes A00-Y89, excluding S00-T98. The classification of causes of death defines groups and subgroups. Groups are umbrella terms covering diseases that are related to each other; subgroups refer to specific diseases. For example, the group diseases of the respiratory system comprises 4 subgroups: influenza, pneumonia, chronic obstructive pulmonary diseases and asthma.

References

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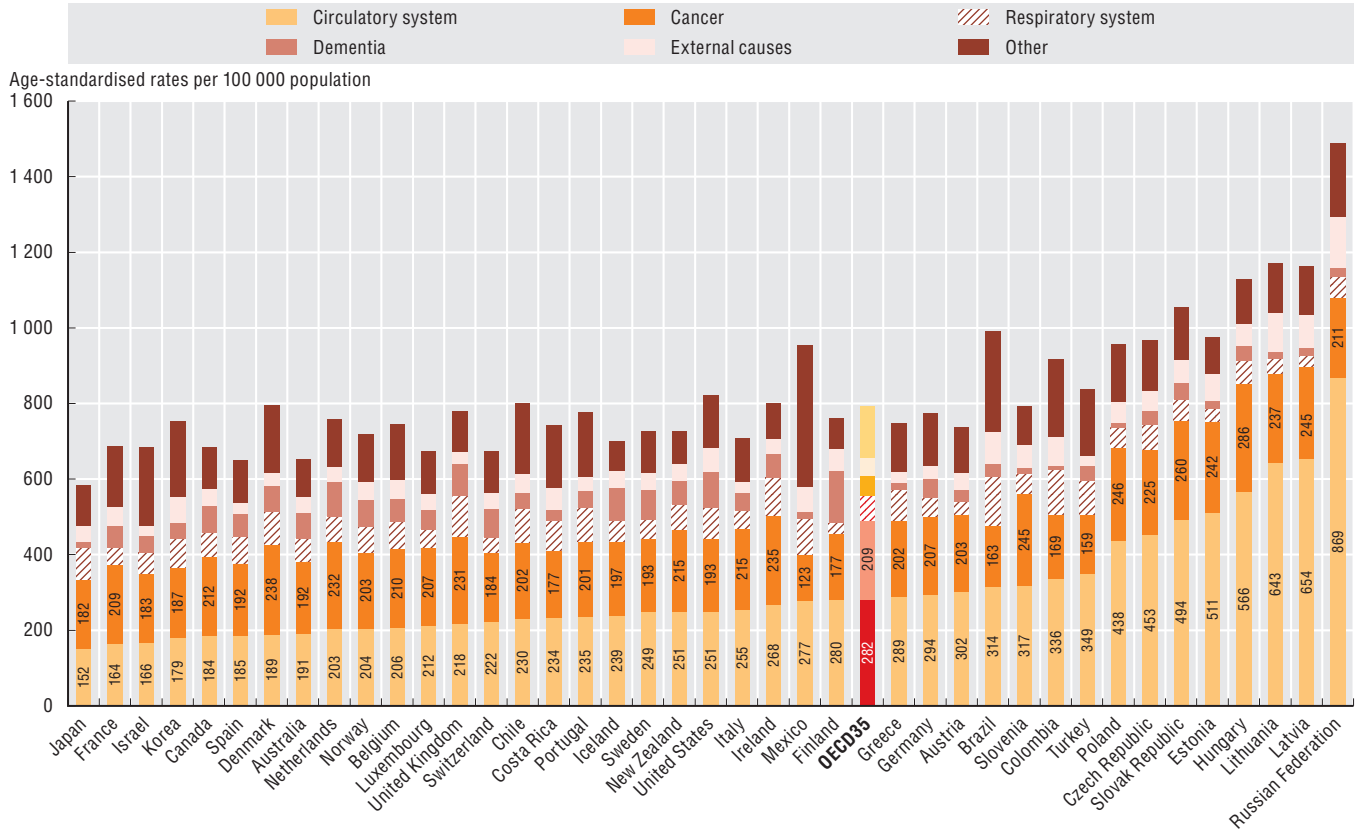
Gore, F. et al. (2011), "Global Burden of Disease in Young People Aged 10–24 Years: A Systematic Analysis", *The Lancet*, Vol. 377, pp. 2093–2102.

Mackenbach, J. et al. (2015), "Variations in the Relation Between Education and Cause-specific Mortality in 19 European Populations: A Test of the 'Fundamental Causes' Theory of Social Inequalities in Health", *Social Science & Medicine*, Vol. 127, pp. 51-62.

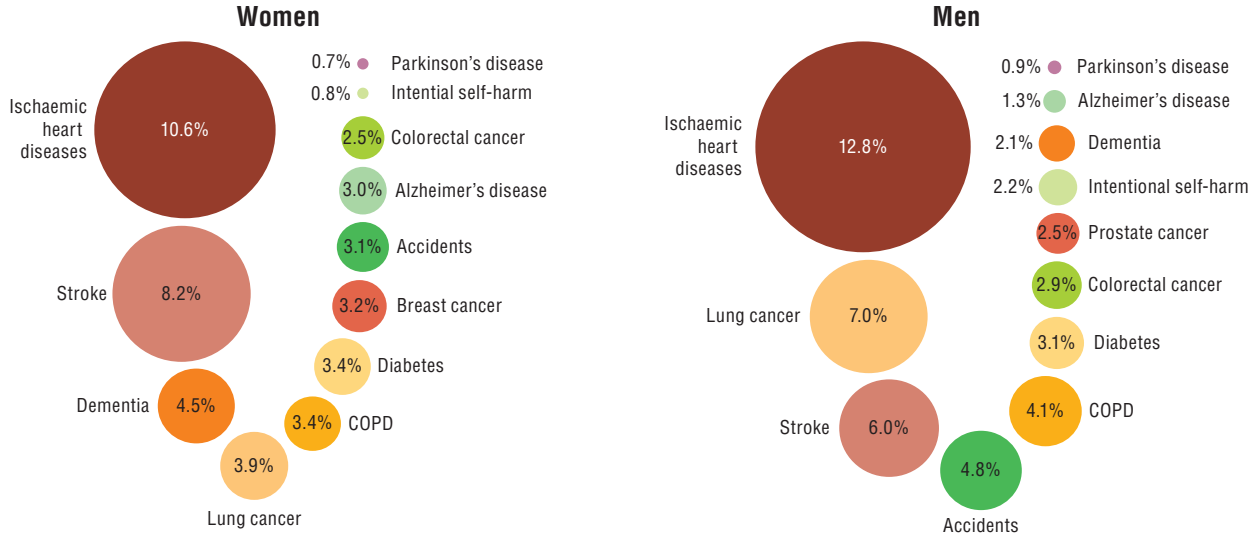
3.6. Main causes of mortality per country, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602329

3.7. Main causes of mortality by gender, 2015 (or nearest year)



Note: Shares of the sum of all deaths across OECD countries, by gender.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602348

Mortality from circulatory diseases

Despite substantial declines in recent decades, circulatory diseases remain the main cause of mortality in most OECD countries, accounting for more than one-third (36%) of all deaths in 2015. Prospects for further reductions may be hampered by a rise in certain risk factors such as obesity and diabetes (OECD, 2015). Circulatory diseases cover a range of illnesses related to the circulatory system, particularly ischaemic heart disease (including heart attack) and cerebrovascular diseases such as stroke.

Ischaemic heart disease (IHD) is caused by the accumulation of fatty deposits lining the inner wall of a coronary artery, restricting blood flow to the heart. IHD alone was responsible for nearly 12% of all deaths in OECD countries in 2015. However, mortality from IHD varies considerably across countries (Figure 3.8). Among OECD countries, Central and Eastern European countries report the highest IHD mortality rates. Rates are also high in the Russian Federation. Japan, Korea and France report the lowest rates. Across OECD countries, IHD mortality rates in 2015 were around 82% higher for men than women.

IHD mortality rates have declined in nearly all OECD countries, with an average reduction of more than 50% since 1990, contributing greatly to gains in life expectancy, particularly among men. The decline has been most remarkable in Denmark, the Netherlands, Norway and Israel, where rates fell by over 70%. Declining tobacco consumption contributed significantly to reducing the incidence of IHD (see indicator on "Smoking among adults" in Chapter 4), and consequently to reducing mortality rates. Improvements in medical care have also contributed to reduced mortality rates (see indicators on "Mortality following acute myocardial infarction" in Chapter 6 and "Hospital discharges" in Chapter 9).

In Korea, IHD mortality rates have increased substantially since 1990, although they remain low compared with nearly all other OECD countries and have started to fall after peaking in 2006. The initial rise in IHD mortality rates in Korea has been attributed to changes in lifestyle and dietary patterns as well as environmental factors at the time of birth, with people born between 1940 and 1950 facing higher relative risks. In 2006, Korea introduced a Comprehensive Plan to tackle circulatory diseases that encompassed prevention and primary care as well as better acute care, contributing to the reduction in mortality in recent years (OECD, 2012).

Cerebrovascular disease was the underlying cause for about 7% of all deaths in OECD countries in 2015. Cerebrovascular disease refers to a group of diseases that relate to problems with the blood vessels that supply the brain. Common manifestations of cerebrovascular disease include ischaemic stroke, which develops when the brain's blood supply is blocked or interrupted, and haemorrhagic stroke which occurs when blood leaks from blood vessels into the surface of the brain. In addition to being an important cause of mortality, the disability burden from stroke and other cerebrovascular diseases is also substantial (Feigi et al., 2016).

There are large variations in cerebrovascular disease mortality rates across countries (Figure 3.9). Among OECD countries, Latvia, Hungary and the Slovak Republic report a cerebrovascular mortality that is more than three times higher than that of Switzerland, Canada and France, and have the highest mortality rates for both IHD and cerebrovascular disease. Rates are also high in the partner countries of the Russian Federation and South Africa. The high prevalence of risk factors common to both diseases (e.g. smoking and high blood pressure) may explain this link.

Since 1990, cerebrovascular disease mortality has decreased in all OECD countries, although to a lesser extent in Poland and the Slovak Republic. On average, the mortality burden from cerebrovascular disease has halved across OECD countries. In Estonia, Luxembourg, Portugal, the Czech Republic and Austria, the rates have been cut by over 70%. As with IHD, the reduction in mortality from cerebrovascular disease can be attributed at least partly to a reduction in risk factors as well as improvements in medical treatments (OECD, 2015; see indicator "Mortality following ischaemic stroke" in Chapter 6) but rising obesity and diabetes threatens progress in tackling cerebrovascular disease (OECD, 2015).

Definition and comparability

Mortality rates are based on numbers of deaths registered in a country in a year divided by the size of the corresponding population. The rates have been directly age-standardised to the 2010 OECD population (available at *http://oe.cd/mortality*) to remove variations arising from differences in age structures across countries and over time. The source is the *WHO Mortality Database*.

Deaths from ischaemic heart disease are classified to ICD-10 codes I20-I25, and cerebrovascular disease to I60-I69.

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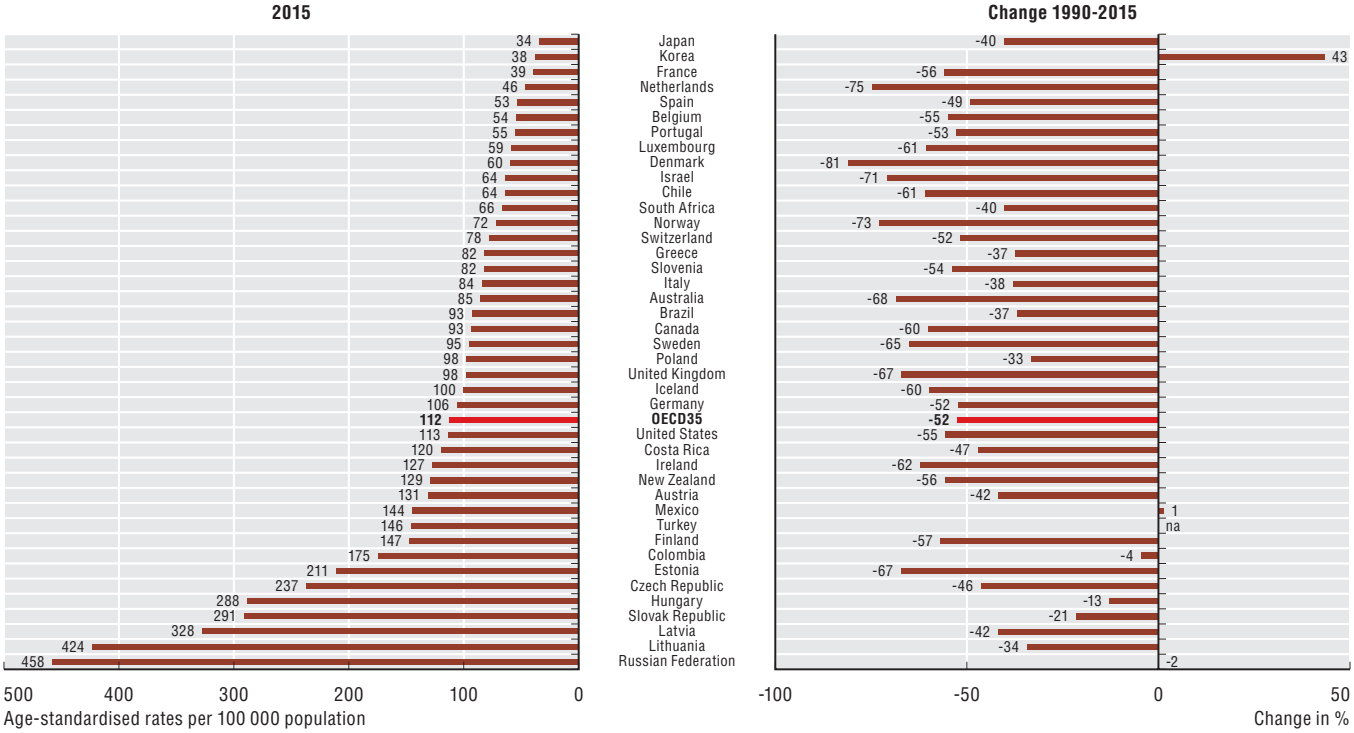
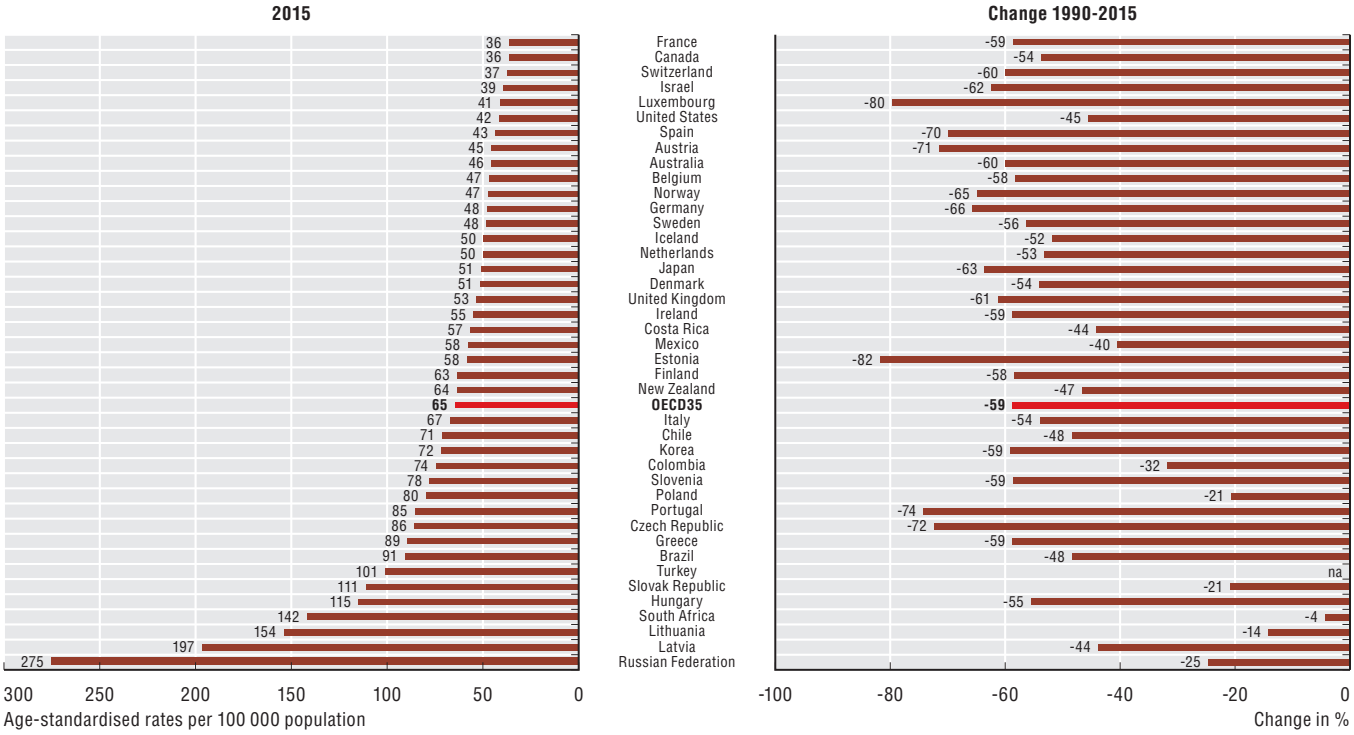
3.8. Ischaemic heart disease mortality, 2015 and change 1990-2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602367

3.9. Cerebrovascular disease mortality, 2015 and change 1990-2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602386

Mortality from cancer

Cancer is the second leading cause of mortality in OECD countries after circulatory diseases, accounting for 25% of all deaths in 2015, up from 15% in 1960. In a number of countries such as Denmark, France, Japan, the Netherlands, Canada, the United Kingdom, Spain, Belgium and Australia, the mortality rate for cancer is higher than for circulatory diseases. The rising share of deaths due to cancer reflects the fact that mortality rates from other causes, particularly circulatory diseases, has been declining more rapidly than for cancer.

There are more than 100 different types of cancers. For a large number of cancer types, the risk of developing the disease rises with age. While genetics is a risk factor, only about 5% to 10% of all cancers are inherited. Modifiable risk factors such as smoking, obesity, lack of exercise and excess sun exposure, as well as environmental exposures, explain up to 90-95% of all cancer cases (Anand et al., 2008). Prevention, early detection and treatment remain at the forefront in the battle to reduce the burden of cancer (OECD, 2013).

In 2015, the average rate of mortality attributable to cancer across OECD countries was just over 200 per 100 000 population (Figure 3.10). Mortality due to cancer was lowest in Mexico, Turkey, Finland, Switzerland, Japan, Israel and Korea, with rates less than 180 per 100 000 population. Among partner countries, rates were also less than 180 per 100 000 in Colombia, Brazil, Costa Rica and South Africa. Hungary, the Slovak Republic, Slovenia and Latvia bear the highest cancer mortality burden, with rates in excess of 240 per 100 000 population.

In most OECD countries, cancer-related mortality rates have fallen since 1990, with the largest reductions in the Czech Republic and Switzerland. On average, rates fell by 18% between 1990 and 2015. Substantial declines in mortality from stomach cancer, colorectal cancer, lung cancer for men, breast, cervical and ovarian cancer for women, as well as prostate cancer for men contributed to this reduction. However, these gains were partially offset by increases in the number of deaths due to cancer of the liver, skin and pancreas for both sexes, as well as lung cancer for women.

Mortality due to cancer is consistently higher for men than for women in all countries (Figure 3.11). The gender gap was particularly wide in Korea, Turkey, Latvia, Estonia, Spain and Portugal, with rates among men more than twice those for women. This gender gap can be explained partly by the greater prevalence of risk factors among men, notably smoking.

Among men, lung cancer imposes the highest mortality burden, accounting for 22% of all cancer-related deaths (Figure 3.12). For women, lung cancer accounted for 16% of all cancer-related deaths. In many countries, lung cancer mortality rates for men have decreased over the last 25 years, in particular in Mexico, the Netherlands, Czech Republic, Finland and the United Kingdom where they fell by about 50%. But lung cancer mortality has risen for women in several countries such as the Netherlands, France and Spain where it has more than doubled since 1990. These conflicting trends are, to a large degree, explained by the high number of females who started smoking several decades later than males.

Breast cancer is the second most common cause of cancer mortality in women in many OECD countries. While there has been an increase in the incidence of breast cancer over the past decade, mortality has declined in most countries due to earlier diagnosis and better treatment. Mortality from breast cancer increased in Korea and Japan, though the rates there remained the lowest in 2015. Mortality rates from breast cancer in 2015 were highest in Ireland, Iceland, Hungary, Denmark and the Netherlands.

Colorectal cancer is a major cause of cancer mortality among both men and women (second-highest cause of cancer mortality in men and third in women). In Japan, it is the leading cause of cancer mortality in women. In 2015, colorectal cancer mortality was lowest in Mexico and Turkey, and highest in Hungary and the Slovak Republic. Prostate cancer has become the most common cancer among men in many OECD countries, particularly among men aged 65 years and over.

Definition and comparability

Mortality rates are based on numbers of deaths registered in a country in a year divided by the size of the corresponding population. The rates have been directly age-standardised to the 2010 OECD population (available at *http://oe.cd/mortality*) to remove variations arising from differences in age structures across countries and over time. The source is the *WHO Mortality Database*.

Deaths from all cancers are classified to ICD-10 codes C00-C97. The international comparability of cancer mortality data can be affected by differences in medical training and practices as well as in death certification across countries.

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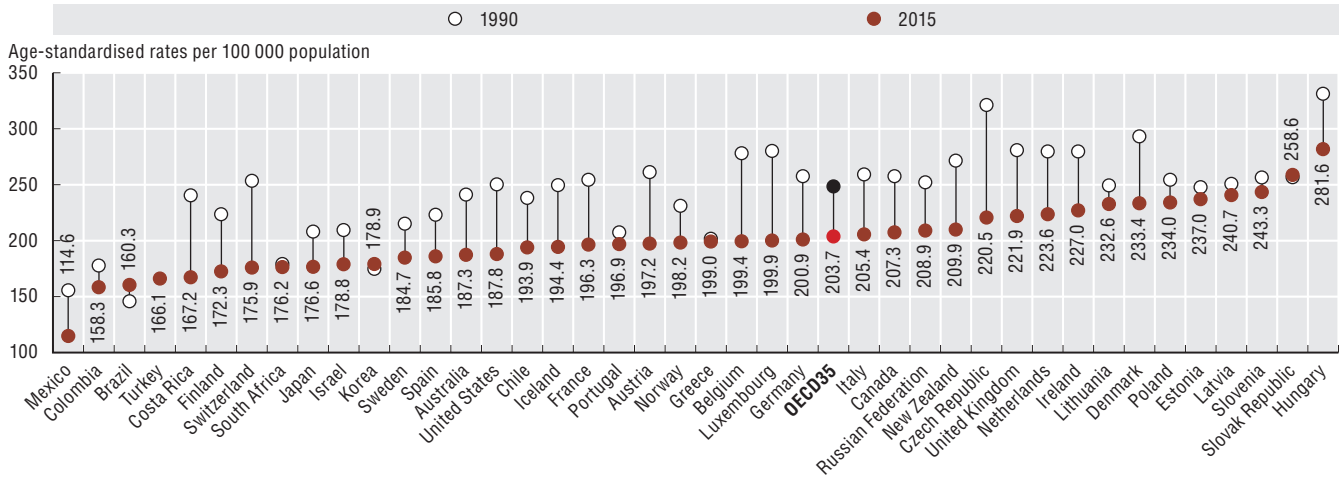
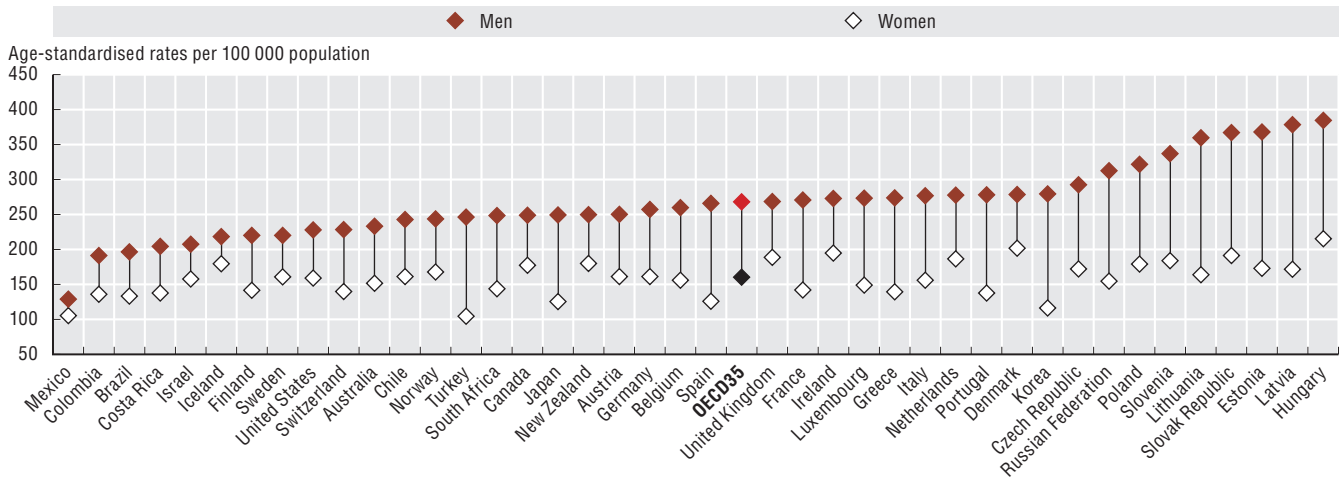
3.10. Cancer mortality, 1990 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602405

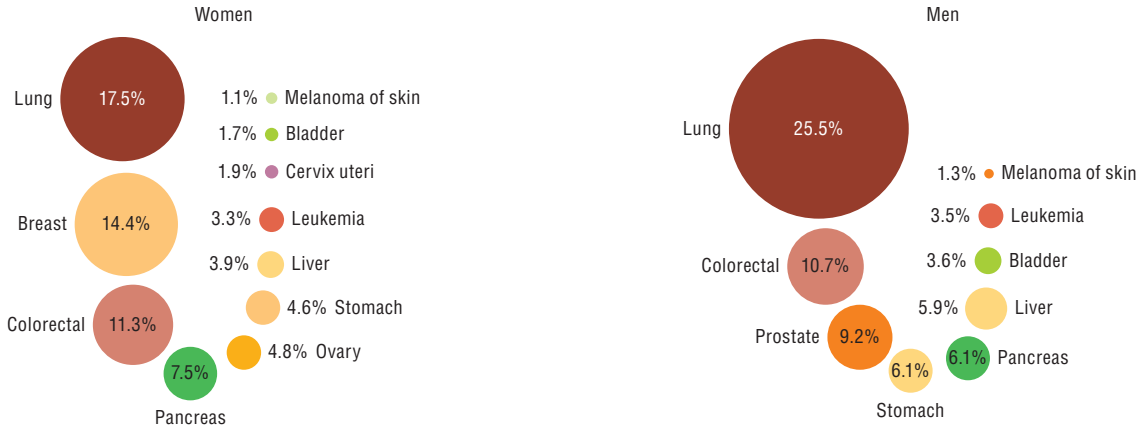
3.11. Cancer mortality by gender, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602424

3.12. Main causes of cancer mortality by gender, 2015 (or nearest year)



Note: Shares of the sum of cancer-related deaths across OECD countries, by gender.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602443

Infant health

Infant mortality, the rate at which babies and children of less than one year of age die, is the most fundamental measure of infant health. In OECD countries, around two-thirds of the deaths that occur during the first year of life are neonatal deaths (i.e. during the first four weeks). Birth defects, prematurity and other conditions arising during pregnancy are the main factors contributing to neonatal mortality in developed countries. For deaths beyond a month (post-neonatal mortality), there tends to be a greater range of causes – the most common being SIDS (sudden infant death syndrome), birth defects, infections and accidents.

In most OECD countries infant mortality is low and there is little difference in rates (Figure 3.13). In 2015, the average in OECD countries was less than four deaths per 1 000 live births. Turkey and Mexico still have comparatively high infant mortality at above ten deaths per 1 000 live births.

In some large partner countries (India, South Africa and Indonesia), infant mortality remains above 20 deaths per 1 000 live births, although in these three countries infant mortality has reduced considerably in recent decades. Indeed, infant mortality has fallen significantly in all OECD and partner countries, with reductions since 1990 particularly large in Slovenia, Estonia, Poland, Korea and China.

Despite this progress in reduced infant mortality, increasing numbers of low birth weight infants is a concern in some OECD countries. In a number of countries, this has contributed to a levelling-off of the downward trend in infant mortality over the past few years. On average, one in 15 babies born in the OECD (or 6.5% of all births) weighed less than 2 500 grams at birth in 2015 (Figure 3.14). In almost all OECD countries, the proportion of low birth weight infants has increased over the past two decades, mainly due to increases in pre-term births (Euro-Peristat, 2013). Korea, Spain, Portugal, Greece and Japan have seen large increases (50% or more) of low birth weight babies since 1990, although the proportions remain below the OECD average in Korea.

Low birth weight can occur as a result of restricted foetal growth or from pre-term birth. Low birth weight infants have a greater risk of poor health or death, require a longer period of hospitalisation after birth, and are more likely to develop significant disabilities. Risk factors for low birth weight include maternal smoking, excessive alcohol consumption, poor nutrition, low body mass index, lower socio-economic status, having had in-vitro fertilisation treatment and multiple births, and a higher maternal age. The increased use of delivery management techniques such as induction of labour and caesarean delivery, which have increased the survival rates of low birth weight babies, may also explain the rise in low birth weight infants. Despite the widespread use of a 2 500 grams limit for low birth weight, physiological variations in size occur across different countries and population groups, and these need to be taken into account when interpreting differences (Euro-Peristat, 2013).

Comparisons of different population groups within countries indicate that both infant mortality and the proportion of low birth weight infants may be influenced by differences in education level, income and associated living conditions. For example, in the United States, black women are more likely to give birth to low birth weight infants, with an infant mortality more than double that for white women (NCHS, 2015). Similar differences have also been observed among the indigenous and non-indigenous populations in Australia, Mexico and New Zealand, reflecting the disadvantaged living conditions of many of these mothers.

Definition and comparability

The infant mortality rate is the number of deaths of children under one year of age, expressed per 1 000 live births. Some of the international variation in infant mortality rates is related to variations in registering practices for very premature infants. While some countries register all live births including very small babies with low odds of survival, several countries apply a minimum threshold of a gestation period of 22 weeks (or a birth weight threshold of 500 g) for babies to be registered as live births (Euro-Peristat, 2013). To remove this data comparability limitation, the data presented in this section are based on a minimum threshold of 22 weeks of gestation period (or 500 grams birth weight) for a majority of OECD countries that have provided these data. However, the data for some countries (e.g., Canada and Australia) continue to be based on all registered live births, resulting in some over-estimation.

Low birth weight is defined by the World Health Organization as the weight of an infant at birth of less than 2 500 grams (5.5 pounds) irrespective of the gestational age of the infant. This threshold is based on epidemiological observations regarding the increased risk of death to the infant and serves for international comparative health statistics. The number of low weight births is expressed as a percentage of total live births.

References

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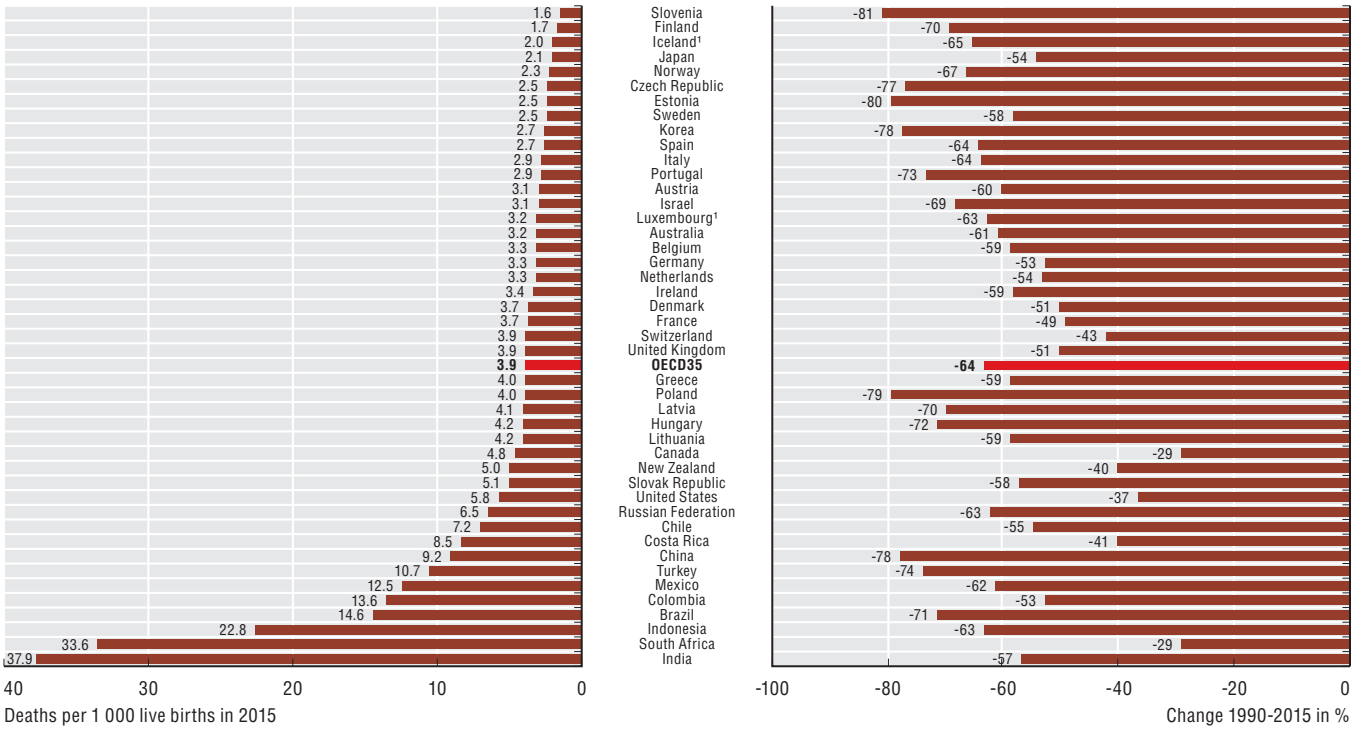
A corrigendum has been issued for this page. See: http://www.oecd.org/about/publishing/Corrigendum_Health_at_a_Glance_2017.pdf

3.13. Infant mortality, 2015 and change 1990-2015 (or nearest year)

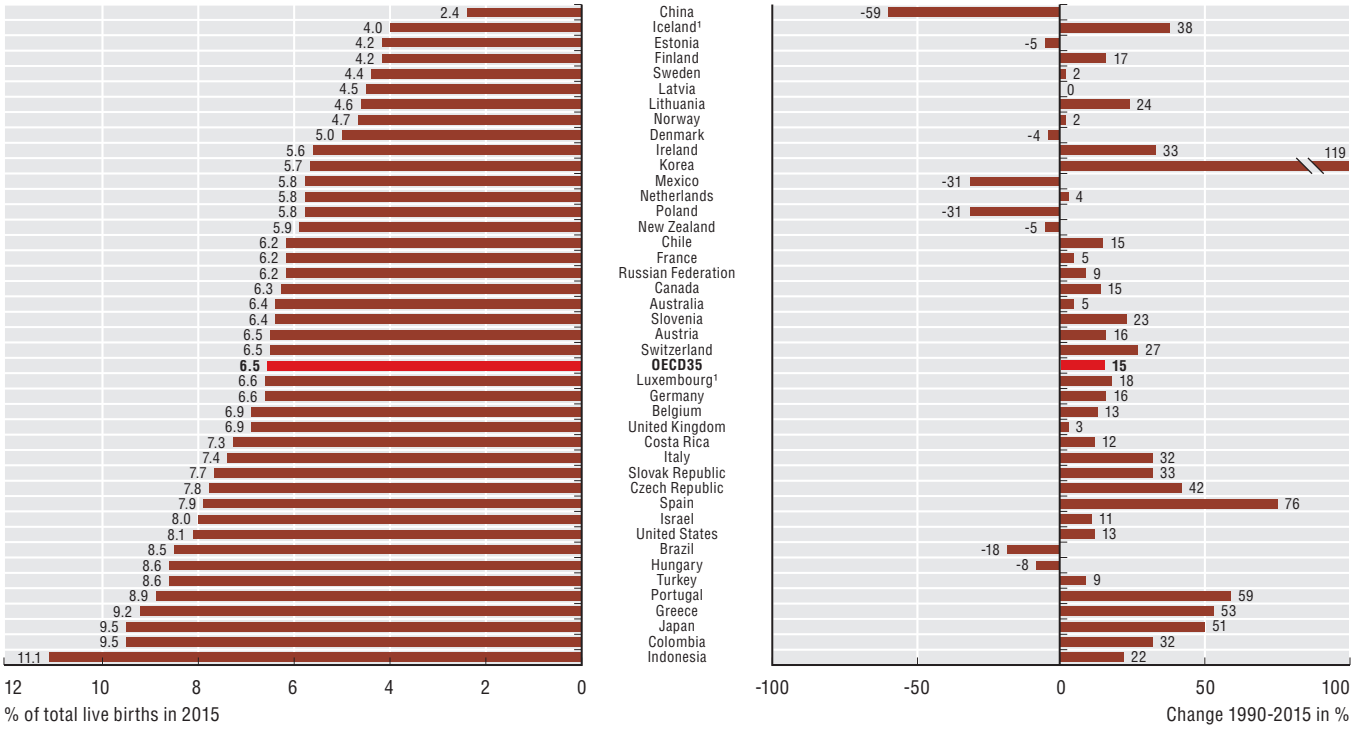


1. Three-year average (1988-90 and 2013-15).

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602462

3.14. Low birth weight infants, 2015 and change 1990-2015 (or nearest year)



1. Three-year average (1988-90 and 2013-15).

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602481

Mental health

Mental illness represents a considerable – and growing – proportion of the global burden of disease. An estimated one in two people will experience a mental illness in their lifetime, and around one in five working-age adults suffer from mental ill-health at any given time (OECD, 2012; OECD, 2015). Depression alone affects millions of individuals each year. Figure 3.17 shows self-reported prevalence of depression in Europe. On average, 12-month prevalence of depression was 7.9% of the population. Women reported higher rates of depression in all countries; in Spain, Lithuania, Hungary, Poland women were more than 50% more likely to report experiencing depression in the previous year than men, rising to 66% in Portugal. People in Iceland or Ireland were close to three times more likely to report depression than people in the Czech Republic (Figure 3.17). These differences are in part driven by different attitudes and understandings around mental ill-health and depression. Lower stigma around depression may contribute to higher rates of self-reported illness, and higher rates of diagnosis.

When people are suffering from a mental disorder, it has significant consequences across their lives, contributing to poorer educational outcomes, higher rates of unemployment, and poorer physical health. In serious cases depression and other mental illnesses, such as bipolar disorder and schizophrenia, can lead to people harming themselves, or even dying from suicide (McDaid et al., 2017). There are other complex reasons that contribute to the rate of death by suicide. The social context, poverty, substance abuse, and unemployment are all associated with higher rates of suicide.

Suicide remains a significant cause of death in many OECD countries. Figure 3.15 shows that in 2015 suicide rates were lowest in South Africa, Turkey, Greece and Colombia with fewer than five deaths by suicide per 100 000 population. Lithuania had the highest suicide rate, with 29 deaths per 100 000, followed by Korea and the Russian Federation. Some caution is needed when comparing suicide rates. Stigma associated with suicide, or problems with recording suicides mean that in some countries deaths by suicide may be under-reported. Unlike depression prevalence, mortality rates for suicide are three-to-four times higher for men than for women. Studies suggest that the gender gap for attempted suicide is smaller, but men tend to use more lethal means when attempting suicide.

Suicide rates have decreased steadily across the OECD, falling by close to 30% between 1990 and 2015. In some countries the declines have been significant, including in Estonia, Finland and Hungary where suicide rates have fallen by 40% or more (Figure 3.16). In Finland significant declines in suicide can be attributed at least in part to targeted mental health promotion and suicide prevention programmes, as well as to improved mental health care. In some other countries suicides have increased in recent years. In Mexico the suicide rate increased from 4.8 per 100 000 population in 2010 to 5.5 in 2015, while in the United States the rate rose from 12.5 to 13.5. A range of interventions can both prevent and treat depression, and prevent suicide, but in many countries people with mental ill-health have difficulties accessing appropriate mental health care in a timely way.

Definition and comparability

The registration of a suicide is a complex procedure, which is affected by factors including how intent is ascertained, who is responsible for completing the death certificate, and cultural dimensions including stigma around suicide. Caution is therefore needed when comparing suicide rates between countries. Mortality rates are based on numbers of deaths divided by the size of the corresponding population. The rates have been age-standardised to the OECD population. The source is the *WHO Mortality Database*; suicides are classified under ICD-10 codes X60-X84, Y870.

Estimates of the prevalence of depression are derived from the second wave of the European Health Interview Survey. Respondents were asked: "During the past 12 months, have you had any of the following diseases or conditions?" with the list including depression. Self-reported data on depression may be subject to under-diagnosis and reporting errors. Studies from several European countries show more variation between countries in self-reported data on mental illness than on other survey methods.

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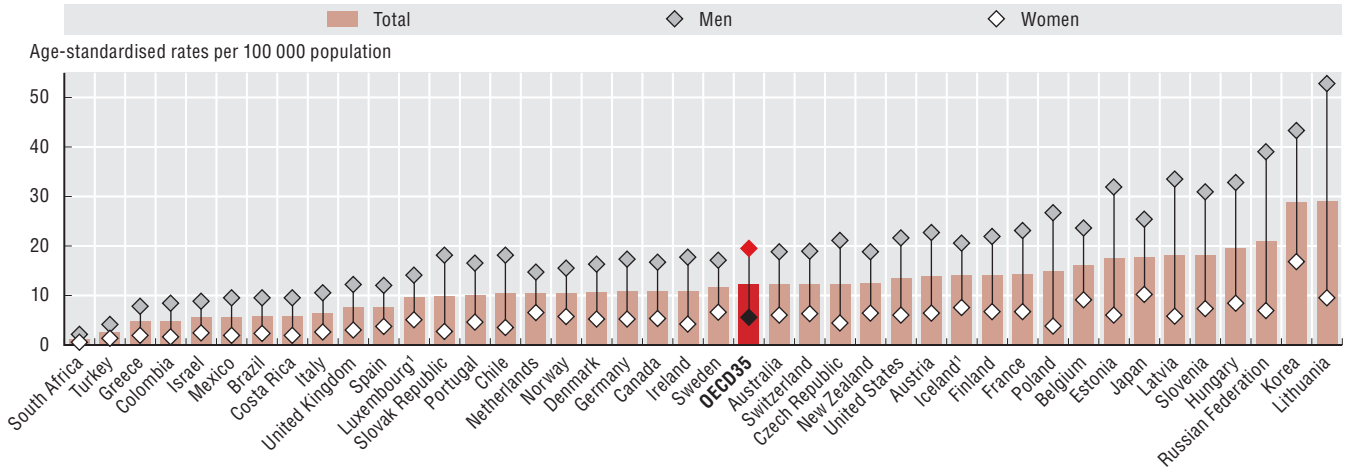
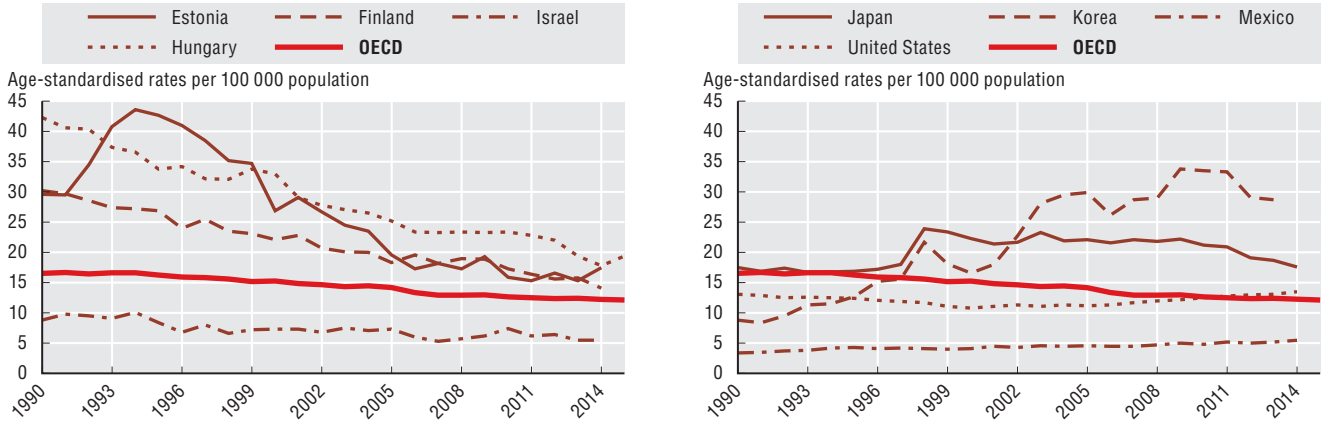
3.15. Suicide, 2015 (or nearest year)



1. Three-year average.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602500

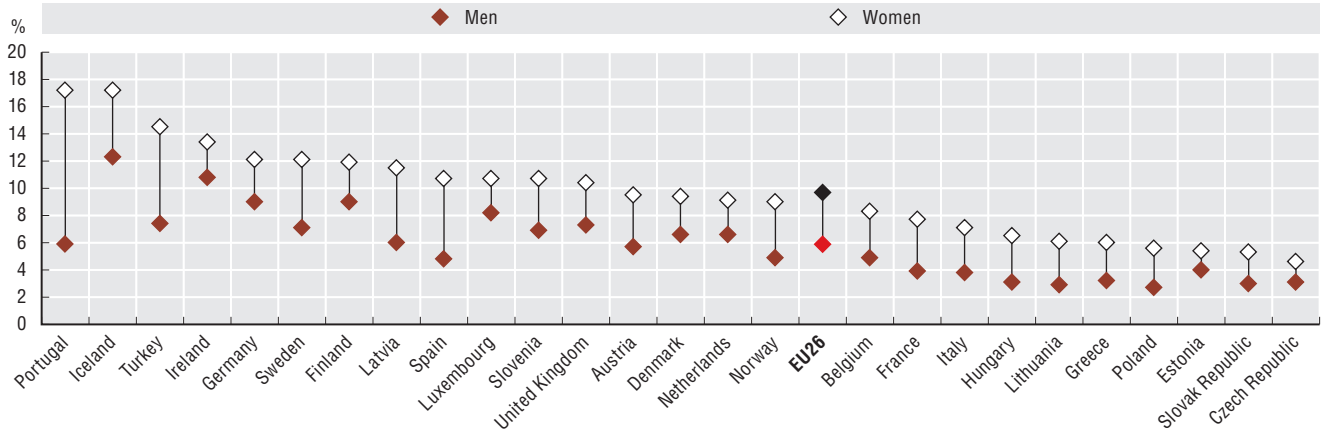
3.16. Trends in suicide, selected OECD countries, 1990-2015



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602519

3.17. Prevalence of chronic depression, 2014



Note: Self-reported prevalence of depression in the past 12 months.
Source: Eurostat Database, 2017.

StatLink http://dx.doi.org/10.1787/888933602538

Perceived health status

Most OECD countries conduct regular health surveys which allow respondents to report on different aspects of their health. A commonly asked question is of the type: "How is your health in general?". Despite the subjective nature of this question, indicators of perceived general health are a good predictor of people's future health care use and mortality (Palladino et al., 2016).

For the purpose of international comparisons, cross-country variations in perceived health status are difficult to interpret because responses may be affected by the formulation of survey questions and responses, and by social and cultural factors. For example, a central tendency bias in self-reporting health has been noted in Japan and Korea (Lee et al., 2003). In addition, since older people report poor health more often than younger people, countries with a larger proportion of aged persons will also have a lower proportion of people reporting to be in good health.

With these limitations in mind, in almost all OECD countries a majority of adults report being in good health (Figure 3.18). New Zealand, Canada, the United States and Australia are the four leading countries, with more than 85% of people reporting to be in good health. However, the response categories offered to survey respondents in these four countries are different from those used in European countries and Asian OECD countries, which introduce an upward bias (see box on "Definition and comparability").

On the other hand, less than half of adults in Japan, Korea, Latvia and Portugal rate their health as being good. The proportion is also relatively low in Estonia, Hungary, Poland and Chile, where less than 60% of adults consider themselves to be in good health. In many of these cases, though, adults consider themselves to be in fair health. A potentially clearer distinction is on adults who consider themselves to be in bad health. Across the OECD, on average 9% of adults consider themselves to be in bad health. The share is over 15% in Portugal, Korea, Latvia, Israel, Hungary and Estonia.

In all OECD countries, men are more likely than women to report being in good health, except in New Zealand, Canada and Australia where the proportion is almost equal. As expected, people's rating of their own health tends to decline with age. In many countries, there is a particularly marked decline in how people rate their health after age 45 and a further decline after age 65.

There are large disparities in self-reported health across different socio-economic groups. Figure 3.19 shows that, in all countries, people with a lower level of income tend to report poorer health than people with higher income, although the gap varies. On average across OECD countries, nearly 80% of people in the highest income quintile report being in good health, compared with just under 60% for people in the lowest income group. These disparities may be explained by differences in living and working conditions, as well as differences in smoking and other risk factors. People in low-income households may also have limited access to certain health services for financial or other reasons (see Chapter 5 on "Access to care"). A reverse causal link is also possible, with poor health status leading to lower employment and lower income.

Greater emphasis on public health and disease prevention among disadvantaged groups, and improving access to health services may contribute to further improvements in population health status in general and reducing health inequalities.

Definition and comparability

Perceived health status reflects people's overall perception of their health. Survey respondents are typically asked a question such as: "How is your health in general?". Caution is required in making cross-country comparisons of perceived health status for at least two reasons. First, people's assessment of their health is subjective and can be affected by cultural factors. Second, there are variations in the question and answer categories used to measure perceived health across surveys and countries. The response scale used in the United States, Canada, New Zealand, Australia and Chile is *asymmetric* (skewed on the positive side), including the following response categories: "excellent, very good, good, fair, poor". In most other OECD countries the response scale is *symmetric*, with response categories being: "very good, good, fair, poor, very poor". In Israel, the scale is *symmetric* but there is no middle category related to "fair" health. Such differences in response categories bias upward the results from those countries that are using an asymmetric scale or a symmetric scale but without any middle category.

Self-reported health by income level is reported for the first quintile (lowest 20% of income group) and the fifth quintile (highest 20%). Depending on the surveys, the income may relate either to the individual or the household (in which case the income is equivalised to take into account the number of persons in the household).

References

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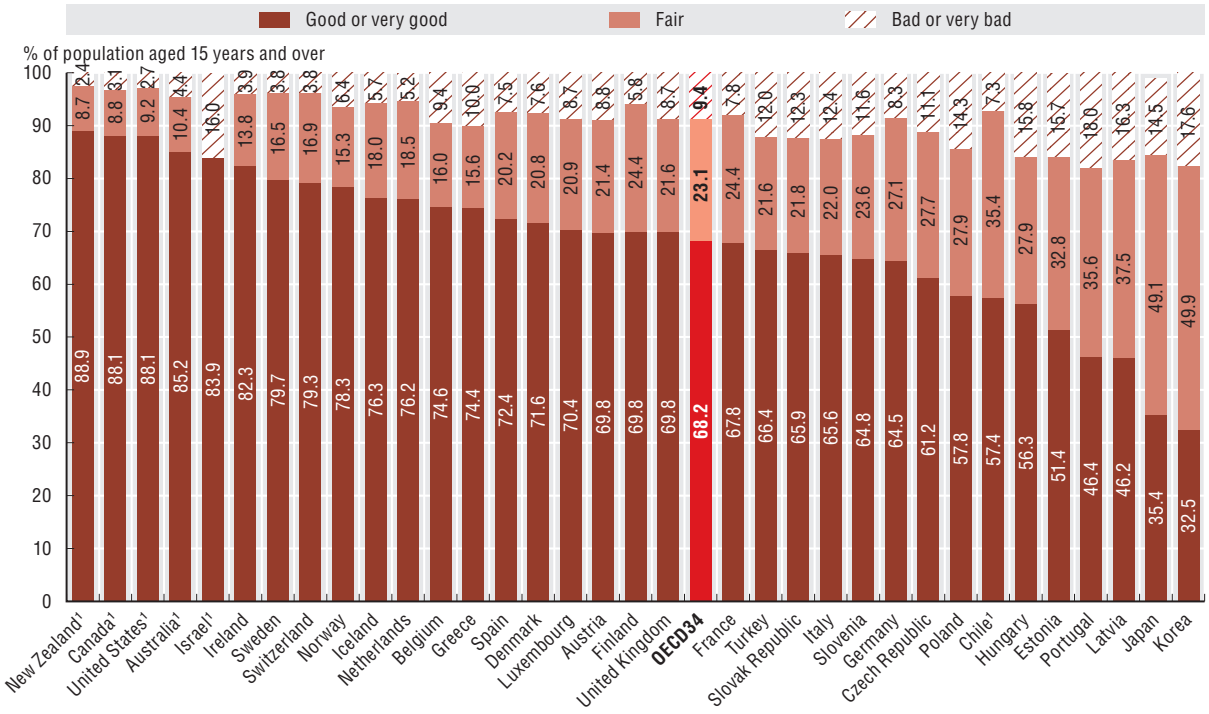
Lumsdaine, R. and A. Exterkate (2013), "How Survey Design Affects Self-assessed Health Responses in the Survey of Health, Ageing, and Retirement in Europe (SHARE)", *European Economic Review*, Vol. 63, pp. 299-307.

Palladino, R. et al. (2016), "Associations Between Multimorbidity, Healthcare Utilisation and Health Status: Evidence from 16 European Countries", *Age and Ageing*, Vol. 45, pp. 431-435, *http://dx.doi.org/10.1093/ageing/afw044*.

3.18. Perceived health status among adults, 2015 (or nearest year)

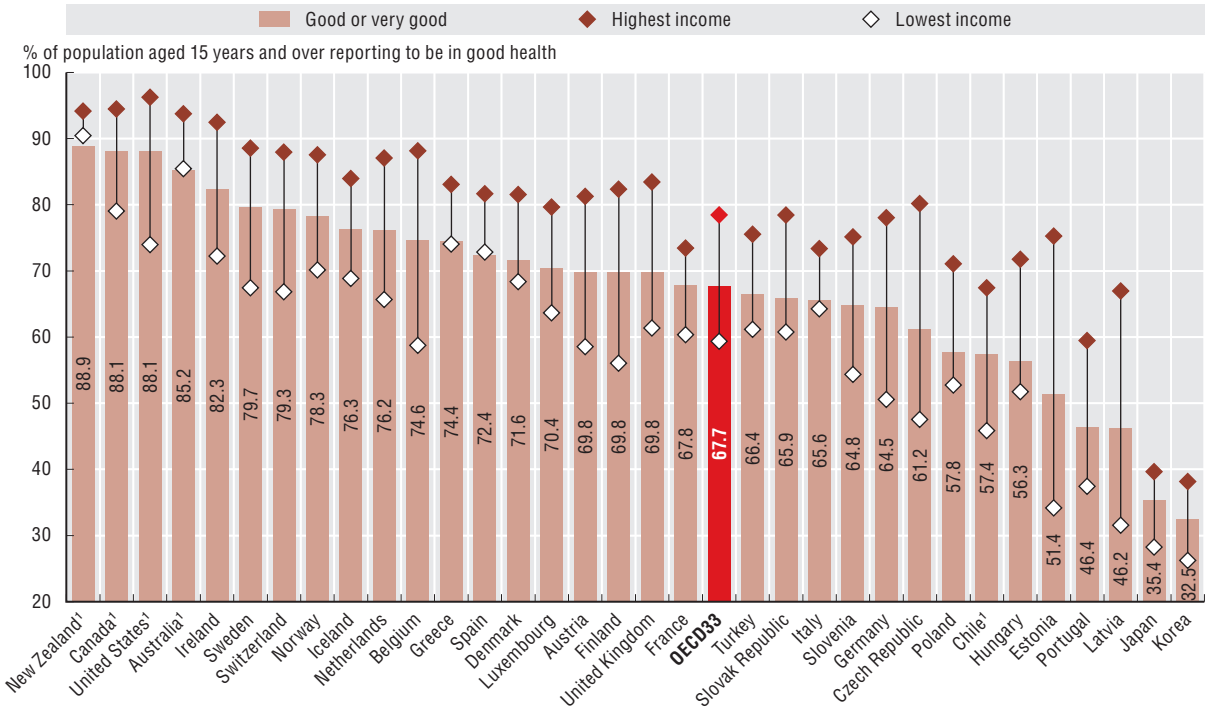


1. Results for these countries are not directly comparable with those for other countries, due to methodological differences in the survey questionnaire resulting in an upward bias. In Israel, there is no category related to fair health.

Source: OECD Health Statistics 2017 (EU-SILC for European countries).

StatLink http://dx.doi.org/10.1787/888933602557

3.19. Perceived health status by income level, 2015 (or nearest year)



Note: Countries are ranked in descending order of perceived health status for the whole population.

1. Results for these countries are not directly comparable with those for other countries, due to methodological differences in the survey questionnaire resulting in an upward bias.

Source: OECD Health Statistics 2017 (EU-SILC for European countries).

StatLink http://dx.doi.org/10.1787/888933602576

Cancer incidence

In 2012, an estimated 5.8 million new cases of cancer were diagnosed in OECD countries, 54% (around 3.1 million) occurring in men and 46% (around 2.7 million) in women. The most common were breast cancer (12.9% of all new cancer cases) and prostate cancer (12.8%), followed by lung cancer (12.3%) and colorectal cancer (11.9%). These four cancers represented half of the estimated overall burden of cancer in OECD countries (Ferlay et al., 2014).

Large variations exist in cancer incidence across OECD countries. Cancer incidence rates are highest in Denmark, Australia, Belgium, Norway, United States, Ireland, Korea, Netherlands and France registering more than 300 new cancer cases per 100 000 population in 2012 (Figure 3.20). The lowest rates were reported in some Latin American and Mediterranean countries such as Mexico, Greece, Chile and Turkey, with around 200 new cases or less per 100 000 population. These variations reflect not only variations in the prevalence of risk factors for cancer, but also national policies regarding cancer screening and differences in quality of reporting.

Cancer incidence was higher for men in all OECD countries in 2012 except in Mexico. However, the gender gap varies widely across countries. In Turkey, Estonia and Spain, incidence among men were around 60% higher than among women, whereas in the United Kingdom, Denmark and Iceland, the gap was less than 10%.

Breast was by far the most common primary sites in women (28% on average), followed by colorectal (12%), lung (10%), and cervical (3%). The causes of breast cancer are not fully understood, but the risk factors include age, family history, breast density, exposure to oestrogen, being overweight or obese, alcohol intake, radiation and hormone replacement therapy. Incidence rates in 2012 were highest in Belgium, Denmark and Netherlands, with rates 25% or more than the OECD average (Figure 3.21). Chile and Mexico had the lowest rate, followed by Turkey and Greece. The variation in breast cancer incidence across OECD countries may be at least partly attributed to variation in the extent and type of screening activities. Although mortality rates for breast cancer have declined in most OECD countries since the 1990s due to earlier detection and improvements in treatments, breast cancer continues to be one of the leading causes of death from cancer among women (see indicator "Mortality from cancer" in Chapter 3 and "Screening, survival and mortality from breast cancer" in Chapter 6).

Prostate cancer has become the most commonly diagnosed cancer among men in almost all OECD countries, except in Hungary, Poland, Turkey and Greece where lung cancer is still predominant, and in Japan and Korea where colorectal cancer is the main cancer among men. On average across OECD countries, prostate cancer accounted for 24% of all new cancer diagnoses in men in 2012, followed by lung (14%) and colorectal (12%). Similar to breast cancer, the causes of prostate cancer are not well-understood but age, ethnic origin, family history, obesity, lack of exercise and poor nutrition are the main risk factors. Incidence in 2012 was highest in Norway, Sweden, Australia and Ireland, with rates more than 50% higher than the OECD average (Figure 3.22). Greece had the lowest rates, followed by Mexico, Korea and Japan. Prostate cancer incidence rates have increased in most OECD countries since the late 1990s with increased use of prostate specific antigen (PSA) tests having led to greater detection (Ferlay et al., 2014). Differences between countries' rates can be partly attributed to differences in the use of PSA testing. Mortality rates from prostate cancer have decreased in some OECD countries as a consequence of early detection and improvements in treatments (see indicator "Mortality from cancer" in Chapter 3).

Definition and comparability

Cancer incidence rates are based on numbers of new cases of cancer registered in a country in a year per 100 000 population. The rates have been directly age-standardised based on Segi's world population to remove variations arising from differences in age structures across countries and over time. The data come from the International Agency for Research on Cancer (IARC), GLOBOCAN 2012, available at *globocan.iarc.fr*. GLOBOCAN estimates for 2012 may differ from national estimates due to differences in methods.

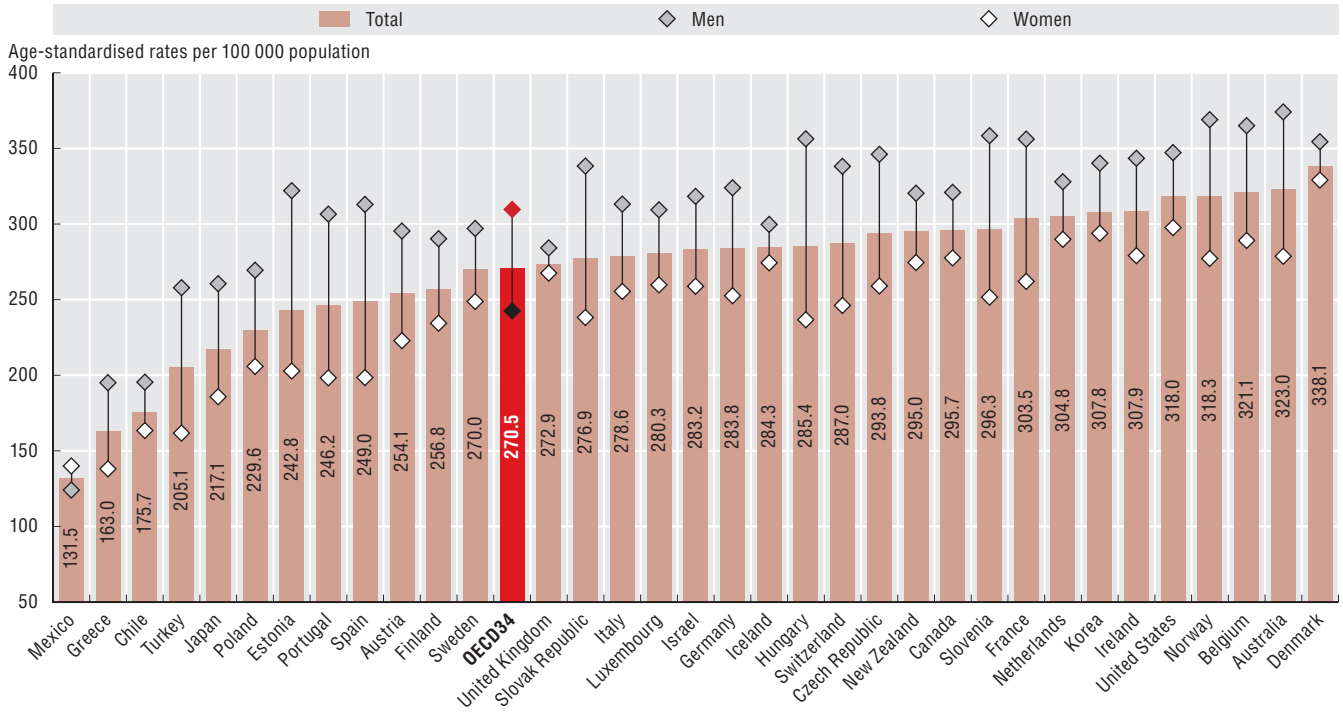
Cancer registration is well established in most OECD countries, although the quality and completeness of cancer registry data may vary. In some countries, cancer registries only cover subnational areas. The international comparability of cancer incidence data can also be affected by differences in medical training and practice.

The incidence of all cancers is classified to ICD-10 codes C00-C97 (excluding non-melanoma skin cancer C44). Breast cancer corresponds to C50, and prostate cancer to C61.

References

Ferlay, J. et al. (2014), "Cancer Incidence and Mortality Worldwide: Sources, Methods and Major Patterns in GLOBOCAN 2012", *International Journal of Cancer*, Vol. 136, No. 5, pp. E359-E386.

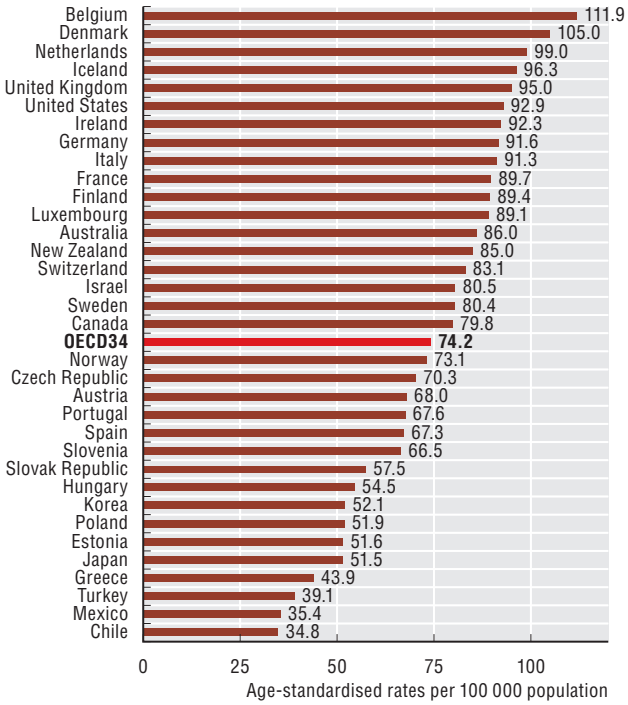
3.20. All cancers incidence by gender, 2012



Source: International Agency for Research on Cancer (IARC), GLOBOCAN 2012.

StatLink http://dx.doi.org/10.1787/888933602595

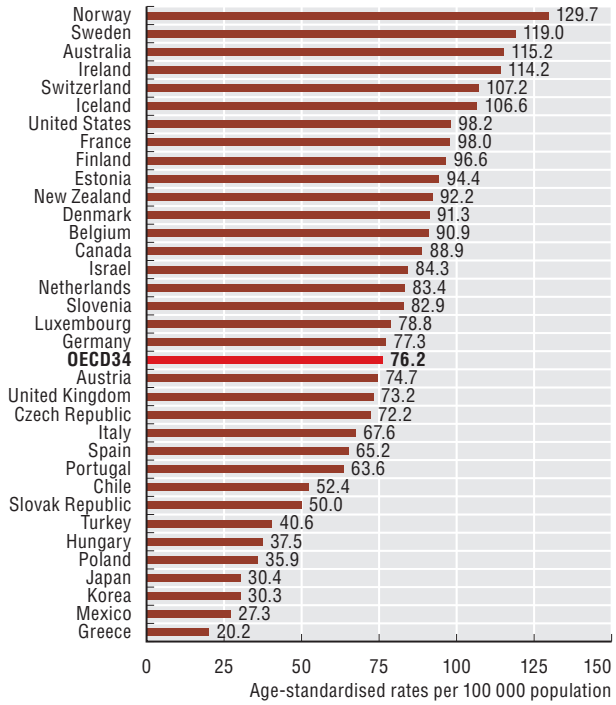
3.21. Breast cancer incidence in women, 2012



Source: International Agency for Research on Cancer (IARC), GLOBOCAN 2012.

StatLink http://dx.doi.org/10.1787/888933602614

3.22. Prostate cancer incidence in men, 2012



Source: International Agency for Research on Cancer (IARC), GLOBOCAN 2012.

StatLink http://dx.doi.org/10.1787/888933602633

Diabetes prevalence

Diabetes is a chronic disease, characterised by high levels of glucose in the blood. It occurs either because the pancreas stops producing the hormone insulin (Type 1 diabetes), or because the cells of the body do not respond properly to the insulin produced (Type 2 diabetes). People with diabetes are more likely to suffer from cardiovascular diseases such as heart attack and stroke, sight loss, foot and leg amputation and renal failure.

Across the OECD, over 93 million adults – or 7% of all adults – were diabetics in 2015 (Figure 3.23). The International Diabetes Federation estimates that a further 33 million adults have undiagnosed diabetes in OECD countries. Diabetes prevalence is highest in Mexico, where more than 15% of adults have diabetes. Diabetes prevalence is also high in Turkey, the United States and Chile, where 10% or more of adults were diabetics. In contrast, less than 5% of adults suffered from diabetes in Estonia, Ireland, Luxembourg, Sweden and the United Kingdom. Among partner countries, diabetes prevalence is relatively high in Brazil and Colombia, at about 10% of the adult population, and low in Lithuania.

Diabetes prevalence has risen slowly or stabilised in the majority of OECD countries, especially in Western Europe, but it has increased markedly in Turkey and most partner countries (Figure 3.24) These trends mirror partly trends in population ageing, as well as the rise of obesity and physical inactivity, and their interactions (NCD Risk Factor Collaboration, 2016). The share of obese people has been increasing strongly all around the world, and especially in the BRIICS (see indicators on obesity in Chapter 4).

Diabetes is slightly more common among men than women and the prevalence increases substantially with age. For example, in the United States the estimated share of diagnosed diabetics was about 3% for those aged 20-44, 12% for those aged 45-64 and 21% for those aged 65 years and over (Menke et al., 2015). Diabetes also disproportionately affects those in lower socio-economic groups and people from certain ethnicities.

Diabetes prevalence among children is much lower than among adults (Figure 3.25). Nevertheless, almost 230 000 children suffered from Type 1 diabetes in OECD countries in 2015. In Finland, almost five children per 1 000 were Type 1 diabetics. Prevalence rates were next highest in Sweden (2.6) and Norway (2). Korea and Japan had the lowest rates amongst OECD countries.

Diabetes bears heavy consequences on communities. Over 700 000 people died partly because of diabetes in OECD countries and these countries spent an average of about USD 4 600 per diabetic adult in 2015 (IDF, 2015). These burdens highlight the need for effective management of diabetes and its complications (see indicator on "Diabetes care" in Chapter 6), as well as appropriate preventive actions (see Chapter 4).

Definition and comparability

The sources and methods of the NCD Risk Factor Collaboration is described in the Lancet article and appendix (Lancet, 2016). Sources were selected among population-based studies that had collected data on measurement of diabetes biomarkers for Type 1 or Type 2 diabetics. Prevalence in sources were converted to meet the definition of diagnosed diabetes as defined in the Global Monitoring Framework for NCDs. Then, Bayesian hierarchical models were applied to estimate trends in prevalence. Adult's population covers those aged 18 years and over.

The sources and methods used by the International Diabetes Federation are outlined in their *Diabetes Atlas, 7th edition* (IDF, 2015). Sources were only included if they met several criteria for reliability. Age-standardised rates were calculated using the world population based on the distribution provided by the World Health Organization. Adult's population covers those aged between 20 and 79 years old with Type 1 or Type 2 diagnosed diabetes.

References

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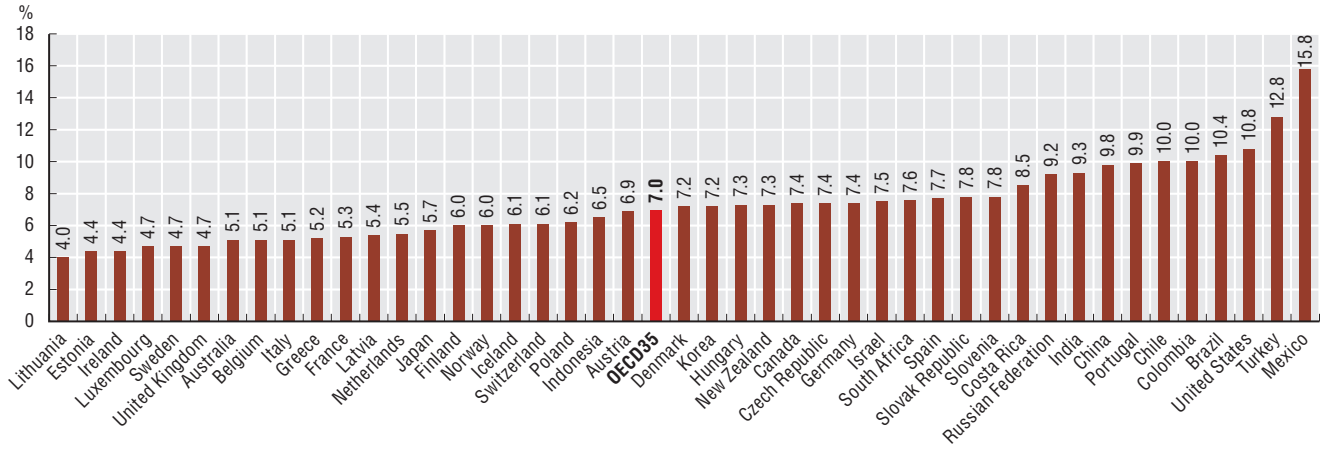
Menke, A. et al. (2015), "Prevalence of and Trends in Diabetes Among Adults in the United States, 1988-2012", Journal of American Medical Association, Vol. 314, No. 10, pp. 1021-1029, *http://dx.doi.org/10.1001/jama.2015.10029*.

NCD Risk Factor Collaboration (2016), "Worldwide Trends in Diabetes Since 1980: A Pooled Analysis of 751 Population-based Studies with 4·4 Million Participants", *The Lancet*, Vol. 387, pp. 1513-1530, *http://dx.doi.org/10.1016/S0140-6736(16)00618-8*.

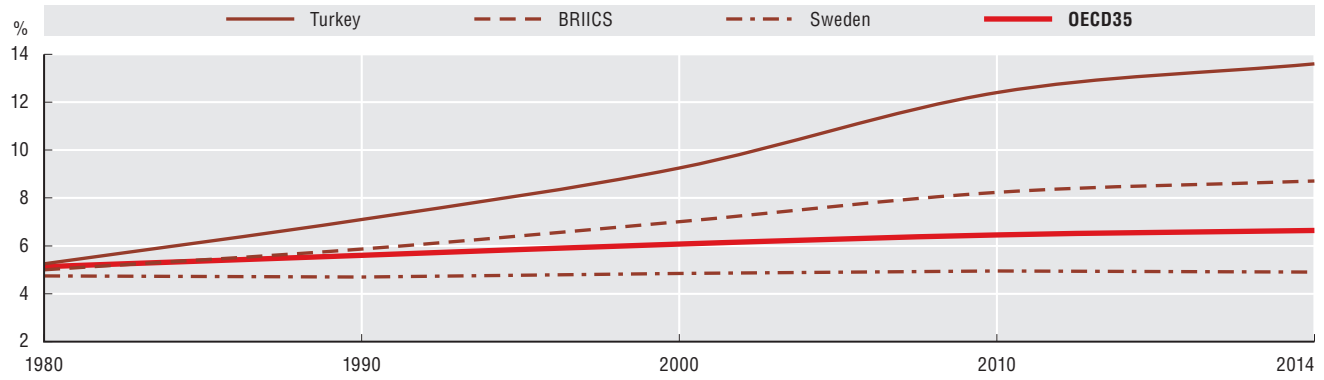
3.23. Share of adults with diabetes, 2015



Note: Data cover those aged between 20 and 79 years old with Type 1 or Type 2 diagnosed diabetes.
Source: IDF Atlas, 7th Edition, 2015.

StatLink http://dx.doi.org/10.1787/888933602652

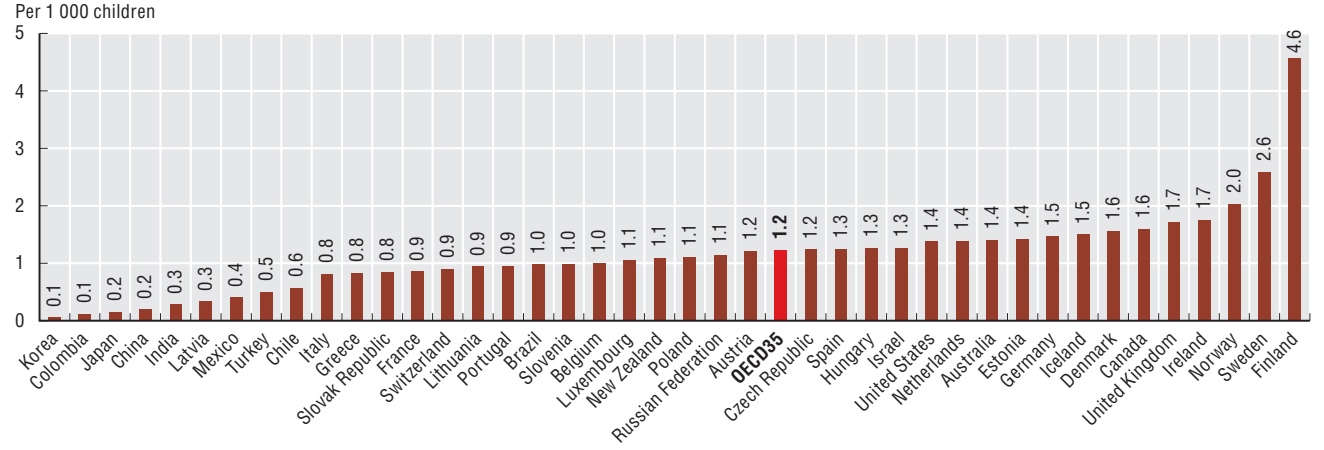
3.24. Trends in share of adults with diabetes, 1980-2014



Note: Data cover those aged 18 years and over with Type 1 or Type 2 diagnosed diabetes.
Source: NCD Risk Factor Collaboration (2016).

StatLink http://dx.doi.org/10.1787/888933602671

3.25. Share of children with Type 1 diabetes per 1000 population, 2015



Note: Data cover those aged under 14 years old.
Source: OECD estimates based on *IDF Atlas*, 7th Edition, 2015 and the United Nations population statistics.

StatLink http://dx.doi.org/10.1787/888933602690

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4. RISK FACTORS FOR HEALTH

Smoking among adults

Alcohol consumption among adults

Smoking and alcohol consumption among children

Healthy lifestyles among adults

Healthy lifestyles among children

Overweight and obesity among adults

Overweight and obesity among children

Air pollution

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Smoking among adults

The health consequences of tobacco smoking are numerous, and include cancers, stroke, and coronary heart disease, among others. It is also an important contributory factor for respiratory diseases, such as chronic obstructive pulmonary disease (COPD), while smoking among pregnant women can lead to low birth weight and illnesses among infants. Smoking causes the largest share of overall years of healthy life lost in 15 OECD countries, and ranks second in another 16 OECD countries (Forouzanfar et al., 2016). The WHO has estimated that tobacco smoking kills 7 million people per year across the world, of which 890,000 are due to second-hand smoke. It is the leading cause of death, illness and impoverishment.

Across the OECD, just over 18% of adults smoke tobacco daily (14% of women and 23% of men) (Figure 4.1). Rates are highest in Greece, Hungary and Turkey, as well as Indonesia (over 25%), and lowest in Mexico as well as Brazil (under 10%). Women smoke the most in Austria, Greece and Hungary, where rates exceed 20%, while they smoke the least in Korea and Mexico, as well as China, India, and Indonesia, where rates are below 5%. In men, rates are highest in Turkey as well as China, Indonesia, and the Russian Federation (exceeding 40%), while they are below 10% in Iceland as well as Brazil. Men smoke more than women in all countries except Denmark and Iceland, where the gender gap is about one percentage point. In other countries, the gender gap ranges from below 2 points in Sweden and the United States, to over 30 points in China (46 points), Indonesia (73 points) and the Russian Federation (34 points).

Daily smoking has decreased in most OECD countries since 2000, although rates have slightly risen in the Slovak Republic (+0.8 points), have greatly increased in Indonesia (+8.8 points), and have not changed in Austria (Figure 4.2). In 2015, an average of 18% of adults smoked daily in the OECD, as opposed to 26% in 2000, equivalent to a 28% drop. The strongest decreases occurred in Denmark, Iceland, Luxembourg, the Netherlands, New Zealand and the United Kingdom, as well as Brazil, India, Lithuania and the Russian Federation, where they exceeded 10 percentage points, and in Norway, where the drop was 20 points. In 2015, rates were highest in Greece, Hungary, Turkey and Indonesia (over 25%), while they were lowest in Mexico and Brazil (under 10%).

Raising taxes on tobacco is the most effective way to reduce tobacco use (WHO, 2015). High levels of taxes as well as stringent policies led to strong reductions in smoking rates between 1996 and 2011 in many OECD countries (OECD, 2015). In 2014, 29 OECD countries applied tobacco advertising bans on at least national television, print media and radio, while 26 countries applied taxation rates of at least 70% (WHO, 2015). In all OECD countries, packages displayed at least a medium-sized a health warning. Every year on May 31st, "World No Tobacco Day" advocates for effective policies to reduce tobacco consumption, and highlights the health and additional risks associated with tobacco use. The theme for 2017 was "Tobacco – a threat to development", and focused on the threats of the industry to the sustainable development of countries.

Definition and comparability

The proportion of daily smokers is defined as the percentage of the population aged 15 years and over who report tobacco smoking every day. Other forms of smokeless tobacco products, such as snuff in Sweden, are not taken into account. This indicator is more representative of the smoking population than the average number of cigarettes smoked per day, as the act of smoking is more determining than the quantity. Most countries report data for the population aged 15 +, but there are some exceptions as highlighted in the data source of the OECD Health Statistics database.

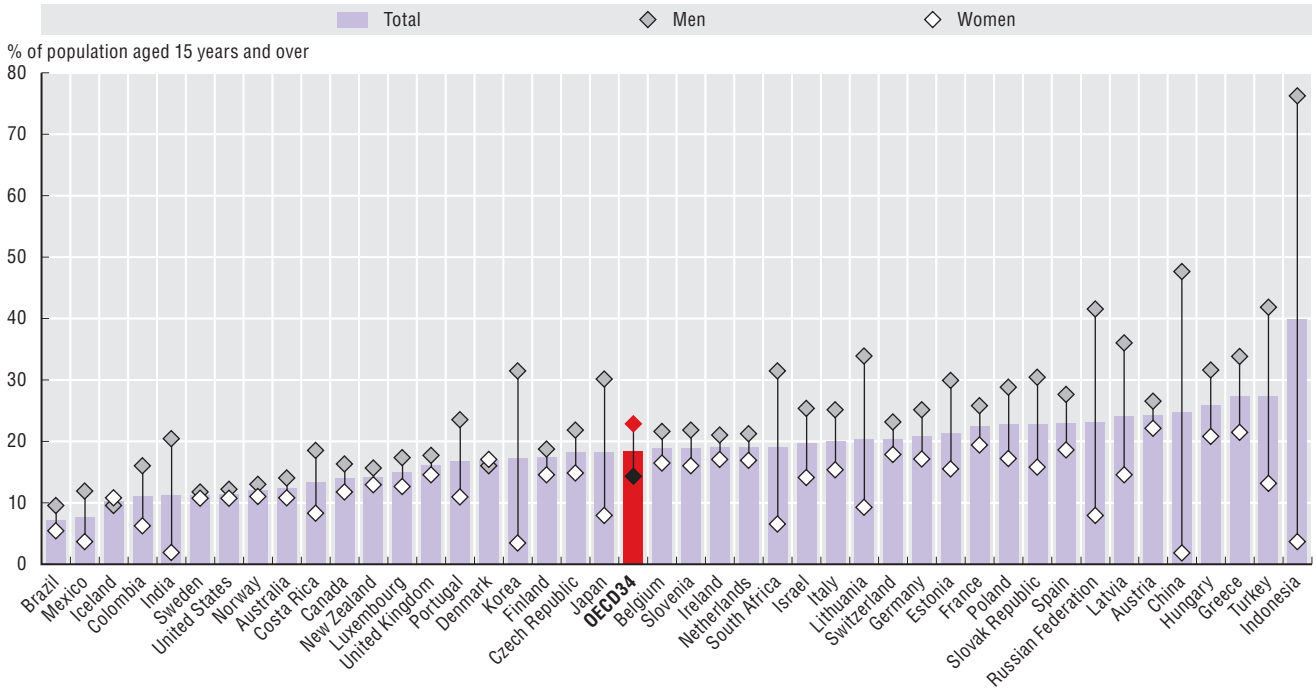
References

Forouzanfar, M.H. et al. (2016), "Global, Regional, and National Comparative Risk Assessment of 79 Behavioural, Environmental and Occupational, and Metabolic Risks or Clusters of Risks, 1990–2015: A Systematic Analysis for the Global Burden of Disease Study 2015", *The Lancet*, Vol. 388, pp. 1659-1724.

OECD (2015), *Cardiovascular Disease and Diabetes: Policies for Better Health and Quality of Care*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264233010-en*.

WHO (2015), *Report on the Global Tobacco Epidemic – Raising Taxes on Tobacco*, WHO, Geneva.

4.1. Adult population smoking daily by gender, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

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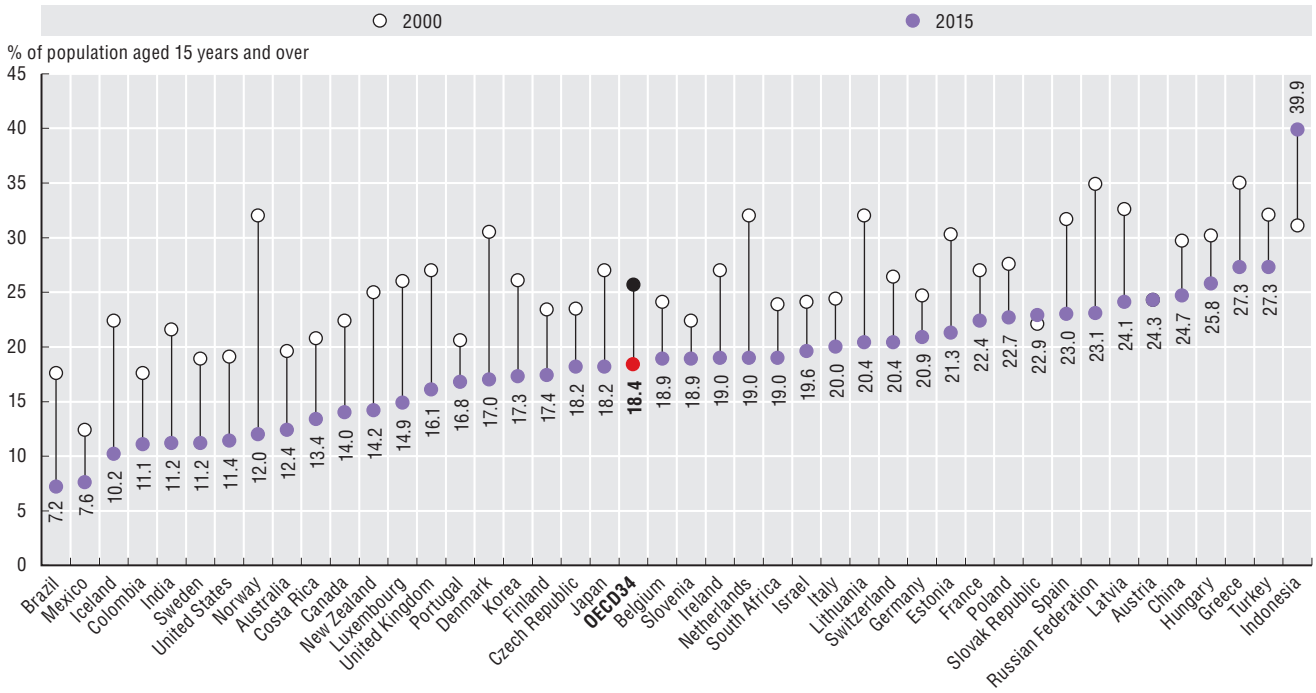
4.2. Adult population smoking daily, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602728

Alcohol consumption among adults

Harmful alcohol use is a leading cause of death and disability worldwide, particularly in those of working age (OECD, 2015). Alcohol use is among the top ten leading risk factors in terms of years of healthy life lost in 32 OECD countries (Forouzanfar et al., 2016), and consumption in OECD countries remains well above the world average. In 2015, alcohol use lead to 2.3 million deaths, caused by cancers, heart diseases and liver diseases, among others. Most alcohol is drunk by the heaviest-drinking 20% of the population. Heavy drinking is associated with a lower probability of employment, more absence from work, and lower productivity and wages.

On average, recorded alcohol consumption has decreased in the OECD since 2000 (Figure 4.3), from 9.5 litres per capita per year to 9 litres of pure alcohol per capita each year, equivalent to 96 bottles of wine. The extent of the decrease varies greatly by country, and consumption has in fact increased in thirteen OECD countries, as well as in China, India, Lithuania and South Africa. Consumption increased by 0.1 to 1 litre in Canada, Chile, Israel, Korea, Mexico, Norway, Slovenia, Sweden and the United States, as well as in South Africa. The increase was stronger in Belgium, Iceland, Latvia and Poland, as well as China, India and Lithuania (1.1 to 5.3 litres per capita). In all other countries, alcohol consumption decreased between 2000 and 2015. The largest drops occurred in Denmark, Ireland, Italy and the Netherlands (more than 2 litres per capita).

Although adult alcohol consumption per capita is a useful measure to assess long-term trends, it does not identify sub-populations at risk from harmful drinking patterns. Heavy drinking and alcohol dependence account for an important share of the burden of diseases associated with alcohol. Across the OECD, an average of 12% of women and 30% of men take part in regular binge-drinking (at least once per month) (Figure 4.4). Rates range from 8% in Hungary to 37% in Denmark, and display large gender gaps, with men exhibiting higher rates in virtually all countries. These gaps are lowest in Spain and Greece (8-10 points), and are highest in Estonia, Finland and Latvia (over 25 points).

Many policies addressing harmful use of alcohol already exist: some target heavy drinkers only, while others are more broadly based. While all OECD countries apply taxes to alcoholic beverages, the level of taxes may greatly vary across countries. New forms of fiscal policies have been implemented like minimum pricing of one unit of alcohol in Scotland. Regulations on advertising alcoholic products have been set up in many OECD countries, but the forms of media included in these regulations (e.g. printed newspapers, billboards, the internet) and the enforcement of the law vary a lot across countries. All OECD countries have legally set maximum levels of blood alcohol concentration for drivers, but the enforcement of these regulations may be haphazard and varies widely across and within countries. Less stringent policies include health promotion messages, school-based and worksite interventions and interventions in primary health care settings. Comprehensive policy packages including fiscal measures, regulations and less stringent policies are shown to be the most effective to reduce harmful use of alcohol (OECD, 2015).

Definition and comparability

Recorded alcohol consumption is defined as annual sales of pure alcohol in litres per person aged 15 years and over. Most countries report data for the population aged 15 +, but there are some exceptions as highlighted in the data source of the OECD Health Statistics database. The methodology to convert alcohol drinks to pure alcohol may differ across countries. Official statistics do not include unrecorded alcohol consumption, such as home production. Unrecorded alcohol consumption and low quality of alcohol consumed (beverages produced informally or illegally) remain a problem, especially when estimating alcohol-related burden of disease among low income groups. The WHO reports unrecorded alcohol consumption in their Global Health Observatory data repository. In some countries (e.g. Luxembourg), national sales do not accurately reflect actual consumption by residents, since purchases by non-residents may create a significant gap between national sales and consumption. Alcohol consumption in Luxembourg is thus the mean of alcohol consumption in France and Germany as recorded in the WHO-GISAH database.

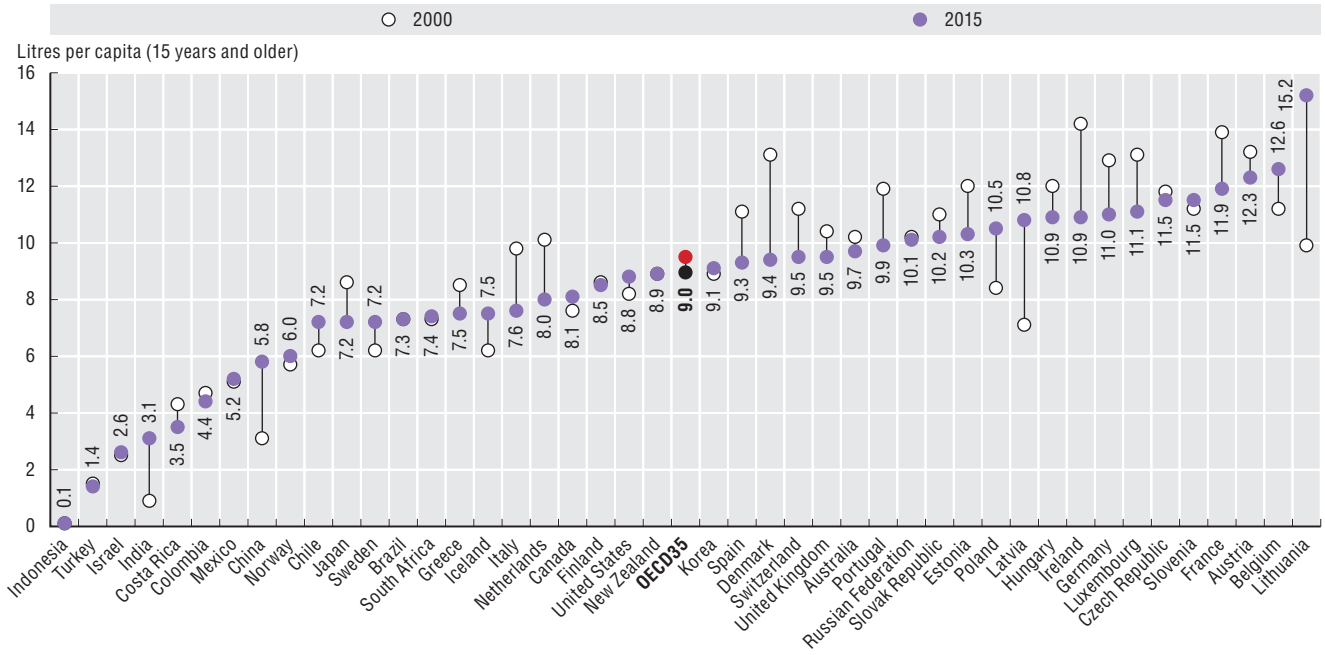
Regular binge drinking is derived from self-reports of the European Health Interview Survey 2014. Regular binge drinking is defined as having six or more alcoholic drinks per single occasion at least once a month over the past 12 months.

References

Forouzanfar, M.H. et al. (2016), "Global, Regional, and National Comparative Risk Assessment of 79 Behavioural, Environmental and Occupational, and Metabolic Risks or Clusters of Risks, 1990–2015: A Systematic Analysis for the Global Burden of Disease Study 2015", *The Lancet*, Vol. 388, pp. 1659-1724.

OECD (2015), *Tackling Harmful Alcohol Use: Economics and Public Health Policy*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264181069-en*.

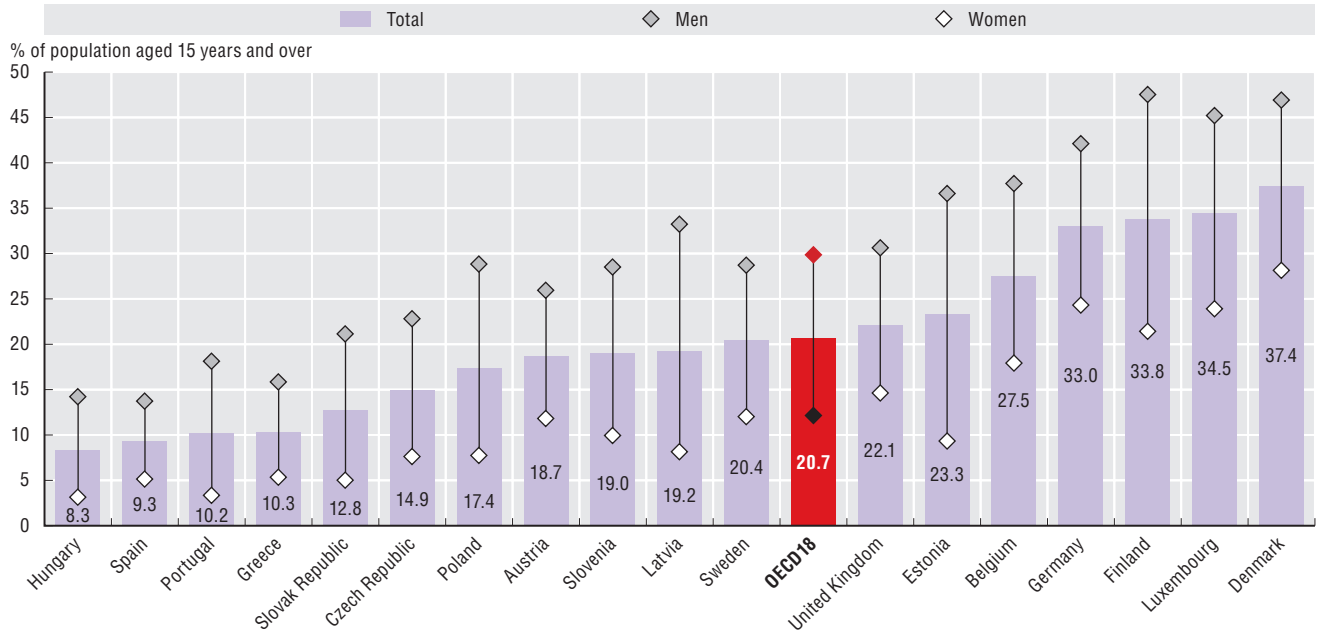
4.3. Recorded alcohol consumption among adults, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602747

4.4. Regular binge-drinking (at least once a month) by gender, 2014



Source: Eurostat EHIS 2014.

StatLink http://dx.doi.org/10.1787/888933602766

Smoking and alcohol consumption among children

Smoking and excessive drinking during adolescence have both immediate and long-term health consequences. Establishing smoking habits early on increases the risk of cardiovascular diseases, respiratory illnesses, and cancer (Currie et al., 2012). Smoking during adolescence has immediate adverse health consequences, including addiction, reduced lung function and impaired lung growth, and asthma (Inchley et al., 2016). It is also associated with an increased likelihood of experimenting with other drugs, as well as engaging in other risky behaviours (O'Cathail et al., 2011). Early and frequent drinking and drunkenness is associated with detrimental psychological, social and physical effects, such as dropping out of high school without graduating (Chatterji and DeSimone, 2005).

Results from the Health Behaviour in School-aged Children (HBSC) surveys, a series of collaborative cross-national studies, allow for monitoring of smoking and drinking behaviours among adolescents. Other national surveys, such as the Youth Risk Behavior Surveillance System in the United States, or the Escapad survey in France, also monitor risky behaviours.

Over 15% of 15-year-olds smoke at least once a week in France, Hungary, Italy, Luxembourg, and the Slovak Republic, as well as Lithuania (Figure 4.5). At the other end of the scale, fewer than 5% report weekly smoking in Iceland and Norway. Across the OECD, the average is 12%. On average, boys smoke slightly more than girls, but girls smoke more than boys in twelve countries (Australia, the Czech Republic, Denmark, France, Germany, Hungary, Italy, Luxembourg, the Slovak Republic, Spain, Sweden and the United Kingdom). Gender gaps are particularly high in Israel, as well as Lithuania and the Russian Federation.

Over 30% of 15-year-olds have been drunk at least twice in the Czech Republic, Denmark, Hungary, Slovenia and the United Kingdom, as well as Lithuania (Figure 4.6). In Iceland, Israel, Luxembourg, Switzerland as well as the Russian Federation, rates drop below 15%. Across the OECD, the average is 22.3%, with a small gap between boys (23.5%) and girls (21.2%). Gender disparities, with boys more prone to drink than girls, are especially high in Austria, Hungary, Israel, as well as Lithuania and the Russian Federation (over 5 points). Only in Canada, Sweden and the United Kingdom do girls report repeated drunkenness more often than boys.

Trends for repeated drunkenness and regular smoking in 15-year-olds display similar patterns (Figure 4.7). Both health behaviours are now at their lowest since 1993-94. Regular smoking displays the strongest decrease, as rates in boys and girls more than halved between 1997-98 and 2013-14. The gender gap for drunkenness has also shrunk since the 1990s. All countries present a decrease in regular smoking since 1997-98, exceeding 60% for both boys and girls in Belgium, Canada, Denmark, Ireland, Norway, Sweden and the United Kingdom, and for girls in Austria, Finland and Switzerland. The decreases are weaker for repeated drunkenness, and reach 60% only for boys in Ireland and Sweden. Rates have increased since 1997-98 for girls in the Czech Republic, Estonia, Hungary, Latvia and Poland.

Worldwide, one third of youth experimentation with tobacco occurs as a result of exposure to tobacco advertising, promotion and sponsorship (WHO, 2013). To reduce youth tobacco use, its use in the general population must be denormalised. Young smokers are responsive to policies aiming to reduce tobacco consumption, including excise taxes to increase prices, clean indoor-air laws, restrictions on youth access to tobacco, and greater education about the effects of tobacco (Forster et al., 2007).

Definition and comparability

Estimates for smoking refer to the proportion of 15-year-old children who self-report smoking at least once a week. Estimates for drunkenness refer to the proportions of 15-year-old children who report that they have been drunk twice or more in their lives.

The Health Behaviour in School-aged Children (HBSC) surveys were undertaken every four years between 1993-94 and 2013-14, and include up to 29 OECD countries, Lithuania and the Russian Federation. Data are drawn from school-based samples of 1,500 in each age group (11-, 13- and 15-year-olds) in most countries.

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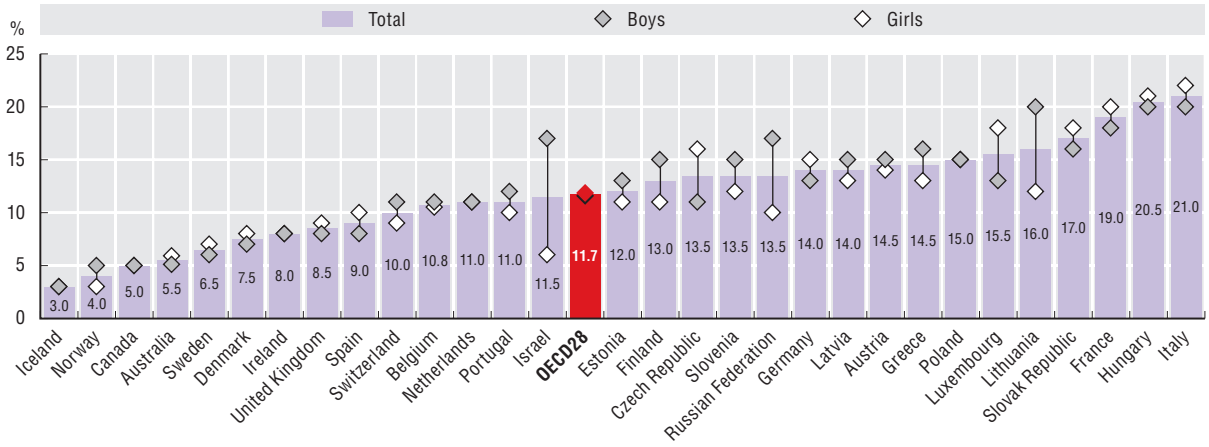
4.5. Smoking among 15-year-olds, 2013-14

Smoking at least once a week



Source: Inchley et al. (2016); Cancer Council Victoria (2016) for Australia.

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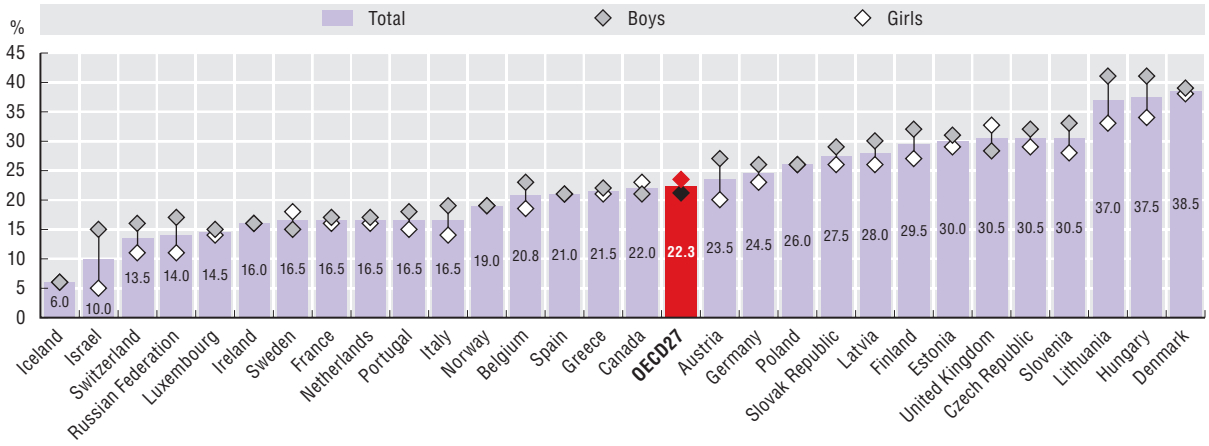
4.6. Drunkenness among 15-year-olds, 2013-14

Drunk at least twice in life



Source: Inchley et al. (2016).

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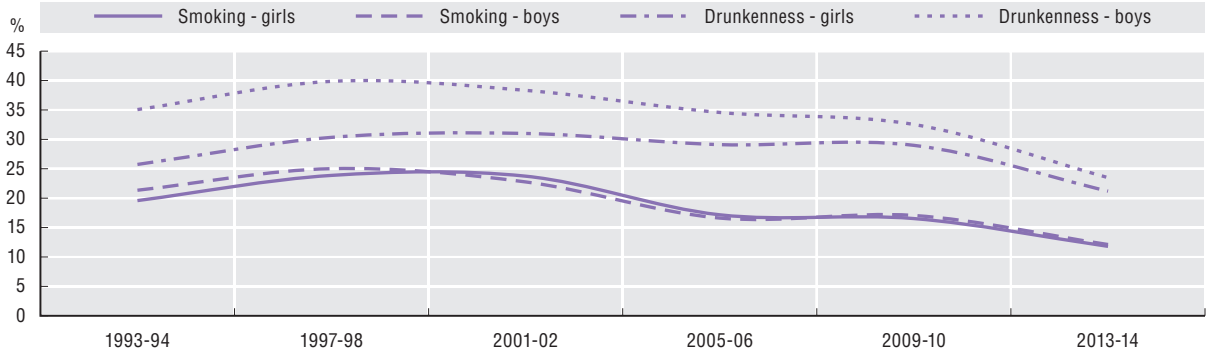
4.7. Trends in regular smoking and repeated drunkenness among 15-year-olds for selected OECD countries, 1994 to 2014



Note: Average for 1993-94 includes 19 countries; average for 1997-98 includes 22 countries; average for 2001-02 includes 25 countries; average for 2005-06 includes 28 countries; averages for 2009-10 and 2013-14 include 27 countries.
Source: WHO (1996); Currie et al. (2000, 2004, 2008, 2012); Inchley et al. (2016).

StatLink http://dx.doi.org/10.1787/888933602823

Healthy lifestyles among adults

Low fruit consumption, low vegetable consumption, and low levels of physical activity are among the ten leading risk factors in terms of years of healthy life lost in 24, 6, and 16 OECD countries respectively (Forouzanfar et al., 2016). Worldwide, diets low in fruit were the cause of nearly 3 million deaths in 2015, while low vegetable consumption caused nearly 2 million deaths, and low physical activity caused 1.6 million deaths. Including fruit and vegetables in the daily diet reduces the risk of coronary heart disease, stroke, as well as certain types of cancer (WHO, 2014). They include dietary fibre which lowers blood pressure and regulates insulin, possibly impacting the risk of type 2 diabetes (InterAct Consortium, 2015). Regular physical activity improves muscular and cardiorespiratory fitness, and reduces the risk of hypertension, coronary heart disease, stroke, diabetes, and various cancers (WHO, 2017). It has also been shown to positively impact mental health (Lindwall et al., 2012). In adults, the WHO recommends at least 150 minutes of moderate-intensity physical activity per week, at least 75 minutes of vigorous-intensity physical activity per week, or an equivalent combination of the two (WHO, 2017).

Fifty-seven per cent of adults across the OECD consume fruit daily, with values ranging from 30-35% in Finland and Latvia, to over 70% in Australia, Italy, New Zealand and Portugal (Figure 4.8). Women consume more fruit than men in all countries, and display the highest rates of consumption in Australia, Canada, Italy and New Zealand (over 75%). Meanwhile, they display the lowest rates in Finland, Latvia, Mexico, the Netherlands and Turkey (under 50%). Levels of consumption for men are highest in Australia, Canada, Italy, Korea, New Zealand, Portugal and Spain (over 60%), while they are lowest in Finland, and Latvia (below 30%). Gender gaps are largest in Austria, the Czech Republic, Denmark, Finland, Germany, Iceland, Latvia, Norway, Slovenia, Sweden and Switzerland (15-20 points), and lowest in Australia, Mexico and Turkey (under 5 points). Overall, 63% of women in the OECD consume fruit daily, while 50% of men do.

Vegetable consumption is higher than fruit consumption (Figure 4.9). On average, 60% of people in the OECD consume vegetables daily (65% of women, and 55% of men). Rates are highest in Australia, Korea, New Zealand and the United States, with over 90% of people reporting eating vegetables daily, although the methodology differs across countries (see Definition and comparability). On the other end of the spectrum, fewer than 40% report doing so in Finland, Germany and the Netherlands. In the United States, men consume slightly more vegetables than women, and in Korea and Mexico they consume the same amount; in all other countries, women consume more vegetables than men. Gender gaps are large in Austria, Denmark, Finland, Germany, Luxembourg, Norway, Sweden and Switzerland (15-19 points).

Over 70% of adults perform at least 150 minutes of moderate physical activity weekly in Austria, Denmark, Finland, France, Iceland, Ireland, Norway, Slovenia and Sweden (Figure 4.10). In Portugal, Italy and Spain, fewer than 60% meet the WHO recommendation. Across the OECD, an average of 66.5% of people perform 150 minutes of moderate physical activity per week, with 70.5% of men and 63% of women. Men are more physically active than women in all countries but Denmark. The gap is particularly high (over 15 points) in the Czech Republic, Latvia, Turkey and Spain.

Definition and comparability

Fruit and vegetable consumption is defined as the proportion of individuals consuming at least one fruit or vegetable per day. Data rely on self-reporting and are subject to errors in recall.

Data for Australia, Korea and New Zealand are derived from quantity-type questions. Data from the United States include juice made from concentrate. In these countries, values may be overestimated as compared with other countries. Most countries report data for the population aged 15 +, but there are some exceptions as highlighted in the data source of the OECD Health Statistics database.

The indicator of moderate physical activity is defined as doing at least 150 minutes of moderate physical activity per week. Estimates of moderate physical activity are based on self-reports from the European Health Interview Survey 2014, combining work-related physical activity with leisure-time physical activity (bicycling for transportation and sport). Walking for transportation is not included.

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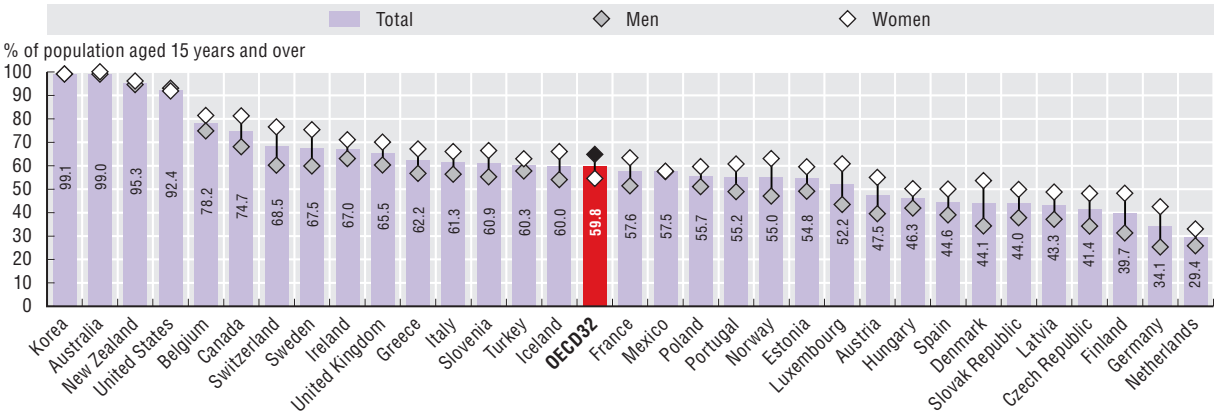
4.8. Daily fruit eating among adults, 2015 (or nearest year)

Note: Data for Australia, Korea and New Zealand are derived from quantity-type questions. Data for the United States include juice made from concentrate.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602842

4.9. Daily vegetable eating among adults, 2015 (or nearest year)



Note: Data for Australia, Korea and New Zealand are derived from quantity-type questions. Data for the United States include juice made from concentrate.
Source: OECD Health Statistics 2017.

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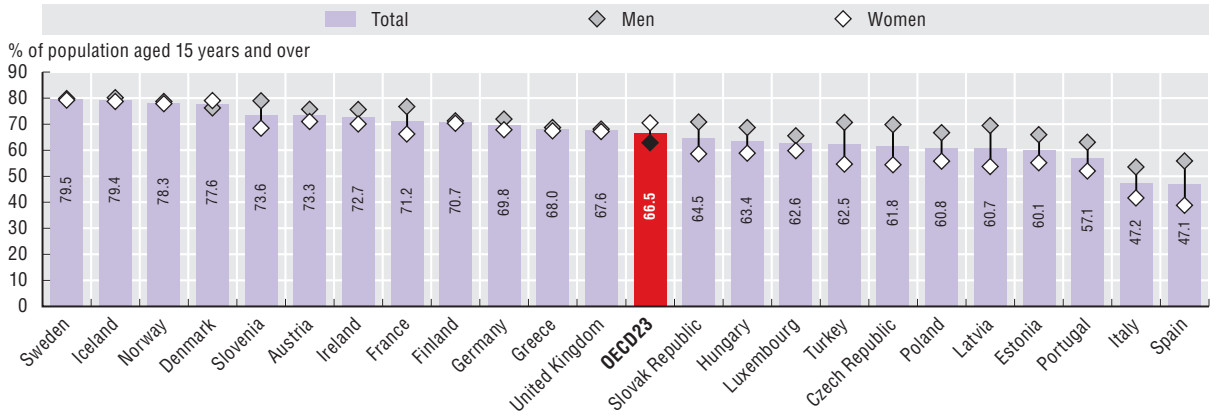
4.10. Moderate weekly physical activity among adults, 2014



Source: Eurostat EHIS 2014.

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Healthy lifestyles among children

Consuming a healthy diet and performing regular physical activity when young can be habit forming, promoting a healthy lifestyle in adult life. Daily consumption of fruit and vegetables can help reduce the risk of coronary heart diseases, strokes, and certain types of cancer (Hartley et al., 2013; World Cancer Research Fund, 2007). The most common guideline recommends consuming at least five portions of fruit and vegetables daily. Moderate-to-vigorous physical activity is beneficial to adolescents' physical, mental and psycho-social health, as it helps build and maintain healthy bones and muscles, reduces feelings of depression and anxiety, and improves academic achievement (Janssen and LeBlanc, 2010; Singh et al., 2012). The WHO recommends 60 minutes of moderate-to-vigorous daily physical activity for those aged 5-17 years.

Over 40% of 15-year-olds consume fruit daily in Canada, Denmark, Iceland and Switzerland, while less than 25% do so in Finland, Greece, Latvia and Sweden (Figure 4.11). Rates exceed 50% for girls in Denmark and Switzerland, while only boys in Canada reach 40%. Rates are under 30% for girls in Greece, Hungary, Latvia, Poland and Sweden, and under 20% for boys in Finland, Latvia, and Sweden. Across the OECD, nearly one in three 15-year-olds consumes fruit daily, with girls at 37% and boys at 28%. Girls consume more fruit than boys in all countries. Gender gaps are largest in Denmark, Finland and Switzerland (17-18 points).

Daily vegetable consumption in 15-year-olds exceeds 50% in Belgium and 40% in Canada, Denmark, Ireland, Israel, the Netherlands and Switzerland (Figure 4.12). Rates are under 25% in the Czech Republic, Estonia, Germany, Portugal, the Slovak Republic, Slovenia and Spain. Overall, the OECD average is 32%, nearly identical to the average for fruit consumption. Rates are highest in girls in Belgium (over 60%), and Israel and Switzerland (over 50%); they are highest for boys in Belgium (over 50%) and Ireland (over 40%). Daily vegetable consumption is lowest for girls in Estonia, Portugal and Spain, and boys in Finland, Germany and Spain. In all countries, girls consume more vegetables than boys. Gender gaps are largest in Finland, Germany, Italy and Switzerland (15 points or over).

Rates of physical activity meeting the WHO guidelines reach 20% in Canada and Spain, and are lower than 10% in Israel, Italy and Switzerland (Figure 4.13). They are consistently higher in boys, and by a large margin, as gender gaps range from 5 points (Israel, Sweden and Switzerland) to 17 points (Luxembourg). Physical activity is lowest in girls in Austria, Israel, Italy and Portugal (5%), and boys in France, Israel, Italy and Switzerland (under 15%). Sufficient physical activity is most prevalent in girls in Canada, Iceland and Latvia (14-15%), and boys in Canada and Spain (nearly 30%). The OECD average is just under 15%, with nearly 20% for boys and 10% for girls, resulting in a 10 point average gender gap.

Nearly all OECD countries promote fruit and vegetable consumption: most widely known is the "5 a day" guideline (OECD, 2017). In recent years, children's daily habits have evolved, due to new leisure patterns (TV, internet, smartphones) which have led to a decrease in physical activity (Inchley et al., 2016). Age-specific policies should promote a decrease in screen time and an increase in physical activity levels. Furthermore, the gender gap between boys and girls has not decreased with time, suggesting that girls should be targeted with gender-sensitive approaches and interventions.

Definition and comparability

Dietary habits are measured here in terms of the proportions of children who report eating fruit and vegetables at least every day or more than once a day, no matter the quantity. No reference to exclude juice, soup or potatoes was mentioned in the survey questions. In addition to fruit and vegetables, healthy nutrition also involves other types of foods.

Data for physical activity consider the regularity of self-reported moderate-to-vigorous physical activity lasting at least 60 minutes. Moderate-to-vigorous physical activity refers to exercise undertaken for at least an hour each day which increases the heart rate, and sometimes leaves the child out of breath.

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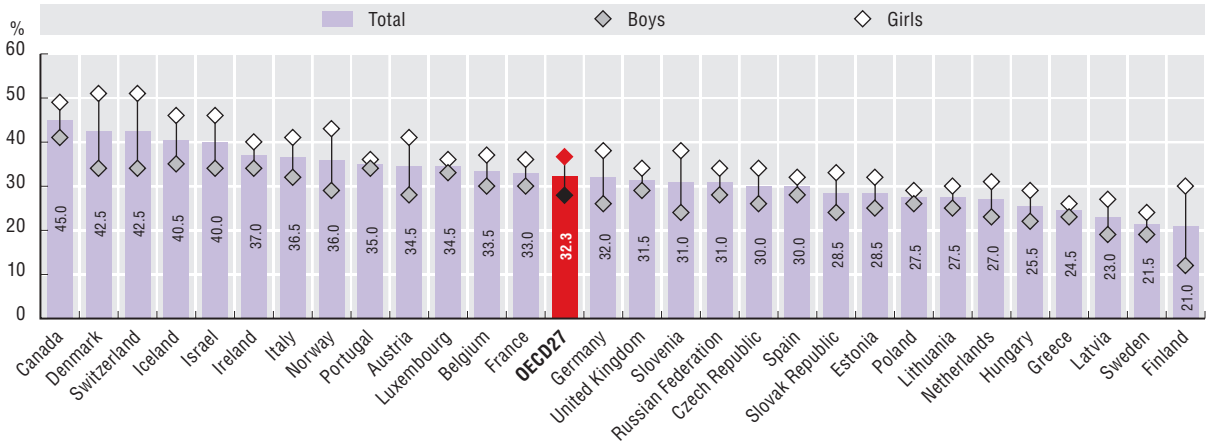
4.11. Daily fruit eating among 15-year-olds, 2013-14



Source: Inchley et al. (2016).

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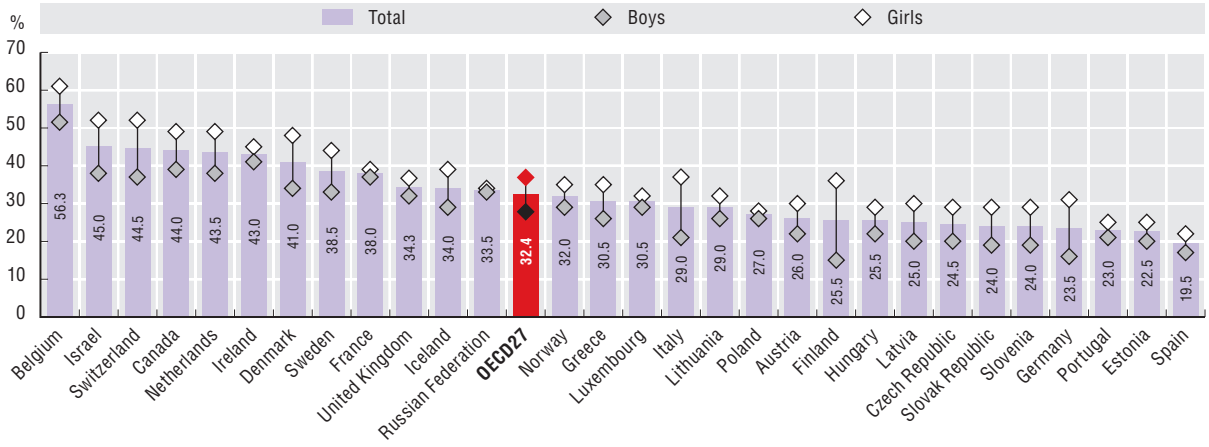
4.12. Daily vegetable eating among 15-year-olds, 2013-14



Source: Inchley et al. (2016).

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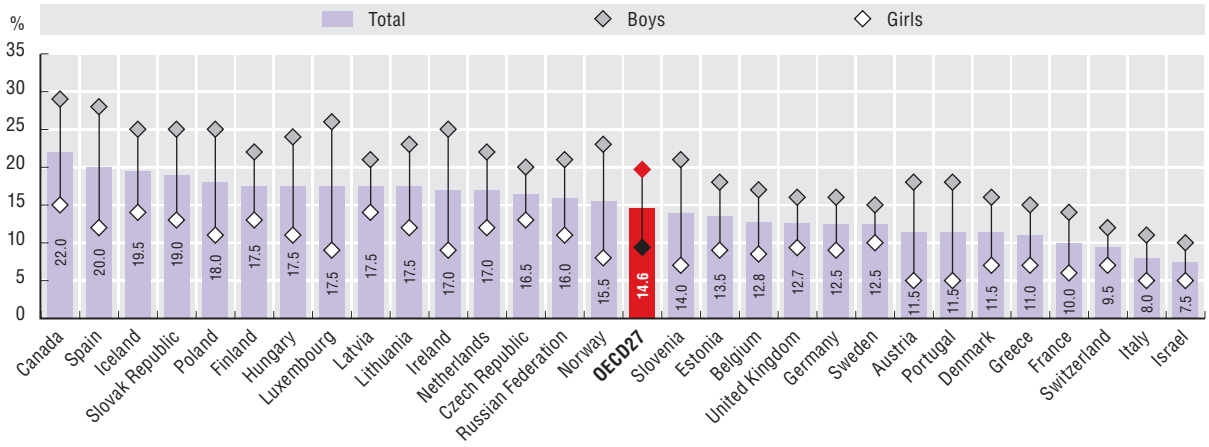
4.13. Moderate-to-vigorous daily physical activity among 15-year-olds, 2013-14



Source: Inchley et al. (2016).

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Overweight and obesity among adults

Overweight and obesity are major risk factors for many chronic diseases, including diabetes, cardiovascular diseases, and cancer. High body mass index (BMI) led to nearly 4 million deaths in 2015, a 19.5% increase since 2005 worldwide. It is the leading risk factor in terms of healthy years of life lost in Turkey, second leading in six other OECD countries, and third leading in another 24 member countries (Forouzanfar et al., 2016). Obesity has risen quickly in the OECD in recent decades, and projections show that this trend will continue (OECD, 2017). It has affected all population groups, regardless of gender, age, race, income or education level, though to varying degrees (Sassi, 2010).

Across the OECD, 54% of the population is overweight, including 19% who are obese (Figure 4.14). Total overweight (BMI≥25) ranges from 24% in Japan and 33% in Korea to just over 70% in Mexico and the United States. Obesity (BMI≥30) is lowest in Italy, Japan and Korea (under 10%), and highest in Hungary, Mexico, New Zealand and the United States (30% or over). In most countries, pre-obesity (25≤BMI<30) accounts for the largest share of overweight people.

On average, 20% of women and 19% of men are obese (Figure 4.15). Gender gaps are lower than 1 point in Canada, France, Germany, Iceland, the Slovak Republic, Spain, Sweden and the United Kingdom. Women are more obese than men in a majority of countries, with disparities 10 points and over in Mexico, Turkey, as well as Colombia, and 22 points in South Africa. In the countries where men are more obese than women (Australia, the Czech Republic, Japan, Korea, Ireland and Slovenia), the gender gaps are much lower.

Obesity has greatly risen in the past two decades, even in countries where rates have been historically low (Figure 4.16). Obesity has more than doubled since the late 1990s in Korea and Norway. Rates seem to have stabilised in recent years in Italy and Japan. OECD countries with historically high rates of obesity are Canada, Chile, Mexico, the United Kingdom and the United States. These countries have also shown a great increase since the 1990s: +92% in the United Kingdom, and +65% in the United States. The increase has been slower in Canada, and Mexico since 2006, and the rise in Chile is nearly imperceptible.

OECD countries have increased implementation of a range of public health policies to try to slow the obesity epidemic (OECD, 2017). Food labelling measures, such as nutrient lists, informative logos, or traffic light schemes have been set up in Australia, England, France and New Zealand, among other countries. Social media and new technologies have become tools for public health promotion, through mass media campaigns aiming to increase public awareness about healthier choices (Goryakin et al., forthcoming). Taxation policies have also been increasingly implemented to raise the price of potentially unhealthy products such as foods high in salt, fat, or sugar. Taxes on sugar-sweetened beverages are amongst the most popular, and there is reasonable evidence that appropriately designed taxes would result in proportional reductions in consumption, especially if fixed at 20% of the retail price or more (WHO, 2016). Comprehensive policy packages that include health promotion, education, interventions in primary care settings, and broader regulatory and fiscal policies, provide affordable and cost-effective solutions to tackle obesity (OECD, 2010).

Definition and comparability

Overweight and obesity are defined as excessive weight presenting health risks because of the high proportion of body fat. The most frequently used measure is based on the body mass index (BMI), which is a single number that evaluates an individual's weight in relation to height (weight/height^2, with weight in kilograms and height in metres). Based on the WHO classification, adults over age 18 with a BMI greater than or equal to 25 are defined as overweight, and those with a BMI greater than or equal to 30 as obese. Pre-obesity defines people whose BMI is greater than or equal to 25 and below 30. Most countries report data for the population aged 15 +, but there are some exceptions as highlighted in the data source of the OECD Health Statistics database.

Overweight and obesity rates can be assessed through self-reported estimates of height and weight derived from population-based health interview surveys, or measured estimates derived from health examinations. Estimates from health examinations are generally higher and more reliable than from health interviews.

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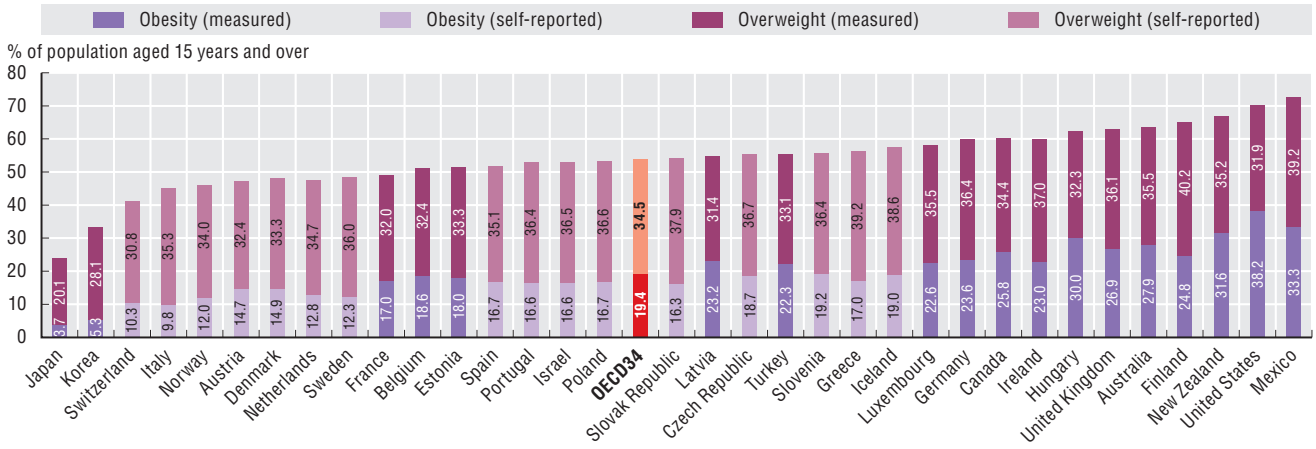
4.14. Overweight including obesity among adults, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

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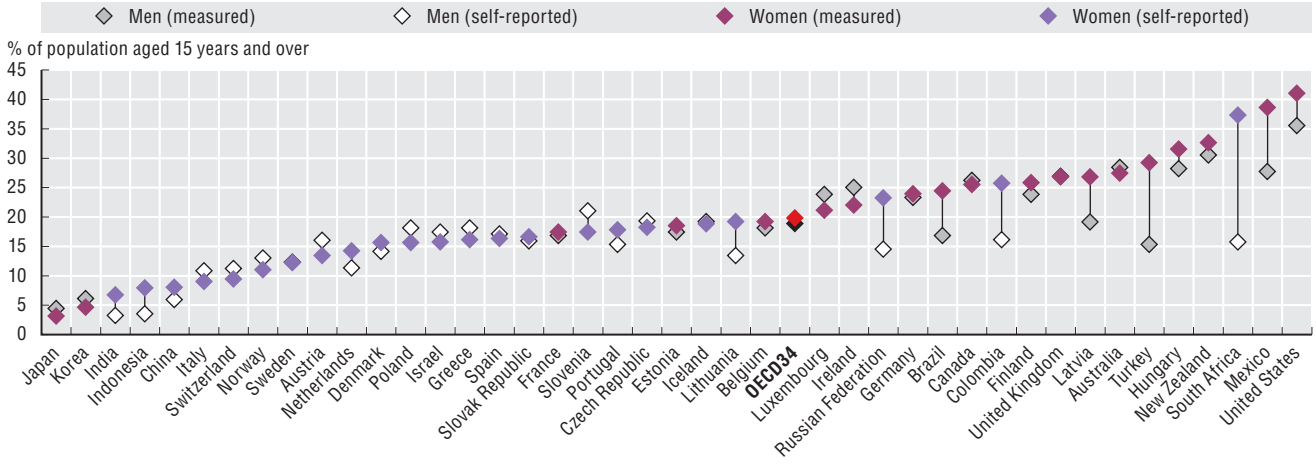
4.15. Obesity among adults by gender, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

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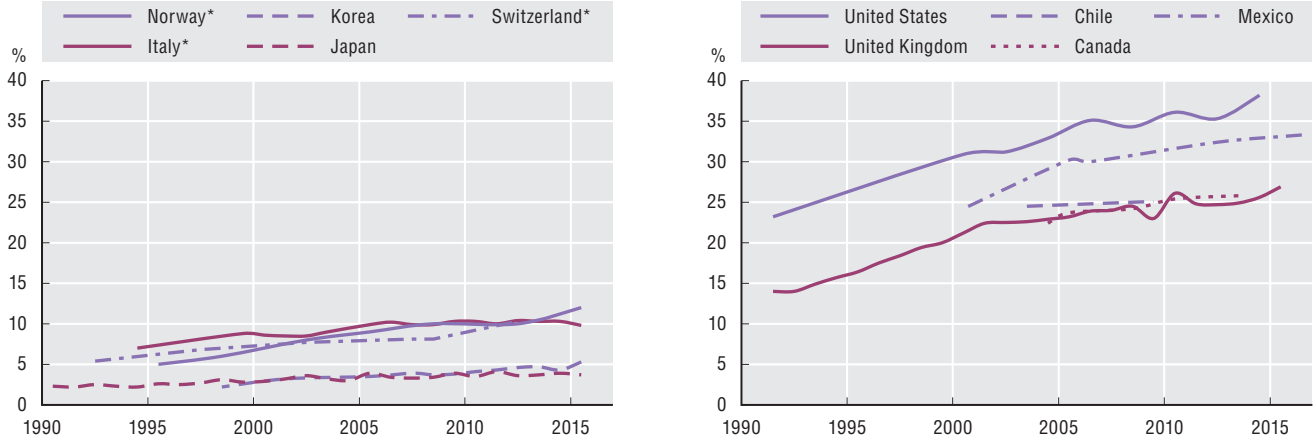
4.16. Evolution of obesity in selected OECD countries, 1990 to 2015 (or nearest year)



Note: Data in countries with a * were self-reported rather than measured.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933602994

Overweight and obesity among children

Childhood obesity has become one of the most serious public health challenges of the 21st century. Obesity can affect a child's physical health, through cardiovascular, endocrine, or pulmonary diseases, and psycho-social health, through the development of poor self-esteem, eating disorders, and depression (Inchley et al., 2016). Obesity can also affect educational attainment (Cohen et al., 2013). Furthermore, childhood obesity is a strong predictor of adult obesity, which has health and economic consequences (WHO, 2016).

Overweight (including obesity) based on measured rather than self-reported height and weight ranges from 15% in Norway to 45% in Chile (Figure 4.17). Across the OECD, the average is 25%, with 26% of overweight boys, and 24% of overweight girls, although rates are based on different age groups. Prevalence of overweight is higher in girls than in boys in Ireland, Mexico, New Zealand, Portugal, Sweden, Switzerland, Turkey and the United Kingdom (England), as well as South Africa. Gender gaps are largest in Denmark, Greece, Korea, Poland, Sweden, as well as South Africa (larger than 8 points).

Over 20% of 15-year-olds self-report overweight in Canada, Greece and the United States, while prevalence drops under 10% in Denmark (Figure 4.18). The highest rates occur for girls in Canada, Greece, Iceland and the United States (15% or over), and in boys in Canada, Greece, Israel, Italy, Slovenia and the United States (over 20%). Rates are lowest in girls in Poland and Norway, as well as Lithuania and the Russian Federation (6-7%), and in boys in Denmark, the Netherlands, France as well as Lithuania (10-14%). Self-reported overweight is higher in boys than in girls in all countries, and the overall OECD average is 16% (19% in boys, 12% in girls). Gender gaps are large overall, but are highest in Canada, Estonia, Greece, Italy, Norway, Poland and the Russian Federation (10-15 points). The gaps remain very small in Denmark, the Netherlands, and Portugal (1-3 points).

Self-reported overweight in 15-year-olds has increased in most OECD countries in the past decade (Figure 4.19). Overall across the OECD, overweight increased by 28%, from 12% in 2001-02 to 16% in 2013-14. The strongest increases occurred in the Czech Republic, Israel, Latvia, Poland, the Slovak Republic and Sweden, where overweight rose by more than 50%, as well as Estonia and Lithuania and the Russian Federation, where they more than doubled. Overweight has dropped since 2001-02 in Denmark, as well as for boys in Iceland and Spain, and girls in Norway and the United Kingdom (England).

Increasingly obesogenic environments have contributed to the rise in overweight and obesity in children. Several OECD countries have implemented policies aimed at tightening regulation of advertisements of unhealthy foods and beverages, specifically targeted toward children and young adults to prevent obesity (OECD, 2017). Children have been found to respond well to school programmes (Veugelers and Fitzgerald, 2005), but a systemic approach encompassing a broad spectrum of factors leading to obesity and including communities, families and individuals is necessary to effectively halt the epidemic and decrease prevalence (Inchley et al., 2016).

Definition and comparability

Estimates of overweight and obesity are based on body mass index (BMI) calculations using either measured or child self-reported height and weight, the latter possibly under-estimating obesity and overweight. Overweight and obese children are those whose BMI is above a set of age- and sex-specific cut-off points (Cole et al., 2000).

Measured data are gathered by the World Obesity Federation (WOF, former IASO) from different national studies. The estimates are based on national surveys of measured height and weight among children at various ages. Caution is therefore needed in comparing rates across countries. Definitions of overweight and obesity among children may sometimes vary among countries, although whenever possible the IOTF BMI cut-off points are used.

Self-reported data are from the Health Behaviour in School-aged Children (HBSC) surveys undertaken between 2001-02 and 2013-14. Data are drawn from school-based samples of 1 500 in each age group (11-, 13- and 15-year-olds) in most countries. Self-reported height and weight are subject to under-reporting, missing data and error, and require cautious interpretation.

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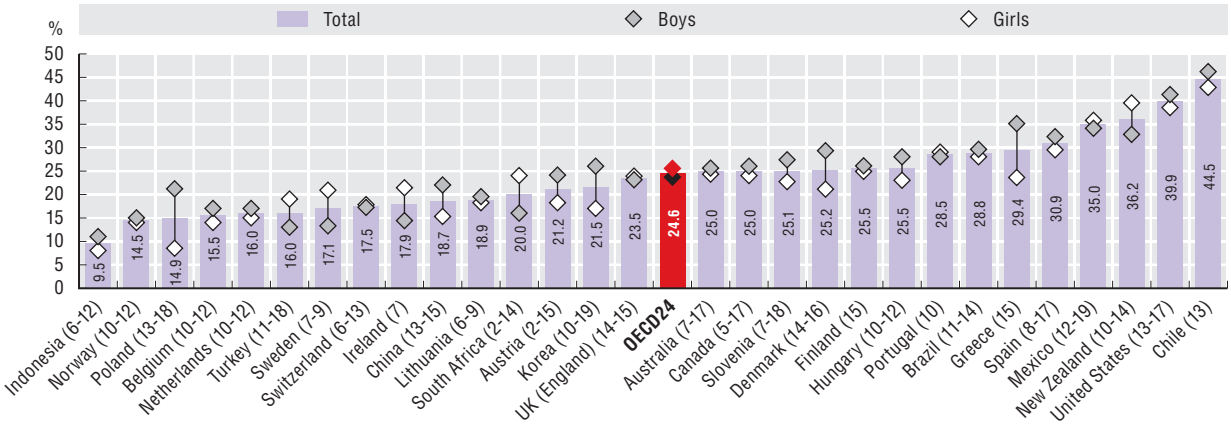
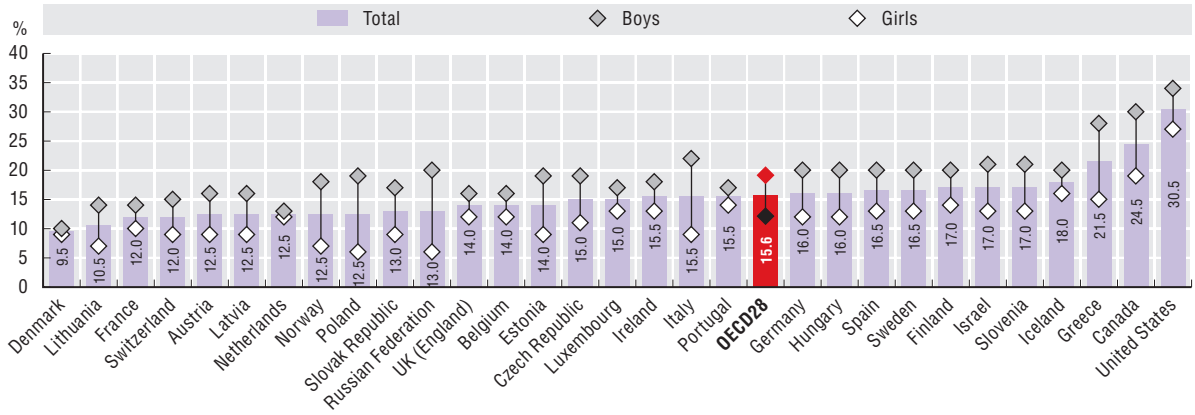
4.17. Measured overweight (including obesity) among children at various ages, 2010 (or nearest year)



Note: The numbers in parentheses refer to the age of the children surveyed in each country.
Source: International Association for the Study of Obesity (2013); World Obesity Federation (2016, 2017); JUNAEB (2016) for Chile; THL National Institute for Health and Welfare for Finland.

StatLink http://dx.doi.org/10.1787/888933603013

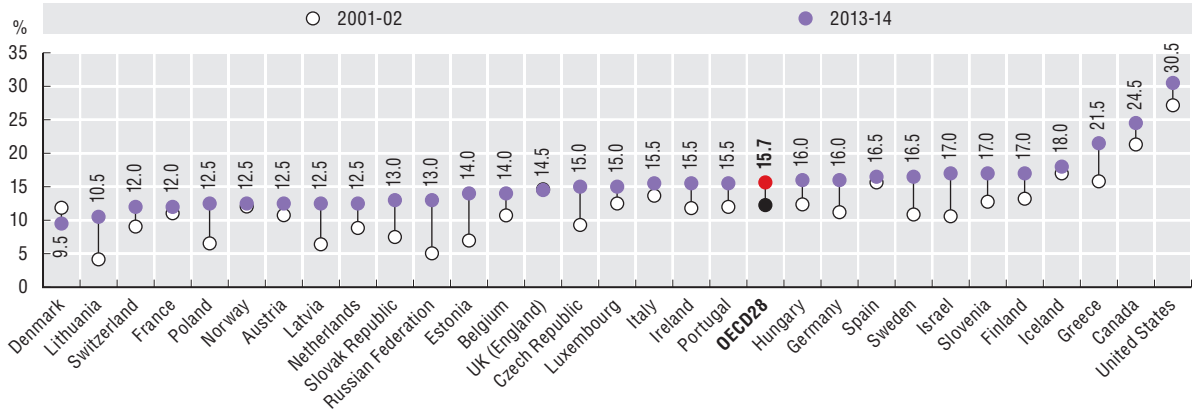
4.18. Self-reported overweight (including obesity) among 15-year-olds, 2013-14



Note: International Obesity Task Force cut-offs. Rates for the United States refer to survey year 2009-10 rather than 2013-14.
Source: Inchley et al. (2016).

StatLink http://dx.doi.org/10.1787/888933603032

4.19. Change in self-reported overweight (including obesity) among 15-year-olds, 2001-02 and 2013-14



Note: International Obesity Task Force cut-offs. Rates for the second data point for the United States refer to survey year 2009-10 rather than 2013-14. Rates for the first data point for Iceland, Luxembourg and the Slovak Republic refer to survey year 2005-06 rather than 2001-02.
Source: Currie et al. (2004); Inchley et al. (2016).

StatLink http://dx.doi.org/10.1787/888933603051

Air pollution

Air pollution is a major environment-related health threat, especially to children and the elderly, as it can cause respiratory diseases, lung cancer, and cardiovascular diseases. It has also been linked to low birth-weight, dementia, and damage to DNA and the immune system (WHO, 2017). Outdoor air pollution in both cities and rural areas was estimated to cause 3 million premature deaths worldwide in 2012 (WHO, 2016), and can also have substantial economic and social consequences, from health costs to building restoration needs and agricultural output (OECD, 2015). Of particular concern for outdoor air pollution are carbon monoxide, nitrogen oxide and ozone, but also fine particulates, or $PM_{2.5}$, whose diameter is 2.5 µm or smaller. These are potentially more dangerous than the larger particulates (PM_{10}), as they can penetrate deeper into the respiratory tract, and cause severe health effects. In 2015, particulate matter pollution was the cause of over 4.2 million deaths worldwide (Forouzanfar et al., 2016). The WHO has claimed that air pollution is one of the most pernicious threats facing global public health today and on a bigger scale than HIV or Ebola (WHO, 2017).

In 2015, exposure levels to $PM_{2.5}$ exceeding the WHO guidelines were higher than 90% in 21 OECD countries (Figure 4.20). In 19 of those countries, 100% of the population was exposed. Australia, Canada, Finland, Iceland, New Zealand and Sweden display rates of nearly 0%, followed by the United States and Norway with rates below 10%. The OECD average is 68%.

The mean annual population exposure to $PM_{2.5}$ has decreased in the OECD, on average, from 18.2 microgrammes/m^3 in 1990 to 15.1 microgrammes/m^3 in 2015 (Figure 4.21). While the overall trend since 1990 has been downward, there have been some increases in population exposure in more recent years. This is largely due to the concentration of pollution sources in urban areas and to increasing use of private vehicles for urban trips (OECD, 2015).

In 2015, population exposure was lowest in Australia, Canada, Finland, Iceland, New Zealand and Sweden, and highest in Korea and Turkey, as well as China, India and South Africa. Population exposure has decreased in most countries since 1990, except in Israel, Italy, Japan, Korea, Turkey, China and India where increases range from 5% in Japan to 24% in India. In countries where exposure has dropped, the decreases range from 3-8% in Finland, Iceland, Spain, Sweden, Switzerland as well as Costa Rica and Indonesia, to 30-40% in the Czech Republic, Hungary, Latvia, Poland, the Slovak Republic as well as Lithuania.

The WHO estimates that overall, 92% of the world's population is breathing air above the $PM_{2.5}$ guidelines (WHO, 2017), and indoor and outdoor air pollution cause approximately 7 million premature deaths per year (WHO, 2014). OECD projections estimate that outdoor air pollution will cause 6 to 9 million premature deaths by 2060, and cost 1% of global GDP (OECD, 2016). Policies to limit air pollution consist of regulatory approaches, such as air quality standards, fuel quality standards or emission ceilings, as well as economic instruments, which include fuel taxes, road pricing or taxes on emissions.

Definition and comparability

The WHO has established guidelines for air pollution, expressed as the average level of exposure of a nation's population (urban and rural) to concentrations of suspended particles which must not be exceeded. The indicators presented here reflect the estimated average level of exposure to concentrations of fine particulates, which measure less than 2.5 microns in diameter. The WHO guidelines for $PM_{2.5}$ are an annual mean of 10 microgrammes/m^3, which is the lower range over which adverse health effects have been observed.

Data for $PM_{2.5}$ are made available by the World Bank, through the Global Burden of Disease Study. They are generated by combining data from different sources, including satellite observations of aerosols in the atmosphere and round-level monitoring of particulates. However, pollutant concentrations are sensitive to local conditions, and measurement protocols may differ across countries. The data must therefore serve as a general indicator of air quality, mostly allowing for cross-country comparison.

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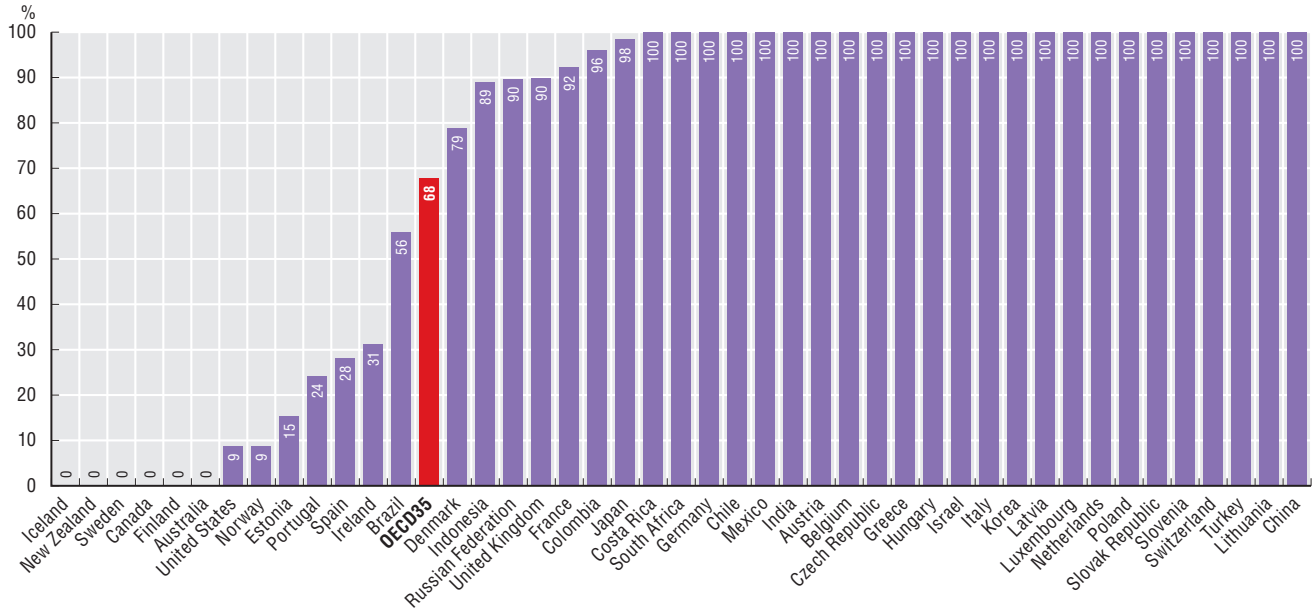
4.20. Population exposed to $PM_{2.5}$ levels exceeding 10 microgrammes/m^3, 2015



Source: World Bank (2017), World Development Indicators (database).

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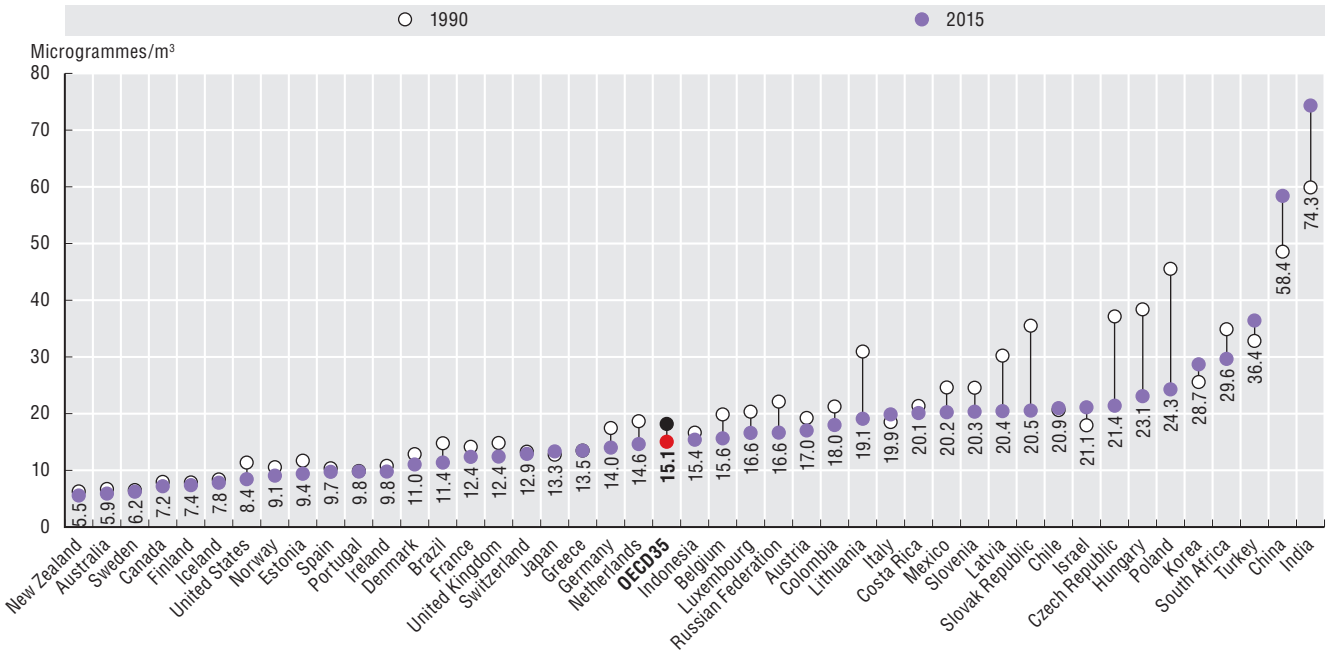
4.21. Mean annual population exposure to $PM_{2.5}$, 1990 and 2015



Source: World Bank (2017), World Development Indicators (database).

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5. ACCESS TO CARE

Population coverage for health care

Unmet needs for health care due to cost

Out-of-pocket medical expenditure

Geographic distribution of doctors

Waiting times for elective surgery

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Population coverage for health care

Health care coverage, through government schemes and private health insurance, provides financial security against unexpected or serious illness. However, the percentage of the population covered by such schemes does not provide a complete indicator of accessibility, since the range of services covered and the degree of cost-sharing applied to those services also affects access to care.

Most OECD countries have achieved universal (or near-universal) coverage of health care costs for a core set of services, which usually include consultations with doctors and specialists, tests and examinations, and surgical and therapeutic procedures (Figure 5.1). Generally, dental care and pharmaceutical drugs are partially covered, although there are a number of countries where these services must be purchased separately (OECD, 2015). Universal coverage has typically been achieved through government schemes (national health systems or social health insurance), though a few countries (the Netherlands and Switzerland) use compulsory private health insurance to cover some or all of the population.

Population coverage for a core set of services is below 95% in seven OECD countries, and lowest in Greece, the United States and Poland. In Greece, the economic crisis continues to have a significant effect, reducing health insurance coverage among the long-term unemployed. Many self-employed workers have also decided not to renew their health insurance because of reduced disposable income. However, since 2014 uninsured people are covered for prescribed pharmaceuticals, emergency services in public hospitals, and for non-emergency hospital care under certain conditions (Eurofound, 2014). Further, since 2016 new legislation has sought to close remaining coverage gaps. In the United States, coverage is provided mainly through private health insurance. Publicly financed coverage covers the elderly, and people with low income or with disabilities. The share of the population uninsured decreased from 14.4% in 2013 to 9.1% in 2015. This followed implementation of the Affordable Care Act, which was designed to expand health insurance coverage (Cohen and Martinez, 2015). However, this Act is under review by the current United States administration. In Poland, a tightening of the law in 2012 made people lose their social health insurance coverage if they fail to pay their contribution. But uninsured people who need medical care utilise emergency hospital services, where they will be encouraged to obtain insurance. In Ireland, though coverage is universal, most of the population have to pay not insignificant user charges (upwards of EUR50) to access primary care (Burke et al., 2016).

Basic primary health coverage, whether provided through government schemes or private insurance, generally covers a defined "basket" of benefits, in many cases with cost-sharing. In some countries, additional health coverage can be purchased through voluntary private insurance to cover any cost-sharing left after basic coverage (complementary insurance), add additional services (supplementary insurance) or provide faster access or larger choice to providers (duplicate insurance). Among OECD countries, nine have private coverage for over half of the population (Figure 5.2).

Private health insurance offers 96% of the French population *complementary* insurance to cover cost-sharing in the social security system. The Netherlands has the largest *supplementary* market (84% of the population), followed by Israel (83%), whereby private insurance pays for prescription drugs and dental care that are not publicly reimbursed. *Duplicate* markets, providing faster private-sector access to medical services where there are waiting times in public systems, are largest in Ireland (45%) and Australia (56%).

The population covered by private health insurance has increased in some OECD countries over the past decade, particularly in Denmark, Korea, Slovenia and Belgium. But private health insurance coverage has come down in other countries, notably Greece, Ireland, New Zealand and the United States (Figure 5.3). The importance of private health insurance is linked to several factors, including gaps in access to publicly financed services, government interventions directed at private health insurance markets, and historical development.

Definition and comparability

Coverage for health care is defined here as the share of the population receiving a core set of health care goods and services under public programmes and through private health insurance. It includes those covered in their own name and their dependents. Public coverage refers to national health systems or social health insurance. Take-up of private health insurance is often voluntary, although it may be mandatory by law or compulsory for employees as part of their working conditions. Premiums are generally not income-related, although the purchase of private coverage can be subsidised by government.

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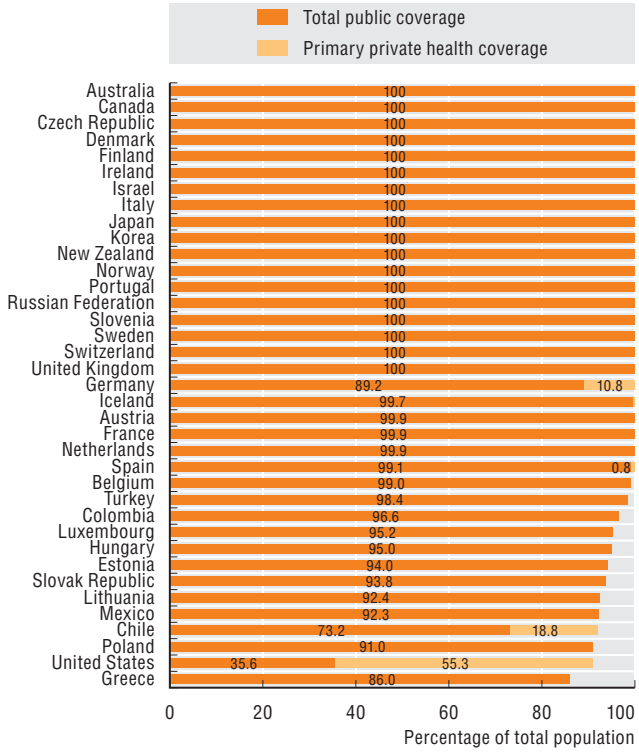
5.1. Population coverage for a core set of services, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

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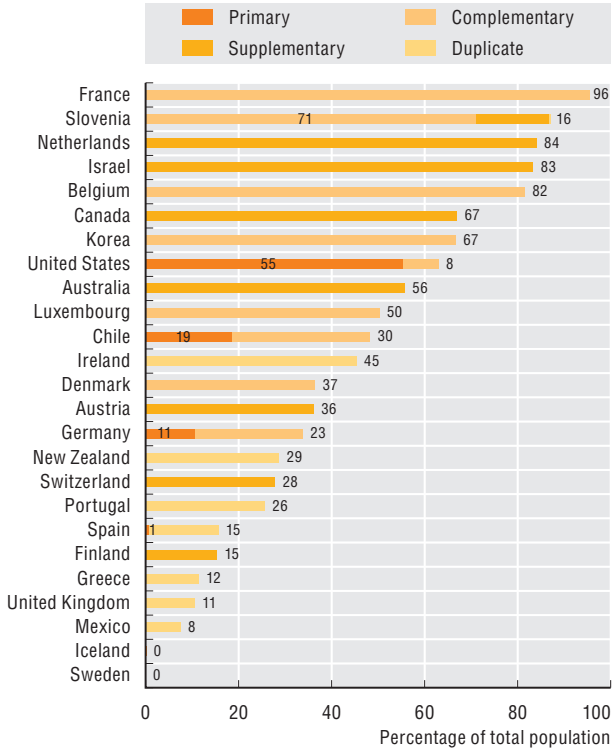
5.2. Private health insurance coverage, by type, 2015 (or nearest year)

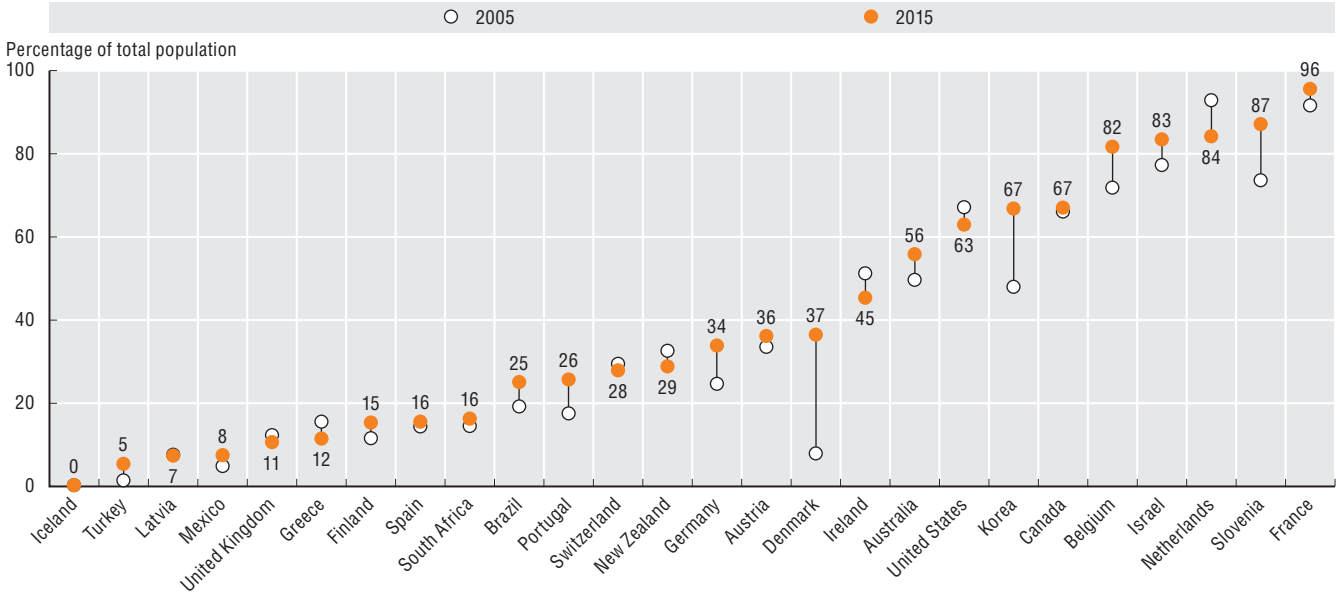


Note: Private health insurance can be both duplicate and supplementary in Australia; both complementary and supplementary in Denmark and Korea; and duplicate, complementary and supplementary in Israel and Slovenia.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603127

5.3. Trends in private health insurance coverage, 2005 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603146

Unmet needs for health care due to cost

Access to health care may be prevented for a number of reasons. These can be due to the functioning of the health care system (such as the cost of health care, distance to the closest health care facility, or waiting lists) or to personal reasons (including fear of not being understood by the doctor or not having the time to seek care). People who forgo health care when they need it may jeopardise their health status.

Unmet needs due to cost is a particularly pressing problem, especially among lower-income groups. Consequently, an increasing number of countries collect data to measure the extent to which health care is foregone due to cost (Fujisawa and Klazinga, 2017). This includes whether people skipped consultations or prescribed medicines due to cost.

On average across OECD countries, just over one in ten people reported having skipped a consultation due to cost in 2016, based on 17 OECD countries (Figure 5.4). Relatively high numbers of people reporting to forego consultations is somewhat surprising, as in most OECD countries consultations are free of charge or with a small co-payment (Paris et al., 2016). The share of the population foregoing consultations due to cost is high in Poland (33%), and also in the United States (22.3%) and Switzerland (20.9%). Less than 5% of the population in Germany, Spain, Sweden, the United Kingdom, Israel and Italy reported skipping consultations due to cost.

In most countries, the share of the population who skipped a consultation due to cost has not changed much in recent years, but there are some exceptions. A large increase was observed in Switzerland, with people who have foregone consultations concentrated among those younger than 50 years of age and those with low income (OFSP, 2016). In Germany and Estonia, the share of the population who skipped consultation due to cost has decreased.

In terms of prescribed medicines, on average 7.1% of people reported having skipped prescribed medicines due to cost, based on 15 OECD countries (Figure 5.5). Most OECD countries have co-payments for prescribed medicines, though often with exemptions for specific population groups (Paris et al., 2016). Population shares reporting foregone prescribed medicines were highest in the United States (18%) and Switzerland (11.6%); and lowest in Germany (3.2%) and the United Kingdom (2.3%). In most countries, the share of the population who skipped prescribed medicine due to cost has slightly decreased in recent years. Large improvements were reported in Israel, Estonia and Australia. In Israel, this may be due in part to policies to improve accessibility and affordability of medicines for chronic patients and the elderly.

Unmet needs for health care due to cost are consistently higher among people in low income groups compared with those in high income groups, across OECD countries (Figure 5.6). An exception is in the United Kingdom, where unmet care needs due to cost are similar for low income adults and the rest of the population. Unmet needs are particularly large among the low income in the United States, where 43% of low income adults reported having unmet care needs due to cost in 2016. There were also large gaps in unmet care needs between high and low income people in France and Canada.

Self-reported unmet care needs should be assessed together with other indicators of potential barriers to access, such as the extent of health insurance coverage and the amount of out-of-pocket payments. Strategies to improve access to care for disadvantaged or underserved populations need to tackle both financial and non-financial barriers, as well as promoting an adequate supply and distribution of the health workforce.

Definition and comparability

The OECD collects data on unmet care needs due to cost reported by populations from national and international sources and a number of countries reporting these measures are increasing over time. These use questions that are similar to those asked in the Commonwealth Fund International Health Policy Survey. Rates for Figures 5.4 and 5.5 refer to both primary and secondary care and they are age-sex standardised to the 2010 OECD population structure, to remove the effect of different population structures across countries. Due to the change of data source for this indicator, data cannot be compared directly with those presented in the previous editions of *Health at a Glance*.

The 2016 Commonwealth Fund's International Health Policy Survey asks whether people did not visit a doctor when they had a medical problem, skipped a medical test, treatment, or follow-up that was recommended by a doctor, or did not fill prescription for medicines or skipped doses because of cost in the past year and as it also collects socio-economic background including income level, it allows analysis on unmet care needs by income group. This survey was carried out in 11 countries.

References

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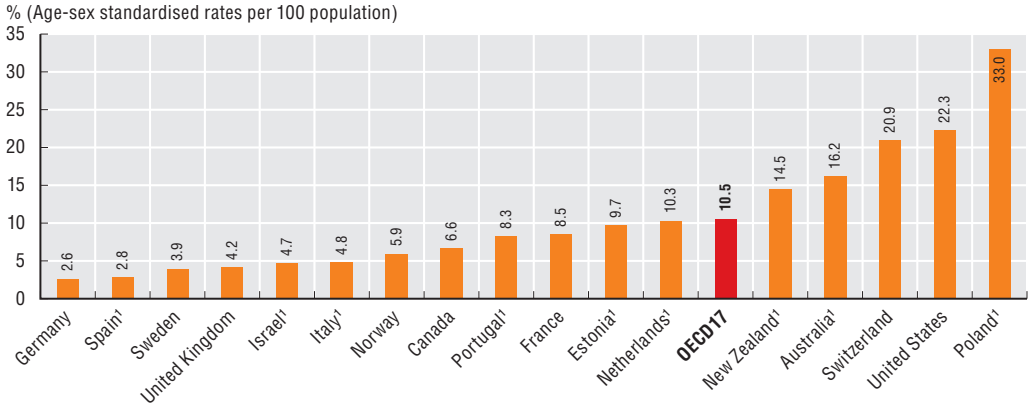
Paris, V. et al. (2016), "Health Care Coverage in OECD Countries in 2012", *OECD Health Working Papers*, No. 88, OECD Publishing, Paris, *http://dx.doi.org/10.1787/5jlz3kbf7pzv-en*.

5.4. Consultations skipped due to cost, 2016 (or nearest year)

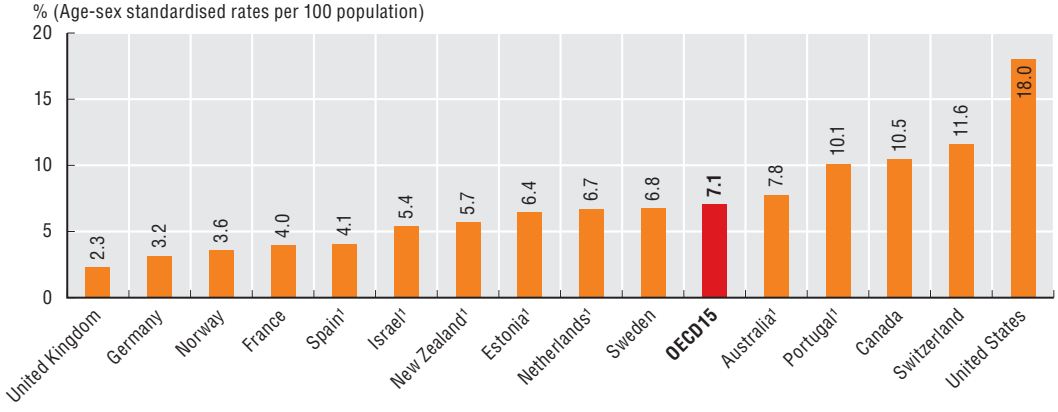


1. National sources.

Source: Commonwealth Fund International Health Policy Survey 2016 and other national sources.

StatLink http://dx.doi.org/10.1787/888933603165

5.5. Prescribed medicines skipped due to cost, 2016 (or nearest year)

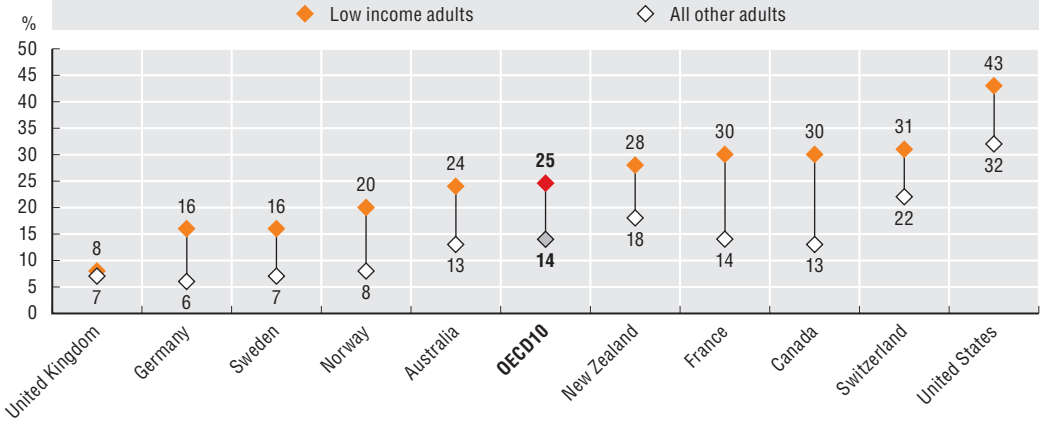


1. National sources.

Source: Commonwealth Fund International Health Policy Survey 2016 and other national sources.

StatLink http://dx.doi.org/10.1787/888933603184

5.6. Unmet care needs due to cost, by income level, 2016



Note: Either did not consult with/visit a doctor because of the cost, skipped a medical test, treatment, or follow-up that was recommended by a doctor because of the cost, did not fill/collect a prescription for medicine, or skipped doses of medicine because of the cost. "Low income" is defined as household income less than 50% of the country median. Sample sizes are small (n < 100) in the Netherlands and the United Kingdom.

Source: Commonwealth Fund International Health Policy Survey 2016.

StatLink http://dx.doi.org/10.1787/888933603203

Out-of-pocket medical expenditure

Financial protection through compulsory or voluntary health coverage can substantially reduce the amount that people need to pay directly for medical care. Yet in some countries the burden of out-of-pocket spending can still create barriers to health care access and use: households that face difficulties paying medical bills may delay or even forgo needed health care. On average across OECD countries, a fifth of all spending on health care comes directly from patients (see indicator "Financing of health care").

Out-of-pocket payments rely on the ability to pay. If the financing of health care becomes more dependent on out-of-pocket payments, the burden shifts, in theory, towards those who use services more, and possibly from high to low-income earners, where health care needs are usually higher. In practice, many countries have safety-nets in place to protect vulnerable groups of the population (such as the poor, the elderly, or people with chronic diseases or disabilities) from excessive out-of-pocket payments. These may be partial or total exemptions or a cap on direct payments, either in absolute terms or as a share of income (Paris et al., 2016).

The burden of out-of-pocket medical spending (that is, excluding long-term care services) can be measured either as a share of total household income or consumption. The share of household consumption allocated to medical care varied considerably across OECD countries in 2015, ranging from lows of around 1.5% of total household consumption in France, Luxembourg and the United Kingdom, to more than 5% in Korea and Switzerland (Figure 5.7). On average, across OECD countries, 3% of household spending goes on medical goods and services.

Health systems in OECD countries differ in the degree of coverage for different health services and goods. In most countries, a higher proportion of the cost is paid directly for pharmaceuticals, dental care and eye care than for hospital care and doctor consultations (Paris et al., 2016). Taking into account these differences and also the relative importance of these different spending categories, it is not surprising that there are significant variations between OECD countries in the breakdown of the medical costs that households have to bear themselves.

In most OECD countries, spending on pharmaceuticals and outpatient care (including dental care) are the two main spending items for out-of-pocket expenditure (Figure 5.8). These two components typically account for almost four-fifths of all medical spending by households. Co-payments and additional services can result in a larger proportion of the cost of inpatient care being taken on directly by households –Greece, Belgium and the Netherlands report a greater share of household spending (20-32%) on inpatient care than the OECD average of less than 10%.

In some Central and Eastern European countries such as Poland, the Czech Republic and Hungary, as well as Canada and Mexico, expenditure on pharmaceuticals accounts for half or more of all out-of-pocket payments. This may be due not only to co-payments for prescribed pharmaceuticals, but also high levels of spending on over-the-counter medicines for self-medication. Therapeutic goods, covering among other items, corrective eye products and hearing aids, can also account for a significant proportion of household spending. In the case of spectacles, compulsory coverage is often limited to paying a contribution for the cost of the lenses, while private households are left to bear the full cost of the frames if they are not covered by complementary private insurance. Overall, therapeutic goods account for more than 20% of household spending in the Netherlands, the United Kingdom, Slovenia, Germany and the Slovak Republic.

Coverage for dental treatment is typically limited and as such dental care plays a significant part in outpatient and overall household spending, accounting for 20% of all out-of-pocket expenditure across OECD countries. In Spain, Norway and Estonia, this figure reaches 30% or more. This can at least partly be explained by the limited compulsory coverage for dental care in these countries compared with a more comprehensive coverage for other categories of care.

Definition and comparability

Out-of-pocket payments are expenditures borne directly by a patient where neither compulsory nor voluntary insurance cover the full cost of the health good or service. They include cost-sharing and other expenditure paid directly by private households and should also include estimations of informal payments to health care providers. Only expenditure for medical spending (i.e. current health spending less expenditure for the health part of long-term care) is presented here, because the capacity of countries to estimate private long-term care expenditure varies widely.

References

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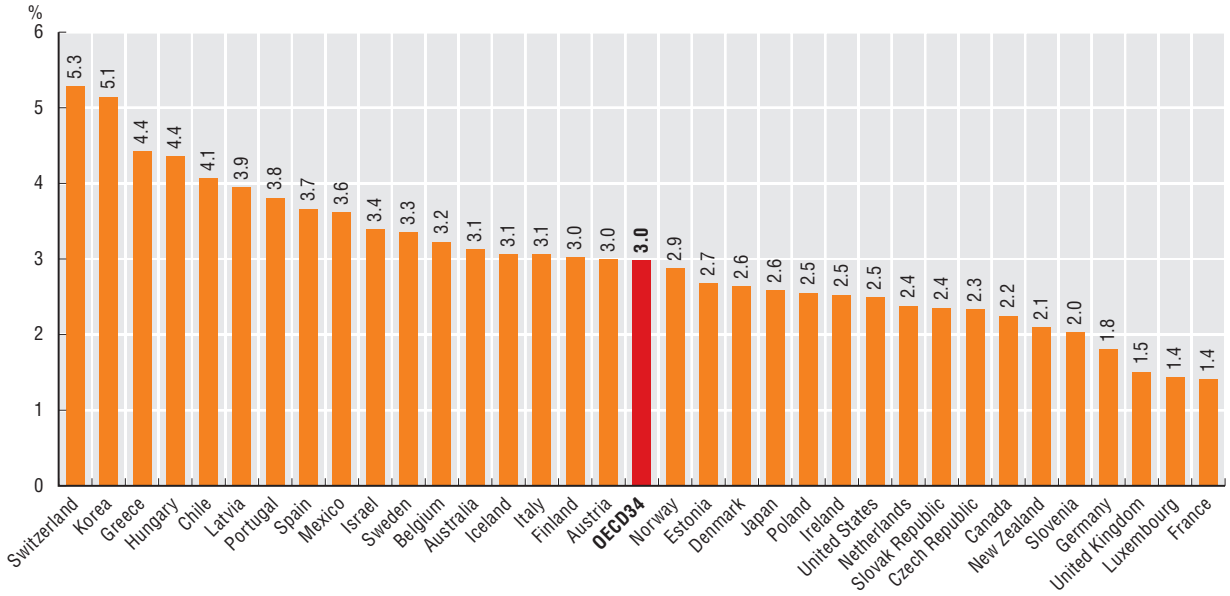
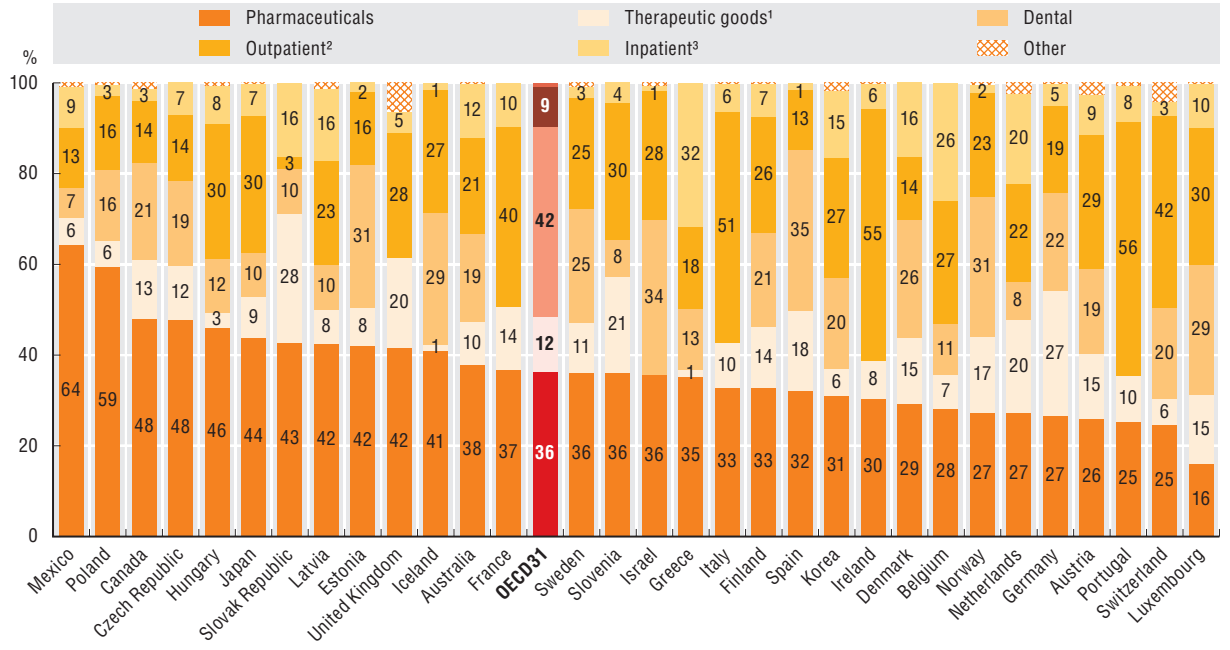
5.7. Out-of-pocket medical spending as a share of final household consumption, 2015 (or nearest year)



Note: This indicator relates to current health spending excluding long-term care (health) expenditure.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603222

5.8. Out-of-pocket medical spending by services and goods, 2015 (or nearest year)



Note: This indicator relates to current health spending excluding long-term care (health) expenditure.
1. Including eye care products, hearing aids, wheelchairs, etc.
2. Includes home care and ancillary services (and dental if not shown separately).
3. Including day care.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603241

Geographic distribution of doctors

Access to medical care requires an adequate number and proper distribution of doctors in all parts of the country. Concentration of doctors in one region and shortages in others can lead to inequities in access such as longer travel or waiting times. The uneven distribution of doctors and the difficulties in recruiting and retaining doctors in certain regions is an important policy issue in most OECD countries, especially those with remote and sparsely populated areas, and those with deprived rural and urban regions.

The overall number of doctors per capita varies across OECD countries from around two per 1 000 population in Turkey, Chile and Korea, to above five per 1 000 population in Greece and Austria (see indicators on doctors in Chapter 8). Beyond these cross-country differences, the number of doctors per capita also varies widely across regions within the same country (Figure 5.9). In many countries there is a high concentration of physicians in capital cities; this is particularly evident in Austria, the Czech Republic, Greece, Mexico, Portugal, the Slovak Republic, and the United States. Between regions, the United States shows nearly a five-fold difference in physician density, while Australia, Belgium and Korea show only around a 20 percent difference in physician densities between regions.

The density of physicians is also consistently greater in urban regions, reflecting the concentration of specialised services such as surgery and physicians' preferences to practice in urban settings. There are large differences in the density of doctors between predominantly urban and rural regions in Canada, the Slovak Republic and Hungary, although the definition of urban and rural regions varies across countries. The distribution of physicians between urban and rural regions was more equal in Japan and Korea, but there are generally fewer doctors in these two countries (Figure 5.10).

Doctors may be reluctant to practice in rural regions due to concerns about their professional life (including their income, working hours, opportunities for career development, isolation from peers) and social amenities (such as educational options for their children and professional opportunities for their spouse). A range of policy levers can be used to influence the choice of practice location of physicians. These include 1) the provision of financial incentives for doctors to work in underserved areas; 2) increasing enrolments in medical education programmes of students coming from specific social or geographic backgrounds or decentralising the location of medical schools; 3) regulating the choice of practice location of doctors (for new medical graduates or foreign-trained doctors); and 4) re-organising service delivery to improve the working conditions of doctors in underserved areas.

Many OECD countries provide different types of financial incentives to attract and retain doctors in underserved areas, including one-time subsidies to help them set up their practice and recurrent payments such as income guarantees and bonus payments (Ono et al., 2014). A number of countries have also introduced measures to encourage students from under-served regions to enrol in medical schools. Japan established in 1973 the Jichi Medical University specifically to educate physicians for service in rural communities, which contributed to improving access to care in underserved rural regions (Ikegami, 2014).

The effectiveness and cost of different policies to promote a better distribution of doctors can vary significantly, with the impact depending on the characteristics of each health system, the geography of the country, physician behaviours, and the specific policy and programme design. Policies should be designed with a clear understanding of the interests of the target group in order to have any significant and lasting impact (Ono et al., 2014).

Definition and comparability

Regions are classified in two territorial levels. The higher level (Territorial Level 2) consists of large regions corresponding generally to national administrative regions. These broad regions may contain a mix of urban, intermediate and rural areas. The lower level is composed of smaller regions classified as predominantly urban, intermediate or rural regions, although there are variations across countries in the classification of these regions. The data on geographic distributions are from the OECD Regional Database.

References

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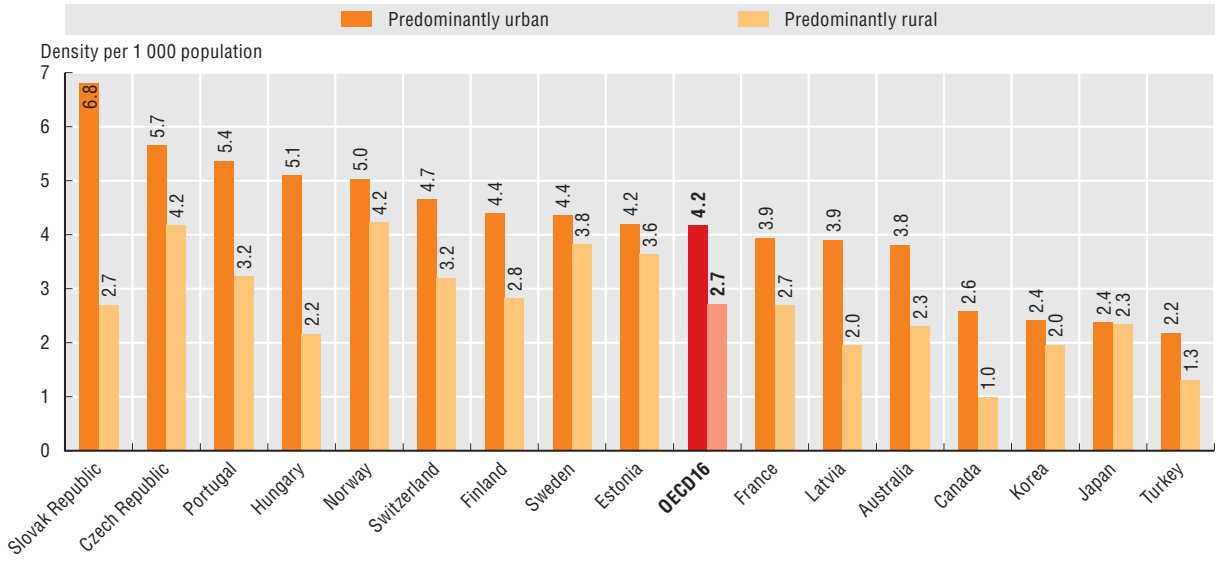
5.9. Physician density, by level 2 regions, 2015 (or nearest year)

Source: OECD Statistics Database 2017.

StatLink http://dx.doi.org/10.1787/888933603260

5.10. Physician density, rural vs urban areas, 2015 (or nearest year)



Source: OECD Statistics Database 2017.

StatLink http://dx.doi.org/10.1787/888933603279

Waiting times for elective surgery

Long waiting times for health services is an important policy issue in many OECD countries (Siciliani et al., 2013), although less relevant in some (e.g. Belgium, France, Germany, Japan, Korea, Luxembourg, Switzerland, United States). Long waiting times for elective (non-emergency) surgery, such as cataract surgery, hip and knee replacement, generates dissatisfaction for patients because the expected benefits of treatments are postponed and the pain and disability remain.

Waiting times are the result of a complex interaction between the demand and supply of health services, with doctors playing a critical role on both sides. The demand for health services and elective surgeries is determined by the health status of the population, progress in medical technologies (including the simplification of many procedures, such as cataract surgery), patient preferences, and the burden of cost-sharing for patients. However, doctors play a crucial role in converting the demand for better health from patients into a demand for medical care. On the supply side, surgical activity rates are influenced by the availability of different categories of surgeons, anaesthetists and other staff involved in surgical procedures, as well as the supply of the required medical equipment.

The measure reported refers to the waiting time from when a medical specialist adds a patient to the waiting list for the procedure, to the moment the patient receives treatment. Both mean and median waiting times are presented. Since a number of patients wait for very long times, the median is consistently and considerably lower than the mean, and might represent a better measure for the central tendency of this indicator. The significant difference between the two measures, especially in countries such as Chile, Estonia, and Poland, highlights the presence of problematic groups of patients who wait significantly longer than others to receive treatment.

In 2015, the mean waiting time for cataract surgery was just over 37 days in the Netherlands, but much longer in Estonia and Poland (Figure 5.11), with average waiting times of 253 and 464 days respectively. Many countries, like the United Kingdom, Denmark, Spain and Chile have seen waiting times remain relatively stable over recent years. Others, shown in the trends graph, have had a general decrease in the past decade, but have increased since 2013.

For hip replacement, the mean waiting time was around 42 days in the Netherlands, but 289 days in Estonia and over 400 days in Chile and Poland (Figure 5.12). The median waiting times were around 41 days in Denmark, 49 days in Italy and 54 days in Israel. It reached between 100 and 150 days in Spain, Norway, Portugal and Australia, and over 200 days in Estonia, Poland and Chile.

Waiting times for knee replacement follows the patterns of hip replacement surgery, with Estonia and Poland having by far the longest waiting times, with median waiting times reaching over 350 days in Poland (Figure 5.13).

Waiting time guarantees have become the most common policy tool to tackle long waiting times in several countries. This has been the case in Finland, where a National Health Care Guarantee was introduced in 2005, leading to a reduction in waiting times for elective surgery (Jonsson et al., 2013). In England, since April 2010, the NHS Constitution has set out a right to access certain services within specific maximum waiting times, or for the NHS to take all reasonable steps to offer a range of alternative providers if this is not possible (Smith and Sutton, 2013). Such guarantees are only effective if they are enforced. There are two main approaches to enforcement: setting waiting time targets and holding providers accountable for achieving these targets; or allowing patients to choose alternative health providers (including the private sector) if they have to wait beyond a maximum amount of time (Siciliani et al., 2013).

Definition and comparability

There are at least two ways of measuring waiting times for elective procedures: 1) measuring the waiting times for patients treated in a given period; or 2) measuring waiting times for patients still on the list at a point in time. The data reported here relate to the first measure (data on the second measure are available in the OECD health database). The data come from administrative databases rather than surveys.

Waiting times are reported both in terms of the average and the median. The median is the value which separates a distribution in two equal parts (meaning that half the patients have longer waiting times and the other half lower waiting times). Compared with the average, the median minimises the influence of outliers (patients with very long waiting times).

References

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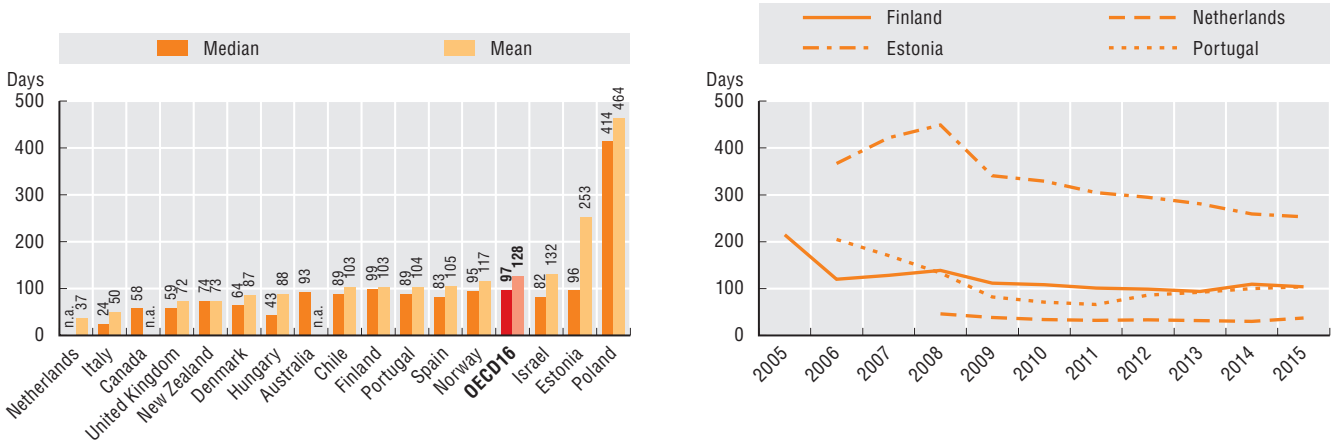
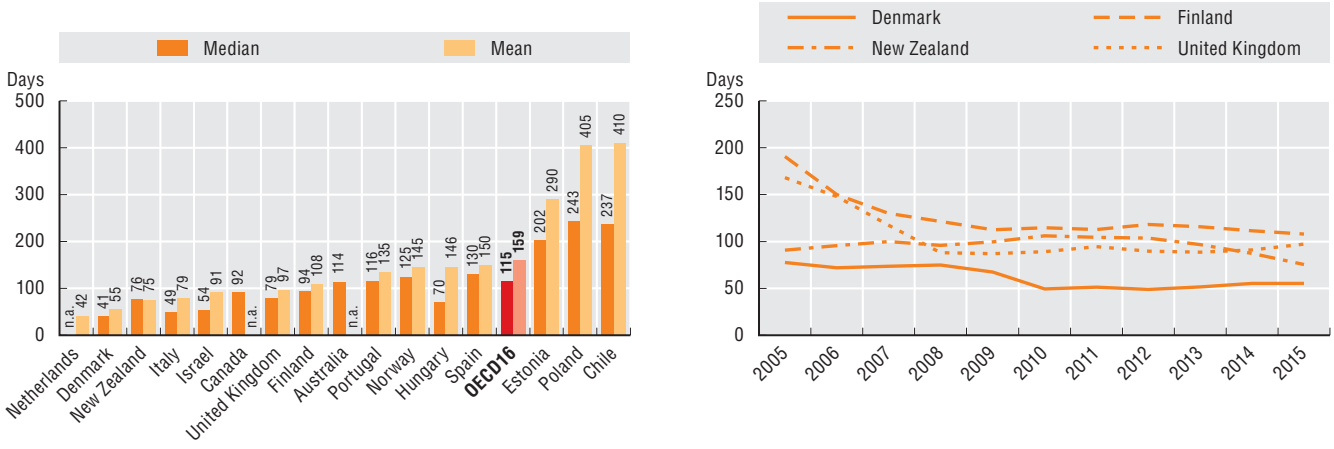
5.11. Cataract surgery waiting times, averages and selected trends, 2015



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603298

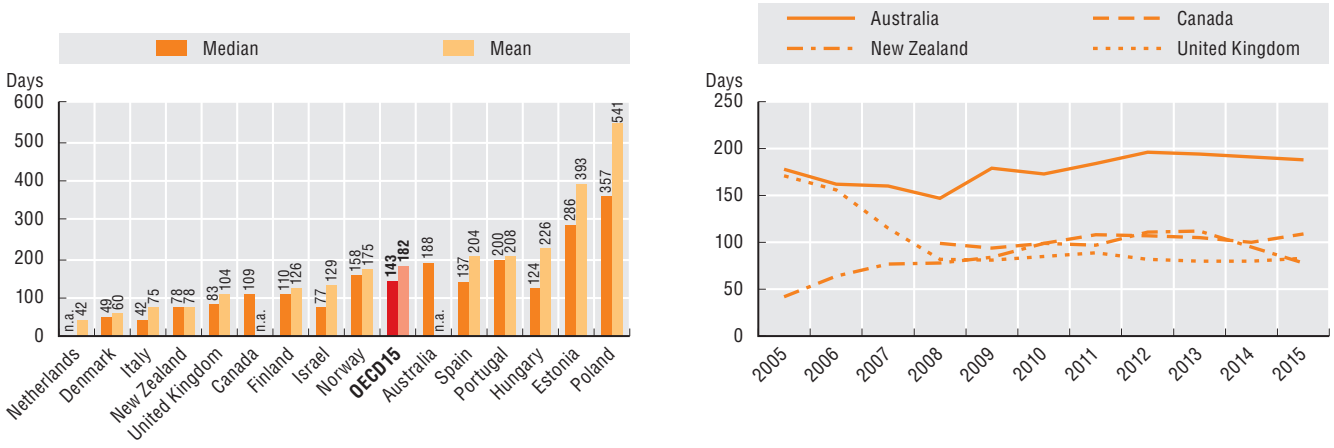
5.12. Hip replacement waiting times, averages and selected trends, 2015



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603317

5.13. Knee replacement waiting times, averages and selected trends, 2015



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603336

6. QUALITY AND OUTCOMES OF CARE

Patient experiences with ambulatory care

Prescribing in primary care

Avoidable hospital admissions

Diabetes care

Mortality following ischaemic stroke

Mortality following acute myocardial infarction (AMI)

Hospital mortality rates

Waiting times for hip fracture surgery

Surgical complications

Obstetric trauma

Care for people with mental health disorders

Screening, survival & mortality for breast cancer

Survival & mortality for colorectal cancer

Survival & mortality for leukemia in children

Vaccinations

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Patient experience with ambulatory care

Delivering health care that is responsive and patient-centred is playing a greater role in health care policy across OECD countries. Considering the health care user as a direct source of information is becoming more prevalent. Since the mid-1990s, there have been efforts to institutionalise measurement and monitoring of patient experiences. This empowers patients and the public, involves them in decisions on health care delivery and governance, and provides insight to the extent to which they are health-literate and have control over the treatment they receive

In many countries, responsible organisations have been established or existing institutions have been identified for measuring and reporting patient experiences. They develop survey instruments for regular collection of patient experience data and standardise procedures for analysis and reporting. An increasing number of countries collect not only Patient-Reported Experience Measures (PREMs) but also Patient-Reported Outcome Measures (PROMs) which collect patients' perception on their specific medical conditions and general health, including mobility, pain/discomfort and anxiety/depression, before and after a specific medical intervention such as cancer and hip and knee replacement. Given the importance of utilising people's voice for developing health systems and improving quality of care, international efforts to develop and monitor patient-reported measures has been intensified in recent years (OECD, 2017a; OECD, 2017b).

Countries use patient-reported data differently to drive quality improvements in health systems. To promote quality of health care through increased provider accountability and transparency, many countries report patient experience data in periodic national health system reports or on public websites, showing differences across providers, regions and over time. Norway uses patient experience measures in payment mechanisms or for fund allocations to promote quality improvement and patient-centred care, and Australia, Canada, the Czech Republic, Denmark, France and the United Kingdom use them to inform health care regulators for inspection, regulation and/or accreditation. Patient-reported measures are also used in some Canadian jurisdictions, Denmark, France and the Netherlands to provide specific feedback for provider's quality improvement (Fujisawa and Klazinga, 2017).

Patients generally report positive experiences when it comes to communication and autonomy in the ambulatory health care system. Across countries, the majority of patients report that they spent enough time with a doctor during consultation (Figure 6.1), a doctor provided easy-to-understand explanations (Figure 6.2), as well as involved them in care and treatment decisions (Figure 6.3). For all three aspects of patient experience, Belgium and Luxembourg score high at above 95% of patients with positive experiences while Poland has lower rates and for instance, only one in two patients report having been involved in their care and treatment during consultation. Japan also has a low rate for patient's perception on time spent with doctor, which can be inferred at least partly by a high number of consultations both per population and doctor (see indicator "Consultations with doctors" in Chapter 9).

In several countries, the proportion of patients with positive experience has decreased in recent years. For example, in Poland the share of patients reporting that a doctor spent enough time with them during consultation fell between 2010 and 2016. However, some countries such as Australia and Estonia have improved some aspects of patient experiences recently.

Definition and comparability

In order to measure and monitor general patient experience in the health system, the OECD recommends collecting data on patient experience with any doctor in ambulatory settings. An increasing number of countries have been collecting patient experience data based on this recommendation through nationally representative population surveys while Japan and Portugal collect them through nationally-representative service user surveys. About half of the countries presented, however, collect data on patient experience with a regular doctor. In 11 countries, the Commonwealth Fund's *International Health Policy Surveys 2010 and 2016* were used as a data source, even though there are critiques relating to the sample size and response rates. Data from this survey refer to patient experience with a regular doctor rather than any doctor. In 2016, the Netherlands which participates in this survey developed a national population survey and this resulted in improved response rates and data quality.

Rates are age-sex standardised to the 2010 OECD population, to remove the effect of different population structures across countries.

References

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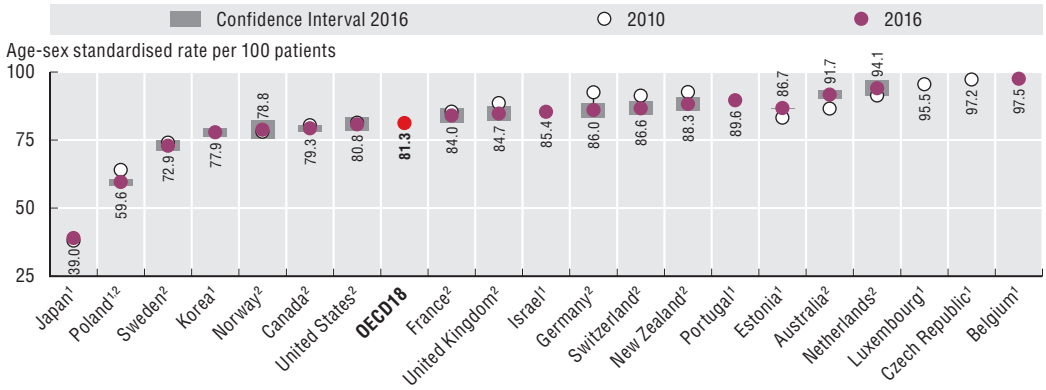
6.1. Doctor spending enough time with patient in consultation, 2010 and 2016 (or nearest year)

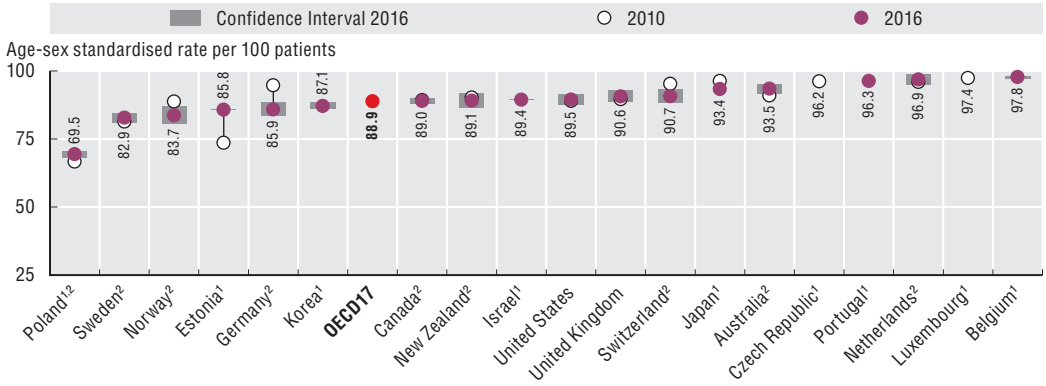


Note: 95% confidence intervals have been calculated for all countries, represented by grey areas.
1. National sources.
2. Data refer to patient experiences with regular doctor.

Source: Commonwealth Fund International Health Policy Survey 2016 and other national sources.

StatLink http://dx.doi.org/10.1787/888933603355

6.2. Doctor providing easy-to-understand explanations, 2010 and 2016 (or nearest year)

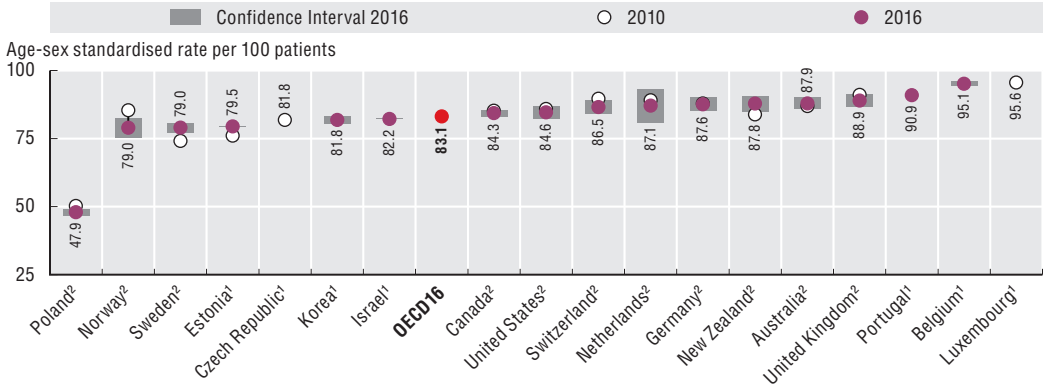


Note: 95% confidence intervals have been calculated for all countries, represented by grey areas.
1 National sources.
2. Data refer to patient experiences with regular doctor.

Source: Commonwealth Fund International Health Policy Survey 2016 and other national sources.

StatLink http://dx.doi.org/10.1787/888933603374

6.3. Doctor involving patient in decisions about care and treatment, 2010 and 2016 (or nearest year)



Note: 95% confidence intervals have been calculated for all countries, represented by grey areas.
1. National sources.
2. Data refer to patient experiences with regular doctor.

Source: Commonwealth Fund International Health Policy Survey 2016 and other national sources.

StatLink http://dx.doi.org/10.1787/888933603393

Prescribing in primary care

Prescribing can be used as an indicator of health care quality supplementing consumption and expenditure information (see Chapter 10). Antibiotics, for example, should be prescribed only where there is an evidence based need to reduce the risk of resistant strains. Likewise, quinolones and cephalosporins are considered second-line antibiotics in most prescribing guidelines. They should generally be used only when first line antibiotics are ineffective. Total volume of antibiotics prescribed, and second-line antibiotics as a proportion of total volume have been validated as markers of quality in the primary care setting.

Figure 6.4 shows volume of all antibiotics prescribed in primary care in 2015, with volumes of second-line antibiotics embedded within the total amount. Total volumes vary more than three-fold across countries, with the Netherlands, Estonia and Sweden reporting the lowest volumes, and Greece and France reporting volumes much higher than the OECD average. Volumes of second-line antibiotics vary almost 16-fold across countries. The Scandinavian countries and the Netherlands report the lowest volumes of second line antibiotics, whereas Korea, Italy and Turkey reported the highest. Variation is likely to be explained, on the supply side, by differences in the regulation, guidelines and incentives that govern primary care prescribers and, on the demand side, by cultural differences in attitudes and expectations regarding the natural history and optimal treatment of infective illness. There has been some growth in the overall volume of antibiotics between 2010 and 2015. The highest growth was seen in Ireland and Poland and the largest decline in Sweden and Iceland.

Antibiotic consumption is consistently higher among children and young adults and older adults. Volumes of antibiotics dispensed to children aged 0-9 years varies by 15-fold across countries but only 5-fold across young adults aged 10-19 years of age (Figure 6.5). Consumption data subdivided by age groups can allow identification of specific age groups that are prescribed high proportion of certain antibiotics and provide detailed information for campaigns or interventions aimed at more prudent use of antibiotics in these sub-groups of population.

Benzodiazepines are often prescribed for older adults for anxiety and sleep disorders, despite the risk of adverse side effects such as fatigue, dizziness and confusion. Long-term use of benzodiazepines can lead to adverse events (falls, road accidents and overdose), tolerance, dependence and dose escalation. Beside the period of use, there is concern about the type of benzodiazepine prescribed, with long-acting types not recommended for older adults because they take longer for the body to eliminate. Figures 6.6 and 6.7 indicate that, across the OECD, on average around 25 per 1 000 older adults are chronic benzodiazepine users (>365 defined daily doses in one year), and 64 per 1 000 older adults have received at least one prescription for a long-acting benzodiazepine or related drugs within the year. The large variation can be explained by different reimbursement and prescribing policies for benzodiazepines as well as differences in disease prevalence and treatment guidelines.

Definition and comparability

Defined daily dose (DDD) is the assumed average maintenance dose per day for a drug used for its main indication in adults. DDDs are assigned to each active ingredient(s) in a given therapeutic class by international expert consensus. For instance, the DDD for oral aspirin equals 3 grams, which is the assumed maintenance daily dose to treat pain in adults. DDDs do not necessarily reflect the average daily dose actually used in a given country. For more detail, see *http://www.whocc.no/atcddd*.

Data for Spain, Estonia, United Kingdom, Portugal and Sweden include data for primary care physicians only. Data for Canada, Ireland, Slovenia and New Zealand include only those dispensed by community pharmacies. Data for Finland, Italy, and Korea include outpatients only. Data for Belgium, Denmark and the Netherlands include outpatients and nursing homes. Data for Turkey include primary care, nursing and residential facilities. Data for Australia include prescriptions dispensed at community pharmacies, private hospital pharmacies and public hospital outpatients and admitted day patients. Results for Canada only include data from the provinces of British Columbia, Manitoba and Saskatchewan.

Denominators comprise the population held in the national prescribing database, rather than the general population.

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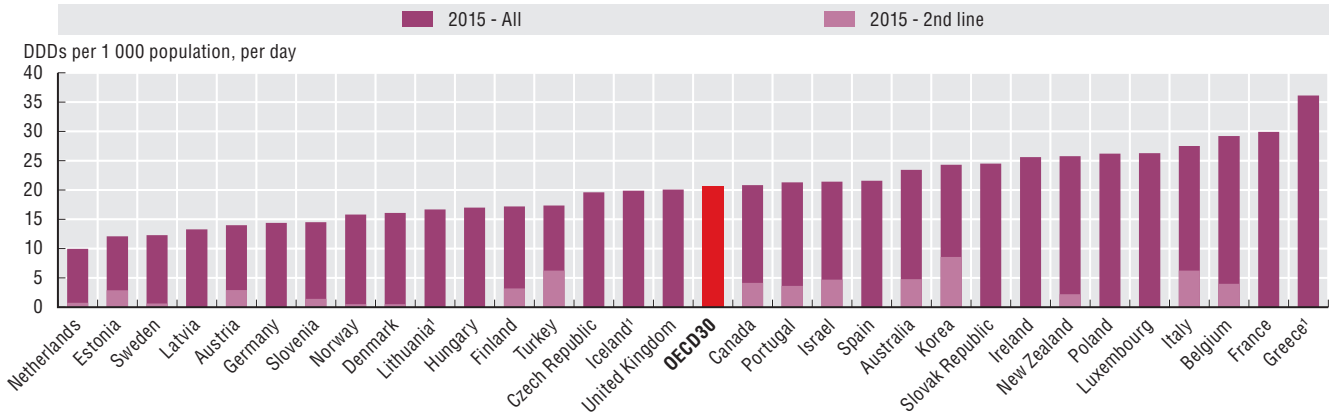
6.4. Overall volume of antibiotics prescribed, 2015 (or nearest year)

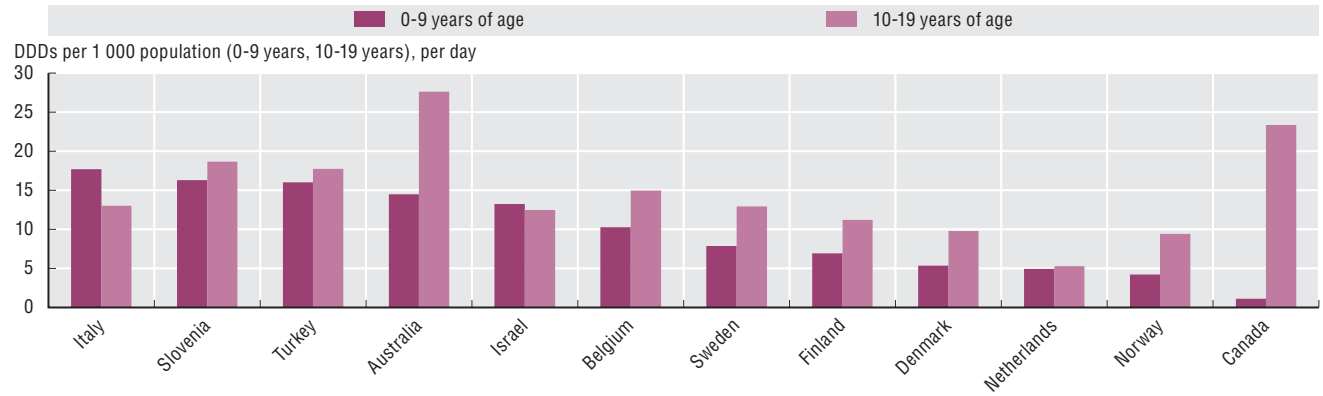


1. Data refer to all sectors (not only primary care).

Source: European Centre for Disease Prevention and Control and *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603412

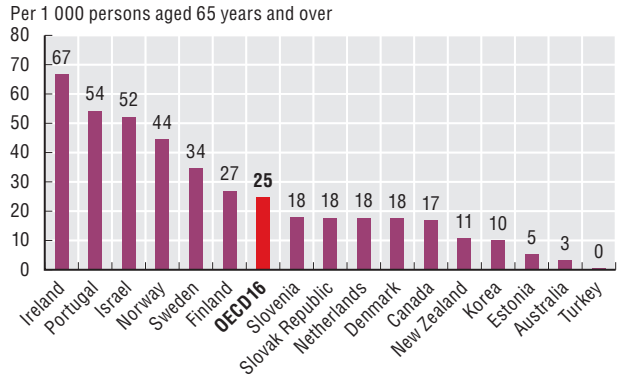
6.5. Volume of antibiotics prescribed in young people, 2015 (or nearest year)



Source: European Centre for Disease Prevention and Control and *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603431

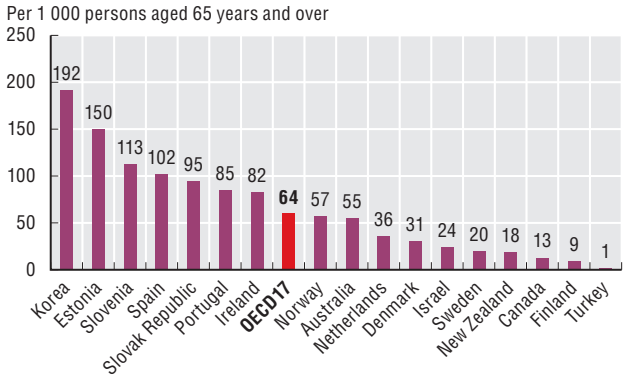
6.6. Chronic Benzodiazepine Use: Number of patients per 1000, aged 65 years and over who have prescriptions for benzodiazepines for more than 365 days, 2015 (or nearest year)



Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603450

6.7. Long-Acting Benzodiazepine use: Number of patients per 1000, aged 65 years and over who have at least one prescription for long-acting benzodiazepines, 2015 (or nearest year)



Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603469

Avoidable hospital admissions

Most health systems have developed a 'primary level' of care whose functions include health promotion and disease prevention, managing new health complaints, managing long-term conditions and referring patients to hospital-based services when appropriate. A key aim is to keep people well, by providing a consistent point of care over the longer-term, tailoring and co-ordinating care for those with multiple health care needs and supporting the patient in self-education and self-management.

Asthma, chronic obstructive pulmonary disease (COPD) and congestive heart failure (CHF) are three widely prevalent long-term conditions. Both asthma and COPD limit the ability to breathe: asthma symptoms are usually intermittent and reversible with treatment, whilst COPD is a progressive disease that almost exclusively affects current or prior smokers. Asthma may affect up to 334 million people worldwide (Global Asthma Network, 2014). About 3 million people died of COPD in 2015, which is equal to 5% of all deaths globally that year (WHO, 2016). CHF is a serious medical condition in which the heart is unable to pump enough blood to meet the body's needs. CHF is often caused by hypertension, diabetes or coronary heart disease. Heart failure is estimated to affect over 26 million people worldwide resulting in more than 1 million hospitalisations annually in both the United States and Europe (Ponikowski et al., 2014).

Common to all three conditions is the fact that the evidence base for effective treatment is well established and much of it can be delivered at a primary care level. A high-performing primary care system, where accessible and high quality services are provided, can reduce acute deterioration in people living with asthma, COPD or CHF and reduce unnecessary admissions to hospital.

Figure 6.8 shows hospital admission rates for asthma and COPD together, given the physiological relationship between the two conditions. Admission rates for asthma vary 15-fold across countries with Italy, Mexico and Colombia reporting the lowest rates and Latvia, Turkey, and Korea reporting rates over twice the OECD average. International variation in admissions for COPD is 25-fold across OECD countries, with Japan and Italy reporting the lowest rates and Hungary and Ireland the highest rates. Combined, there is a lower 7-fold variation across countries for the two respiratory conditions.

Hospital admission rates for CHF vary 12-fold, as shown in Figure 6.9 Colombia, Costa Rica and Mexico, have the lowest rates, while Hungary, Poland and Lithuania report rates about 2 times the OECD average.

Figure 6.10 reveals that in Austria, Israel and Ireland a reduction in admission rates for CHF has been achieved in recent years, whereas in Belgium rates have remained relatively stable and in Spain rates have increased. While observed improvements may represent advances in the quality of primary care for these countries, recent reviews undertaken by OECD indicate that investment in primary care may not be happening fast enough (OECD, 2017b), potentially resulting in wasteful spending on health care (OECD, 2017a)

Definition and comparability

The indicators are defined as the number of hospital admissions with a primary diagnosis of asthma, COPD or CHF among people aged 15 years and over per 100 000 population. Rates are age-sex standardised to the 2010 OECD population aged 15 and over. Admissions resulting from a transfer from another hospital and where the patient dies during the admission are excluded from the calculation as these admissions are considered unlikely to be avoidable.

Disease prevalence and availability of hospital care may explain some, not all, variations in cross-country rates. Differences in coding practices among countries may also affect the comparability of data. For example, the exclusion of "transfers" cannot be fully complied with by some countries. Differences in data coverage of the national hospital sector across countries may also influence indicator rates.

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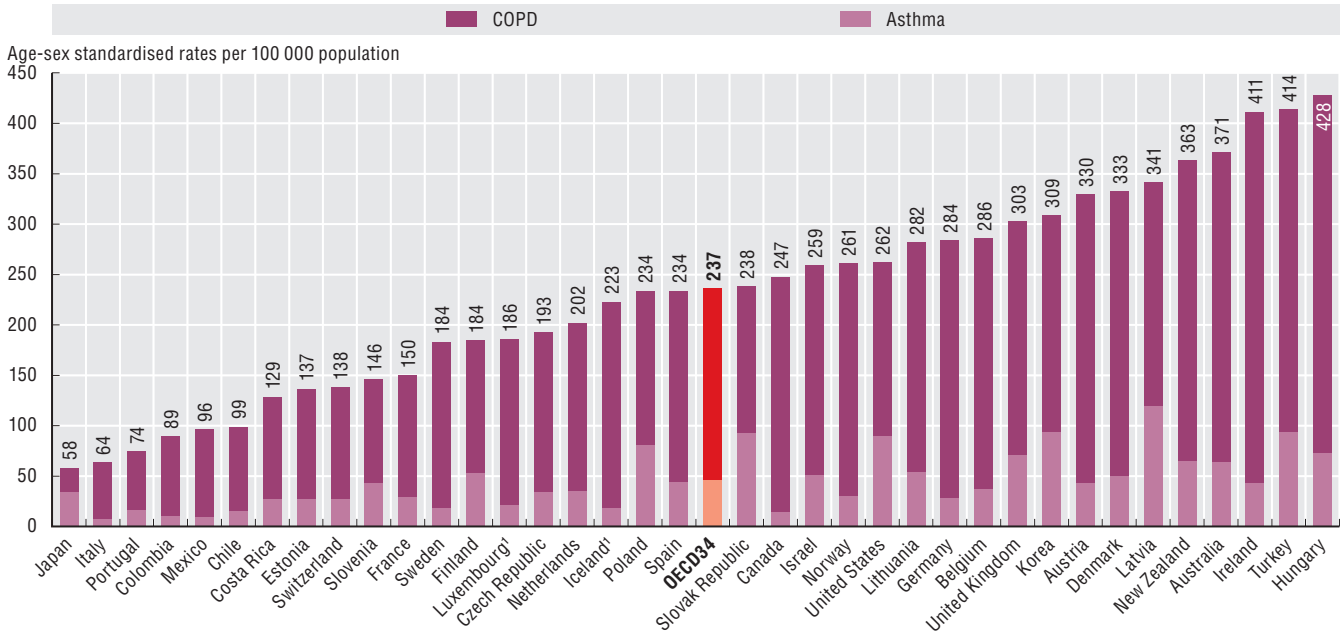
6.8. Asthma and COPD hospital admission in adults, 2015 (or nearest year)

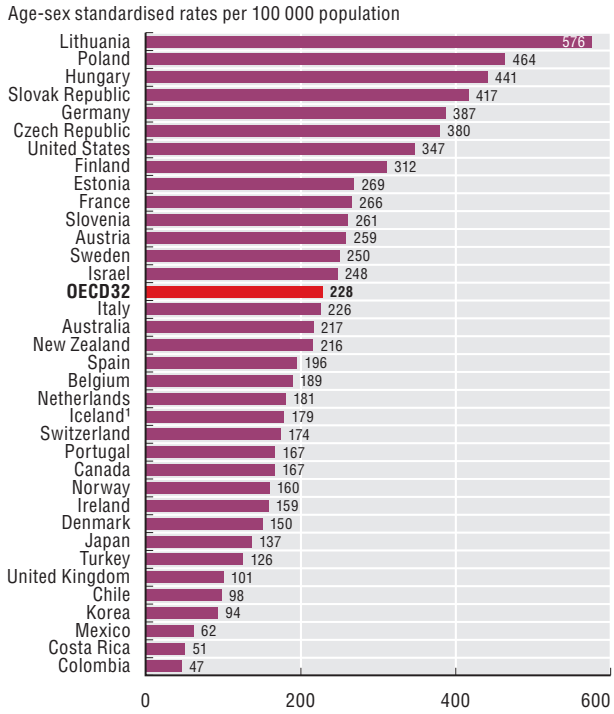


1. Three-year average.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603488

6.9. Congestive heart failure (CHF) hospital admission in adults, 2015 (or nearest year)

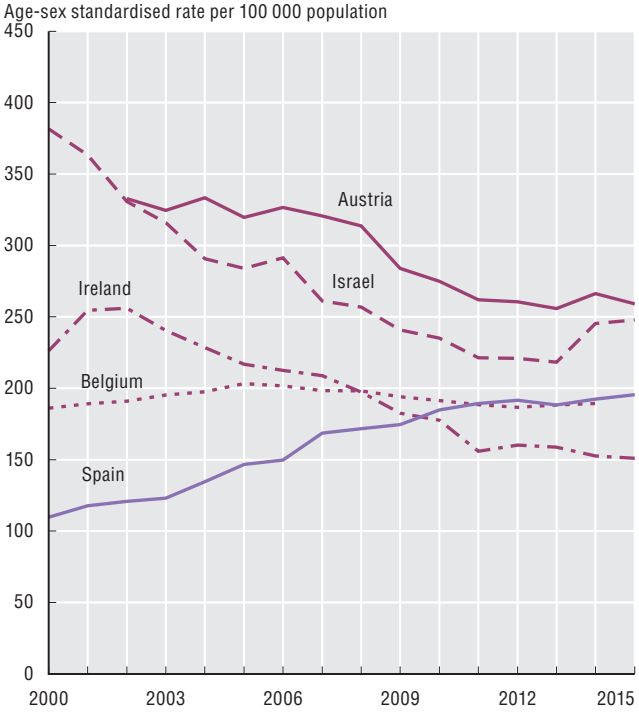


1. Three-year average.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603507

6.10. Trends on CHF hospital admission in adults, selected countries



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603526

Diabetes care

Diabetes is a chronic disease that occurs when the body's ability to regulate excessive glucose levels in the blood is diminished. It is a leading cause of cardiovascular disease, blindness, kidney failure and lower limb amputation. Globally it is estimated that over 400 million adults had diabetes in 2015 and by 2040 it is projected this will grow to over 640 million adults. Diabetes caused 5 million deaths in 2015 (IDF, 2015).

Ongoing management of diabetes usually involves a considerable amount of self-care, and therefore, advice and education are central to the primary care of people with diabetes. Effective control of blood glucose levels through routine monitoring, dietary modification and regular exercise can reduce the onset of serious complications and the need for hospitalisation. Management of other key risk factors such as smoking, blood pressure and lipid levels are also important in reducing complications of diabetes.

In diabetic individuals with hypertension, angiotensin-converting enzyme inhibitors (ACE-I) or angiotensin receptor blockers (ARB) are recommended in most national guidelines as first-line medications to reduce blood pressure. Figure 6.12 reveals there is broad consistency in the proportion of diabetic patients on recommended antihypertensive medications, with only Korea, Italy, Finland, Belgium and the Slovak Republic with rates less than 80%.

Figure 6.11 shows avoidable hospital admissions for diabetes. While admissions have fallen in many countries over time, more than a 7-fold variation in the rates is still evident across countries. Italy, Iceland and Spain report the lowest rates with Austria, Korea and Mexico reporting rates at least two times that of the OECD average. Prevalence of diabetes may explain some of the variation in rates. A positive relationship can be demonstrated between overall hospital admissions and admissions for diabetes, providing some indication that access to hospital care can also play a role in explaining international variation (OECD, 2015).

Hospital admissions for major lower extremity amputation reflect the long-term quality of diabetes care. Figure 6.13 shows the rates of amputation in adults with diabetes. In the left panel the rates based on the general population are presented. The international variation in rates is over 14-fold, with Colombia, Korea, Italy, Finland, and the United Kingdom reporting rates lower than 3 per 100 000 general population and Austria, Israel and Mexico reporting rates above 14. In the right panel rates based on the estimated diabetic population are presented. The rates based on the diabetic population are 9-fold higher than for the general population and display differences in the ranking of countries, providing an indication that differences in disease prevalence across countries may explain some, but not all, cross-country variation. In OECD countries, rates of amputation have declined significantly since 2000 (Carinci et al., 2016).

Definition and comparability

People with diabetes who have first choice antihypertensive medication prescriptions is defined as the number of people that have one or more prescriptions of an angiotensin converting enzyme inhibitor (ACE-I) or angiotensin receptor blocker (ARB) among people who are long term users of glucose regulating medication (people with diabetes) who also have one or more prescriptions per year from a range of medications often used in the management of hypertension.

Diabetes avoidable admission is based on the sum of three indicators: admissions for short-term and long-term complications and for uncontrolled diabetes without complications. The indicator is defined as the number of hospital admissions with a primary diagnosis of diabetes among people aged 15 years and over per 100 000 population. Major lower extremity amputation in adults with diabetes is defined as the number of discharges of people aged 15 years and over per 100 000 population, for the general population and the estimated population with diabetes. Rates for these indicators have been directly age-standardised to the 2010 OECD population.

Differences in data definition and coding practices between countries may affect the comparability of data. For example, coding of diabetes as a principal diagnosis versus a secondary diagnosis varies across countries. This is more pronounced for diabetes than other conditions, given that in many cases admission is for the secondary complications of diabetes rather than diabetes itself. Diabetes population estimates used to calculate the amputation indicators were self-reported by countries. Differences in data coverage of the national hospital sector across countries may also influence indicator rates.

References

Carinci, F. et al. (2016), "Lower Extremity Amputation Rates in People with Diabetes as an Indicator of Health Systems Performance. A Critical Appraisal of the Data Collection 2000–2011 by the Organization for Economic Cooperation and Development (OECD)", *Acta Diabetologica*, Vol. 53, pp. 825-832.

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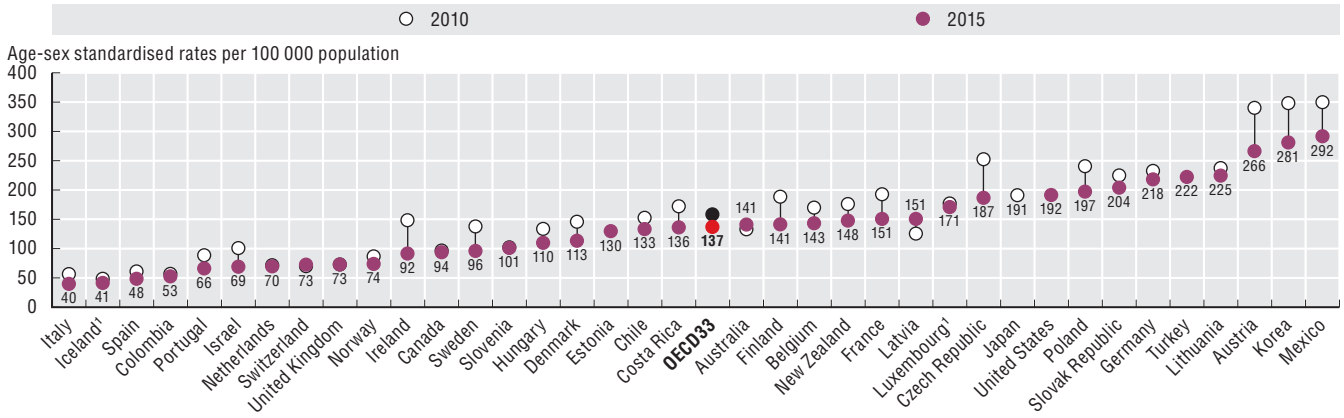
OECD (2015), *Cardiovascular Disease and Diabetes: Policies for Better Health and Quality of Care*, OECD Health Policy Studies, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264233010-en*.

6.11. Diabetes hospital admission in adults, 2010 and 2015 (or nearest year)

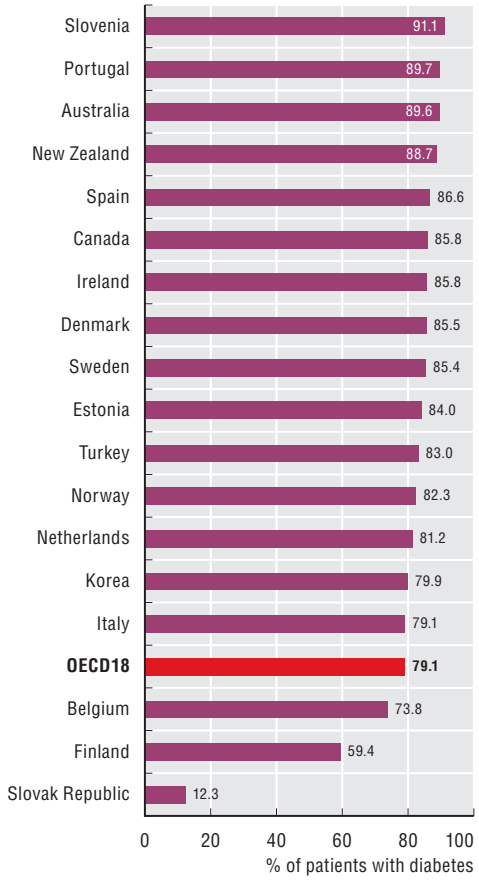


1. Three-year average.

Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603545

6.12 People with diabetes with a prescription of recommended antihypertensive medication in the past year, 2015 (or nearest year)

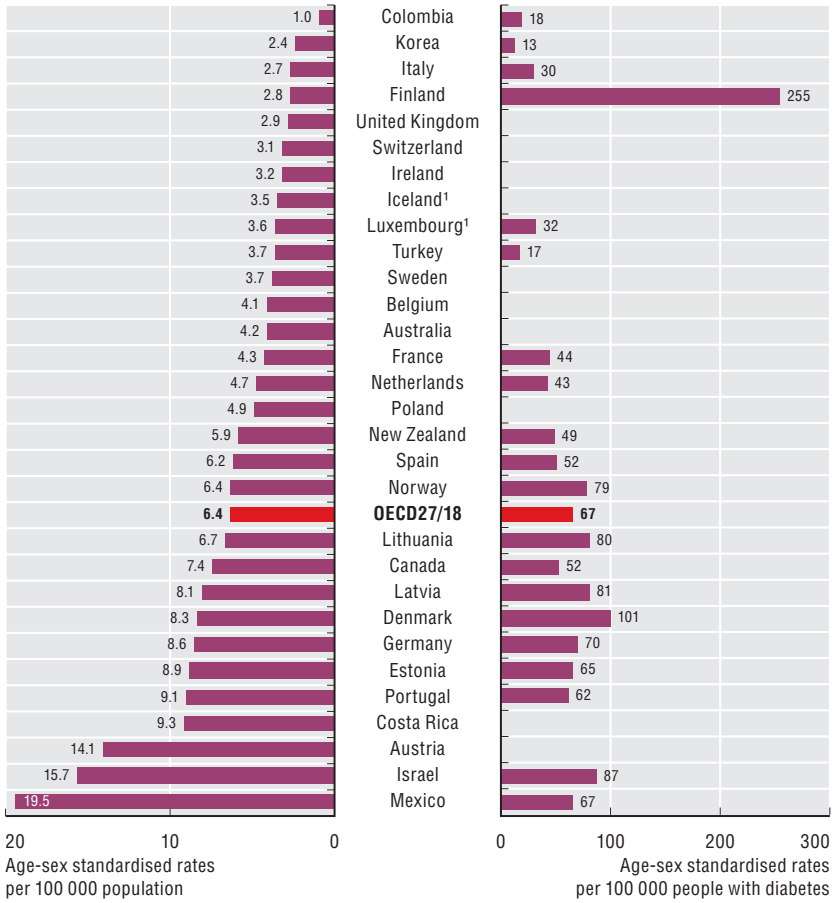


Note: Data for Canada only includes provinces of British Columbia, Manitoba and Saskatchewan.

Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603564

6.13. Major lower extremity amputation in adults with diabetes, 2015 (or nearest year)



1. Three-year average.

Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603583

Mortality following ischaemic stroke

Worldwide an estimated 26 million people have experienced a stroke, with over 10 million people having an initial stroke each year. Stroke is the second leading global cause of death behind heart disease and accounted for just under 12 percent of total deaths worldwide in 2013 (American Heart Association, 2017). Stroke is also the second leading cause of disability. A stroke occurs when the blood supply to a part of the brain is interrupted, leading to a necrosis (i.e. cell death) of the affected part.

Of the two types of stroke that exist, about 85% are ischaemic (caused by clotting) and 15% are haemorrhagic (caused by bleeding).Treatment for ischaemic stroke has advanced dramatically over the last decade with systems and processes now in place in many OECD countries to identify suspected ischaemic stroke patients as early as possible and to quickly deliver acute reperfusion therapy.

Figure 6.14 shows the case-fatality rates within 30 days of admission for ischaemic stroke where the death occurred in the same hospital as the initial stroke admission. Figure 6.15 shows the case-fatality rate where deaths are recorded regardless of where they occurred (after transfer to another hospital or after discharge). This indicator is more robust because it captures fatalities more comprehensively. Although more countries report the same-hospital measure using unlinked data, an increasing number of countries are investing in their data infrastructure and using linked data to provide more comprehensive measures.

Across OECD countries 8.2% of patients in 2015 died within 30 days in the same hospital in which the initial admission for ischaemic stroke occurred (Figure 6.14). The case-fatality rates were highest in Latvia (18.3%) and Mexico (19.2%). Rates were less than 4% in Costa Rica, Korea, and Japan. In Japan, many efforts have been dedicated to improving the treatment of stroke patients in hospitals, through systematic blood pressure monitoring, major material investment in hospitals and the establishment of stroke units (OECD, 2015a). With the exception of Japan, Korea and Germany, countries that achieve better results for ischaemic stroke also tend to report good case-fatality rates for acute myocardial infarction (AMI). This suggests that certain aspects of acute care may be influencing outcomes for both stroke and AMI patients.

Across the 22 countries that reported in- and out-of-hospital case-fatality rates, 11.6% of patients died within 30-days of being admitted to hospital for stroke (Figure 6.15). This figure is higher than the same-hospital based indicator because it only counts each patient once and captures deaths that occur not just in the same hospital but also in other hospitals and out-of-hospital.

Between 2010 and 2015, case-fatality rates for ischaemic stroke have decreased substantially, whereas in Costa Rica and Latvia rates have increased over this period by more than 1% point (Figures 6.14 and 6.15). Across the OECD, case fatalities fell from 9.2% to 8.2% when considering same hospital rates and from 12.4% to 11.6% when considering in- and out-of-hospital rates. Figure 6.16 illustrates the evolution of stroke rates for selected countries over this period, noting the United Kingdom was able to reduce their rates by an average annual reduction of more than 5% compared to an OECD average of 0.8%. Better access to high-quality stroke care, including timely transportation of patients, evidence-based medical interventions and high-quality specialised facilities such as stroke units have helped to reduce 30-day case-fatality rates (OECD, 2015b).

Despite the progress seen so far, there is still room to improve implementation of best practice acute care for cardiovascular diseases including stroke across countries. To shorten acute care treatment time, targeted strategies can be highly effective. Advances in technology are now leading to models of care to deliver reperfusion therapy in an even more speedy and efficient manner, whether through pre-hospital triage via telephone, administration via telemedicine, or actually administering the therapy in the ambulance (Chang and Prabhakaran, 2017). But to encourage the use of evidence-based advanced technologies in acute care, wider approaches are needed. Adequate funding and trained professionals should be made available, and health care delivery systems should be adjusted to enable easy access (OECD, 2015b).

Definition and comparability

Case-fatality rates are defined in indicator "Mortality following acute myocardial infarction" in Chapter 6.

References

American Heart Association (2017), "Heart Disease and Stroke Statistics 2017 At-a-Glance", *https://www.heart.org/idc/groups/ahamah-public/@wcm/@sop/@smd/documents/downloadable/ucm_491265.pdf*, accessed 01-09-2017.

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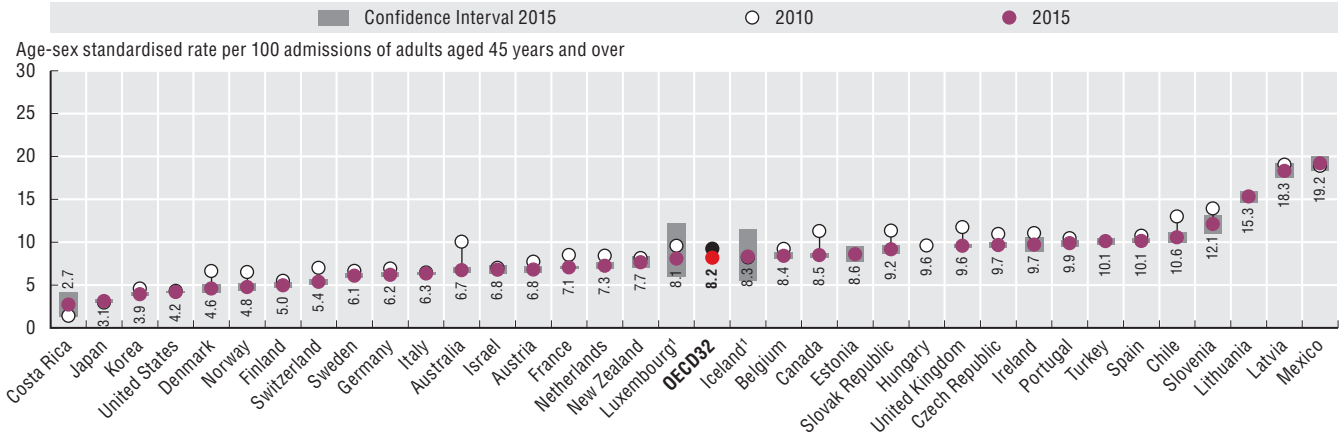
6.14. Thirty-day mortality after admission to hospital for ischaemic stroke based on unlinked data, 2010 and 2015 (or nearest years)



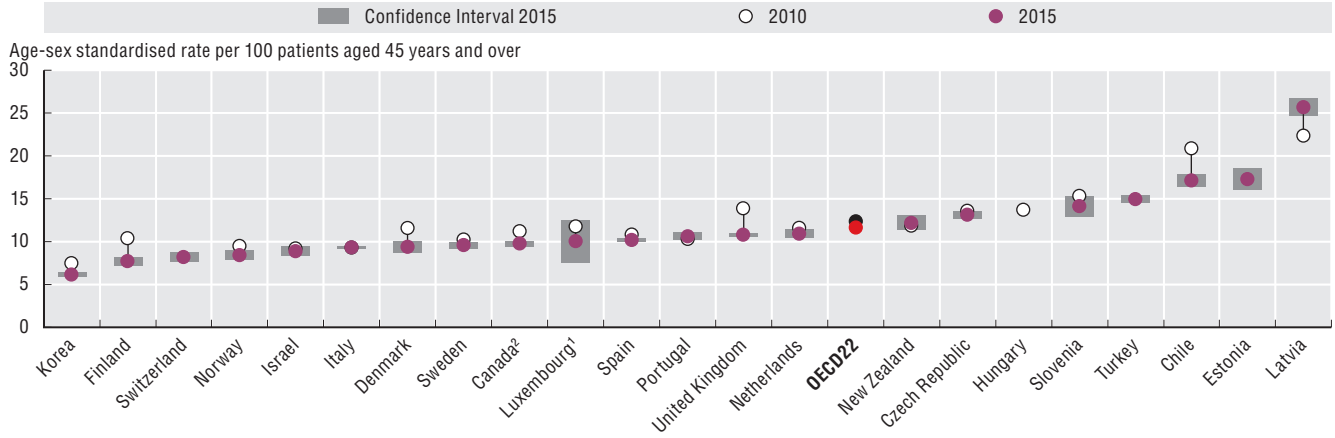
Note: 95% confidence intervals have been calculated for all countries, represented by grey areas.

1. Three-year average.

Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603602

6.15. Thirty-day mortality after admission to hospital for ischaemic stroke based on linked data, 2010 and 2015 (or nearest years)



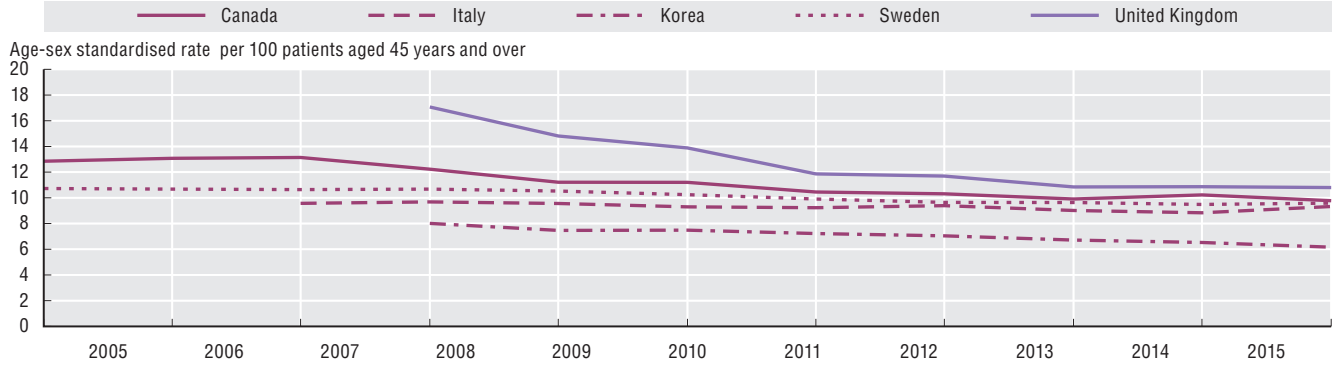
Note: 95% confidence intervals have been calculated for all countries, represented by grey areas.

1. Three-year average.
2. Results for Canada do not include deaths outside of acute care hospitals.

Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603621

6.16. Thirty-day mortality after admission to hospital for ischaemic stroke based on linked data for selected countries



StatLink http://dx.doi.org/10.1787/888933603640

Mortality following acute myocardial infarction (AMI)

Mortality due to coronary heart disease has declined substantially since the 1970s (see indicator "Mortality from circulatory diseases" in Chapter 3). Important advances in both prevention policies, such as for smoking (see indicator "Smoking among adults" in Chapter 4), and treatment of cardiovascular diseases have contributed to these declines (OECD, 2015a).

A good indicator of acute care quality is the 30-day AMI case-fatality rate. The measure reflects the processes of care, such as timely transport of patients and effective medical interventions. The indicator is influenced by not only the quality of care provided in hospitals but also differences in hospital transfers, average length of stay and AMI severity.

Figure 6.17 shows the case-fatality rates within 30 days of admission for AMI where the death occurs in the same hospital as the initial AMI admission. The lowest rates are found in Australia, Denmark and Norway (all 4% or less). The highest rates are in Latvia, Hungary and Mexico, suggesting AMI patients do not always receive recommended care. In Mexico, the absence of a coordinated system of care between primary care and hospitals may have contributed to delays in repurfusion and low rates of angioplasty (Martínez-Sánchez, 2017). High rates of uncontrolled diabetes may also be a contributing factor in explaining the high AMI case-fatality rates (see indicator "Diabetes care" in Chapter 6) as patients with diabetes have worse outcomes after AMI compared to those without diabetes, particularly if the diabetes is poorly controlled. In Japan, people are less likely to die of heart disease overall, but are more likely to die once admitted into hospital for AMI compared to many other OECD countries. One possible explanation is that the severity of patients' admitted to hospital with AMI may be more advanced among a smaller group of people across the population, but could also reflect underlying differences in emergency care, diagnosis and treatment patterns (OECD, 2015b).

Figure 6.18 shows 30-day case fatality rates where fatalities are recorded regardless of where they occur (after transfer to another hospital or after discharge). This is a more robust indicator because it records deaths more widely than the same-hospital indicator, but it requires a unique patient identifier and linked data which is not available in all countries. The AMI case-fatality rate ranges in 2015 from 7.1% in Canada to 18% in Latvia.

Case-fatality rates for AMI have decreased substantially between 2005 and 2015 (Figures 6.17 and 6.18). Across the OECD, case fatalities fell from 8.5% to 7.5% when considering same hospital deaths and from 11.3% to 9.9% when considering deaths occurred in and out of hospital. The rate of decline was particularly striking in Finland, the Netherlands and Denmark, when considering deaths occurred in and out of hospital, with an average annual reduction of over 4% compared to the OECD average of 2.5%.

Figure 6.19 illustrates the evolution of the decline in AMI case fatality rates for selected countries. Better access to high-quality acute care for heart attack, including timely transportation of patients, evidence-based medical interventions and specialised health facilities such as percutaneous catheter intervention-capable centres have helped to reduce 30-day case-fatality rates (OECD, 2015a). For example, Korea had higher case-fatality rates for AMI but in 2006 it has implemented a Comprehensive Plan for CVD, encompassing prevention, primary care and acute CVD care (OECD, 2012). Under the Plan, specialised services were enhanced through a creation of regional cardio and cerebrovascular centres throughout the country, and average waiting time from emergency room arrival to initiation of catheterisation fell from 72.3 in 2010 to 65.8 minutes in 2011, leading to a reduction in case-fatality (OECD, 2015a).

Definition and comparability

The case-fatality rate measures the percentage of people aged 45 and over who die within 30 days following admission to hospital for a specific acute condition. Rates based on unlinked data refer to a situation where the death occurred in the same hospital as the initial admission. Rates based on linked data refer to a situation where the death occurred in the same hospital, a different hospital, or out of hospital. While the linked data based method is considered more robust, it requires a unique patient identifier to link the data across the relevant datasets which is not available in all countries.

Rates are age-sex standardised to the 2010 OECD population aged 45+ admitted to hospital for a specific acute condition such as AMI (ICD-10 I21, I22) and ischaemic stroke (ICD-10 I63-I64).

References

Martínez-Sánchez, C. et al. (2017), "Reperfusion Therapy of Myocardial Infarction in Mexico: A Challenge for Modern Cardiology", *Archivos de cardiología de México*, Vol. 87, No. 2, pp 144-150, *http://dx.doi.org/10.1016/j.acmx.2016.12.007*.

OECD (2015a), *Cardiovascular Disease and Diabetes: Policies for Better Health and Quality of Care*, OECD Health Policy Studies, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264233010-en*.

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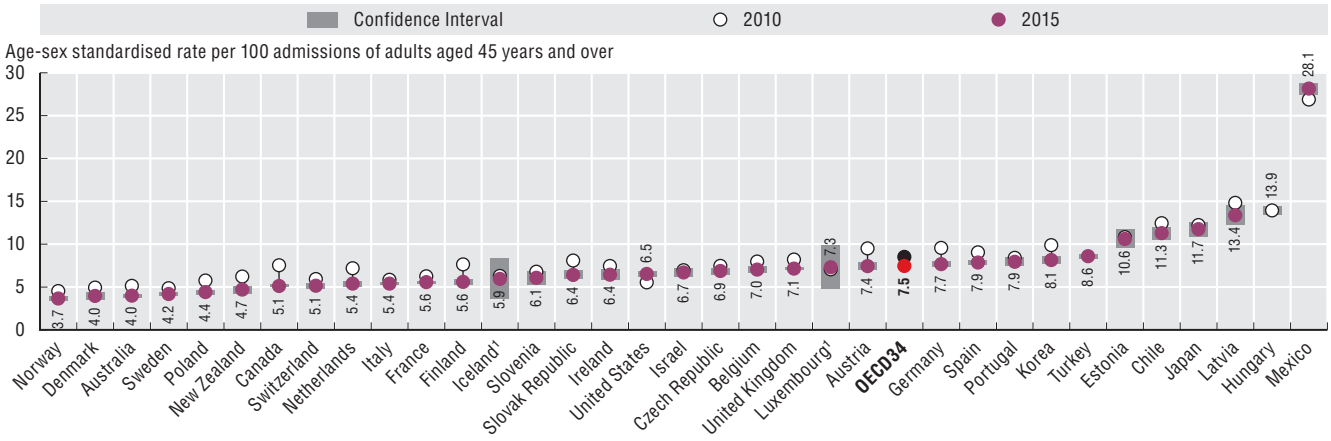
OECD (2012), *OECD Reviews of Health Care Quality: Korea 2012: Raising Standards*, OECD Publishing, Paris, *p://dx.doi.org/10.1787/9789264173446-en*.

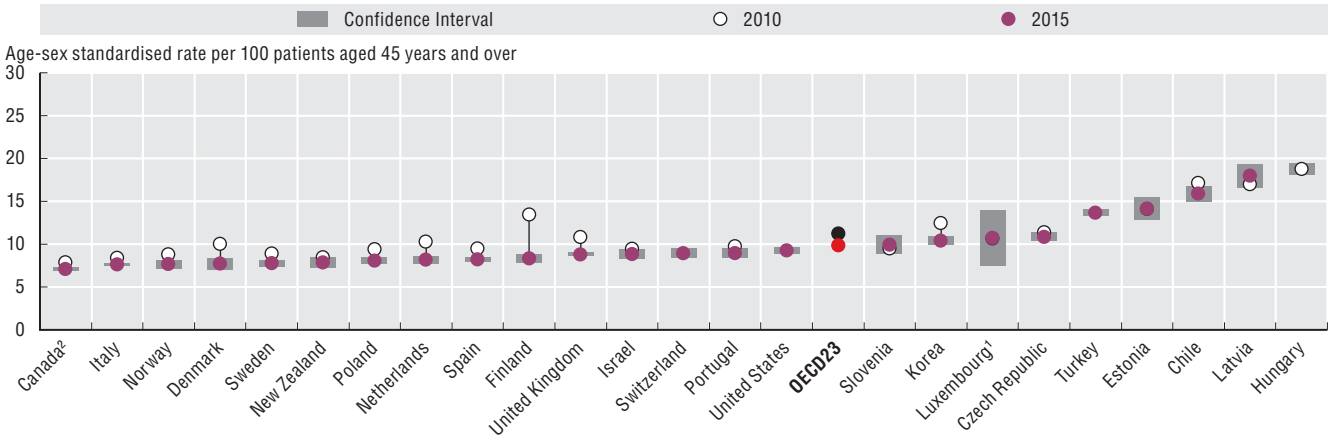
6.17. Thirty-day mortality after admission to hospital for AMI based on unlinked data, 2010 and 2015 (or nearest years)



Note: 95% confidence intervals have been calculated for all countries, represented by grey areas.
1. Three-year average.
Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603659

6.18. Thirty-day mortality after admission to hospital for AMI based on linked data, 2010 and 2015 (or nearest years)



Note: 95% confidence intervals have been calculated for all countries, represented by grey areas.
1. Three-year average.
2. Results for Canada do not include deaths outside of acute care hospitals.
Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603678

6.19. Thirty-day mortality after admission to hospital for AMI based on linked data for selected countries

StatLink http://dx.doi.org/10.1787/888933603697

Hospital mortality rates

Variations in acute myocardial infarction (AMI) 30-day case fatality rates at the national level are influenced by the level of within-country variation in rates across hospitals. Most OECD countries have established national hospital performance measurement and public reporting programmes to monitor efforts to improve the cost, quality and access of hospital care.

Figure 6.20 plots the AMI 30-day case fatality rates (where the death occurs in the same hospital as the initial AMI admission). Rates are presented according to the caseload for each hospital and identifies where the rates are higher or lower than expected. While most hospitals have rates no different than expected, all countries (except Norway) had at least one outlier hospital.

The total number of hospitals and proportion of hospitals by number of AMI admissions varies across countries (Table 6.1). Countries with a large number of hospitals are likely to have more outlier hospitals than countries with fewer hospitals. Figure 6.21 presents the differences in dispersion of AMI 30-day case fatality rates across hospitals within countries. The interquartile range of rates within countries varies markedly. For example, the difference between the upper and lower rates for Israel is 1.8 deaths per 100 admissions, and 4.9 deaths per 100 admissions for Latvia (based on unlinked data). Using linked data, the results are slightly different, with Sweden rather than Israel having the least within-country variation.

Multiple factors contribute to variations in outcomes of care including hospital structure, processes of care and organisational culture. Significant variation in adherence to guideline recommendations for cardiac care is observed across countries and within countries (OECD, 2015, p. 174). In Sweden, a comprehensive national programme of quality improvement that includes public reporting, rapid diffusion of technology, use of evidence-based practice and a system of evaluating and reporting quality and outcomes of care is likely to have contributed to a reduced variation in hospital care of patients after an AMI (Chung et al., 2015, p. 7).

Definition and comparability

The case-fatality rate measures the percentage of people aged 45 and over who die within 30 days following admission to hospital for a specific acute condition. Rates based on unlinked data refer to situations where the death occurred in the same hospital as the initial admission. Rates based on linked data include all deaths irrespective of where they occur. While the linked data method is considered more robust, it requires a unique patient identifier to link the data across the relevant datasets, which is not available in all countries.

The specific methodology used to calculate the hospital case fatality rates presented here differs from that used for the indicator "Mortality following acute myocardial infarction" and is likely to vary from the methods used by participating countries for national monitoring and reporting purposes. Key methodological choices include: unit of measurement, type of hospital, patient risk adjustment variables, selection of reference population, method of standardisation and data issues.

Different analytical methods can result in quite different rates for and rankings of organisations and countries, making direct comparison between rates problematic. The specific analytical method used here is one of several valid options considered during the development work of the OECD. For more details on the methodology used to calculate these indicators see Brownwood et al. (forthcoming).

Figure 6.20 is a funnel plot and reflects that the precision of indicator rates increases as the caseload increases. All rates within the 99.7% control limits are considered to be no different than expected, whereas those outside the 99.7% control limits are considered higher or lower than expected. The reference population rate was calculated from pooled data from selected countries and used to calculate the standardised rates. Figure 6.21 is a turnip plot that graphically represents the relative dispersion of rates but does not give an indication of statistical significance of the variations in rates. Countries are ordered according to ascending level of dispersion as measured by the interquartile range (between the 25th percentile and the 75th percentile) of rates. Hospitals with less than 50 AMI admissions were excluded from both figures to improve data reliability.

References

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Chung, S.C. et al. (2015), "Comparison of Hospital Variation in Acute Myocardial Infarction Care and Outcome Between Sweden and United Kingdom: Population Based Cohort Study Using Nationwide Clinical Registries", *British Medical Journal*, Vol. 351, *http://doi.org/10.1136/bmj.h3913*.

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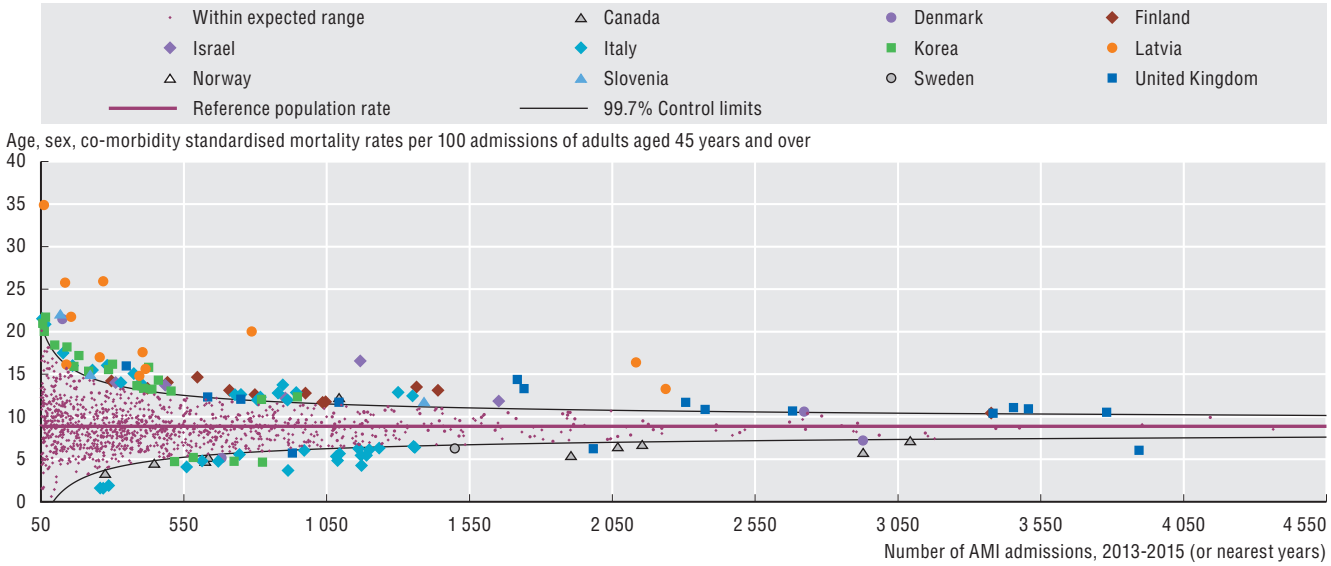
6.20. Thirty-day mortality after admission to hospital for AMI based on linked data, 2013-2015 (or nearest years)



Note: Each dot in the figure represents a single hospital, unless otherwise stated. Results for Canada do not include deaths outside of acute care hospitals. UK data are limited to England and is presented at trust-level (i.e. multiple hospitals).
Source: OECD Hospital Performance Data Collection 2017.

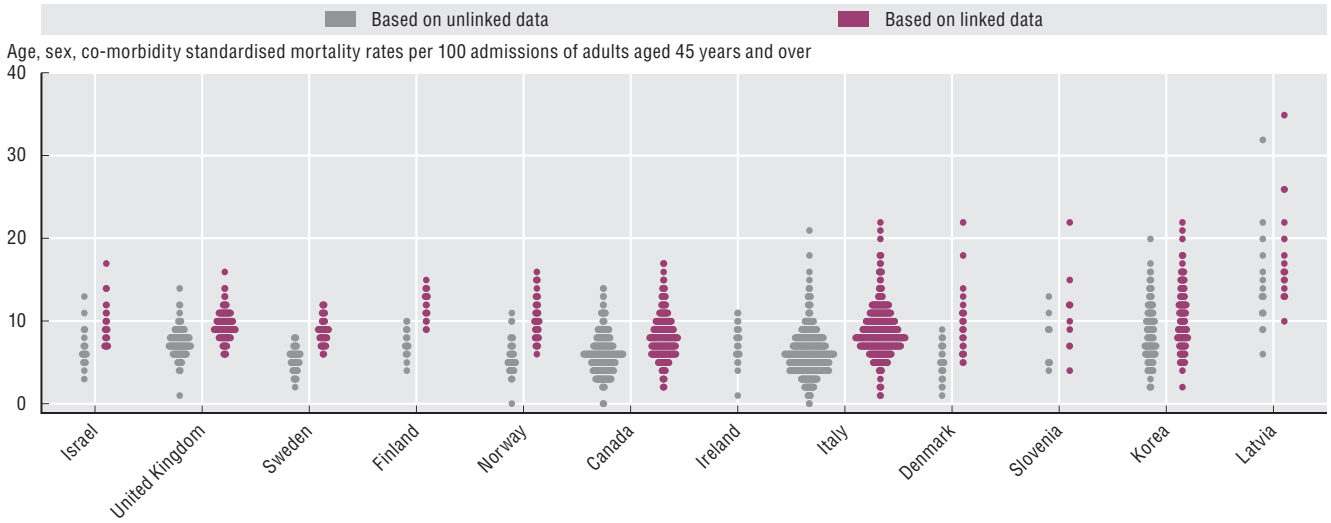
StatLink http://dx.doi.org/10.1787/888933603716

Table 6.1. Number of hospitals by AMI admissions based on unlinked data, 2013-2015 (or nearest years)

AMI admissions	CAN	DNK	FIN	ISR	IRE	ITA	KOR	LVA	NOR	SVN	SWE	GBR
> 300	151	21	21	21	20	336	67	6	35	3	62	142
50-300	158	7	0	5	8	160	83	11	17	7	4	8
< 50	261	1	0	0	6	328	155	5	2	4	0	59

StatLink http://dx.doi.org/10.1787/888933606262

6.21. Thirty-day mortality after admission to hospital for AMI based on linked and unlinked data, 2013-2015 (or nearest years)



Note: The width of each line in the figure represents the number of hospitals (frequency) with the corresponding rate. Data for Canada not linked to death statistics. UK data are limited to England and presented at trust level (i.e. multiple hospitals). Ordered by inter quartile range of admission-based data. Rates based on linked data are also standardised for previous AMI.
Source: OECD Hospital Performance Data Collection 2017.

StatLink http://dx.doi.org/10.1787/888933603735

Waiting times for hip fracture surgery

The main risk factors for hip fractures are associated with ageing, including an increased risk of falling and loss of skeletal strength from osteoporosis. With increasing life expectancy across most OECD countries, it is anticipated that hip fracture will become a more significant public health issue in coming years.

In most instances following hip fracture, surgical intervention is required to repair or replace the hip joint. There is general consensus that early surgical intervention maximises patient outcomes and minimises the risk of complications. General agreement is that surgery should occur within two days (48 hours) of hospitalisation. Guidelines in some countries call for even earlier intervention. For example, the National Institute for Health and Care Excellence (NICE) clinical guidelines recommend hip fracture surgery to be performed on the day of hospital admission or the next day (National Institute for Health and Care Excellence, 2014).

The time taken to initiate hip fracture surgery after hospital admission is widely considered to be a clinically meaningful process indicator of the quality of acute care received by patients with hip fracture. In 2015, on average across the OECD over 80% of patients admitted for hip fracture underwent surgery within two days (Figure 6.22). In Norway, Denmark and the Netherlands, the proportion was greater than 95%. Countries with the lowest proportion of patients operated on within two days of admission include Italy (53.2%), Spain (48.4%), Portugal (46.5%), Latvia (46.0%) and Costa Rica (24.9%).

Many patients were treated sooner than two days following admission, with about a quarter of patients treated on the same day and around two thirds of patients treated by the end of the next day across the OECD. Rates were higher than 40% on the same day in the Netherlands, and 80% by the end of the next day in Denmark.

Figure 6.23 shows the proportion of hip-fracture repairs occurring within two days of admission in OECD countries between 2005 and 2015. The OECD average increased from 72% to 81% over that time. The greatest improvement was observed in Switzerland, where the proportion increased from 46% to 91% and in Italy, where it increased from 28% in 2007 to 53% in 2015. A policy of comparative public reporting of hospital indicators, including time to surgery following hip fracture, implemented by Italian authorities may partly explain the improvement observed in that country. In Canada, the percentage of patients operated on within the two day benchmark increased over time, but there is considerable variation in this indicator between provinces and hospitals (CIHI, 2015). Only Portugal reported a decline of hip fracture repair within two days of admission, reducing from 57% in 2008 to 47% in 2015.

Time to surgery for hip fracture patients is influenced by many factors, including hospitals' surgical theatre capacity, flow and access and targeted policy interventions, including public reporting and monitoring of performance (Siciliani et al, 2013) Improvement in timely surgery for patients with a particular diagnosis or injury (e.g. hip fracture) may be achieved at the expense of timeliness in others (e.g. hip or knee replacements).

Definition and comparability

This indicator is defined as the proportion of patients aged 65 years and over admitted to hospital in a specified year with a diagnosis of upper femur fracture, who had surgery initiated within two calendar days of their admission to hospital. Data are also provided for the proportion of those patients who had surgery within one day of their admission to hospital, and for patients who had surgery on the same day as their hospital admission. Some countries supplied results for surgery within two calendar days only.

The capacity to capture time of admission and surgery in hospital administrative data varies across countries, resulting in the inability to precisely record surgery within 48 hours. While recent research and development data indicates that the impact of measuring days rather than hours may only result in marginally higher rates, the impact on relative performance across countries can be noticeable, given the similarity of rates in many countries.

While cases where the hip fractures occurred during the admission to hospital should be excluded, not all countries have a 'present on admission' flag in their datasets to enable them to identify such cases accurately.

References

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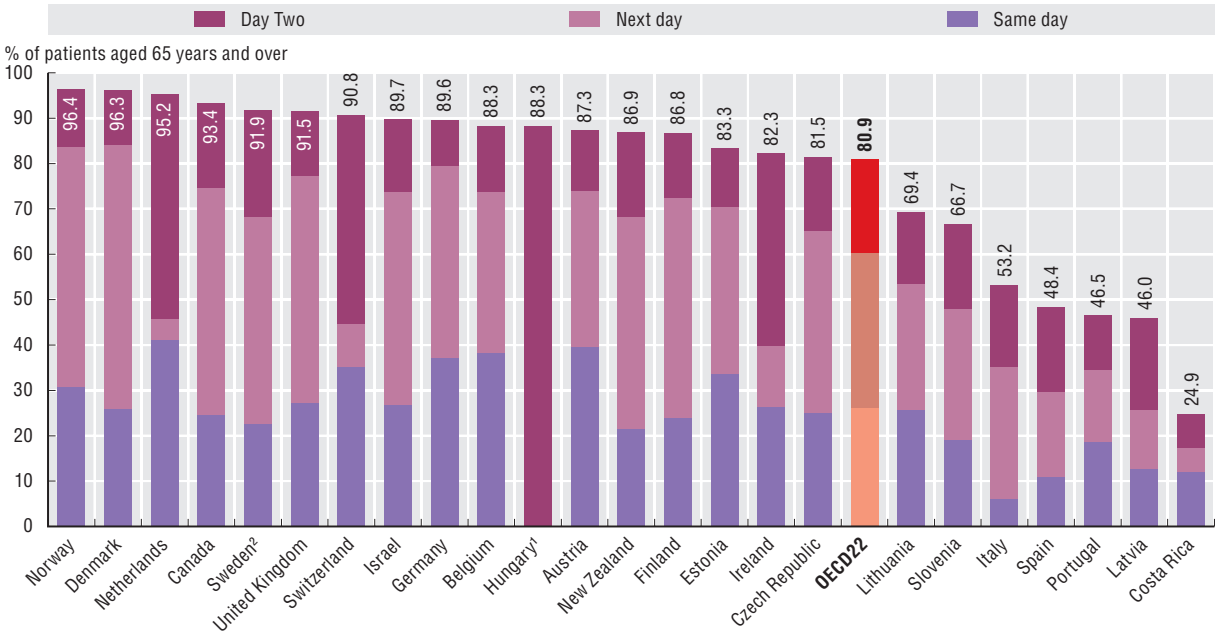
6.22. Hip fracture surgery initiation after admission to the hospital, 2015 (or nearest year)

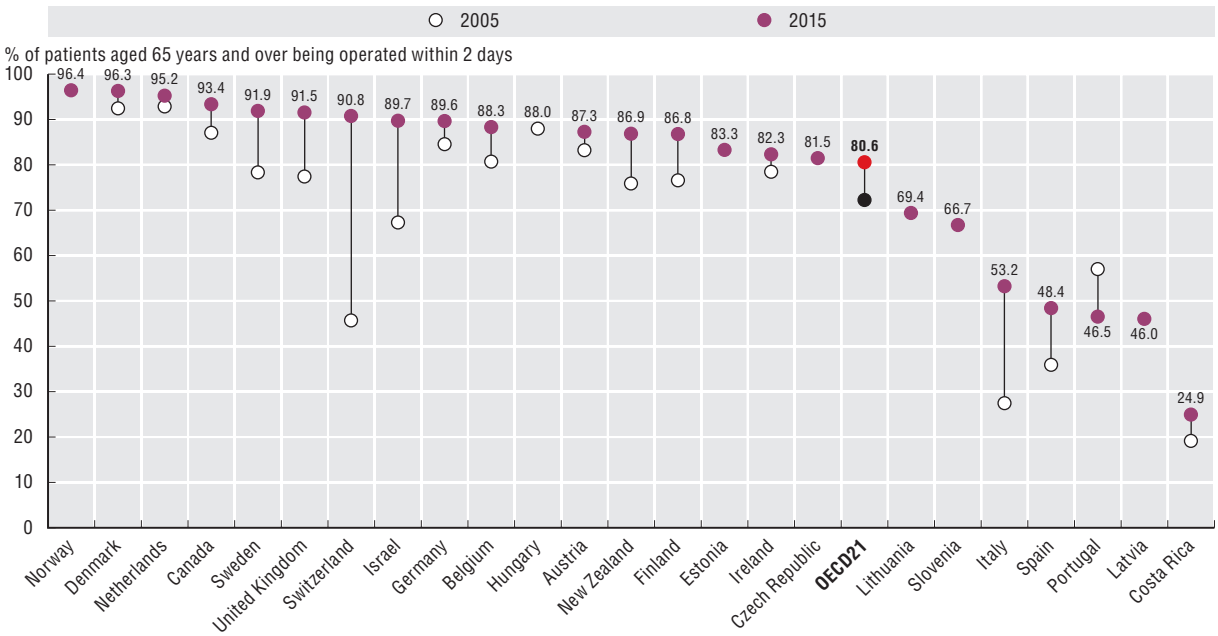


1. Hungary only provided data for within two calendar days.
2. Sweden provided data within 12, 24 and 48 hours.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603754

6.23. Hip fracture surgery initiation after admission to hospital, 2005 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933603773

Surgical complications

Patient safety remains one of the most prominent issues in health policy and public debate. Evidence suggests that over 15% of hospital expenditure and activity in OECD countries can be attributed to treating safety failures, many of which are preventable (OECD, 2017a; OECD, 2017b). In the United States an estimated USD 28 billion has been saved between 2010 and 2015 by systematically improving safety (AHRQ, 2016).

Robust comparison of performance with peers is fundamental to securing improvement. Two types of patient safety event can be distinguished for this purpose: *sentinel or "never"* events that should never occur such as failure to remove surgical foreign bodies at the end of a procedure; and *adverse* events, such as post-operative sepsis, which can never be fully avoided given the high-risk nature of some procedures, although increased incidence at an aggregate level may indicate a systemic failing.

Figure 6.24 illustrates a never event, rates of foreign body left in during procedure. The most common risk factors for this never event are emergencies, unplanned changes in procedure, patient obesity and changes in the surgical team; preventive measures include counting instruments, methodical wound exploration and effective communication among the surgical team.

Figure 6.25 shows rates for two related adverse events, pulmonary embolism (PE) and deep vein thrombosis (DVT) after hip or knee replacement surgery. PE and DVT cause unnecessary pain and in some cases death, but can be prevented by anticoagulants and other measures before, during and after surgery. Large variations in rates are observed, with nearly a 20-fold variation in DVT. Variations in DVT rates may be influenced by differences in diagnostic practices across countries, with evidence that routine ultrasound screening can significantly increase the detection of DVT (Kodadek, 2016).

Figure 6.26 shows rates for another adverse event, sepsis after abdominal surgery. Likewise, sepsis after surgery, which may lead to organ failure and death, can in many cases be prevented by prophylactic antibiotics, sterile surgical techniques and good postoperative care.

The left panel of Figures 6.24, 6.25 and 6.26 shows the rate of the three respective postoperative complications based on the "surgical admission", the hospital admission where the surgery took place. The right panel of these figures shows rates based on not only the surgical admission but all subsequent re-admissions to hospital within 30 days, whether at the same hospital or in another hospital.

Caution is needed in interpreting the extent to which these indicators accurately reflect international differences in patient safety rather than differences in the way that countries report, code and calculate rates of adverse events (see "Definition and comparability" box).

Definition and comparability

Two methods of calculating surgical complications are presented. The surgical admission-based method uses unlinked data to calculate the number of discharges with ICD codes for the complication in any secondary diagnosis field, divided by the total number of discharges for patients aged 15 and older. The all admission-based method uses linked data to extend beyond the surgical admission to include all subsequent related re-admissions to any hospital within 30 days. While the all admission-based method is considered more robust and is less affected by variations in the length of stay and hospital transfer practices, it requires a unique patient identifier and linked data which is not available in all countries. While the all admission-based method strengthens identification of valid complications, the impact on indicator rates is unclear given only one admission per patient is counted when multiple qualifying admissions are identified.

A fundamental challenge in international comparison of patient safety indicators centres on differences in the underlying data. Variations in how countries record diagnoses and procedures and define hospital admissions can affect calculation of rates. In some cases, higher adverse event rates may signal more developed patient safety monitoring systems and a stronger patient safety culture rather than worse care. There is a need for greater consistency in reporting of patient safety across countries and significant scope exists for improved data capture within national patient safety programmes.

References

AHRQ (2016), "National Scorecard on Rates of Hospital-Acquired Conditions 2010 to 2015: Interim Data From National Efforts to Make Health Care Safer", Agency for Healthcare Research and Quality, *http://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patientsafety/pfp/2015-natlscorecard -hac-rates.pdf*, accessed 26.01.2017.

Kodadek, L.M. and E.R. Haut (2016), "Screening and Diagnosis of VTE: The More You Look, The More You Find?", *Current Trauma Reports*, Vol. 2, No. 1, pp. 29–34.

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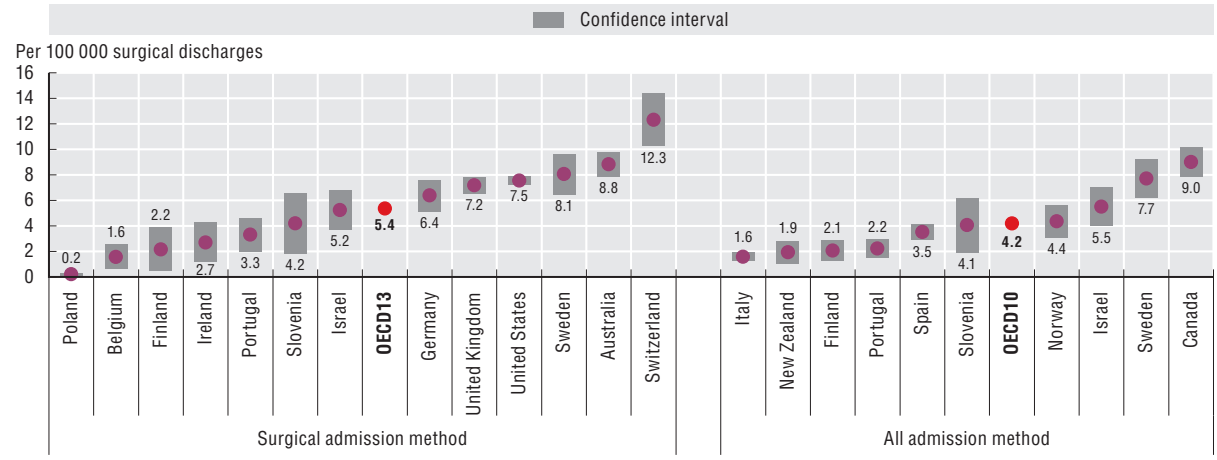
OECD (2017b), *The Economics of Patient Safety: Strengthening a Value-Based Approach to Reducing Patient Harm at a National Level Publishing*, OECD, Paris, available at *http://www.oecd.org/els/health-systems/The-economics-of-patient-safety-March-2017.pdf*.

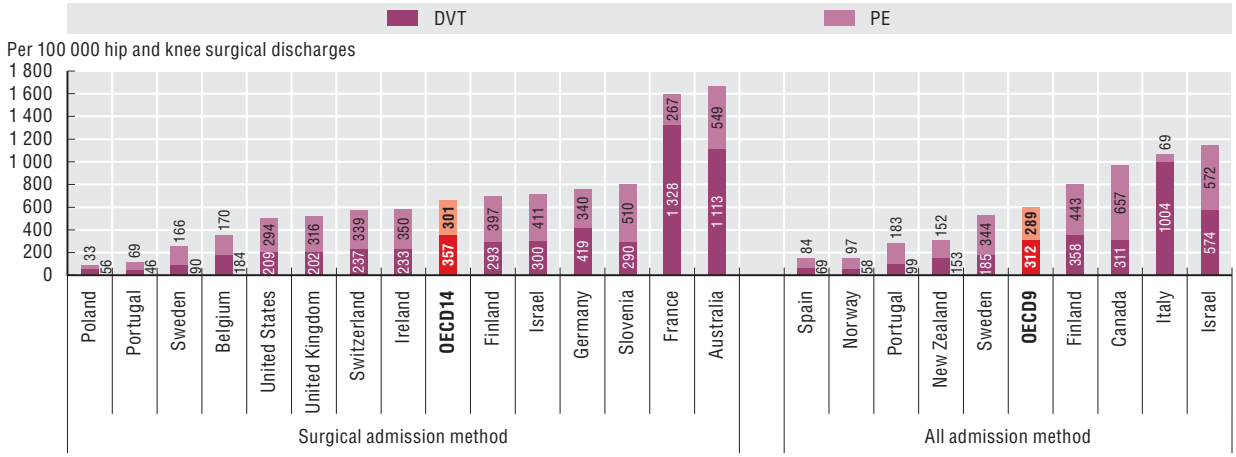
6.24. Foreign body left in during procedure, 2015 (or nearest year)



Note: Given very low incidence of events, 95% confidence intervals have been calculated for all countries as represented by grey areas.
Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603792

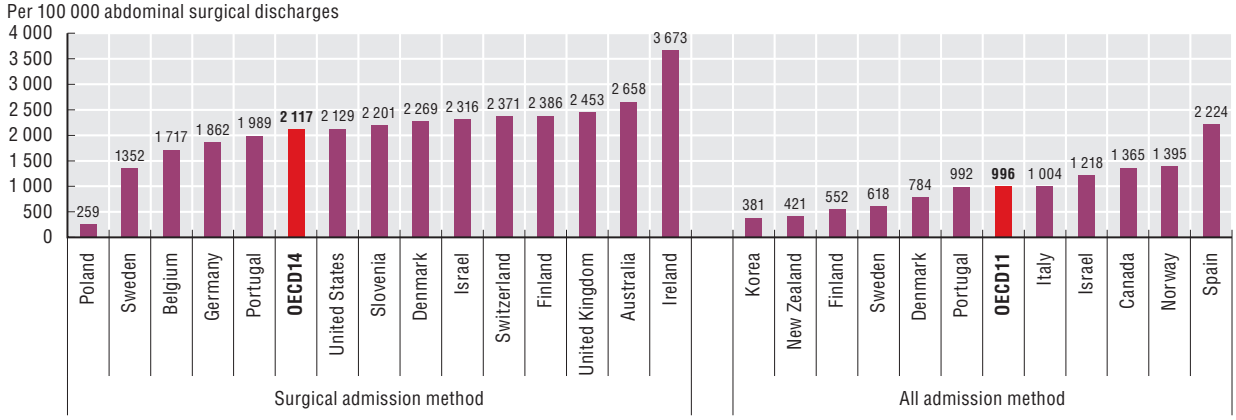
6.25. Postoperative pulmonary embolism (PE) or deep vein thrombosis (DVT) in hip and knee surgeries, 2015 (or nearest year)



Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603811

6.26. Postoperative sepsis in abdominal surgeries, 2015 (or nearest year)



Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603830

Obstetric trauma

Patient safety during childbirth can be assessed by looking at potentially avoidable tearing of the perineum during vaginal delivery (Harvey, 2015). Such tears extend to the perineal muscles and bowel wall require surgery. They are more likely to occur in the case of first vaginal delivery, high baby birth weight, labour induction, occiput posterior baby position, prolonged second stage of labour and instrumental delivery. Possible complications include continued perineal pain and incontinence. These types of tears are not possible to prevent in all cases, but can be reduced by employing appropriate labour management and high quality obstetric care. Hence, the proportion of deliveries involving higher degree lacerations is a useful indicator of the quality of obstetric care.

Obstetric trauma indicators are considered to be relatively reliable and comparable across countries, particularly given they are less sensitive to variations in coding practices across countries. Nevertheless, differences in the consistency with which obstetric units report these complications may complicate international comparison. Fear of litigation, for example, may cause under-reporting; conversely systems that rely on specially trained administrative staff to identify and code adverse events from patients' clinical records may produce more reliable data.

While rates of obstetric trauma may be influenced by the overall national rate of caesarean sections, assisted vaginal delivery and episiotomy, these remain issues of ongoing research. For example, episiotomy is a surgical incision of the perineum performed to widen the vaginal opening for the delivery of an infant. Wide variation in the use of episiotomy during vaginal deliveries currently exists across Europe, ranging from around 70% of births in Portugal and Poland in 2010 to less than 10% in Sweden, Denmark and Iceland (Euro-Peristat, 2013). The selective use of episiotomy to decrease severe perineal lacerations during delivery remains controversial

Figure 6.27 shows rates of obstetric trauma *with* instrument and Figure 6.28 shows rates of obstetric trauma after vaginal delivery *without* instrument. Obstetric trauma with instrument refers to deliveries using forceps or vacuum extraction. As the risk of a perineal laceration is significantly increased when instruments are used to assist the delivery, rates for this patient population are reported separately.

High variation in rates of obstetric trauma is evident across countries. Reported rates of obstetric trauma *with* instrument vary from below 2% in Israel, Italy and Poland to more than 10% in Denmark, Sweden and Canada. The rates of obstetric trauma after vaginal delivery *without* instrument vary from below 0.5 per 100 deliveries in Poland and Israel to over 2.5 per 100 deliveries in Denmark, United Kingdom and Canada.

While the average rate of obstetric trauma *with* instrument (5.7 per 100 instrument-assisted vaginal deliveries) across OECD countries in 2015 was nearly 4 fold the rate without instrument (1.5 per 100 vaginal deliveries *without* instrument assistance), there is a strong relationship between the two indicators, with Italy, Israel and Poland reporting the lowest rates and Canada, Denmark and New Zealand reporting amongst the highest rates for both indicators.

No clear trend is evident in the rates of obstetric trauma over the five year period 2010-2015, with the OECD average remaining relative static for both vaginal deliveries *with* and *without* instrument. While rates for both indicators indicate noticeable improvements in Denmark and Norway over this period, rates for some countries including Slovenia and Spain would appear to have deteriorated.

Definition and comparability

The two obstetric trauma indicators are defined as the proportion of instrument assisted/non-assisted vaginal deliveries with third- and fourth-degree obstetric trauma codes (ICD-10 O70.2, O70.3) in any diagnosis and procedure field.

Several differences in data reporting across countries may influence the calculated rates of obstetric patient safety indicators. These relate primarily to differences in coding practice and data sources. Some countries report the obstetric trauma rates based on administrative hospital data and others based on obstetric register data. There is some evidence that registries produce higher quality data and report a greater number of obstetric trauma events compared to administrative datasets (Baghestan et al., 2007).

Careful interpretation of obstetric trauma for instrument assisted delivery rates over time is required, given the very low number of trauma cases in some countries is likely to give rise to significant year on year variation.

References

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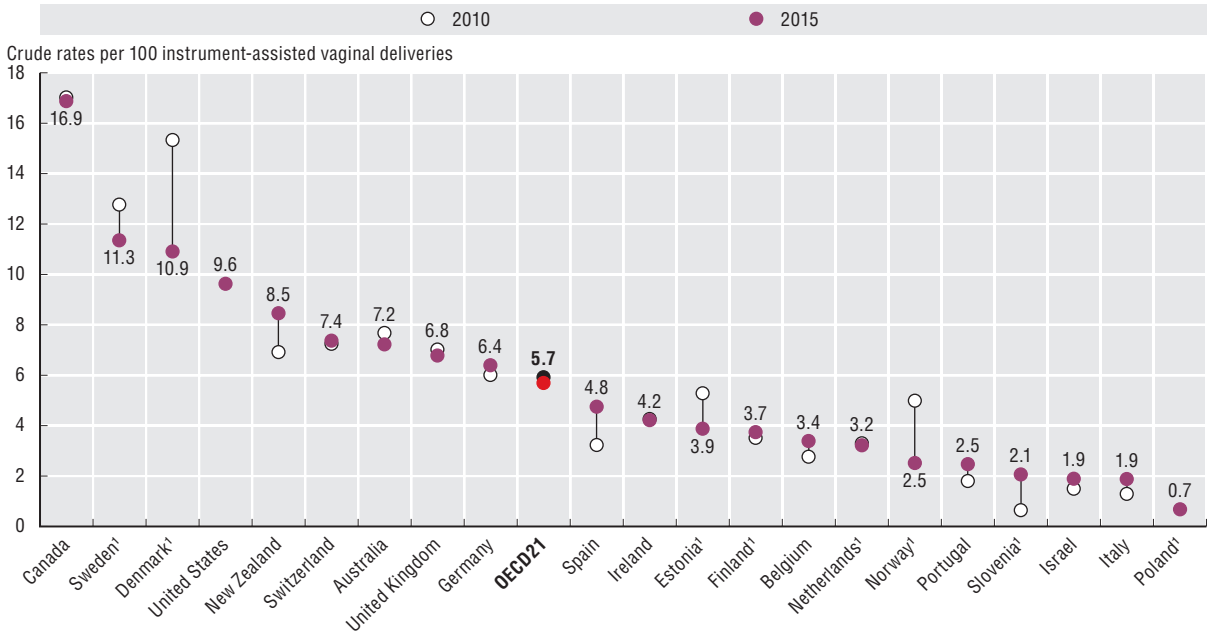
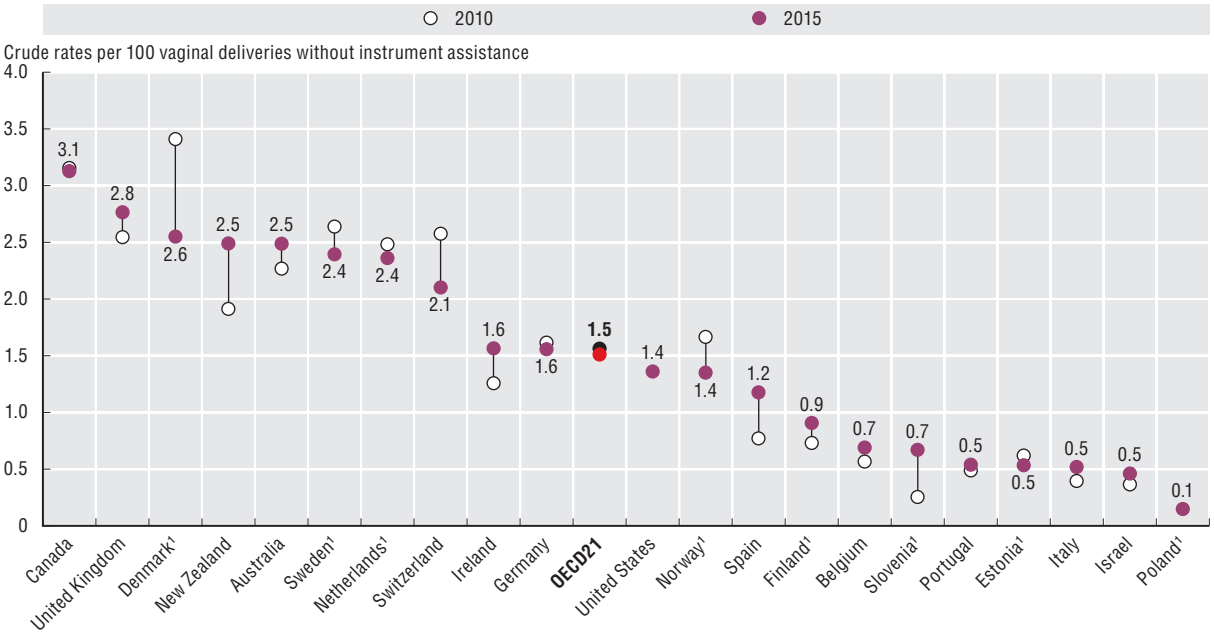
6.27. Obstetric trauma, vaginal delivery with instrument, 2010 and 2015 (or nearest year)



1. Based on registry data.
Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603849

6.28. Obstetric trauma, vaginal delivery without instrument, 2010 and 2015 (or nearest year)



1. Based on registry data.
Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603868

Care for people with mental health disorders

The burden of mental illness is substantial, affecting an estimated one in four of the OECD population at any time, and one in two across the life course (see indicator on "Mental health" in Chapter 3; OECD, 2014a). High quality, timely care has the potential to improve outcomes and may help reduce suicide and excess mortality for individuals with psychiatric disorders.

High quality care for mental disorders in inpatient settings is vital, and inpatient suicide is a 'never event', which should be closely monitored as an indication of how well inpatient settings are able to keep patients safe from harm. Figure 6.29 shows rates of inpatient suicide amongst all psychiatric hospital admissions. Most countries report rates below 1 per 1 000 patients, but Costa Rica, the Netherlands, Denmark, and Israel are exceptions with rates of over 1. Steps to prevent inpatient suicide include identification and removal of likely opportunities for self-harm, risk assessment of patients, monitoring and appropriate treatment plans.

Suicide rate after hospital discharge can indicate the quality of care in the community, and co-ordination between inpatient and community settings. Across countries, suicide rate among patients who had been hospitalised in the previous year was as low as 1 per 1 000 patients in the United Kingdom but it was higher than 5 in the Netherlands and Lithuania (Figure 6.30). Denmark also has high suicide rates, but this may reflect that hospitalised patients have more severe psychiatric disorders than other countries. Patients with milder psychiatric disorders are usually treated in ambulatory settings.

Patients with a psychiatric illness are particularly at risk immediately following discharge from hospital. In most countries, over one quarter of suicides within the first year following discharge occurs in the first month, and in New Zealand and Sweden, as many as half of suicides among patients discharged in the previous year happen in the first month of discharge. It is known that suicide in the high-risk days following discharge can be reduced by good discharge planning and follow-up, and enhanced levels of care immediately following discharge (OECD, 2014a).

Individuals with a psychiatric illness have a higher mortality rate than the general population. An "excess mortality" value that is greater than one implies that people with mental disorders face a higher risk of death than the rest of the population. Figures 6.31 and 6.32 show the excess mortality for schizophrenia and bipolar disorder, which is above two in most countries. In order to reduce their high mortality, a multifaceted approach is needed for people with mental disorders, including primary care prevention of physical ill health, better integration of physical and mental health care, behavioural interventions, and changing professional attitudes. In view of improving quality of health care for people with mental disorders, these efforts can be assessed regularly. For example, Sweden monitors the use of inpatient physical care for patients with a mental disorder that could have been avoided if primary care and/or primary or secondary prevention was sufficient (OECD, 2014a; OECD, 2014b).

Definition and comparability

The inpatient suicide indicator is composed of a denominator of patients discharged with a principal diagnosis or first two secondary diagnosis code of mental health and behavioural disorders (ICD-10 codes F10-F69 and F90-99) and a numerator of these patients with a discharge code of "suicide" (ICD-10 codes: X60-X84). Data should be interpreted with caution due to a very small number of cases. Reported rates can vary over time, so where possible a 3-year average has been calculated to give more stability to the indicator.

Suicide within 30 days and within one year of discharge is established by linking discharge following hospitalisation with a principal diagnosis or first two listed secondary diagnosis code of mental health and behavioural disorders (ICD-10 codes F10-F69 and F90-99), with suicides recorded in death registries (ICD-10 codes: X60-X84). In cases with several admissions during the reference year, the follow-up period starts from the last discharge.

For the excess mortality indicators the numerator is the overall mortality rate for persons aged between 15 and 74 years old diagnosed with schizophrenia or bipolar disorder. Most countries use registry data as a data source. The denominator is the overall mortality rate for the general population in the same age group. The relatively small number of people with schizophrenia or bipolar disorder dying in any given year can cause substantial variations from year-to-year, so three-year averages were presented.

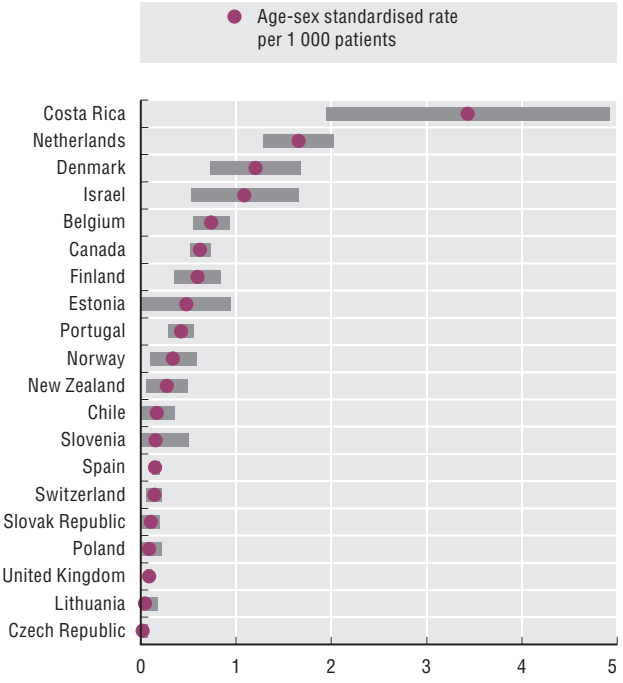
The data have been age-sex standardised to the 2010 OECD population structure, to remove the effect of different population structures across countries.

References

OECD (2014a), *Making Mental Health Count. The Social and Economic Costs of Neglecting Mental Health Care*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264208445-en*.

OECD (2014b), *OECD Reviews of Health Care Quality: Norway: Raising Standards*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264208469-en*.

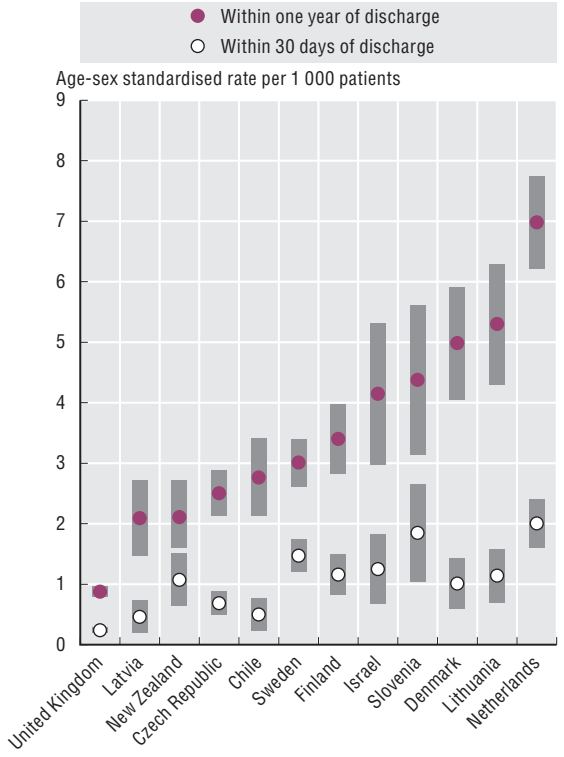
6.29. Inpatient suicide amongst patients with a psychiatric disorder, 2014 (or nearest year)



Note: multiple year average when data available. 95% confidence intervals have been calculated for all countries, represented by grey areas.
Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603887

6.30. Suicide following hospitalisation for a psychiatric disorder, within 30 days and one year of discharge, 2015 (or nearest year)



Note: 95% confidence intervals have been calculated for all countries, represented by grey areas.
Source: *OECD Health Statistics 2017*.

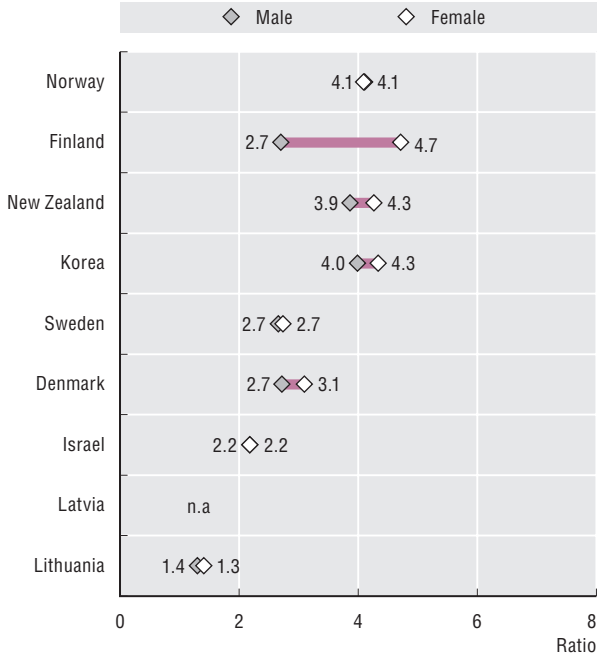
StatLink http://dx.doi.org/10.1787/888933603906

6.31. Excess mortality from schizophrenia, 2014

Note: Three-year average for all countries.
Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603925

6.32. Excess mortality from bipolar disorder, 2014



Note: Three-year average for all countries.
Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933603944

Screening, survival and mortality for breast cancer

Breast cancer is the cancer with both the highest incidence and prevalence for women across OECD countries. One in nine women will have breast cancer at some point in their life. Risk factors that increase a person's chance of getting this disease include age, family history of breast cancer, genetic predisposition, reproductive factors, oestrogen replacement therapy, and lifestyles including obesity, physical inactivity, diet and alcohol consumption.

Most OECD countries have adopted breast cancer screening programmes as an effective way for detecting the disease early (OECD, 2013). However, due to recent progress in treatment outcomes and concerns about false-positive results, over-diagnosis and overtreatment, breast cancer screening recommendations have been re-evaluated in recent years. Taking into account recent research findings, WHO recommends organised population-based mammography screening if women are able to make an informed decision based on the benefits and risks of mammography screening (WHO, 2014).

Screening rates range from less than 20% in Mexico to over 80% in a few countries including Sweden, Portugal, Denmark, Finland and Slovenia (Figure 6.33). Screening coverage increased substantially among countries with low rates a decade ago. Mexico had an increase of more than ten-fold, and Lithuania an almost four-fold increase. On the other hand, several countries that had the highest screening rates in the mid-2000s experienced some reductions, including Finland, the Netherlands, and the United States.

Breast cancer survival reflects early diagnosis as well as improved treatments. All OECD countries have attained five-year net breast cancer survival of 80% except Chile, the Slovak Republic, Poland and Estonia (Figure 6.34). Net survival of people with colon and rectal cancers is also low in these countries (see indicators on "Survival and mortality for colorectal cancer").

Over the last decade, the five-year net breast cancer survival has improved in OECD countries. Net survival has increased considerably in some Central and Eastern European countries such as Estonia and the Czech Republic, although survival after breast cancer diagnosis is still below the OECD average. Improvements may be related to strengthening of cancer care governance in these countries. For instance, the Czech Republic intensified its effort to tackle the burden of breast cancer through the introduction of a screening programme and a National Cancer Control Programme in the early 2000s (OECD, 2014).

With respect to mortality rates, most OECD countries showed a decline over the past decade (Figure 6.35). The reduction is a reflection of improvements in early detection and treatment of breast cancer. Improvements were substantial in the Czech Republic and Denmark with a decline of over 20% in a decade but Denmark still has one of the highest rates. On the other hand, within the OECD, in Iceland and Korea, the mortality rate from breast cancer increased by more than 10% over the past decade. In Iceland the mortality is the highest in the OECD while in Korea, it remains the lowest.

Definition and comparability

Screening rates are based on surveys or encounter data, which may influence the results. Survey-based results may be affected by recall bias. Programme data are often calculated for monitoring national screening programmes and differences in target population and screening frequency may lead to variations in screening coverage across countries.

Five-year net survival is the cumulative probability that cancer patients survive their cancer for at least 5 years, after controlling for the risks of death from other causes. Net survival is expressed as a percentage. Net survival for patients diagnosed during 2000-2004 is based on a cohort approach, since all patients had been followed up for at least 5 years by the end of 2014. For patients diagnosed during 2010-2014, the period approach is used, which allows estimation of five-year survival, though 5 years of follow-up are not available for all patients. Cancer survival estimates are age-standardised with the International Cancer Survival Standard (ICSS) weights.

Data collection, quality control and analysis were performed centrally as part of the CONCORD programme, the global programme for the surveillance of cancer survival, led by the London School of Hygiene and Tropical Medicine (Allemani et al., 2015). In some countries, not all regional registries participated, but survival estimates from the CONCORD programme are considered the best available data from those countries for international comparisons.

See indicator "Mortality from cancer" in Chapter 3 for definition, source and methodology underlying cancer mortality rates.

References

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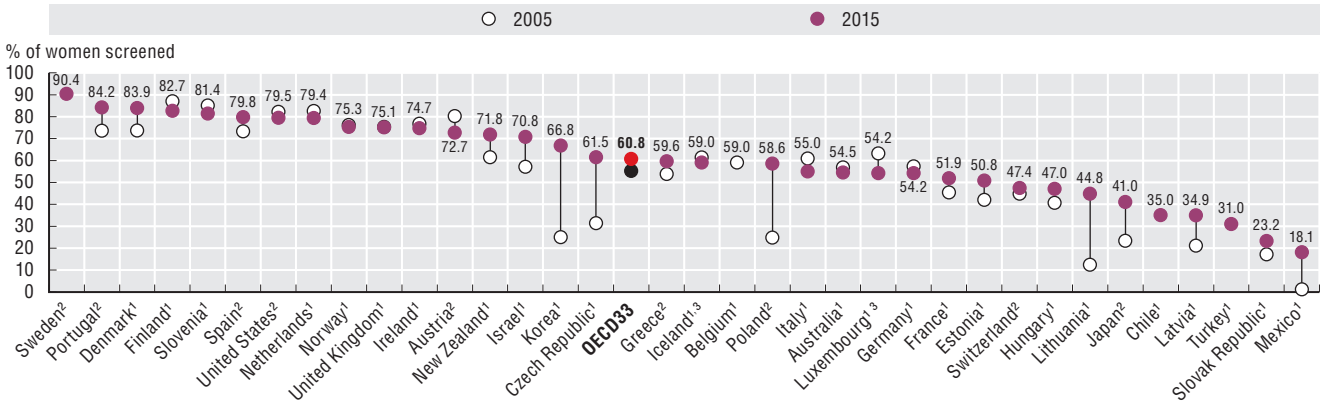
WHO (2014), "WHO Position Paper on Mammography Screening", Geneva.

6.33. Mammography screening in women aged 50-69 within the past 2 years, 2005 and 2015 (or nearest years)

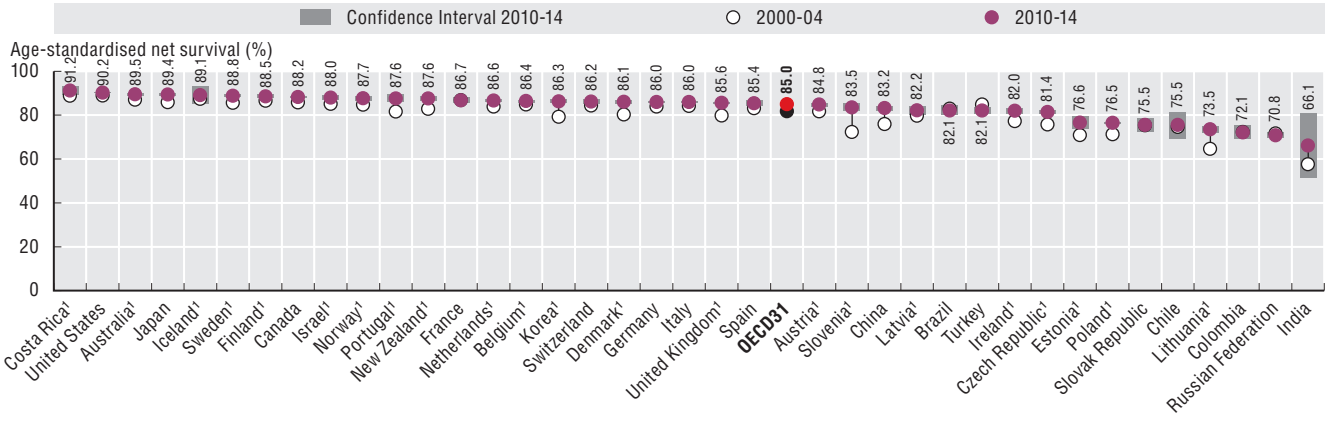


1. Programme.
2. Survey.
3. Three-year average.

Source: *OECD Health Statistics 2017 and EHIS Eurostat database.*

StatLink http://dx.doi.org/10.1787/888933603963

6.34. Breast cancer five-year net survival, 2000-2004 and 2010-2014



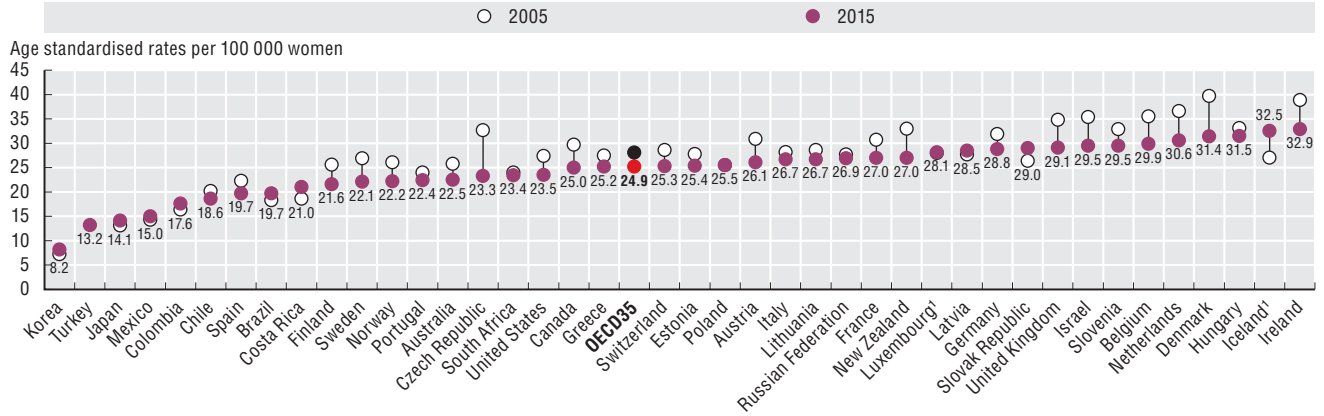
Note: 95% confidence intervals have been calculated for all countries, represented by grey areas. Expected updates in the data may reduce the survival estimate for Costa Rica.

1. Data with 100% coverage of the national population.

Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

StatLink http://dx.doi.org/10.1787/888933603982

6.35. Breast cancer mortality in women, 2005 and 2015 (or nearest years)



1. Three-year average.

Source: *OECD Health Statistics 2017.*

StatLink http://dx.doi.org/10.1787/888933604001

Survival and mortality for colorectal cancer

Colorectal cancer is the third most commonly diagnosed form of cancer after prostate and lung cancers, for men, and the second most common cancer after breast cancer, for women, across OECD countries (see indicator "Mortality from cancer" in Chapter 3). There are several factors that place certain individuals at increased risk for the disease, including age, ulcerative colitis, a personal or family history of colorectal cancer or polyps, and lifestyle factors such as a diet high in fat and low in fibre, lack of physical activity, obesity, and tobacco and alcohol consumption. Incidence is significantly higher for men than women across countries. Generally, rectal cancer is more difficult to cure than colon cancer due to a higher probability of spreading to other tissue, recurrence and postoperative complications.

Following screening for breast and cervical cancers, colorectal cancer screening has become available, and an increasing number of countries have introduced free population-based screening, targeting people in their 50s and 60s (OECD, 2013). Partly because of uncertainties about the cost-effectiveness of screening (Lansdorp-Vogelaar et al., 2010), countries are using different methods. In most countries that provide faecal occult blood test, screening is available every two years and the screening periodicity schedule is less frequent with colonoscopy and flexible sigmoidoscopy, generally every ten years. These differences make screening coverage difficult to compare across countries.

Advances in diagnosis and treatment of colorectal cancer including improved surgical techniques, radiation therapy and combined chemotherapy and their wider and timelier access have contributed to increased survival over the last decade. In general, OECD countries showed improvement in five-year net survival for colon and rectal cancers. On average across OECD countries, five-year colon cancer survival improved from 57.0% to 62.8% for patients with colon cancer between 2000-04 and 2010-14 periods while survival for rectal cancer also improved from 55.1% to 61.0% during the same periods (Figures 6.36 and 6.37). Some countries show a considerable improvement including Chile, Lithuania, Korea, Denmark and Estonia for colon cancer, and Latvia, Lithuania, Slovenia, Denmark, Ireland and Korea for rectal cancer. Generally, countries with low survival estimates for colon cancer tend to have low estimates also for rectal cancer. Among OECD countries, net survival estimates are low for both cancers in countries such as Chile, the Czech Republic, Poland, the Slovak Republic and Turkey.

In terms of mortality rates, most countries experienced a decline in recent years, with the average rate across OECD countries falling from 26.8 to 23.9 deaths per 100 000 population between 2005 and 2015 (Figure 6.38). The decline was particularly large in Austria, the Czech Republic, Denmark and Israel with a reduction of over 30%. Despite some progress, Central and Eastern European countries, particularly the Czech Republic, Slovenia and the Slovak Republic continue to have higher mortality rates than other OECD countries.

However, in some OECD countries, the mortality rate from colorectal cancer increased during the same period. For instance, Hungary which had the highest mortality rate a decade ago, reported even higher rates. In Latin American countries including Chile and Mexico, the increase was particularly large, by more than 10%, over the last decade, although the rate remains much lower than the OECD average. Despite increases, some of these countries have made progress in strengthening their systems to reduce the burden of colorectal cancer. For example, in 2013, Chile included treatment for colorectal cancer as part of its guaranteed health care coverage plan, which assures improved access, quality, financial protection and timeliness of care for priority diseases, and this may lead to improved outcomes of colorectal cancer in the future (OECD, 2018).

Definition and comparability

Net survival and mortality rates are defined in indicator "Screening, survival and mortality for breast cancer" in Chapter 6. See indicator "Mortality from cancer" in Chapter 3 for definition, source and methodology underlying cancer mortality rates. Mortality rates of colorectal cancer are based on ICD-10 codes C18-C21 (colon, rectosigmoid junction, rectum, and anus) while survival estimates are based on C18-C19 for colon cancer and C20-C21 for rectum cancer.

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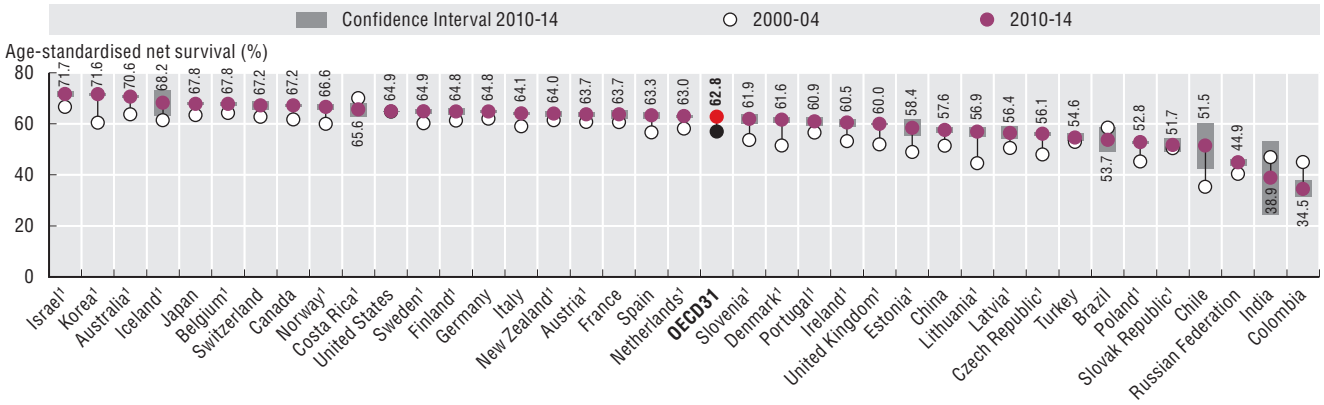
6.36. Colon cancer five-year net survival, 2000-04 and 2010-14



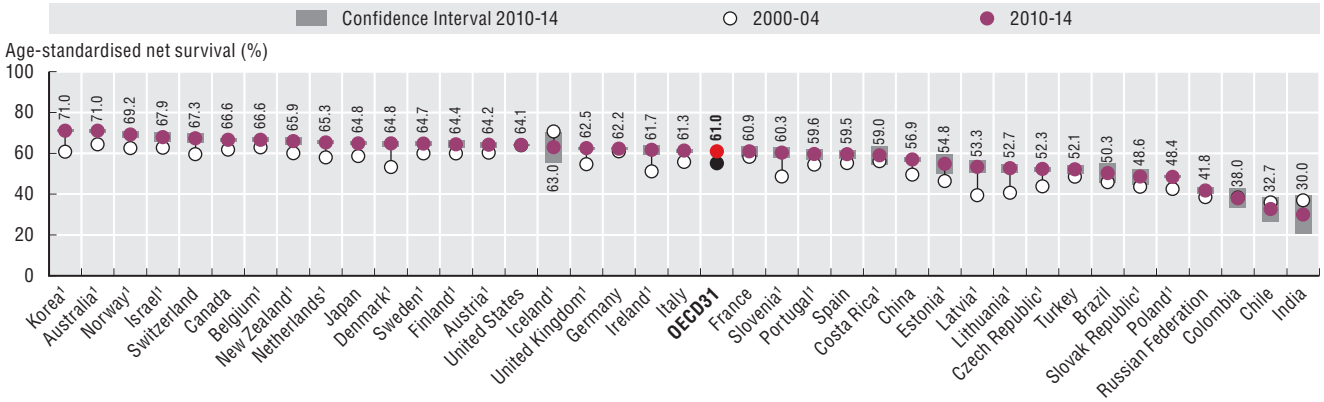
Note: 95% confidence intervals have been calculated for all countries, represented by grey areas. Expected updates in the data may reduce the survival estimate for Chile to 43.9, and may also reduce the estimate for Costa Rica. Updates may also lead to very small changes in the survival estimates for Canada and for the OECD average.

1. Data with 100% coverage of the national population.

Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

StatLink http://dx.doi.org/10.1787/888933604020

6.37. Rectal cancer five-year net survival, 2000-04 and 2010-14



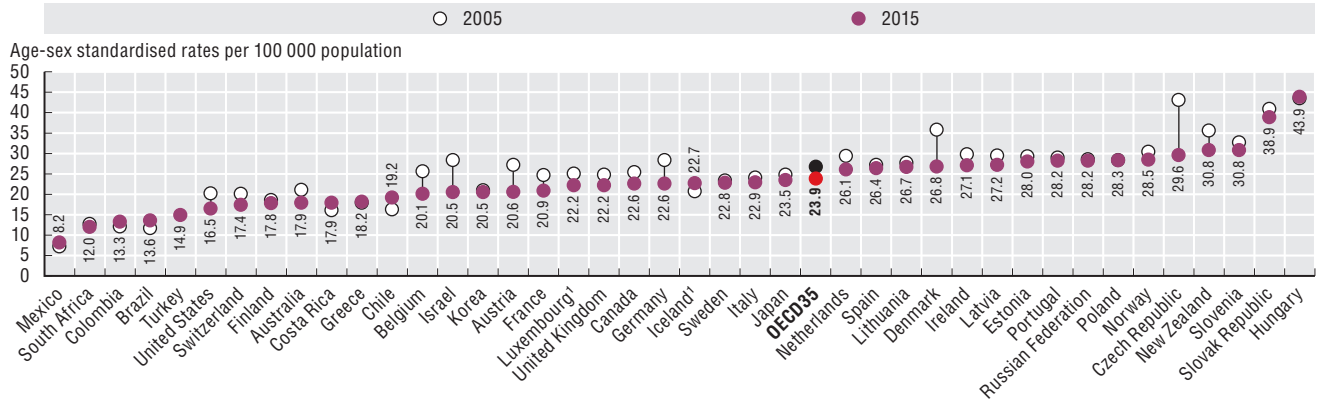
Note: 95% confidence intervals have been calculated for all countries, represented by grey areas. Expected updates in the data may reduce the survival estimate for Costa Rica.

1. Data with 100% coverage of the national population.

Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

StatLink http://dx.doi.org/10.1787/888933604039

6.38. Colorectal cancer mortality, 2005 and 2015 (or nearest years)



1. Three-year average.

Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933604058

Survival and mortality for leukaemia in children

Leukaemia is the most common childhood cancer and accounts for over 30% of all cancers diagnosed in children aged below 15 years old in the world (IARC, 2012). Causes of leukaemia are not well known, but some known risk factors include inherited factors such as Down syndrome and a family history of leukaemia and non-inherited factors including exposure to inonising radiation. There are different types of leukaemia but about three-quarters of cases among children are acute lymphoblastic leukaemia (ALL). The second most frequent type is acute myeloid leukaemia. Prognosis of leukaemia is different depending on various factors including age, initial white blood cell count, gender, initial reaction to induction treatment and type of leukaemia. Children with acute leukaemia who are free of the disease for 5 years are considered to have been cured as remission after 5 years is rare.

On average across OECD countries, there were 4.7 new cases of leukaemia per 100 000 children aged between 0 and 14 in 2012. Cross-country variations are large and incidence rates in Germany and Finland are high at around 7 per 100 000 children while they are as low as around 3 in Iceland and Greece. South Africa, India and China also have low incidence rates, below 3.0 per 100 000 children (Figure 6.39).

Five-year net survival of acute lymphoblastic leukaemia among children is on average 86.7% during the period of 2010-2014 across OECD countries. Although prognosis of ALL is considered better among girls than among boys, the difference in net survival is not statistically significant for most countries with the exception of Estonia where survival for girls is slightly better.

Over time, five-year net survival for children with ALL has improved across OECD countries (Allemani et al., 2015). This improvement is mainly due to progress in chemotherapy and stem cell transplantation technology. However, countries have not benefited equally from progress in medical technologies. Survival estimates are high in Finland (95.2%) and Denmark (94.0%) but they are low in Mexico (52.7%) and Chile (63.9%). Net survival is low also in China (57.7%), Brazil (66.0%) and Colombia (68.9%) (Figure 6.40). In these countries, survival prospect of children with ALL may improve through better access to effective treatment, by expanding health care coverage and providing high quality care by accredited professionals at specialised centres. Some of these countries are making progress in improving access and quality of care for childhood cancer. For example, Chile included access to care for childhood cancer as part of its guaranteed health care coverage plan and although a shortage of qualified professionals still exist at specialised centres, quality of care has become similar across providers (OECD, 2018).

Across OECD countries, the mortality rate of childhood leukaemia has also improved over time (La Vecchia et al., 2009; Malvezzi et al., 2013) and it was less than 1 per 100 000 children in most OECD countries in 2012 (Figure 6.41). The rate is particularly low at less than 0.3 in Australia, and Austria. However, the mortality rate is high in Turkey at 3.0 per 100 000 children and Mexico at 2.6.

Definition and comparability

Incidence and mortality rates come from the International Agency for Research on Cancer (IARC), GLOBOCAN 2012, available at *www.globocan.iarc.fr*. They refer to crude rates and are not age-standardised. GLOBOCAN estimates for 2012 may differ from national estimates due to differences in methods. For example, the incidence reported by the German Centre for Cancer Registry Data (ZfKD) and German Children's Cancer Registry is about 5 per 100 000. Net survival is defined in indicator "Screening, survival and mortality for breast cancer" in Chapter 6.

References

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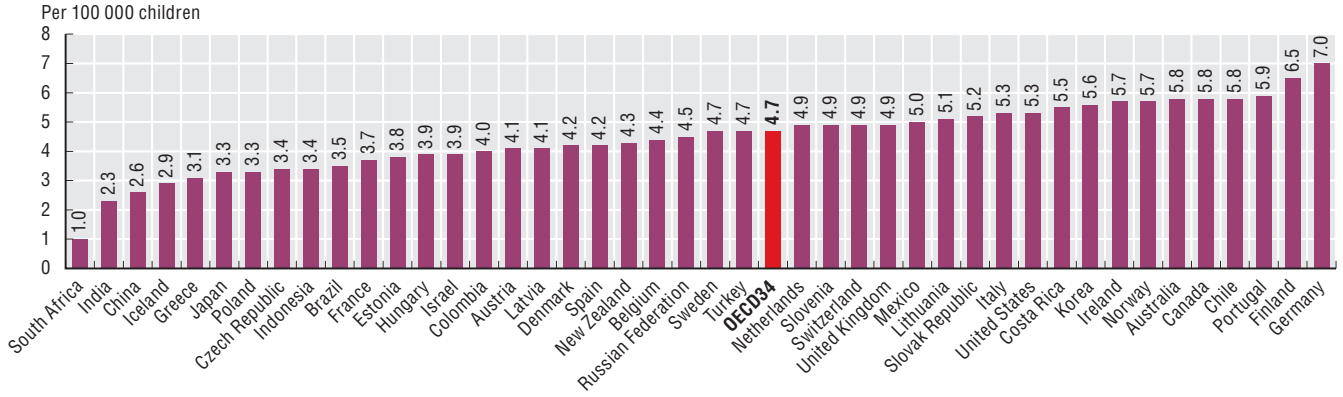
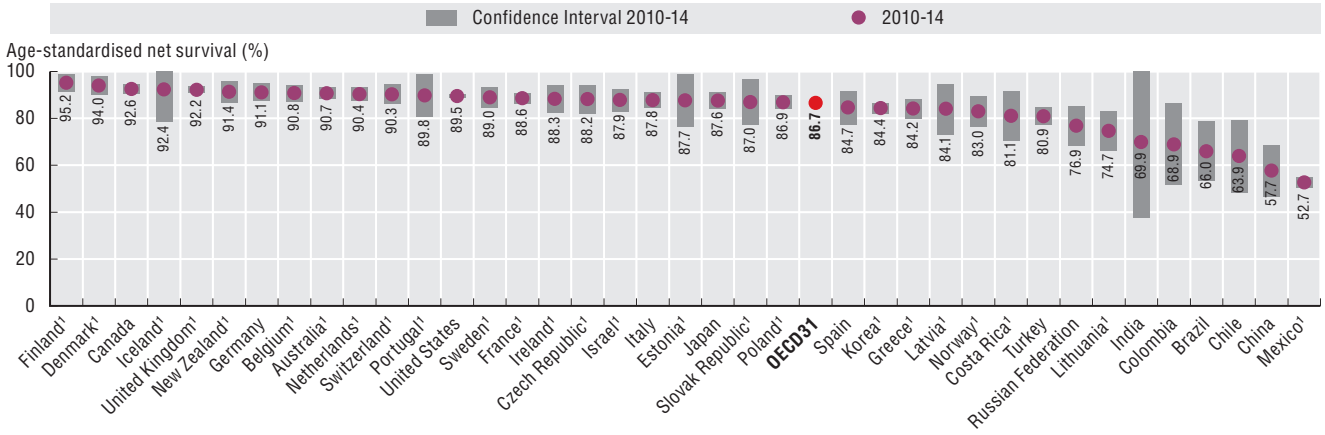
6.39. Leukaemia incidence in children aged 0-14, 2012



Source: International Agency for Research on Cancer (IARC), GLOBOCAN 2012.

StatLink http://dx.doi.org/10.1787/888933604077

6.40. Acute lymphoblastic leukaemia five-year net survival, 2010-14



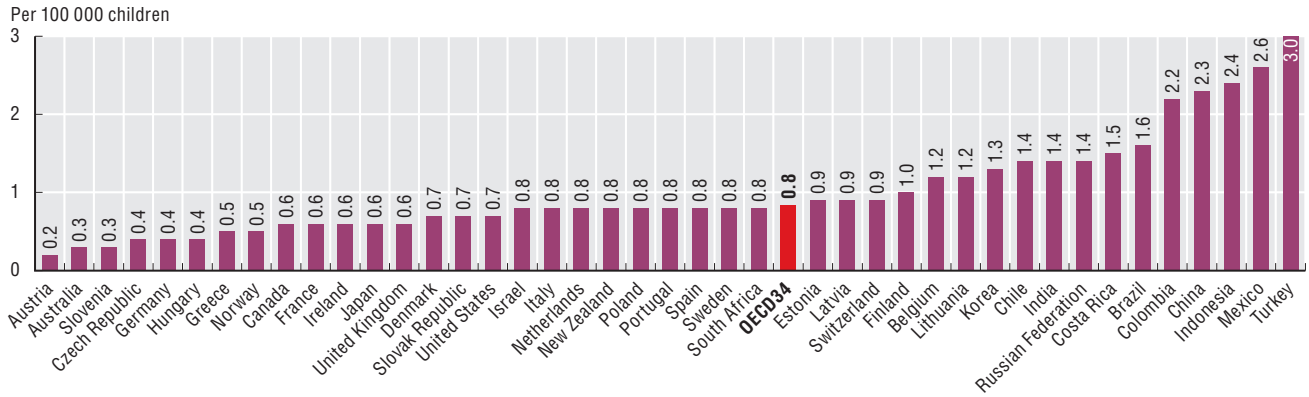
Note: 95% confidence intervals have been calculated for all countries, represented by grey areas. Expected updates in the data may reduce the survival estimate for Costa Rica.

1. Data with 100% coverage of the national population

Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

StatLink http://dx.doi.org/10.1787/888933604096

6.41 Leukaemia mortality in children aged 0-14, 2012



Source: International Agency for Research on Cancer (IARC), GLOBOCAN 2012.

StatLink http://dx.doi.org/10.1787/888933604115

Vaccinations

All OECD countries have established vaccination programmes based on their interpretation of the risks and benefits of each vaccine. For children, vaccination rates for diphtheria, tetanus and pertussis (DTP), measles, and hepatitis B at age 1 are high across OECD countries (Figures 6.42 and 6.43). On average, over 95% of children receive the recommended DTP or measles vaccinations, while almost 94% receive a recommended hepatitis B vaccination. Vaccination rates for DTP are below 90% in Indonesia, Mexico, and India. Vaccination rates for measles are below 90% in Italy, Indonesia, and India while vaccination rates for hepatitis B are below 90% in Mexico, France, Indonesia, India, and Germany.

Overall rates of vaccination among children are increasing. Between 2005 and 2015, vaccination rates among children have increased 1 percentage point for DTP vaccination, more than 2 percentage points for measles, and nearly 12 percentage points for hepatitis B among OECD countries. Large increases in hepatitis B vaccination can be seen over this period in a number of OECD countries including France and the Netherlands, reflecting the introduction of national programmes. However, vaccination rates have dropped in recent years in some countries, notably for measles coverage in Australia and Italy. Even small decreases in vaccination can result in large increases in disease cases (Lo et al. 2017). While national vaccination coverage rates are high, some populations remain under-covered. A 2015 outbreak of measles in the United States was caused by a number of unvaccinated individuals, while in Europe 1020 cases of measles were reported between February 2016 and January 2017 in Italy alone. (CDC, 2017; ECDC, 2017).

Not all countries follow WHO recommendations to incorporate hepatitis B into national immunisation programmes, including Denmark, Finland, Sweden, and the United Kingdom, where vaccination is not part of the general infant vaccination programme, but is provided to high-risk groups. Other OECD countries that do not include vaccination against hepatitis B in their infant programmes are Iceland, Hungary, Japan, Slovenia and Switzerland. In Canada, the Hepatitis B immunisation schedule varies by jurisdiction.

Influenza is a common infectious disease responsible for 3 to 5 million severe cases worldwide, including 250 000 to 500 000 deaths. Hospitalisation and death occur mainly among high-risk groups and in industrialised countries most deaths associated with influenza occur among people age 65 or older (WHO, 2016). Safe and effective vaccination is available for influenza and most countries recommend annual vaccination among older adults.

In 2003, countries participating in the World Health Assembly committed to the goal of attaining vaccination coverage against influenza among the elderly of at least 75% by 2010. Figure 6.44 shows vaccination among adults over 65 for 2005 and 2015. Over this period, the average vaccination rate against influenza among the elderly population decreased among OECD countries from 49% to 43%. Large decreases can be seen in Germany, Slovenia, and Italy. Some countries did show increased vaccination over this time period including Mexico, Israel, the United States, Portugal, Denmark, Greece, and New Zealand. Only two countries attained the 75% target: Mexico and Korea, with the United Kingdom coming close to meeting the target.

Definition and comparability

Vaccination rates reflect the percentage of children that receives the respective vaccination in the recommended timeframe. The age of complete immunisation differs across countries due to different immunisation schedules. For those countries recommending the first dose of a vaccine after age one, the indicator is calculated as the proportion of children less than two years of age who have received that vaccine. Thus, these indicators are based on the actual policy in a given country.

Some countries administer combination vaccines (e.g. DTP for diphtheria, tetanus and pertussis) while others administer the vaccinations separately. Some countries ascertain vaccinations based on surveys and others based on encounter data, which may influence the results.

Influenza vaccination rates refer to the number of people aged 65 and older who have received an annual influenza vaccination, divided by the total number of people over 65 years of age. In some countries, the data are for people over 60 years of age. 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.

References

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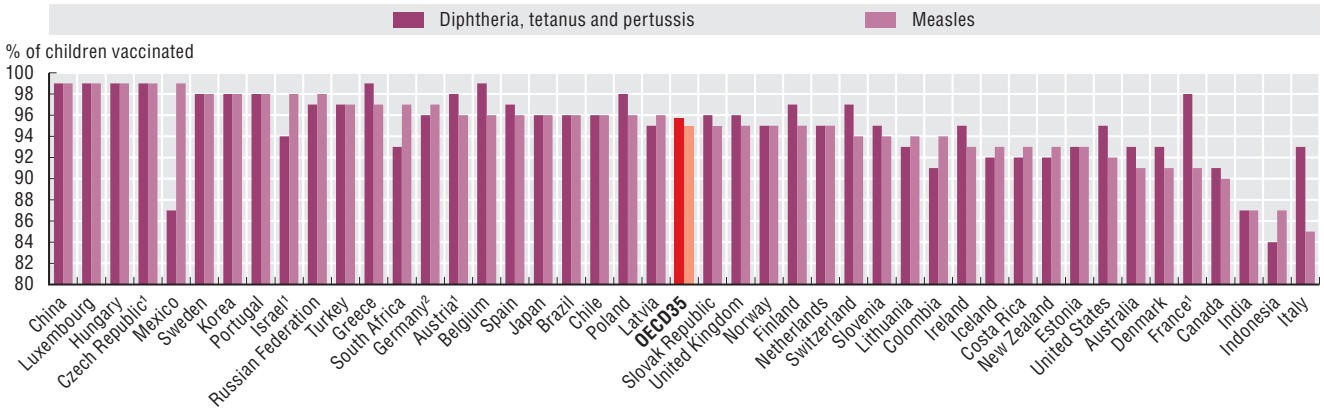
6.42. Percent of children aged 1 vaccinated for diphtheria, tetanus and pertussis (DTP) and measles, 2015 (or nearest year)

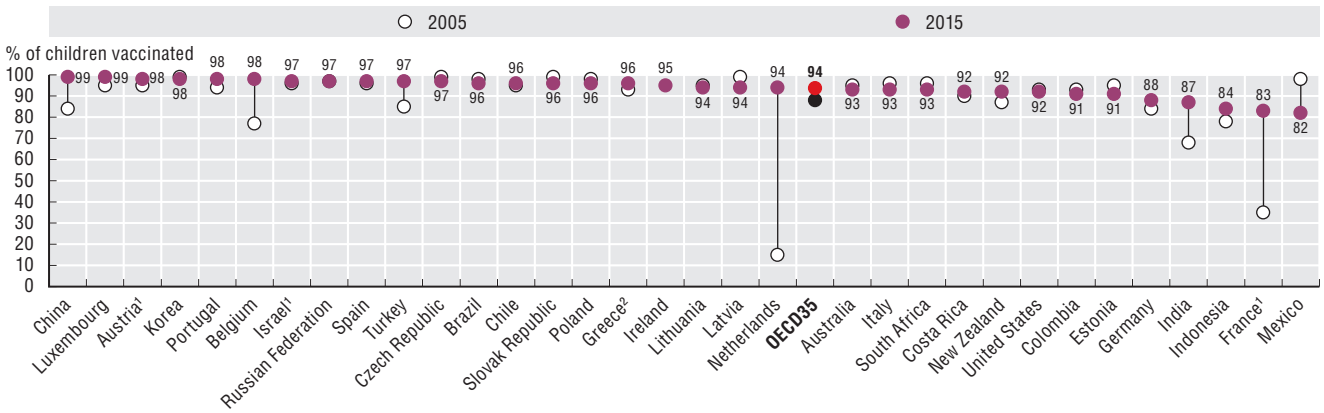


1. All data estimated.
2. Measles data estimated.

Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933604134

6.43. Percent of children aged 1 vaccinated for hepatitis B, 2005 and 2015

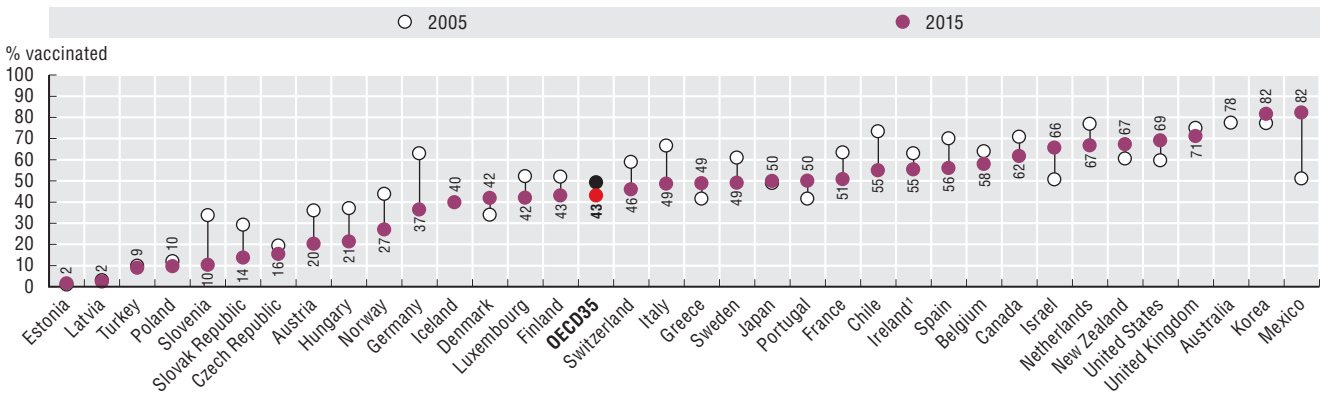


1. 2015 data estimated.
2. 2005 data estimated.

Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933604153

6.44. Percent of population aged 65 and over vaccinated for influenza, 2005 and 2015



1. 2015 data estimated.

Source: *OECD Health Statistics 2017*.

StatLink http://dx.doi.org/10.1787/888933604172

7. HEALTH EXPENDITURE

Health expenditure per capita

Health expenditure in relation to GDP

Financing of health care

Sources of health care financing

Health expenditure by type of service

Health expenditure by provider

Capital expenditure in the health sector

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Health expenditure per capita

The financial resources that a country devotes to health care, both for individuals and for the population as a whole, and how this changes over time is the result of a wide array of social and economic factors, as well as the financing and organisational structures of a country's health system.

In 2016, the United States is estimated to have outspent all other OECD countries by a wide margin, spending the equivalent of USD 9 892 for each resident (Figure 7.1). This level of health spending is almost two-and-a-half times the average of the 35 OECD countries (USD 4 003) and 25% above Switzerland, the next highest spender (adjusted for the different purchasing powers – see box "Definition and comparability"). Compared with the other G7 countries, the United States spends almost 80% more than Germany and more than twice as much on health care per person as Canada, France and Japan. OECD countries spending half or less of the OECD average include many of the Central and Eastern European members of the OECD, such as Estonia and Poland, together with Chile. Lowest per capita spenders on health in the OECD were Mexico and Turkey with levels around a quarter of the OECD average, and similar to spending in key emerging economies such as the Russian Federation, South Africa and Brazil. China spent around 20% of the OECD per capita spending level, while both India and Indonesia spent less than 10% of the OECD average based on latest available figures.

Figure 7.1 also shows the split of health spending based on whether it is paid from government sources or some kind of compulsory insurance, or through voluntary means such as voluntary health insurance or direct payments (see indicator on "Financing of health care"). In general, the ranking of per capita expenditure of government and compulsory schemes is comparable to that of total spending. Even if voluntary insurance in the United States continues to play a significant role in financing health care, the level of spending from federal and state programmes (such as Medicaid) and Medicare is still greater on a per capita basis in the United States than in most other OECD countries, with the exceptions being Luxembourg, Norway and Switzerland.

Per capita spending on health across the OECD continued to grow in 2016 following the trend of recent years. This comes after the abrupt slowdown in health spending growth between 2009 and 2011 in the wake of the global financial and economic crisis. On average, annual health spending growth across the OECD since 2009 has been 1.4% compared with 3.6% in the six years up to 2009 (Figure 7.2).

In a number of countries there have been significant turnarounds in annual growth rates in health spending in the years before, compared with after the financial crisis. In Greece, strong annual growth increases were reversed after 2009 (5.4% vs. -5.0%). A similar if less dramatic picture is also observed in Portugal (2.2% vs. -1.3%). In general, health spending growth slowed down in the vast majority of OECD countries and preliminary figures or estimations for 2016 still point to negative or near-zero growth in a few. Only four countries – Iceland, Hungary, Switzerland and Chile – have recorded higher average growth in the period since 2009 compared to the period before. Indeed, health spending in Hungary together with Poland and Estonia has remained relatively resilient since 2009 with annual growth of between 2.7-3.6%

Away from Europe, Korea and Chile have continued to report annual health spending increases above 5% in real terms since 2009. Preliminary country estimates for 2016 suggest further strong spending growth of 6.3% in Korea and 4.5% in Chile. In the United States, health spending grew by 4.1% in real terms in 2015, the fastest rate for more than ten years, with a preliminary estimate by the OECD suggesting a further increase of 2.7% in 2016. In the medium-term, the US Centers for Medicare & Medicaid Services (CMS) expect health spending growth above that of GDP in the United States, driven on by faster growing medical prices.

Definition and comparability

Expenditure on health measures the final consumption of health goods and services (*i.e.* current health expenditure). This includes spending by both public and private sources on medical services and goods, public health and prevention programmes and administration.

To compare spending levels between countries, per capita health expenditures are converted to a common currency (US dollar) and adjusted to take account of the different purchasing power of the national currencies, in order to compare spending levels. Economy-wide (GDP) PPPs are used as the most available and reliable conversion rates. For the calculation of growth rates in real terms, economy-wide GDP deflators are used for all countries. In some countries (e.g. France and Norway), health specific deflators exist, based on national methodologies, but these are not used in this publication due to limited comparability.

Note that data for 2016 are based on preliminary figures either provided by the country or estimates made by OECD Secretariat.

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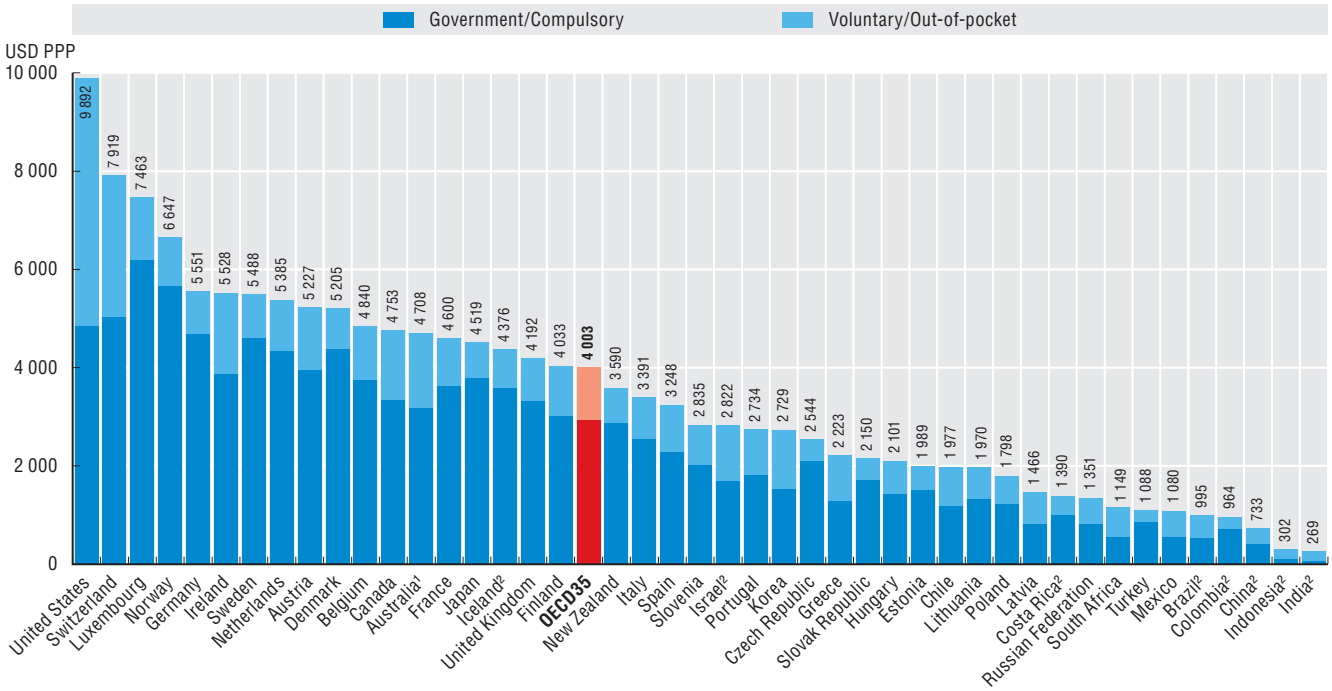
OECD/Eurostat/WHO (2017), *A System of Health Accounts 2011: Revised edition*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264270985-en*.

7.1. Health expenditure per capita, 2016 (or nearest year)



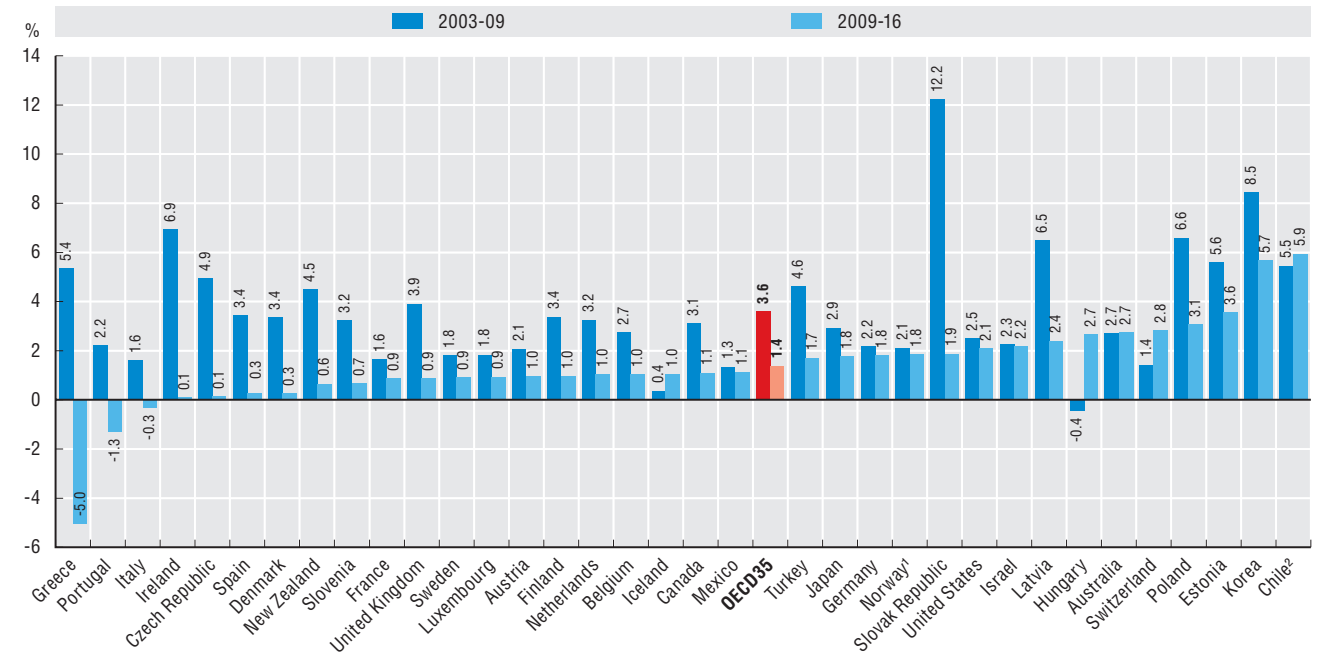
Note: Expenditure excludes investments, unless otherwise stated.

1. Australian expenditure estimates exclude all expenditure for residential aged care facilities in welfare (social) services.
2. Includes investments.

Source: OECD Health Statistics 2017, WHO Global Health Expenditure Database.

StatLink http://dx.doi.org/10.1787/888933604191

7.2. Annual average growth rate in per capita health expenditure, real terms, 2003 to 2016 (or nearest year)



1. Mainland Norway GDP price index used as deflator.
2. CPI used as deflator.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604210

Health expenditure in relation to GDP

How much a country spends on health care over time relative to spending on all other goods and services in the economy can be down to both growth in health spending itself as well as how well the economy is performing overall. In 2016, health spending is estimated to have accounted for 9.0% of GDP on average across OECD countries, largely unchanged in recent years. This comes after a period of health spending growth above that of the overall economy in the 1990s and 2000s that saw health expenditure as a share of GDP rise sharply in many OECD countries.

In 2016, the United States spent 17.2% of GDP on health, almost five percentage points above Switzerland, the next highest country, and more than eight percentage points above the OECD average (Figure 7.3). A group of ten high-income OECD countries, including Germany, France, Japan and Canada, follow with around 11% of GDP going on health services. Another large group of countries spanning Europe, as well as Australia and New Zealand (and South Africa) fit roughly within a band of between 8-10% of GDP. A similar sized group of mainly Central and Eastern European countries, such as Hungary, the Czech Republic and Poland allocate between 6-8% of their GDP to health. Only Mexico, Latvia and, notably Turkey at 4.3%, spend less than 6% of GDP on health services. Turkey's health spending as a share of GDP is at a similar level to that in India.

Looking at changes over time, the average health spending to GDP ratio jumped sharply in 2009 as overall economic conditions deteriorated rapidly in many countries while health spending growth was sustained at around 3% on average in 2008 and 2009 (Figure 7.4). While subsequent health spending growth also significantly declined – approaching zero growth on average in 2010/11 – this step increase in the health spending to GDP ratio has been largely maintained as the rate of health spending growth has tended to closely track the growth in the overall economy since 2012.

However, behind the overall OECD average, some different patterns emerge on a country by country basis. In the United States, after a number of years (2009-14) when the ratio of health spending to GDP has been stable at around 16.4%, 2015 and 2016 have seen this increase again to reach the 17.2% in 2016 (Figure 7.5). This mirrors the period before the economic crisis when health spending rose almost a percentage point between 2003 and 2008. Korea has seen the most notable increase in the share of economic resources allocated to health over time with a significant progression in the ratio over many years on the back of growing wealth and increased health coverage for the population. In 2003, health spending in Korea accounted for only 4.3% whereas in 2016 it was estimated to have reached 7.2%. At the other end of the scale, no discernible impact can be seen for Mexico which has seen its health spending to GDP ratio remain relatively constant throughout the period at around 6% of GDP.

In Europe, Germany has seen its health spending to GDP ratio stabilise since 2009 as health spending growth has aligned with economic growth with a slow but steady increase to reach 11.3% in 2016, almost one percentage point above the level in 2003. Greece, on the other hand, where there have been significant cuts in health spending since 2009, has seen the health spending to GDP ratio fluctuate – approaching close to 10% in 2010 – before returning to a similar level to that in the early 2000s at around 8% of GDP.

Definition and comparability

See indicator on "Health expenditure per capita" for a definition of expenditure on health.

Gross Domestic Product (GDP) = final consumption + gross capital formation + net exports. Final consumption of households includes goods and services used by households or the community to satisfy their individual needs. It includes final consumption expenditure of households, general government and non-profit institutions serving households.

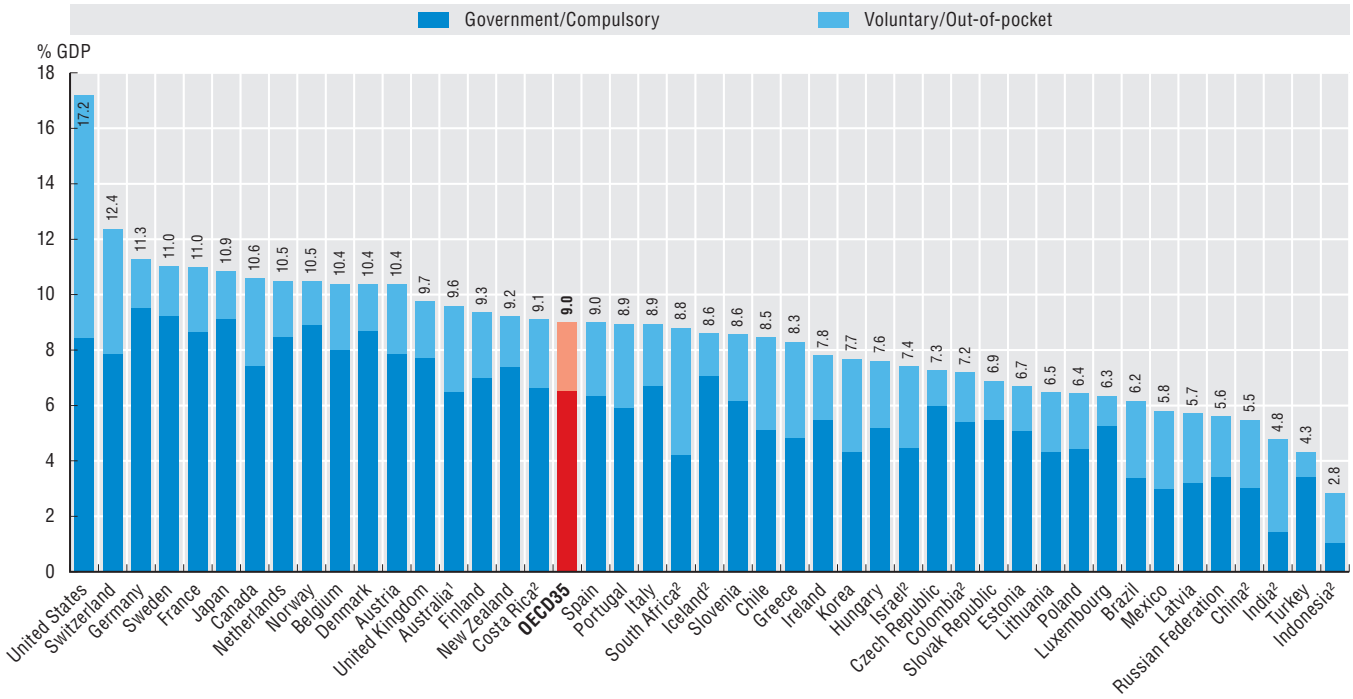
In countries, such as Ireland and Luxembourg, where a significant proportion of GDP refers to profits exported and not available for national consumption, GNI may be a more meaningful measure than GDP.

Note that data for 2016 are based on preliminary figures provided by the country or estimates made by OECD Secretariat.

References

OECD/Eurostat/WHO (2017), *A System of Health Accounts 2011: Revised edition*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264270985-en*.

7.3. Health expenditure as a share of GDP, 2016 (or nearest year)



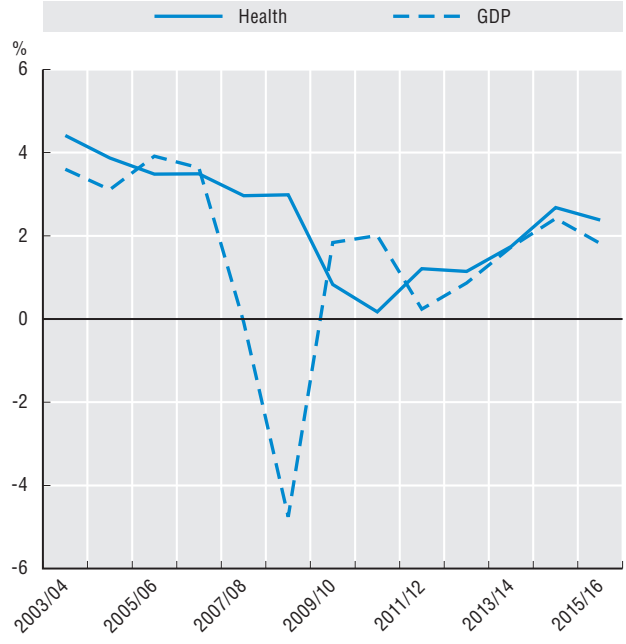
Note: Expenditure excludes investments, unless otherwise stated.

1. Australian expenditure estimates exclude all expenditure for residential aged care facilities in welfare (social) services.
2. Includes investments.

Source: OECD Health Statistics 2017, WHO Global Health Expenditure Database.

StatLink http://dx.doi.org/10.1787/888933604229

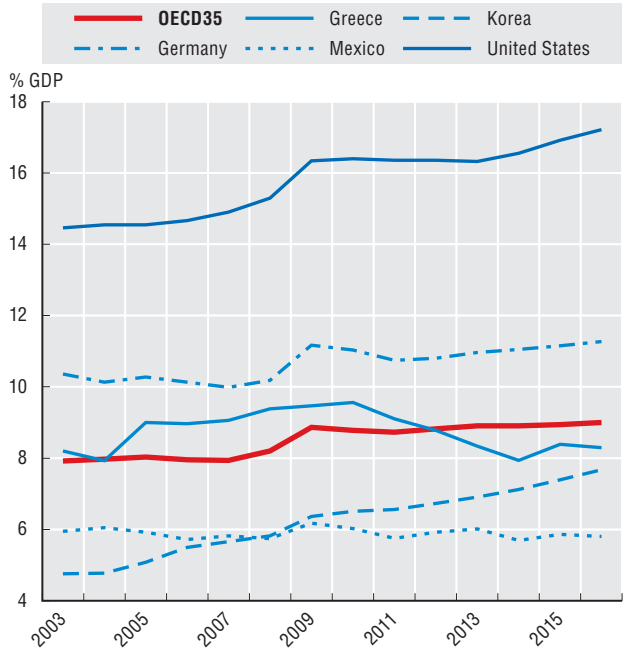
7.4. Average annual growth in per capita health expenditure and GDP, 2003-16 (OECD average)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604248

7.5. Health expenditure as a share of GDP, selected OECD countries, 2003-16



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604267

Financing of health care

Health care can be paid for through a variety of financing arrangements. In some countries, health care might be predominantly covered by government schemes by which individuals are automatically entitled to care based on their residency. In other cases, compulsory health insurance schemes (either through public or private entities) finance the bulk of health spending. In addition to these, a varying proportion of health care spending consists of payments by households (either as standalone payments or as part of co-payment arrangements) as well as various forms of voluntary health insurance intended to replace, complement or supplement automatic or compulsory coverage.

In all but one OECD country, government schemes and compulsory health insurance constitute the main health care financing arrangements. Together they accounted, on average, for almost three-quarters of all health care spending across the OECD in 2015 (Figure 7.6). In Denmark, Sweden and the United Kingdom, central, regional or local government financed 80% or more of all health spending. In Germany, Japan, France and the Slovak Republic more than 75% of all health expenditure was paid for through compulsory health insurance. Only in the United States was less than half of all health spending financed by government or compulsory health insurance. By contrast, a large proportion of health spending (35%) was paid for via voluntary health insurance.

Governments provide a multitude of public services out of their overall budgets. Hence, health care is competing with many other sectors such as education, defence and housing. The size of public funds allocated to health is determined by a number of factors including, among others, the type of system in place and the demographic composition of the population. Relative budget priorities may also shift from year to year as a result of political decision-making and economic effects. In 2015, health spending by government schemes and compulsory insurance stood at around 15% of total government expenditure across the OECD (Figure 7.7). In Japan, Switzerland, New Zealand, the United States and Germany more than 20% of public spending was dedicated to health care. On the other hand, less than one out of every ten euros spent by governments or compulsory health insurance was allocated to health care in Latvia and Greece.

After government schemes and compulsory health insurance, the main source of funding tends to be out-of-pocket payments. On average across the OECD, private households directly financed around one-fifth of all health spending in 2015. This share is above a third of health spending in Greece (35%), Korea (37%), Mexico (41%) and Latvia (42%), while in France it is below 10%. With the implementation of universal health coverage in some OECD countries over previous decades, there have been some significant reductions in the share of health care costs payable by households. More recently, the share of out-of-pocket spending has been generally stable but with some notable increases in some European countries (Figure 7.8). In Greece (+6.2 percentage points) and Spain (+4.7 pp) the share of health spending payable by households has increased since 2009 due to the implementation of reforms to balance public budgets which shifted some financing responsibilities to patients. On the other hand, this share has been reduced in Mexico (-6.0 pp) and Chile (-2.3 pp) over the same time period.

Definition and comparability

Health care financing can be analysed from the point of view of *financing schemes* (financing arrangements through which health services are paid for and obtained by people, e.g. social health insurance), *financing agents* (organisations managing the financing schemes, e.g. social insurance agency), and *types of revenues* (e.g. social insurance contributions). Here "financing" is used in the sense of financing schemes as defined in the System of Health Accounts (OECD, Eurostat and WHO, 2011) and includes government schemes, compulsory health insurance as well as voluntary health insurance and private funds such as households' out-of-pocket payments, NGOs and private corporations. Compulsory health insurance can be offered by private insurers, in some cases without an obligation to contract individuals (e.g. in Chile and Germany). Out-of-pocket payments are expenditures borne directly by patients and include cost-sharing arrangements and any informal payments to health care providers.

Total government expenditure is as defined in the System of National Accounts and includes intermediate consumption, compensation of employees, interest, social benefits, social transfers in kind, subsidies, other current expenditure and capital expenditure payable by central, regional and local governments as well as social security funds. Relating spending from government financing schemes and compulsory insurance schemes to total government expenditure is overestimated to a certain extent for those countries with compulsory health insurance provided by private insurers.

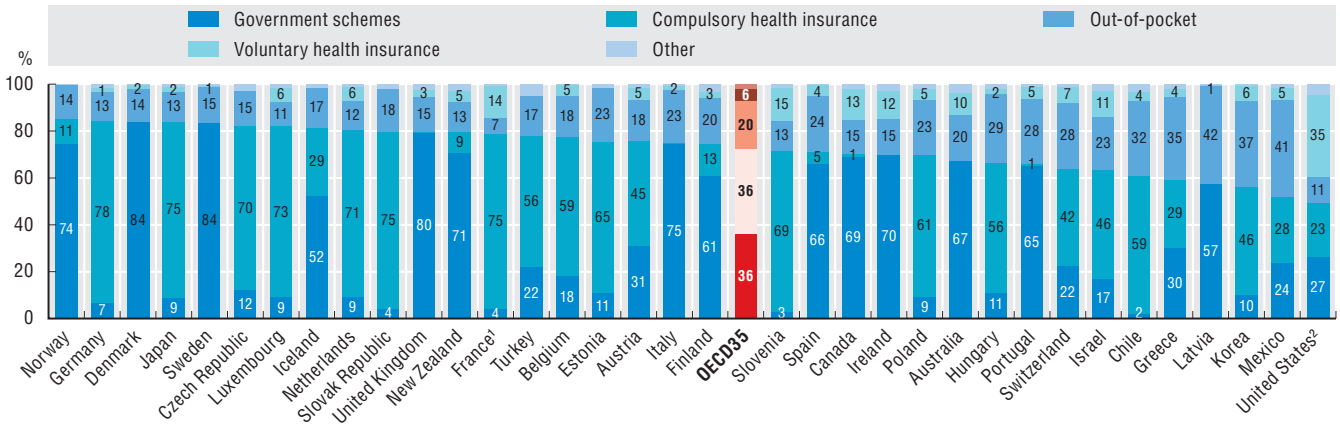
Spending by private health insurance companies in the United States are considered under voluntary health insurance although the Affordable Care Act (ACA) constitutes a mandate for individuals to buy health insurance or pay a penalty since 2014.

References

Mueller, M. and D. Morgan (2017), "New Insights into Health Financing: First Results of the International Data Collection Under the System of Health Accounts 2011 Framework", *Health Policy*, Vol. 121, No. 7, pp. 764–769.

OECD/Eurostat/WHO (2017), *A System of Health Accounts 2011: Revised edition*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264270985-en*.

7.6. Health expenditure by type of financing, 2015 (or nearest year)

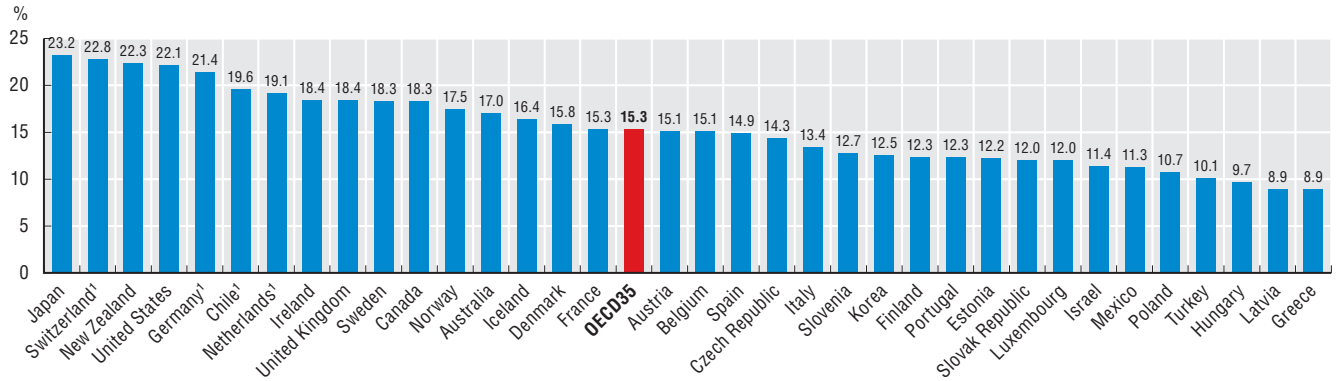


1. France does not include out-of-pocket payments for inpatient LTC thus resulting in an underestimation of the out-of-pocket share.
2. Spending by private health insurance companies in the United States is reported under voluntary health insurance.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604286

7.7. Health spending by government schemes and compulsory health insurance as share of total government expenditure, 2015 (or nearest year)

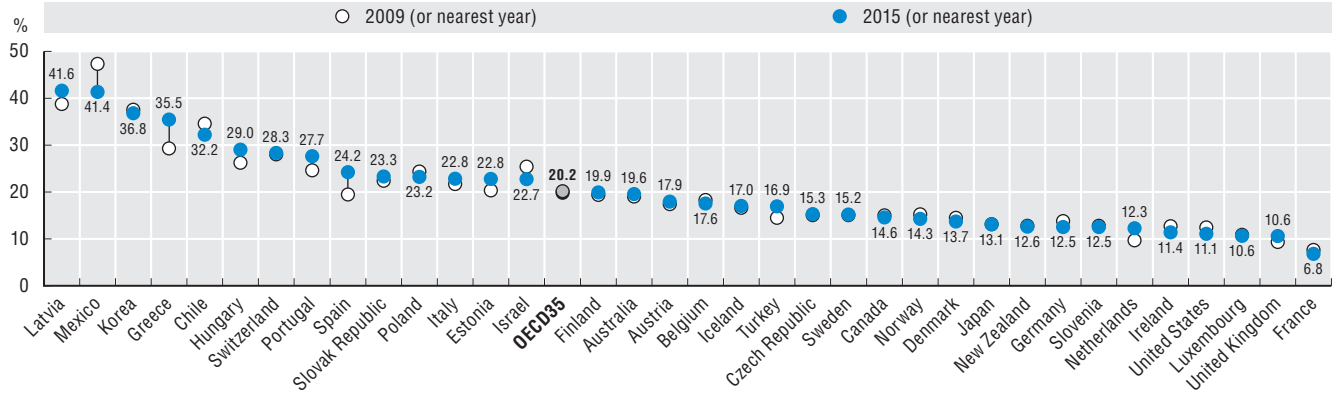


Note: Relating spending from government and compulsory insurance to total government expenditure may lead to an overestimation in countries where compulsory insurance is provided by private insurers.
1. Includes spending by private health insurers for compulsory insurance.

Source: OECD Health Statistics 2017, OECD National Accounts Database.

StatLink http://dx.doi.org/10.1787/888933604305

7.8. Change in out-of-pocket expenditure as a share of expenditure on health, 2009 to 2015 (or nearest years)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604324

Sources of health care financing

In all OECD countries, the various schemes that pay for the health care goods and services rely on a mix of different sources of revenues. Government schemes, for example, typically receive budget allocations out of the overall government revenues (e.g. from income and corporate taxation, value-added tax, etc.). Social health insurance is usually financed out of social contributions payable by employees and employers. However, these schemes may also receive a varying proportion of their revenues from governmental transfers. The main sources of revenue for private health insurance are either compulsory or voluntary prepayments, which typically take the form of regular premium payments as part of an insurance contract. Out-of-pocket payments are exclusively financed from households' own revenues. Some health financing schemes (e.g. non-profit or enterprise schemes) may also receive donations or additional income from investments or rental. Resident financing schemes can also receive transfers from abroad as part of bilateral co-operations with foreign governments or other development partners. However, these transfers play no role in the vast majority of OECD countries.

The composition of revenues is strongly correlated with a country's system of health care financing. Hence, when analysing the overall revenue structure in, say, Denmark – where health care activities are predominantly financed through local government schemes (see indicator on "Financing of health care") – governmental transfers are the most important revenue (Figure 7.9). Comparing the structure of financing schemes with the types of revenues that these schemes receive can give important insights into how financing works in different health systems: in many countries, the government's role is typically larger than as just a simple purchaser of health services (Mueller and Morgan, 2017). In Japan, for example, the government is directly responsible for only 9% of all health spending but government transfers to the different schemes existing in the country constitute 42% of all revenues for health care financing.

The role governments play as a financing source can be highlighted more clearly when only analysing the composition of revenues for compulsory health insurance, which in most OECD countries consists of social health insurance (SHI) (Figure 7.10). In the countries analysed, governmental transfers are a source of revenue in each case but the importance differs significantly. In Japan, more than 40% of the revenues of SHI stems from governmental transfers. The shares are similar in Chile and Finland but account for less than 5% in Estonia, Poland and Slovenia. In those countries, SHI funds finance their outlays nearly exclusively via social contributions. Yet, even here, substantial variations exist when analysing this stream of revenues in more detail. In Poland, employees bear the brunt of social contributions, whereas in Estonia the financing responsibility falls on employers.

Some countries are planning to reduce their reliance on wage-based contributions in the face of shrinking labour markets and financial shocks, and are increasingly looking for ways to diversify their revenue base (OECD, 2015). While there is little year-to-year change in the health financing structure and composition of revenues, some trends can be discerned over a longer time horizon (Figure 7.11). In Belgium, for example, the share of social contributions in all revenues has fallen from over 50% to around 43% over the last decade. At the same time, governmental transfers have gained importance. The latter is also true for the United States where the share from government transfers increased from 34% to 41% over the same time period. In Korea, on the other hand, government transfers have stagnated while the share through social contributions has increased.

Definition and comparability

Health financing schemes have to raise revenues in order to pay for health care goods and service for the population they are covering. There are different types of revenues which can however be closely correlated with the financing scheme. In general, financing schemes can receive transfers from the government, social insurance contributions, voluntary or compulsory prepayments (e.g. insurance premiums), other domestic revenues and revenues from abroad as part of development aid.

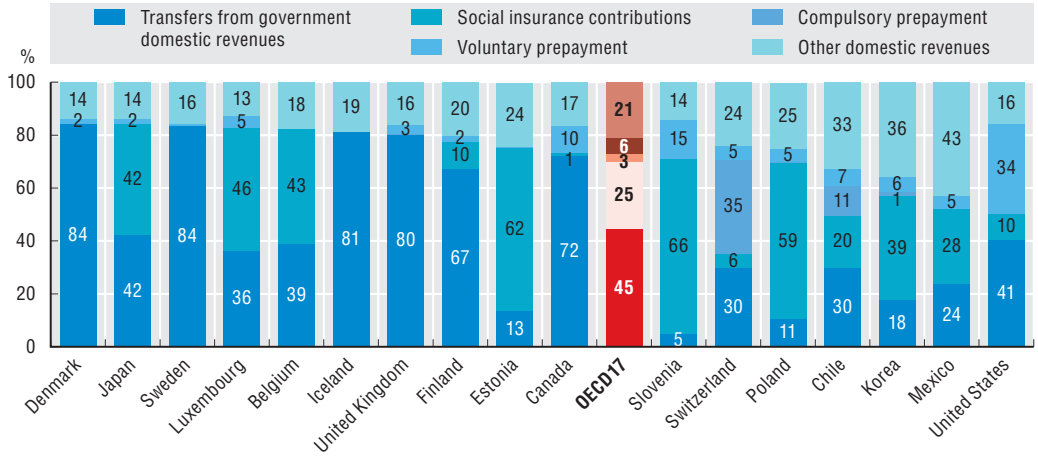
In reality, the revenues of a health financing scheme are typically not identical to its expenses in a given year leading to a surplus or deficit of funds. In practice, most countries only analyse the composition of revenues per scheme and apply the resulting shares on a pro-rata basis to the expense of each financing scheme thus equating revenues with its expenses.

References

Mueller, M. and D. Morgan (2017), "New Insights into Health Financing: First Results of the International Data Collection Under the System of Health Accounts 2011 Framework", *Health Policy*, Vol. 121, No. 7, pp. 764–769.

OECD (2015), *Fiscal Sustainability of Health Systems: Bridging Health and Finance Perspectives*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264233386-en*.

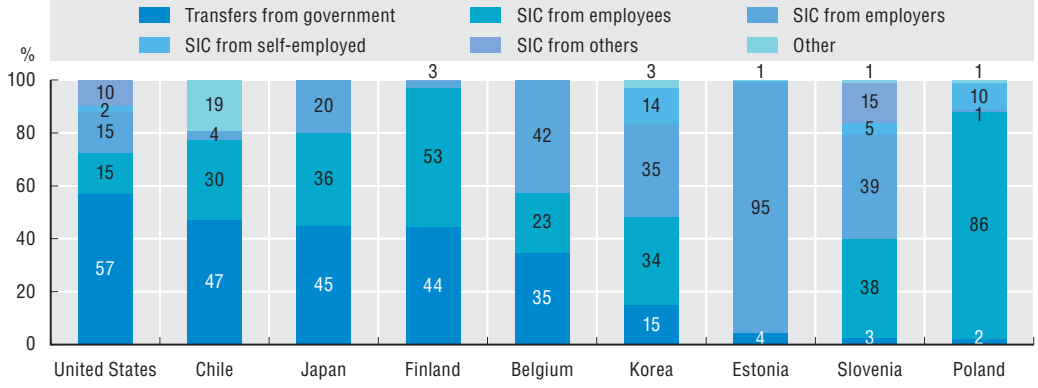
7.9. Health financing sources by type of revenue, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604343

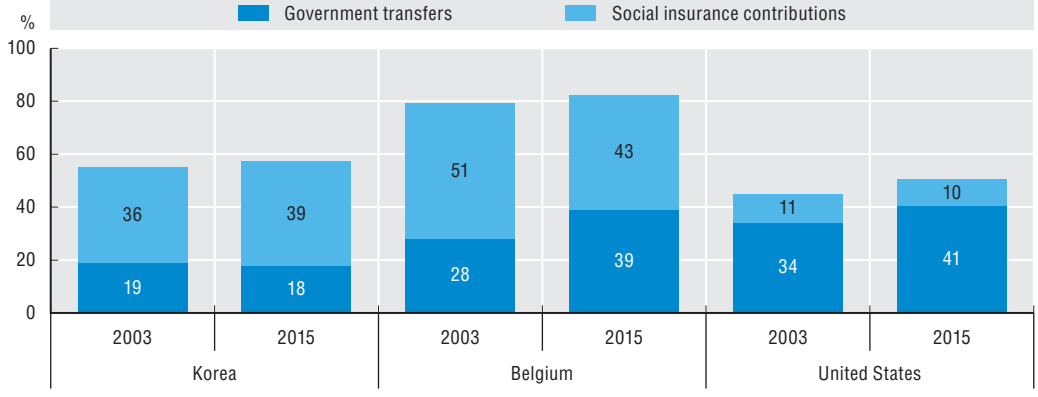
7.10. Financing sources of compulsory insurance by type of revenue, selected countries, 2015 (or nearest year)



Note: SIC stands for social insurance contributions. "Other" includes compulsory prepayment and other domestic revenues.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604362

7.11. Share of government transfers and social insurance contributions in all revenues of financing schemes, selected countries, 2003-15



Source: OECD Health Statistics 2017.

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Health expenditure by type of service

How health spending is split between the various services and goods reflects a variety of factors, from disease burden and system priorities to organisational aspects and costs. Spending on inpatient and outpatient care combined accounts for the major part of health expenditure across OECD countries – almost two-thirds of health spending on average in 2015 (Figure 7.12). A further 19% of health spending was accounted for by medical goods (mainly pharmaceuticals), while 14% went on long-term care services. The remaining 6% was spent on prevention and public health services as well as on the overall governance and administration of the health system.

Greece has a particularly high share of spending on *inpatient* care (including day care in hospitals) – accounting for 40% of its health spending in 2015. Inpatient care also plays an important role in Poland, Austria and France, taking up more than a third of total spending. Countries with a high share of *outpatient* spending include Portugal (48%) and Israel (47%). The United States also consistently reports one of the highest shares of outpatient care. However, this includes physicians' fees in cases where they independently bill patients for hospital care.

The third major category of health spending is on medical goods. Variations can be due to a number of factors such as the different distribution channels in place, the extent of generic use as well as the relative prices of pharmaceuticals. In the Slovak Republic (35%) and Hungary (32%), medical goods represent the largest component of health spending. The share is also high in Latvia, Mexico and Greece, at around 30%. In Denmark, Luxembourg and Norway, on the other hand, spending on medical goods represents only 10-11% of health spending.

There are also differences between countries in the amount of health expenditure on long-term care services (see Chapter 11). Norway, Sweden and the Netherlands, with their established formal arrangements for the elderly and the dependent population, allocate more than a quarter of all health spending to long-term care. Whereas in many Southern European and Central and Eastern European countries with more informal long-term care sectors, spending on long-term care services accounts for a much smaller share.

The slowdown in health spending experienced in many OECD countries following the economic crisis affected all parts of the health sector, but to varying degrees (Figure 7.13). Expenditure for pharmaceuticals contracted annually by 0.5% after positive annual increases of 2.3% during the pre-crisis years and even stronger growth in the 1990s and early 2000s. Despite initially protecting public health budgets, prevention spending growth also turned negative in around half of OECD countries after 2009. On average, spending on preventive care contracted by 0.2% on an annual basis, after recording very high growth rates during the period 2003-09 (4.6%). Part of the reversal in spending growth can be explained by the H1N1 influenza epidemic, which led to significant one-off outlays for vaccinations in many countries around 2009 (Gmeinder et al., forthcoming).

While spending on inpatient, outpatient and long-term care has continued to grow, the rates have also significantly reduced since 2009. Expenditure growth for outpatient care nearly halved overall (4% vs 2.3%), but remained positive in the majority of OECD countries. Some governments decided to protect expenditure for primary care and front-line services while looking for cuts elsewhere in the health system. The annual average growth rate for inpatient care dropped to almost half of its previous growth rate, down from 2%, and turned negative between 2009 and 2015 in around one-quarter of OECD countries. Reducing wages in public hospitals, postponing staff replacement and delaying investment in hospital infrastructure were among the most frequent measures taken in OECD countries to balance health budgets.

Definition and comparability

The *System of Health Accounts* (OECD, Eurostat and WHO, 2017) defines the boundaries of the health care system from a functional perspective, with health care functions referring to the different types of health care services and goods. Current health expenditure comprises personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as administration – referring to governance and administration of the overall health system rather than at the health provider level). Curative, rehabilitative and long-term care can also be classified by mode of provision (inpatient, day care, outpatient and home care).

Concerning long-term care, only the health aspect is reported as health expenditure, although it is difficult in certain countries to separate out clearly the health and social aspects of long-term care. Thus, estimations of long-term care expenditure continue to be one of the main factors limiting comparability across countries.

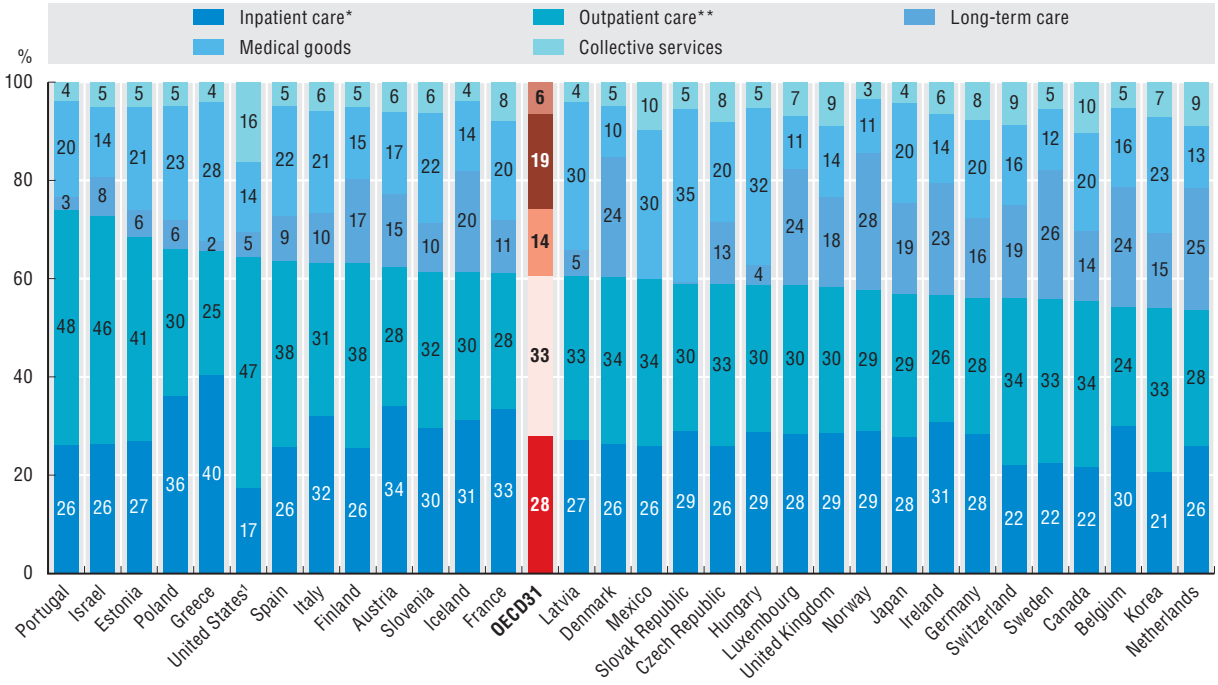
For the calculation of growth rates in real terms, economy-wide GDP deflators are used.

References

Gmeinder, M., D. Morgan and M. Mueller (2017, forthcoming), "How Much Do OECD Countries Spend on Prevention?", *OECD Health Working Paper*, OECD Publishing, Paris.

OECD, Eurostat and WHO (2017), *A System of Health Accounts 2011: Revised edition*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264270985-en*.

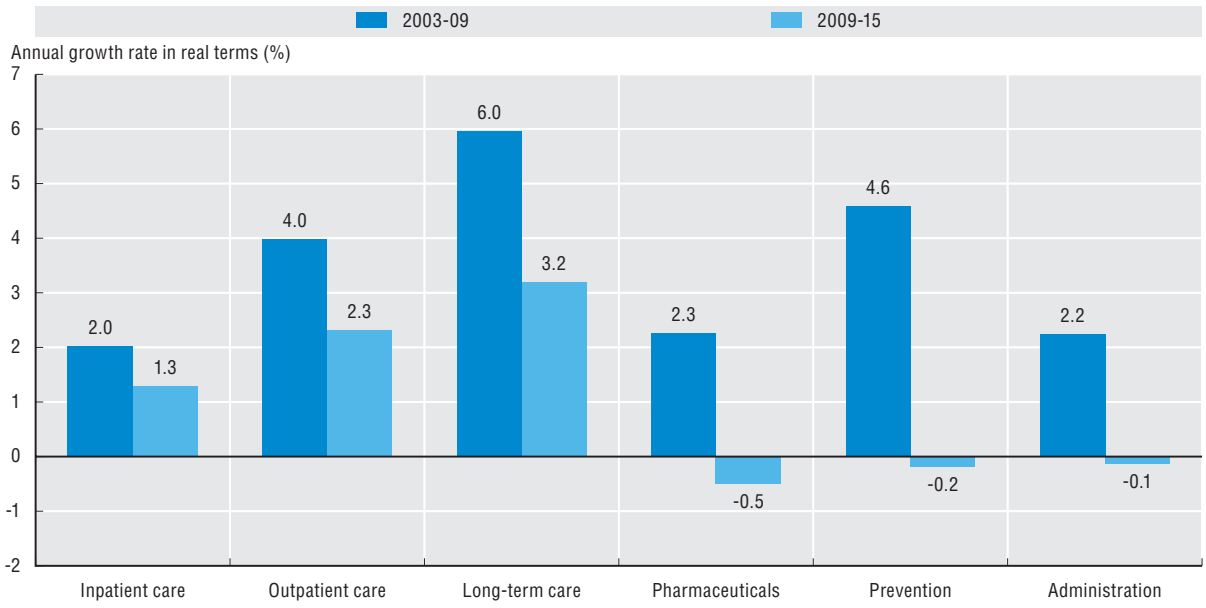
7.12. Health expenditure by type of service, 2015 (or nearest year)



Note: Countries are ranked by curative-rehabilitative care as a share of current expenditure on health.
* Refers to curative-rehabilitative care in inpatient and day care settings. ** Includes home care and ancillary services.
1. Inpatient services provided by independent billing physicians are included in outpatient care for the United States.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604400

7.13. Growth rates of health expenditure per capita for selected services, OECD average, 2003-15



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604419

Health expenditure by provider

Across OECD countries, the delivery of health care services and goods takes place in many different organisational settings, ranging from hospitals and medical practices to pharmacies and even private households caring for family members. A breakdown by provider allows the tracking of health expenditure from an organisational point of view, a useful complement to the functional breakdown of health expenditure (see indicator "Health expenditure by type of service").

While the way in which health care provision is organised across OECD countries varies considerably, hospitals are the main health care provider in terms of health spending (Figure 7.14). They account for nearly 40% of overall health spending on average and represent the main spending category for all but a handful of countries. In Turkey, Estonia and Italy around half of all health spending is accounted for by activities delivered in hospitals. On the other hand, hospitals in Canada, Germany and Mexico account for 30% or less of health spending.

Ambulatory providers are the second main category with regard to health spending. Overall, around one-quarter of health spending relates to ambulatory providers, ranging from more than 50% in Israel to 20% or less in Ireland, the Slovak Republic, the Netherlands and Turkey. The category covers a wide range of facilities and depending on the country-specific organisational set up, most spending relates either to medical practices including offices of GPs and specialists (e.g. Austria, France and Germany) or ambulatory health care centres (e.g. Finland, Ireland and Sweden). On average, practices of GPs and specialists together with ambulatory health care centres account for around two-thirds of all spending on ambulatory providers. Around one-fifth of ambulatory provider spending relates to dental practices and about 10% to providers of home health care services. Other main provider categories include retailers (mainly pharmacies selling prescription and over-the-counter medicines) and residential long-term care facilities (mainly providing inpatient care to long-term dependent people).

The activities performed by providers classified within the same category can differ widely across countries. This variation is particularly pronounced in hospitals (Figure 7.15). Although inpatient curative and rehabilitative care accounts for the vast majority of hospital expenditure in almost all OECD countries, hospitals are also important providers of outpatient care in most countries, for example through accident and emergency departments, hospital-based specialist outpatient units, or laboratory and imaging services provided to outpatients. In Sweden, Estonia, Finland and Portugal outpatient care accounts for over 40% of hospital expenditure. On the other hand, in Greece, Germany and Belgium, less than 10% of hospital expenditure goes on outpatient care.

Many countries have seen a growing share of health spending going to hospitals in recent years while at the same time there has been a tendency to shift medical services from inpatient to day care settings (see indicator on "Ambulatory surgery" in Chapter 9). The main motivation behind this is the generation of efficiency gains and a reduction of waiting times. Moreover, for some interventions day care procedures are now the most appropriate treatment method. Hence, in a number of countries day care now accounts for more than 10% of all hospital expenditure. Furthermore, the provision of long-term care in hospital makes up a sizeable share of hospital expenditure in some countries (e.g. Korea, Japan and Iceland).

Definition and comparability

The universe of health care providers is defined in the System of Health Accounts (OECD, Eurostat and WHO, 2017) and encompasses *primary providers*, i.e. organisations and actors that deliver health care goods and services as their primary activity, as well as *secondary providers* for which health care provision is only one among a number of activities.

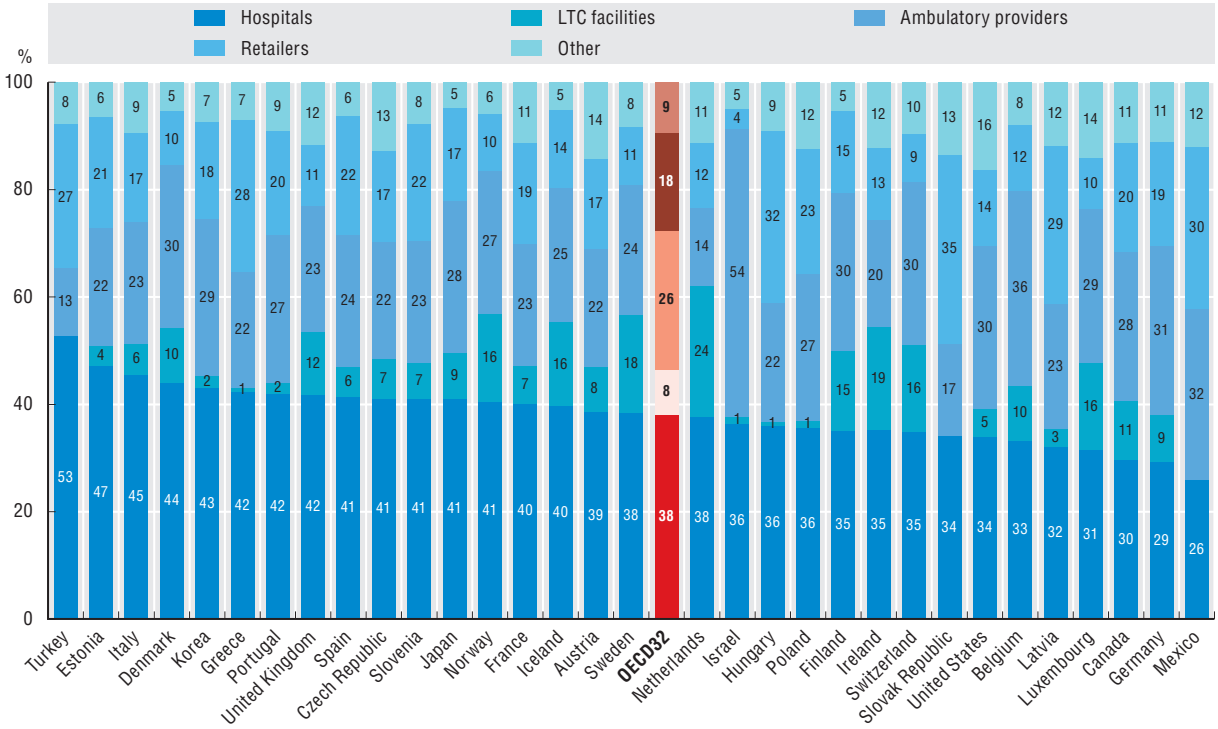
The main categories of primary providers are hospitals (acute and psychiatric), residential long-term care facilities, ambulatory providers (practices of GPs and specialists, dental practices, ambulatory health care centres, providers of home health care services), providers of ancillary services (e.g. ambulance services, laboratories), retailers (e.g. pharmacies), and providers of preventive care (e.g. public health institutes).

Secondary providers include residential care institutions whose main activities might be the provision of accommodation but provide nursing supervision as secondary activity, supermarkets that sell over-the-counter medicines, or facilities that provide health care services to a restricted group of the population such as prison health services. Secondary providers also include providers of health care system administration and financing (e.g. government agencies, health insurance agencies) and households as providers of home health care.

References

OECD, Eurostat and WHO (2017), *A System of Health Accounts 2011: Revised edition*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264270985-en*.

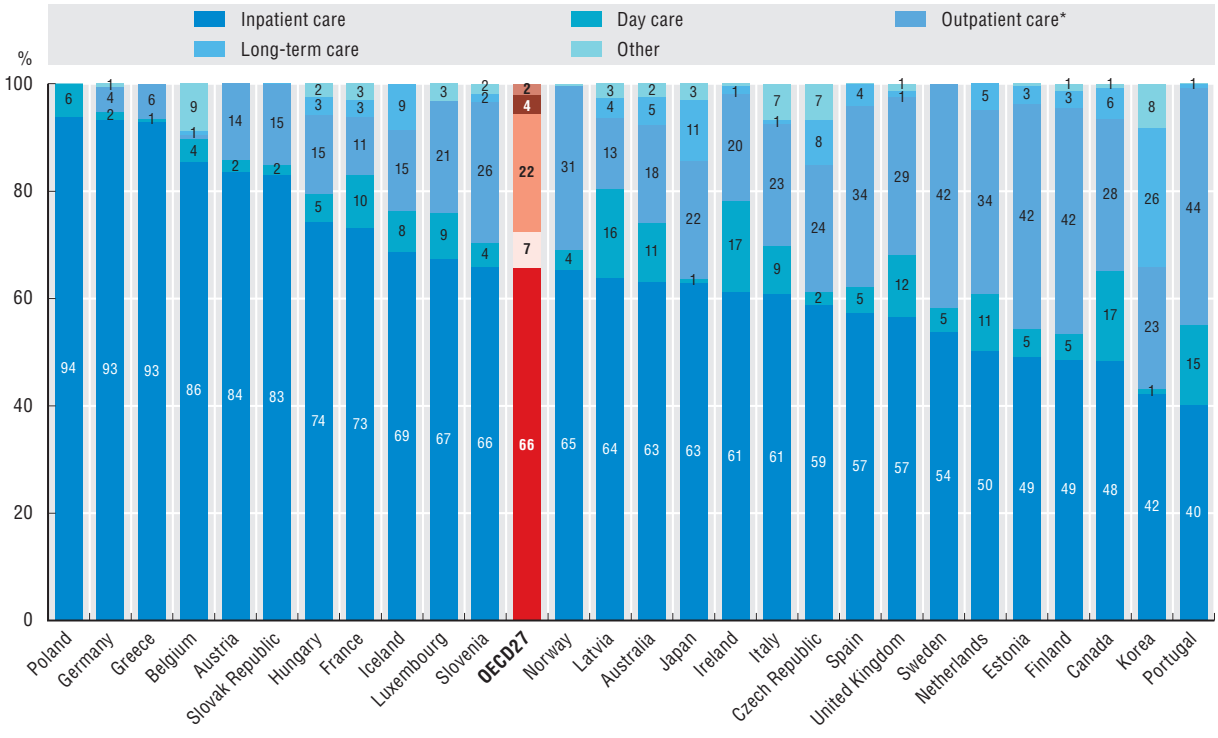
7.14. Health expenditure by provider, 2015 (or nearest year)



Note: Countries are ranked by hospitals as a share of current expenditure on health.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604438

7.15. Hospital expenditure by type of service, 2015 (or nearest year)



Note: Countries are ranked by inpatient curative-rehabilitative care as a share of hospital expenditure.
*Includes ancillary services.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604457

Capital expenditure in the health sector

Although health systems remain a highly labour-intensive sector, capital has been an increasingly important factor of production of health services over recent decades, as reflected for example by the growing importance of diagnostic and therapeutic equipment or the expansion of information and communications technology (ICT) in health care (see previous indicator on eHealth adoption in general practice and hospital). However, the level of resources invested in infrastructure, equipment and ICT tends to fluctuate more with economic cycles than current spending on health services, as investment decisions are often more discrete and can more easily be postponed or brought forward depending on economic circumstances. In making capital investment decisions, policy-makers need to carefully assess not only the short-term costs, but also the potential benefits in the short, medium and longer-term. Slowing down investment in health infrastructure and equipment may also reduce the capacity to treat patients and contribute to increases in waiting times for different types of services.

In 2016, OECD countries allocated, on average, around 0.5% of their GDP for *capital* expenditure in the health sector (Figure 7.16). This compares with the 9% of GDP going on *current* spending, that is on medical care, pharmaceuticals, etc. (see indicator "Health spending as a share of GDP"). As is the case with current spending, there are significant differences in the current levels of investment expenditure between countries and in the recent trends observed following the economic crisis.

As a proportion of GDP, Japan was the highest spender on capital investment in 2015 with more than 1% of its GDP going on construction, equipment and technology in the health and social sector. A number of European countries – Belgium, Austria and Germany – were also relatively high capital spenders in 2015, with between 0.7-0.8% of GDP invested. For the most part, OECD countries find themselves within a relatively narrow band of between 0.4-0.6% of GDP each year. However, either due to the economic conditions or the peculiarities of a small economy (Luxembourg and Iceland) capital spending can be significantly lower. Greece, for example, spent just under 0.15% of its GDP on capital investment in the health sector in 2015.

By its very nature, capital spending fluctuates from year to year more than current spending as capital projects on construction (i.e. building of hospitals and other health care facilities) and investment programmes on new equipment (e.g., medical and ICT equipment) are implemented. Decisions on capital spending also tend to be more affected by economic cycles, with spending on health system infrastructure and equipment often a prime target for reduction or postponement in economic downturns. Figure 7.17 shows that a number of hard-hit European countries have seen annual investment in the health sector fall in real terms post-crisis. Greece, in particular, reported capital spending in the health sector at around a third of the level reported ten years before. Portugal and Italy have both seen investment drop by 30% or more from the peaks in 2010. The United Kingdom is also notable in seeing a significant reduction in investment: up to 2009, capital spending was increasing rapidly year-on-year whereas between 2011 and 2014 it was back to 2003 levels.

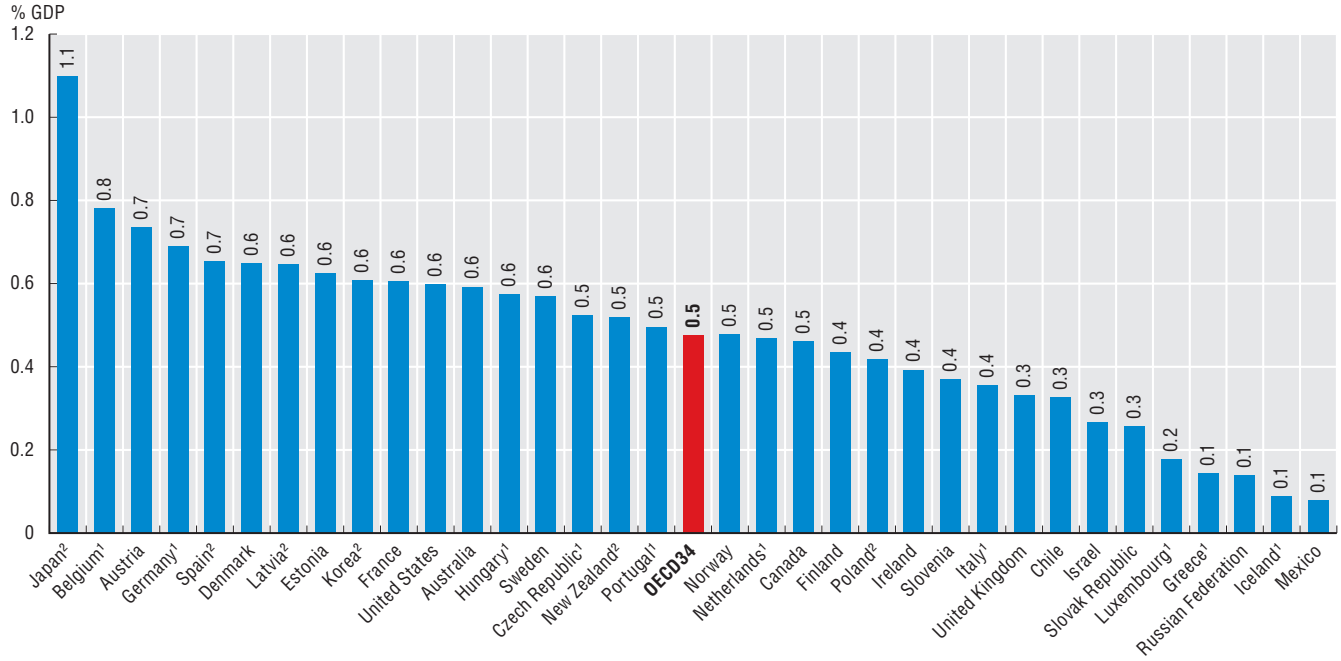
Outside of Europe a number of countries reported a continual increase in capital expenditure. Korea and Japan have seen recent investment in the health care sector around 50% higher, in real terms, than the levels of ten years earlier (Figure 7.18).

Definition and comparability

Gross fixed capital formation in the health sector is measured by the total value of the fixed assets that health providers have acquired during the accounting period (less the value of the disposals of assets) and that are used repeatedly or continuously for more than one year in the production of health services. The breakdown by assets includes infrastructure (e.g. hospitals, clinics, etc.), machinery and equipment (including diagnostic and surgical machinery, ambulances, and ICT equipment), as well as software and databases.

Gross fixed capital formation is reported by many countries under the System of Health Accounts. It is also reported under the National Accounts broken down by industrial sector according to the International Standard Industrial Classification (ISIC) Rev. 4 using Section Q: Human health and social work activities or Division 86: Human health activities. The former is normally broader than the SHA boundary while the latter is narrower.

7.16. Gross fixed capital formation in the health care sector as a share of GDP, 2015 (or nearest year)

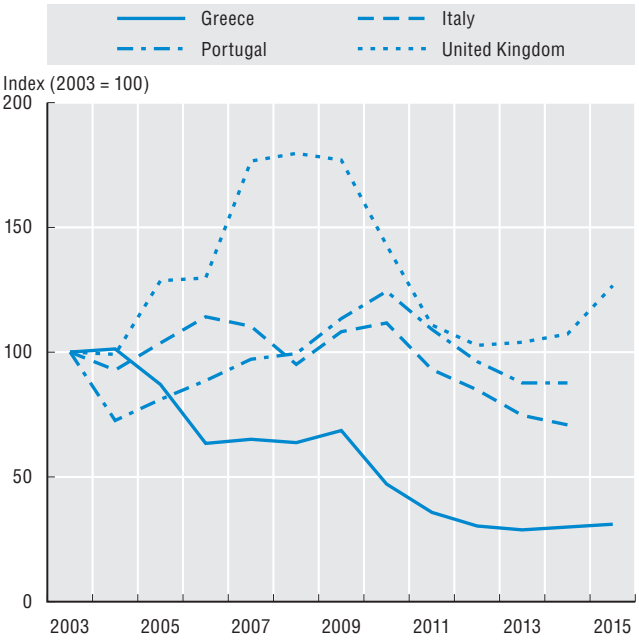


1. Refers to gross fixed capital formation in ISIC 86: Human health activities (ISIC Rev. 4).
2. Refers to gross fixed capital formation in ISIC Q: Human health and social work activities (ISIC Rev. 4).

Source: OECD Health Statistics 2017, OECD National Accounts.

StatLink http://dx.doi.org/10.1787/888933604476

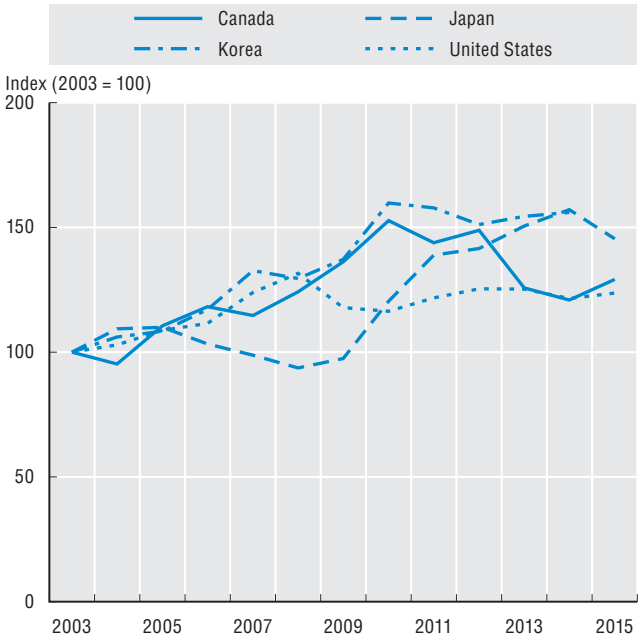
7.17. Gross fixed capital formation, constant prices, selected European OECD countries, 2003-15



Source: OECD Health Statistics 2017, OECD National Accounts.

StatLink http://dx.doi.org/10.1787/888933604495

7.18. Gross fixed capital formation, constant prices, selected non-European OECD countries, 2003-15



Source: OECD Health Statistics 2017, OECD National Accounts.

StatLink http://dx.doi.org/10.1787/888933604514

8. HEALTH WORKFORCE

Health and social care workforce

Doctors (overall number)

Doctors by age, sex and category

Medical graduates

Remuneration of doctors (general practitioners and specialists)

Nurses

Nursing graduates

Remuneration of nurses

Foreign-trained doctors and nurses

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Health and social care workforce

Employment in health and social care represents a large and growing share of the labour force in many countries across the world (UN High-Level Commission on Health Employment and Economic Growth, 2016). In the OECD, health and social work activities constituted around 10% of total employment on average in 2015 (Figure 8.1). The employment share is particularly pronounced in the Scandinavian countries, Finland and the Netherlands, where jobs in health and social work represent 15-20% of these countries' workforces.

Moreover, the percentage of workers employed in health and social work has steadily risen across much of the OECD between 2000 and 2015. For the OECD overall, there was an average percentage point increase of 1.7 from 2000 to 2015. Some of the greatest increases have taken place in Japan, Ireland, Korea, Luxembourg and the Netherlands. Four countries experienced a decrease in share of employment in health and social work: Latvia, Mexico, Poland and the Slovak Republic.

The rapid employment growth in health and social care contrasts markedly with the experience in other sectors (Figure 8.2). Across the OECD, employment in health and social work grew on average by 42% (with a median value of 34%) between 2000 and 2015. Over the same time period, there was an overall decline in the number of jobs in agriculture and industry in the OECD countries. Employment growth in health and social work was also noticeably higher than employment growth in the services sector, and was significantly above the growth in total employment.

Past and current experiences show that employment in the health and social sector tends to be less sensitive to cyclical fluctuations than employment in other sectors in the economy. While the total employment declined slightly in the United States during the economic recessions of the early 1990s and significantly in 2008-09, employment in the health and social sector continued to grow steadily over this same period. In most OECD countries, the number of doctors and nurses continued to rise through the recession period (see indicators on doctors and nurses).

Looking forward, employment in health and social care sector is likely to increase, but the type of skills and functions are expected to change. This reflects a number of factors. Ageing populations will change the pattern of demand for health and social services. This could include greater demand for long-term care and related social services, which are particularly labour-intensive (OECD, 2011). Over time, rising incomes and availability of new technologies will raise expectations on the quality and scope of care (OECD, 2015).

Many countries have also started to introduce new care delivery models that will involve greater integration of health and social services in order to meet the needs of ageing societies. These changes are expanding the roles of non-physician providers (such as nurse practitioners and pharmacists and community health workers) into health care, aimed at maintaining access to services and increasing the productivity of the health workforce, as well as improving the continuity and quality of care for the patients. These changes will likely lead to significant transformations in staffing profile and skills requirements in the health and social care sector.

Definition and comparability

Health and Social Work is one of the economic activities defined according to the major divisions of the International Standard Industrial Classification of All Economic Activities (ISIC). Health and Social Work is a sub-component of the Services sector, and is defined as a composite of human health activities, residential care activities (including long-term care), and social work activities without accommodation. The employment data are taken from the OECD National Accounts (SNA) database for the 35 OECD member countries, except for Iceland and Turkey where the source is the OECD Annual Labour Force Statistics (ALFS) database.

References

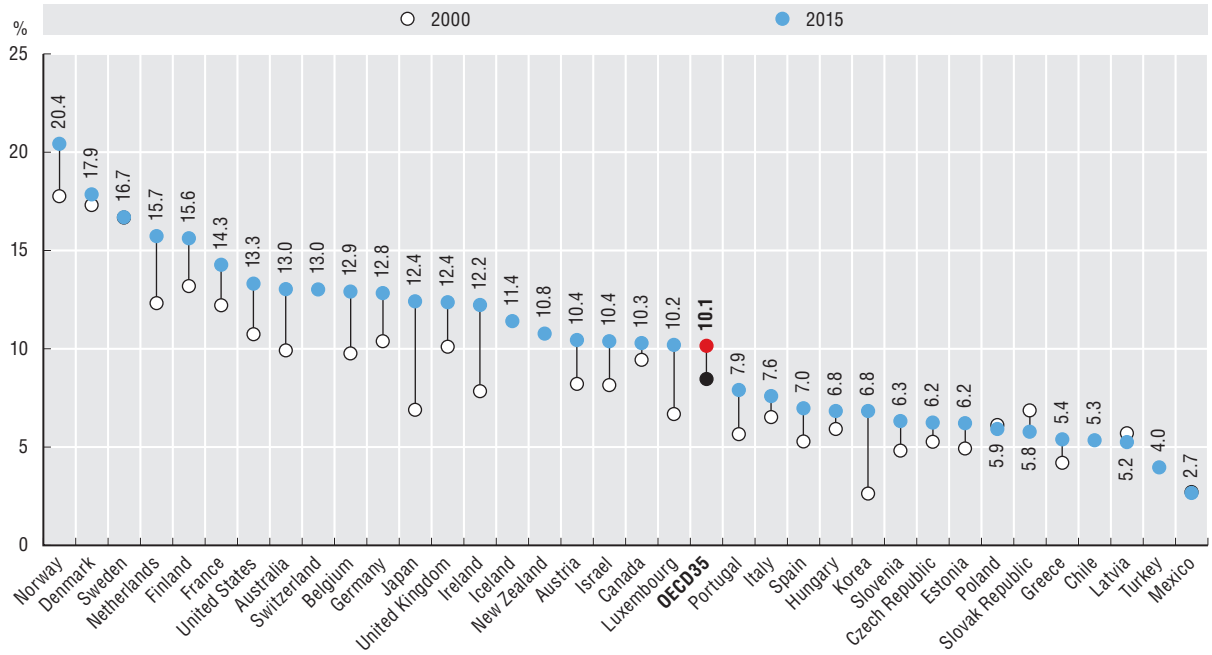
OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

OECD (2015), *Fiscal Sustainability of Health Systems: Bridging Health and Finance Perspectives*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264233386-en*.

OECD (2011), *Help Wanted?: Providing and Paying for Long-Term Care*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264097759-en*.

UN High-Level Commission on Health Employment and Economic Growth (2016), *Working for Health and Growth: Investing in the Health Workforce*, Geneva, WHO. Retrieved from *http://www.who.int/hrh/com-heeg/reports*.

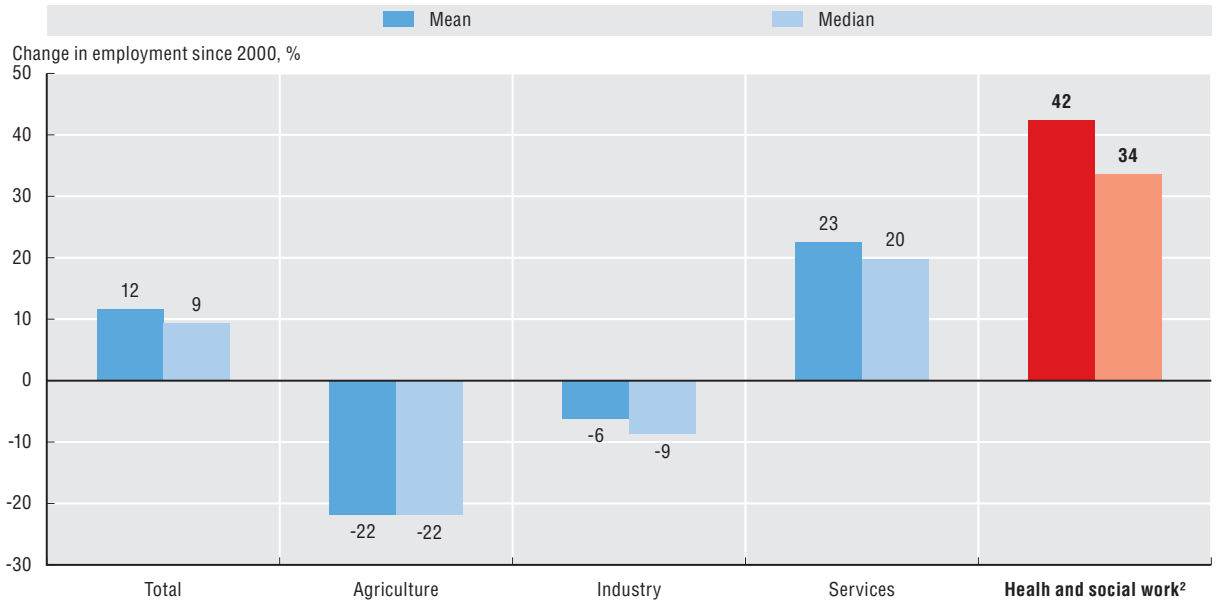
8.1. Employment in health and social work as a share of total employment, 2000 and 2015 (or nearest year)



Source: OECD National Accounts; OECD Annual Labour Force Statistics for Iceland and Turkey.

StatLink http://dx.doi.org/10.1787/888933604533

8.2. Employment growth by sector between 2000 and 2015 (or nearest year), OECD average[1]



1. Average of 30 OECD countries (excluding Chile, Iceland, New Zealand, Switzerland and Turkey).
2. Health and social work is classified as a sub-component of the services sector.

Source: OECD National Accounts.

StatLink http://dx.doi.org/10.1787/888933604552

Doctors (overall number)

The number of doctors per capita varies widely across OECD countries. In 2015, Greece had the highest number with 6.3 doctors per 1 000 population, but this number is an over-estimation as it includes all doctors who are licensed to practice but may no longer be practising for various reasons. Greece was followed by Austria (5.1 doctors per 1 000 population). Turkey, Chile and Korea had the lowest number among OECD countries at around two doctors per 1 000 population. The OECD average was 3.4 doctors per 1 000 population. Among the partner countries, the number of doctors per capita is significantly lower: there was less than one doctor per 1 000 population in Indonesia, India and South Africa. In China, the number of doctors per capita is still about half the OECD average, but it has grown by 44% since 2000 (Figure 8.3).

Since 2000, the number of doctors has increased in nearly all OECD countries, both in absolute number and on a per capita basis. The growth rate was particularly rapid in some countries which started with lower levels in 2000 but have grown at a significantly faster rate than the OECD average growth rate, such as Korea, Mexico and the United Kingdom (Figure 8.4).

At the same time, countries with high physician density such as Australia and Austria have also continued to show a high rate of increase over the same period. The number of doctors has continued to increase strongly in Australia, driven by a strong rise in the number of graduates from domestic medical education programmes (see the indicator on "Medical graduates").

In the United Kingdom, concerns were raised in the early 2000s about possible surpluses in certain categories of doctors. This resulted in policies to reduce student intakes and to some tapering of the growth rate in the number of doctors. More recently, though, funding for additional student places at medical schools was announced to meet the growing demand for care (Department of Health, 2016). The number of physicians per capita remained fairly stable between 2000 and 2015 in France, Israel, Poland and the Slovak Republic. In Israel, the number of doctors increased at nearly the same pace as the population size.

Overall, most OECD countries have shown a steady increase in the number of doctors, and did not show much effect of the global recession. In countries such as Australia, there were about 30% more employed doctors in 2015 than in 2008. There were some exceptions: the 2008-09 recession appears to have had an impact in Greece, where the number of doctors increased between 2000 and 2008, but has stopped growing afterwards and has even shown some decline since 2012.

Projecting the future supply and demand of doctors is challenging given the high levels of uncertainty concerning their retirement and migration patterns as well as changes in their demand (Ono et al., 2013). Many OECD countries have anticipated the upcoming retirement of a significant number of doctors by increasing their training efforts over the past decade to ensure that there would be enough new doctors to replace those who will retire. But the impact of this increase into medical education will take several years for the effects to be felt. The difficulties in anticipating the actual number of practicing doctors have resulted in countries continually having to revise and adjust their policies. However, in most OECD countries, there is a shared concern on the shortages of general practitioners (see the indicator "Doctors by age, sex and category") and the undersupply of doctors in rural and remote regions (see the indicator on the "Geographic distribution of doctors" in Chapter 5).

Definition and comparability

The data for most countries refer to practising doctors, defined as the number of doctors who are providing care directly to patients. In many countries, the numbers include interns and residents (doctors in training). The numbers are based on head counts. Several countries also include doctors who are active in the health sector even though they may not provide direct care to patients, adding another 5-10% of doctors. Greece and Portugal report the number of physicians entitled to practice, resulting in an even larger over-estimation of the number of practicing doctors. Belgium sets a minimum threshold of activities for doctors to be considered to be practising, thereby resulting in an under-estimation compared with other countries which do not set such minimum thresholds. Data for India may be over-estimated as they are based on medical registers which are not updated to account for migration, retirement or death, nor do they take into account doctors registered in multiple states.

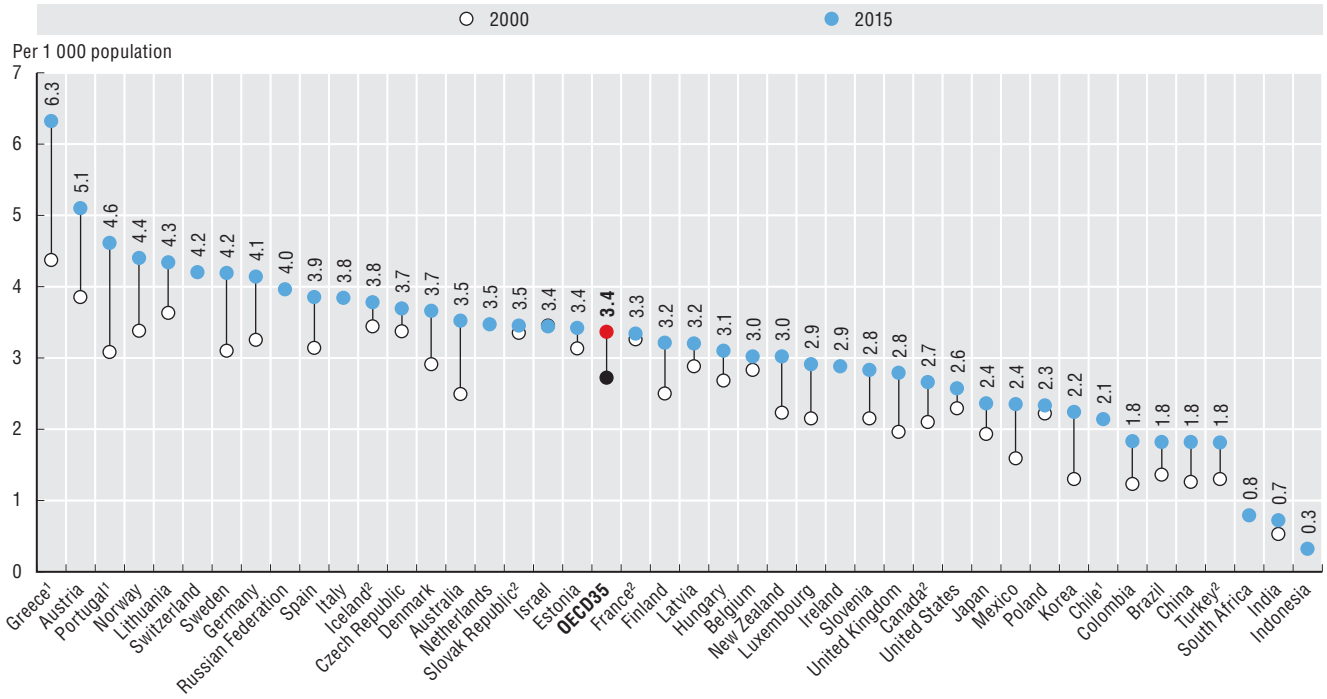
References

Department of Health (2016), "Up to 1,500 extra medical training places announced", Department of Health, London, *https://www.gov.uk/government/news/up-to-1500-extra-medical-training-places-announced*.

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

Ono, T., G. Lafortune and M. Schoenstein (2013), "Health Workforce Planning in OECD Countries: A Review of 26 Projection Models from 18 Countries", *OECD Health Working Papers*, No. 62, OECD Publishing, Paris, *http://dx.doi.org/10.1787/5k44t787zcwb-en*.

8.3. Practising doctors per 1 000 population, 2000 and 2015 (or nearest year)



1. Data refer to all doctors licensed to practice, resulting in a large over-estimation of the number of practising doctors (e.g. of around 30% in Portugal).
2. Data include not only doctors providing direct care to patients, but also those working in the health sector as managers, educators, researchers, etc. (adding another 5-10% of doctors).

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604571

8.4. Evolution in the number of doctors, selected OECD countries, 2000 to 2015 (or nearest year)

1. The data for Greece refer to all doctors licensed to practice.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604590

Doctors by age, sex and category

The age and gender composition of the medical workforce and the mix between different categories of doctors have important implications on the availability of medical services. The ageing of doctors in OECD countries has, for many years, raised concerns that there may not be sufficient new recruits to replace them, although there is evidence that the retirement of doctors often only occurs gradually and that their retirement age is increasing (OECD, 2016). The growing imbalance in favour of greater specialisation over general medicine raises concerns in many countries about access to primary care for all the population.

In 2015, on average across OECD countries, one-third of all doctors were over 55 years of age, up from one-fifth in 2000 (Figure 8.5). Between 2000 and 2015, France, Italy, Spain and Austria more than doubled the share of doctors over 55 years of age. While these doctors might be expected to retire over the next ten years, a growing number of them will likely continue to practice after 65 years. In Israel and Italy, half (or more) of all doctors were over 55 years of age in 2015. It should be noted that the high share in Israel may be due partly to the fact that these numbers are based on all doctors licensed to practice, which may include some who may no longer be practicing. At the other end, only 13-17% of doctors in the United Kingdom and Korea were aged over 55. This is consistent with the large numbers of new graduates entering medical practice over the past decade (see the indicator on "Medical graduates").

Several OECD countries have reformed their pension systems and increased the retirement age to take into account longer life expectancy. While few studies have examined the impact of these pension reforms specifically on doctors, it is possible that these pension reforms may prolong the working lives of doctors after age 65, which could have a significant impact on the future replacement needs.

In 2015, 46% of doctors on average across OECD countries were women, up from 39% in 2000 (Figure 8.6). At least half of all doctors now are women in 11 countries, with Latvia and Estonia showing the highest share at over 70%. Between 2000 and 2015, the share of women doctors rose most rapidly in the Netherlands (49%) and Belgium (47%). By contrast, only about one-in-five doctors in Japan and Korea were women in 2015, although Japan showed a significant increase of 42% over the 2000 figure.

On average across OECD countries, generalists made up about 30% of all physicians in 2015 (Figure 8.7), a similar share to 2005. Greece, Hungary and the United States showed the lowest share of generalists, while countries such as France, Canada and Australia have been able to maintain a more equal balance between specialists and generalists. It should be noted that in Ireland and Portugal, most generalists are not general practitioners but rather non-specialist doctors working in hospitals or other settings. In the United States, general internal medicine doctors are categorised as specialists although their practice is often very similar to that of general practitioners, resulting in some underestimation of the capacity to provide generalist care.

In response to concerns about shortages of general practitioners, many countries have taken steps to improve the number of training places in general medicine. In Canada, the number of post-graduate training places in family medicine more than doubled between 2000 and 2013, as part of a national effort to improve access to primary care (CAPER, 2015). However, in most OECD countries, specialists earn more than general practitioners, providing financial incentives for doctors to specialize (see indicator on the "Remuneration of doctors").

Definition and comparability

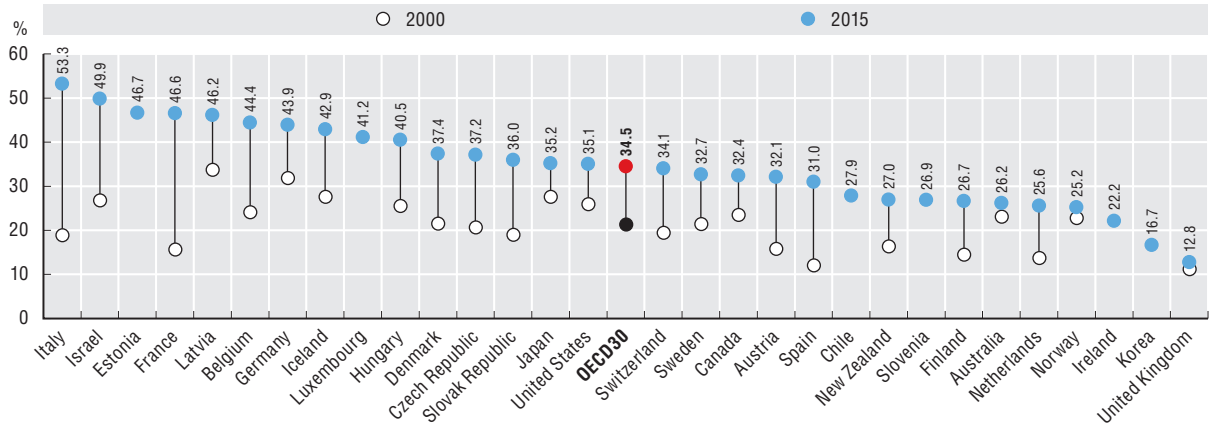
The definition of doctors is provided under the previous indicator. In some countries, the data are based on all doctors licensed to practice, not only those practising (e.g., Greece and Portugal). Not all countries are able to report all their physicians in the two broad categories of specialists and generalists. This may be due to the fact that specialty-specific data are not available for doctors in training or for those working in private practice.

References

CAPER (2015), "Field of Post-M.D. Training by Faculty of Medicine Providing Post-M.D. Training 2013-2014", Database available at *http://www.caper.ca*.

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

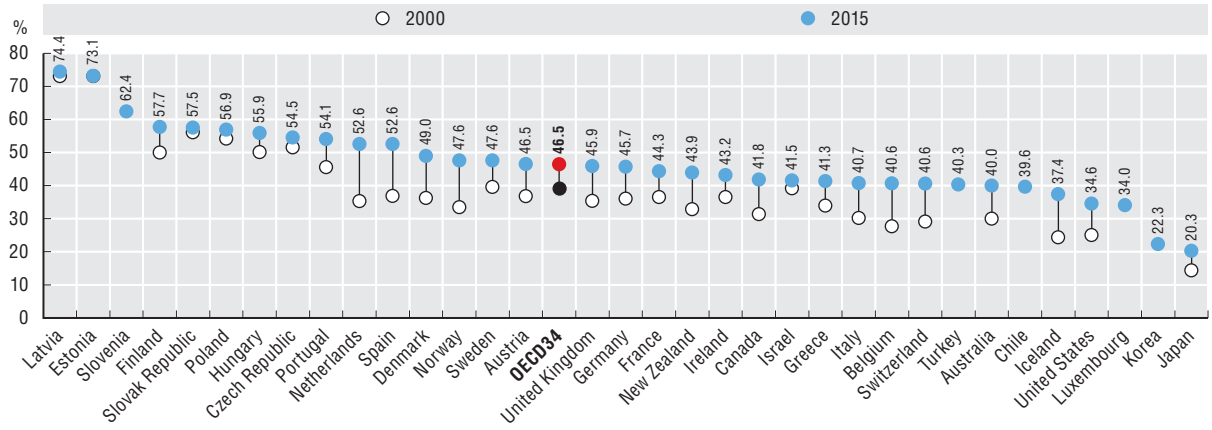
8.5. Share of doctors aged 55 years and over, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604609

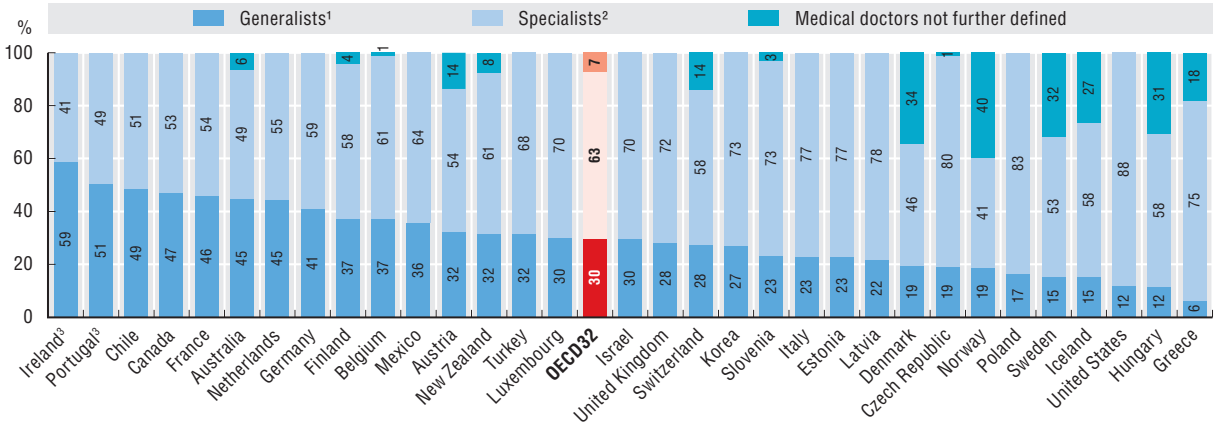
8.6. Share of female doctors, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604628

8.7. Generalists and specialists as a share of all doctors, 2015 (or nearest year)



1. Generalists include general practitioners/family doctors and other generalist (non-specialist) medical practitioners.
2. Specialists include paediatricians, obstetricians/gynaecologists, psychiatrists, medical, surgical and other specialists.
3. In Ireland and Portugal, most generalists are not GPs ("family doctors"), but rather non-specialist doctors working in hospitals or other settings.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604647

Medical graduates

The number of new medical graduates in a given year reflects to a large extent government decisions taken a few years earlier on the number of students admitted in medical schools (so-called *numerus clausus* policies). Since 2000, most OECD countries have increased the number of students admitted to medical education in response to concerns about current or possible future shortages of doctors (OECD, 2016), but large variations remain across countries.

In 2015, there were on average about 12 new medical graduates per 100 000 population across OECD countries (Figure 8.8). This proportion was highest in Ireland at 24 new medical graduates per 100 000. At the other end, Israel and Japan had the lowest number of new medical graduates relative to their population. In Ireland, the number of medical graduates increased strongly in 2013 due at least partly to the opening of new Graduate Entry Programmes a few years earlier, allowing students with an undergraduate degree in another discipline to obtain a medical degree in four years only.

In Israel, the low number of domestic medical graduates is compensated by the high number of foreign-trained doctors. About one-third of foreign-trained doctors in Israel are people who were born in Israel but have pursued their study abroad before coming back. The situation is quite different in Japan, where there are very few foreign-trained doctors. Since 2008, the Japanese government decided to increase intakes in medical education in response to current and projected shortages of doctors; however, this policy has not yet translated into an increase in the number of medical graduates.

The expansion of the *numerus clausus* in many of the OECD countries over the past fifteen years has resulted in an increase in the number of medical graduates, although they are occurring at varying paces (Figure 8.9). Australia has shown the fastest rate of increase in the number of medical graduates, growing by 2.7 times between 2000 and 2015. While most of this growth reflects an increase in the number of domestic students, it should be noted that this figure also reflects a growing number of international students in medical schools in Australia.

In the United Kingdom, the number of medical graduates doubled between 2000 and 2015, reflecting an effort to increase the domestic supply and rely less on foreign-trained doctors. While there was a slight decrease in the number of graduates from 2013, in 2016 the government announced the intent to provide funding for additional 1 500 students to meet the growing demand for care (Department of Health, 2016). By contrast, there has been a continued slow-down in the growth in number of medical graduates in the Netherlands (ACMMP, 2014).

In France, the number of medical graduates increased steadily since 2006 following a large increase in the *numerus clausus* between 2000 and 2006. However, the number of graduates is expected to stabilize in the coming years, as admission quotas have remained fairly stable over the past few years. Spain showed a slight decline in the number of medical students until 2012, when the numbers have begun to increase rapidly again, growing by 36% between 2012 and 2015.

In the United States, the increase in admission intakes to medical schools also took place after 2005, and the number of medical graduates has shown a gradual increase over the past decade, which included a growing number of American students who study abroad (notably in Caribbean countries), with the intention of coming back to complete their post-graduate training and practice in the United States. This is expected to create additional pressures to increase the number of residency posts to allow both domestic graduates and foreign-trained US national graduates to complete their post-graduate training.

There has also been a strong rise in the number of medical graduates in the Czech Republic and Poland. This increase since around 2009 can be explained partly by the growing number of international students choosing these countries to purse their medical studies. International students accounted for about 30% of all medical graduates in the Czech Republic in recent years. The internationalisation of medical education combined with migration makes it more challenging for national governments to set their own domestic policies (OECD, 2016).

Definition and comparability

Medical graduates are defined as the number of students who have graduated from medical schools in a given year. The data for Australia, Austria and the Czech Republic include foreign graduates, but other countries may exclude them. In Denmark, the data refer to the number of new doctors receiving an authorisation to practice, which may result in an over-estimation if these include a certain number of foreign-trained doctors.

References

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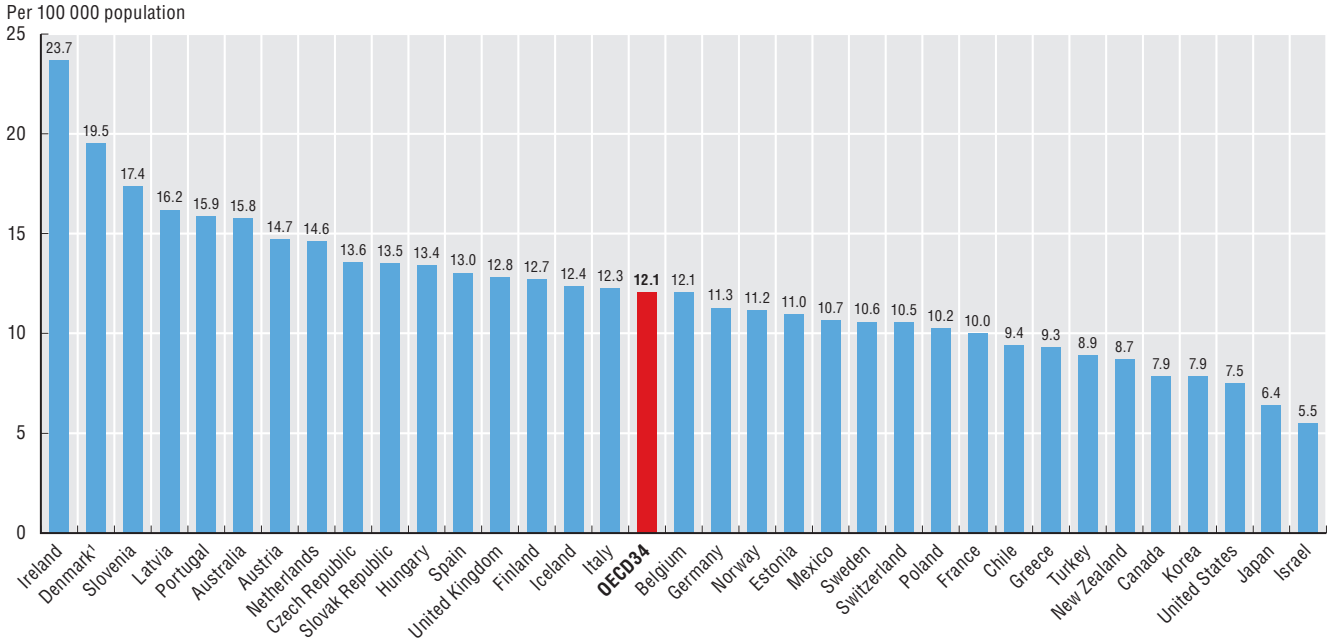
Department of Health (2016), "Up to 1,500 Extra Medical Training Places Announced", Department of Health, London, *https://www.gov.uk/government/news/up-to-1500-extra-medical-training-places-announced*.

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

UN High-Level Commission on Health Employment and Economic Growth (2016), "Working for Health and Growth: Investing in the Health Workforce", WHO, Geneva, retrieved from *http://www.who.int/hrh/com-heeg/reports*.

8.8. Medical graduates, 2015 (or nearest year)

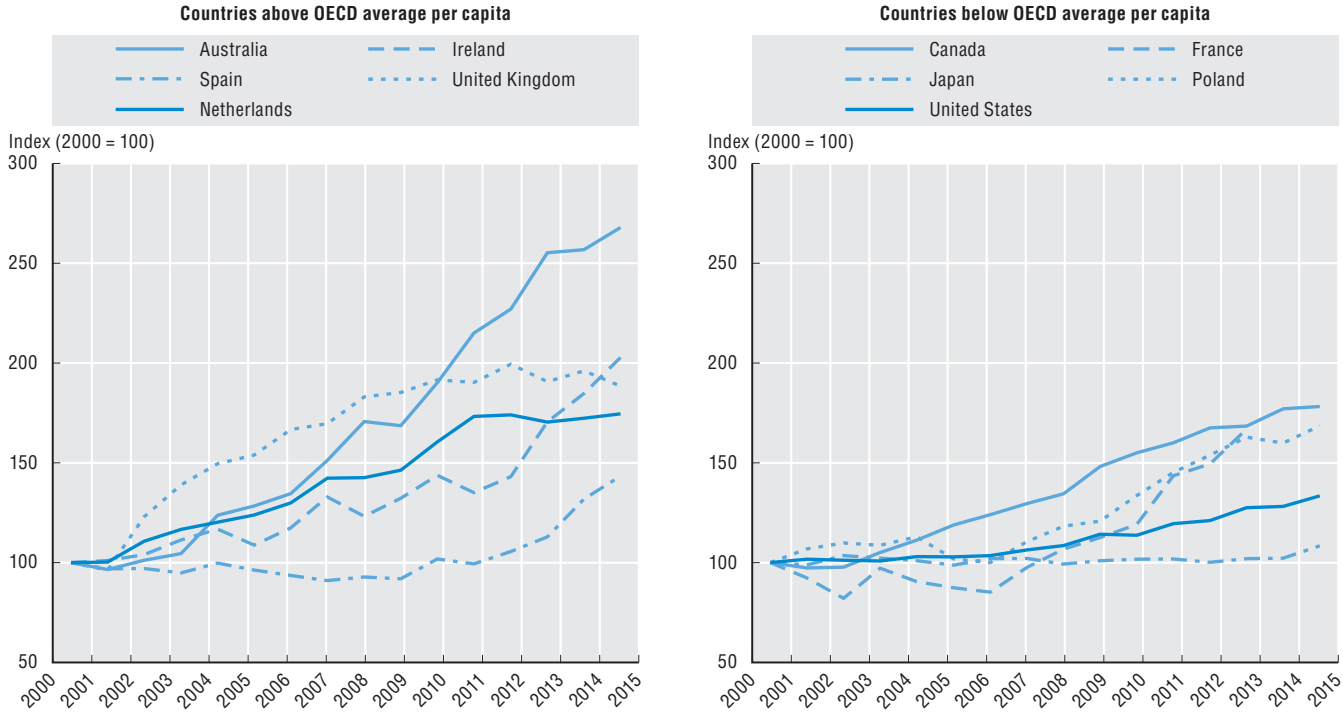


1. In Denmark, the number refers to new doctors receiving an authorisation to practice, which may result in an over-estimation if these include foreign-trained doctors.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604666

8.9. Evolution in the number of medical graduates, selected OECD countries, 2000 to 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604685

Remuneration of doctors (general practitioners and specialists)

The remuneration level for different categories of doctors has an impact on the financial attractiveness of different medical specialties. In many countries, governments influence the level and structure of physician remuneration by being one of the main employers of physicians or purchaser of their services, or by regulating their fees. With the increasing international mobility of doctors across national borders (see the indicator on migration of doctors and nurses), the relative levels of remuneration across countries can play an important role in influencing these movements.

OECD data on physician remuneration distinguish between salaried and self-employed physicians. In some countries this distinction is increasingly blurred, as some salaried physicians are allowed to have a private practice and some self-employed doctors may receive part of their remuneration through salaries. A distinction is also made between general practitioners and all other medical specialists combined, although there may be wide differences in the income of different medical specialties.

In the OECD countries where data are available, the remuneration of doctors (both general practitioners and specialists) is much higher than that of the average worker (Figure 8.10). In 2015, self-employed general practitioners in Austria, Canada, France and the United Kingdom earned around three times the average wage in the country while in Germany they earned over four times the average wage. In Australia, self-employed general practitioners earned about two times the average wage in 2015, but it should be noted that this is an under-estimation since the figure includes the remuneration of physicians in training.

In most countries, specialists earned significantly more than the average worker, and more than the general practitioners. In 2015, the income gap between specialists and general practitioners was particularly high in Australia, Belgium and Luxemburg, where the self-employed specialists earned over twice the remuneration earned by general practitioners. In comparison with the average worker, self-employed specialists in Belgium and Luxembourg earned six times the average wage, and in France and Germany they earned around five times the average wage. It should be noted that in Belgium the remuneration included practice expenses, thereby resulting in an over-estimation.

In many OECD countries, the income gap between general practitioners and specialists has continued to widen over the past decade, reducing the financial attractiveness of general practice (Figure 8.11). Since 2005, the remuneration of specialists has risen faster than that of generalists in Canada, Finland, France, Hungary, Israel, Luxembourg and Mexico. On the other hand, in Austria, Belgium, Estonia and the Netherlands, the gap has narrowed slightly, as the income of general practitioners grew faster than that of specialists.

In some OECD countries, the economic crisis of 2008-09 had an impact on the remuneration of doctors and other health workers. Several European countries hard hit by the recession either froze or reduced the wages or fees of doctors in efforts to reduce cost while protecting access to care for the population. This has been the case in Estonia, Ireland, Italy and Slovenia, where doctors saw their remuneration decrease for some years after the crisis. However, in more recent years, the remuneration of doctors and other health workers has started to rise again (OECD, 2016).

Definition and comparability

The remuneration of doctors refers to average *gross* annual income, including social security contributions and income taxes payable by the employee. It should normally exclude practice expenses for self-employed doctors.

A number of data limitations contribute to an under-estimation of remuneration levels in some countries: 1) payments for overtime work, bonuses, other supplementary income or social security contributions are excluded in some countries (Austria for GPs, Ireland for salaried specialists and Italy); 2) incomes from private practices for salaried doctors are not included in some countries (e.g. Czech Republic, Hungary, Iceland, Ireland and Slovenia); 3) informal payments, which may be common in certain countries (e.g. Greece and Hungary), are not included; 4) data relate only to public sector employees who tend to earn less than those working in the private sector in Chile, Denmark, Greece, Hungary, Iceland, Ireland, Norway, the Slovak Republic and the United Kingdom; and 5) physicians in training are included in Australia.

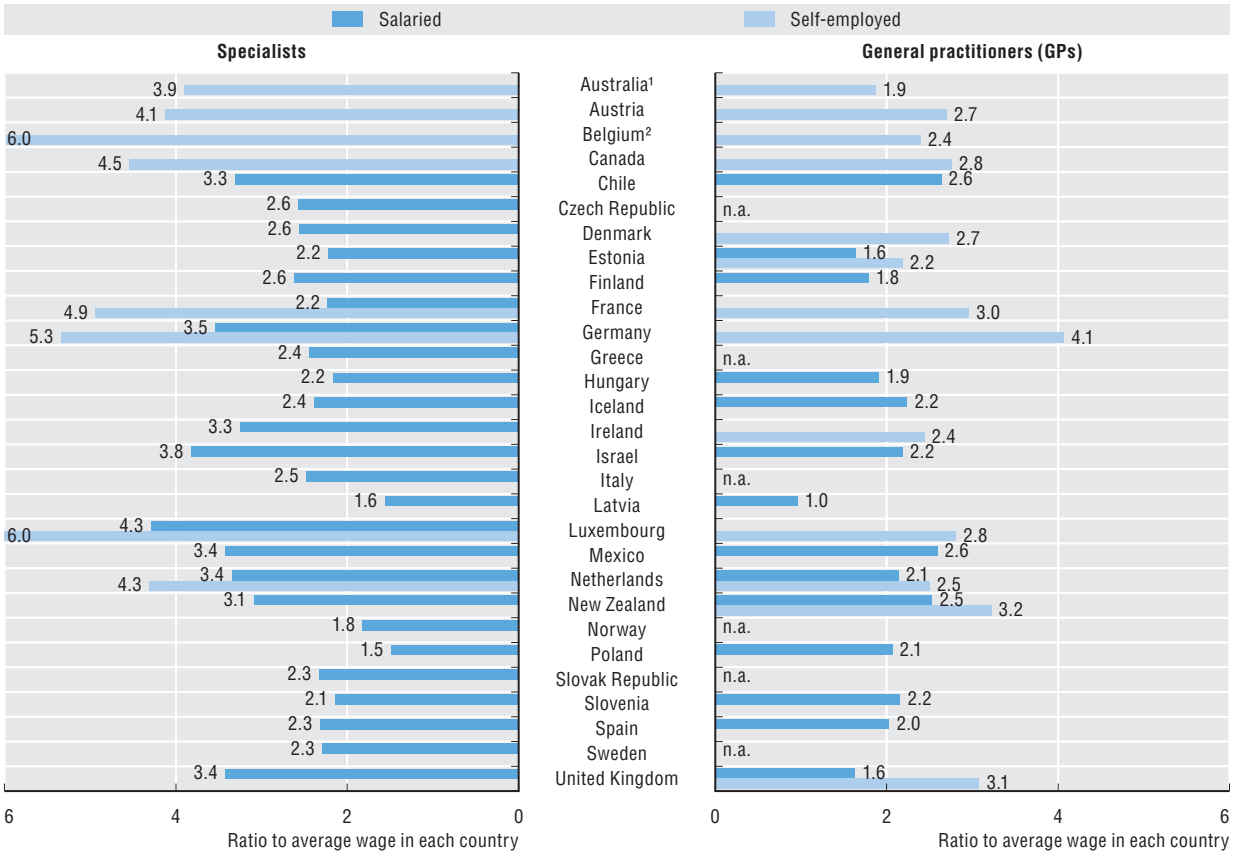
The data for some countries include part-time workers, while in other countries the data refer only to doctors working full time. In Belgium, the data for self-employed doctors include practice expenses, resulting in an over-estimation.

The income of doctors is compared to the average wage of full-time employees in all sectors in the country. The source for the average wage of workers in the economy is the *OECD Employment Database*. For the calculation of growth rates in real terms, economy-wide GDP deflators are used.

Reference

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

8.10. Remuneration of doctors, ratio to average wage, 2015 (or nearest year)

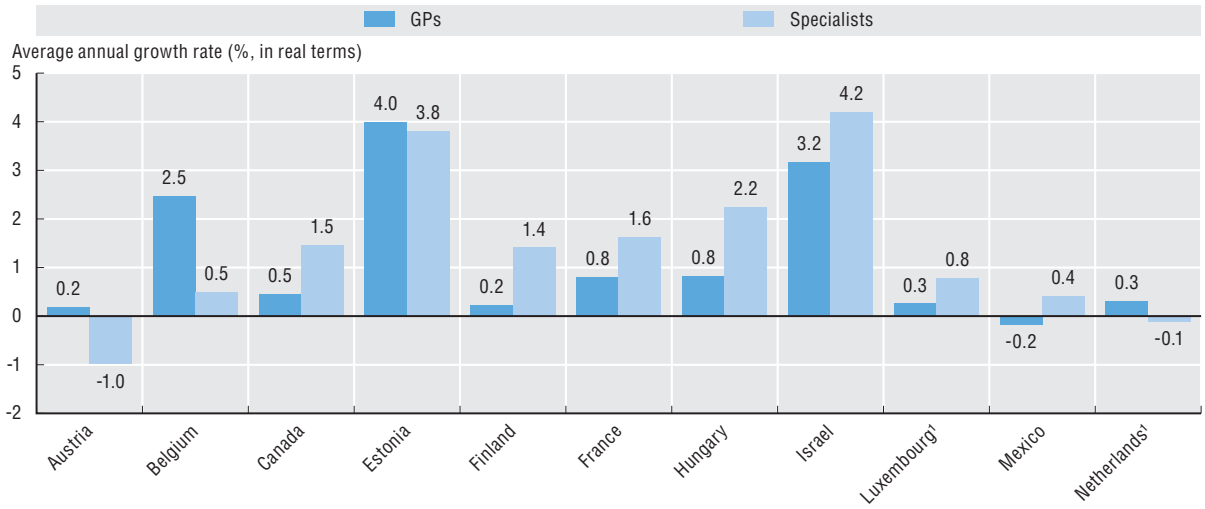


1. Physicians in training included (resulting in an under-estimation).
2. Practice expenses included (resulting in an over-estimation).

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604704

8.11. Growth in the remuneration of GPs and specialists, 2005-15 (or nearest year)



1. The growth rate for the Netherlands and for Luxembourg is for self-employed GPs and specialists.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604723

Nurses

Nurses greatly outnumber physicians in most OECD countries, and they play a critical role in providing health care not only in traditional settings such as hospitals and long-term care institutions but increasingly in primary care settings (especially to manage the care of the chronically ill) and in home care settings.

There are growing concerns in many OECD countries about possible future shortages of nurses, given that the demand for nurses is expected to rise in a context of population ageing and the retirement of the current "baby-boom" generation of nurses. These concerns have prompted actions in many countries to increase the training of new nurses (see the indicator on "Nursing graduates"), combined with efforts to increase the retention rate of nurses in the profession. The retention rate of nurses has increased in recent years in many countries either due to the impact of the economic crisis that have prompted more nurses to stay or come back in the profession, or following deliberate efforts to improve their working conditions (OECD, 2016).

On average across OECD countries, the number of nurses on per capita basis has gone up from 7.3 per 1 000 population in 2000 to nine nurses per 1 000 population in 2015 (Figure 8.12). In 2015, the number of nurses per capita was highest in Switzerland, Norway, Denmark, Iceland and Finland, with more than 14 nurses per 1 000 population. The number of nurses per capita in OECD countries was lowest in Turkey, Chile and Mexico (with less than 3 per 1 000 population). With regards to OECD partner countries, the number of nurses per capita was generally low compared with the OECD average. In 2015, Colombia, Indonesia, South Africa, India and Brazil had fewer than 1.5 nurses per 1 000 population, although numbers have been growing quite quickly in Brazil in recent years.

The number of nurses per capita increased in almost all OECD countries since 2000. Korea and Portugal had a relatively low density of nurses but have now converged towards the OECD average. France has also increased from a relatively low density to a level above the OECD average. A significant increase was registered in countries that already had a high density of nurses in 2000, such as Switzerland, Finland and Denmark. In Ireland and Israel, the number of nurses per capita declined between 2000 and 2015 as the size of the population grew more rapidly than the number of nurses. In the Slovak Republic, the number of nurses declined both in absolute numbers and on a per capita basis.

In 2015, there were about three nurses per doctor on average across OECD countries, with about half of the countries reporting between two to four nurses per doctor (Figure 8.13). The nurse-to-doctor ratio was highest in Japan, Finland and Denmark (with 4.6 nurses per doctor). It was lowest in Chile, Turkey and Mexico with less than 1.2 nurse per doctor).

In response to shortages of doctors and to ensure proper access to care, some countries have developed more advanced roles for nurses. Evaluations of nurse practitioners from the United States, Canada and the United Kingdom show that advanced practice nurses can improve access to services and reduce waiting times, while delivering the same quality of care as doctors for a range of patients, including those with minor illnesses and those requiring routine follow-up. Existing evaluations find a high patient satisfaction rate, while the impact on cost is either cost-reducing or cost-neutral. The implementation of new advanced practice nursing roles may require changes to legislation and regulation to remove any barrier to extensions in their scope of practice (Delamaire and Lafortune, 2010).

Definition and comparability

The number of nurses includes those employed in public and private settings providing services directly to patients ("practising") and in some cases also those working as managers, educators or researchers.

In those countries where there are different levels of nurses, the data include both "professional nurses" who have a higher level of education and perform higher level tasks and "associate professional nurses" who have a lower level of education but are nonetheless recognised and registered as nurses. Health care assistants (or nursing aids) who are not recognised as nurses are excluded. Midwives are excluded, except in some countries where they are at least partly included because they are considered as specialist nurses or for other reasons (Australia, Ireland and Spain).

Austria and Greece report only nurses working in hospital, resulting in an under-estimation.

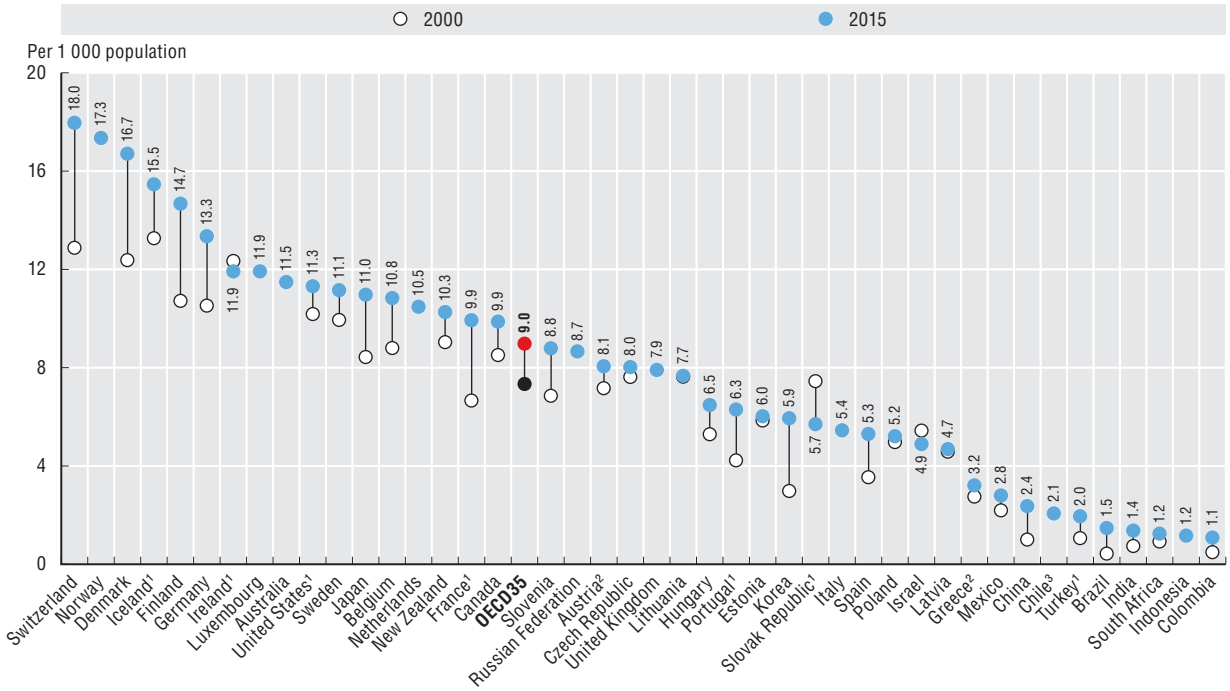
References

Delamaire, M.-L. and G. Lafortune (2010), "Nurses in Advanced Roles: A Description and Evaluation of Experiences in 12 Developed Countries", *OECD Health Working Paper*, No. 54, OECD Publishing, Paris, http://dx.doi.org/10.1787/5kmbrcfms5g7-en.

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

UN High-Level Commission on Health Employment and Economic Growth (2016), "Working for Health and Growth: Investing in the Health Workforce", WHO, Geneva, retrieved from *http://www.who.int/hrh/com-heeg/reports*.

8.12. Practising nurses per 1 000 population, 2000 and 2015 (or nearest year)

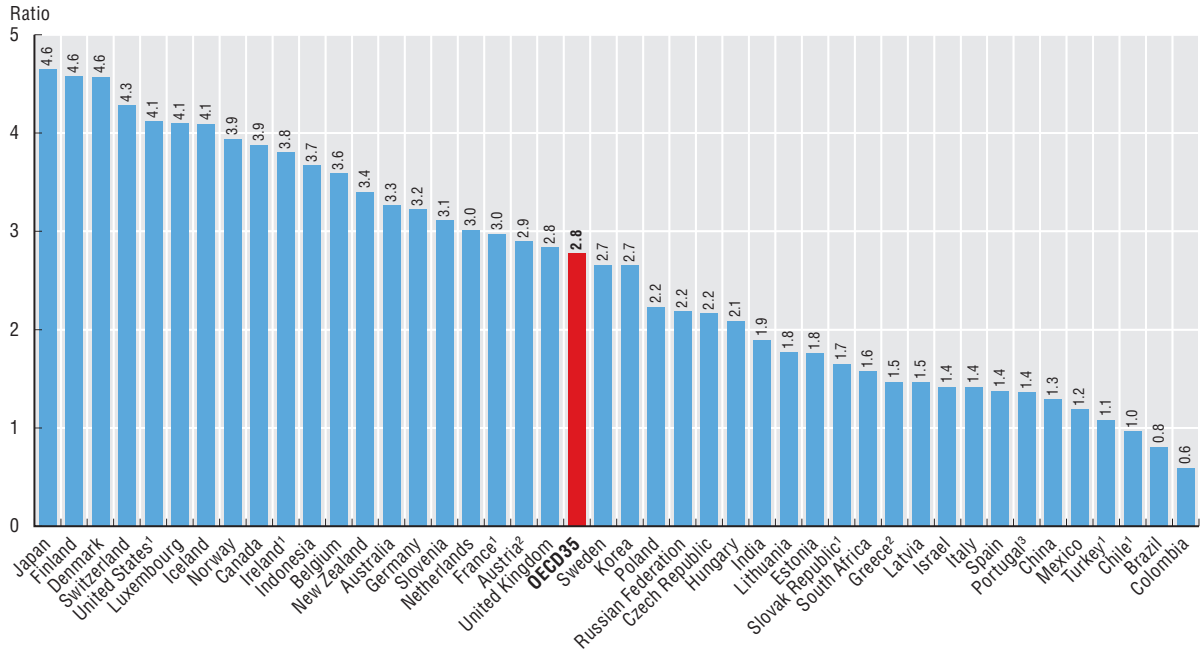


1. Data include not only nurses providing direct care to patients, but also those working in the health sector as managers, educators, researchers, etc.
2. Austria and Greece report only nurses employed in hospital.
3. Data in Chile refer to all nurses who are licensed to practice.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604742

8.13. Ratio of nurses to doctors, 2015 (or nearest year)



1. For those countries which have not provided data for practising nurses and/or practising doctors, the numbers relate to the "professionally active" concept for both nurses and doctors (except for Chile where numbers include all nurses and doctors licensed to practice).
2. For Austria and Greece, the data refer to nurses and doctors employed in hospital.
3. The ratio for Portugal is underestimated because the numerator refers to professionally active nurses while the denominator includes all doctors licensed to practice.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604761

Nursing graduates

Many OECD countries have taken steps over the past decade or so to increase the number of students admitted in nursing schools in response to concerns about current or possible future shortages of nurses (OECD, 2016). Nonetheless, there are wide variations across countries in training efforts of new nurses, which may be explained by: differences in the current number and age structure of the nursing workforce (and hence the replacement needs); in the capacity of nursing schools to take on more students; and the future employment prospects of nurses.

In 2015, there were on average around 46 new nurse graduates per 100 000 population across OECD countries, up from less than 40 in 2003. Korea, Switzerland and Denmark had the highest number of new nurse graduates relative to their population, with these three countries graduating more than 90 new nurses per 100 000 population in 2015. Mexico, Luxembourg and the Czech Republic had the lowest number, with less than 16 nurse graduates per 100 000 population (Figure 8.14).

Over the past decade, the number of nursing graduates has increased in all OECD countries, but at different rates (Figure 8.15). The number has increased strongly in many of the countries which had relatively low number of graduates per capita. Mexico has among the lowest number of nursing graduates, but between 2000 and 2015 there was an eight-fold increase in the number of nursing graduates per capita. Over the same period, Italy has also shown a four-fold increase in the number of nursing graduates per capita.

Among the countries already with above average number of nursing graduates per capita, the increase has been more modest. Germany has shown an increase in the number of nurse graduates since 2012 through the expansion of registered nurse training programmes in several universities, in addition to the programmes traditionally offered in vocational nursing schools (Cassier-Woidasky, 2013). Norway has also shown a modest increase in the last few years. Japan and Finland showed a decline in the number of nursing graduates in the earlier part of the decade, but has shown some modest increase in recent years.

In France, the number of graduates from nursing schools increased by 87% between 2000 and 2015. The *numerus clausus* set by the French Ministry of Health to control entry in nursing education programmes was expanded substantially since 1999. Most of the growth occurred in the academic year of 2000/01 when the annual quota was increased by 43%, driven by a projected reduction in the supply of nurses resulting from the reduction of working time to 35 hours per week, as well as a more general concern about the anticipated retirement of a large number of nurses.

Definition and comparability

Nursing graduates refer to the number of students who have obtained a recognised qualification required to become a licensed or registered nurse. They include graduates from both higher level and lower level nursing programmes. They exclude graduates from Masters or PhD degrees in nursing to avoid double-counting nurses acquiring further qualifications.

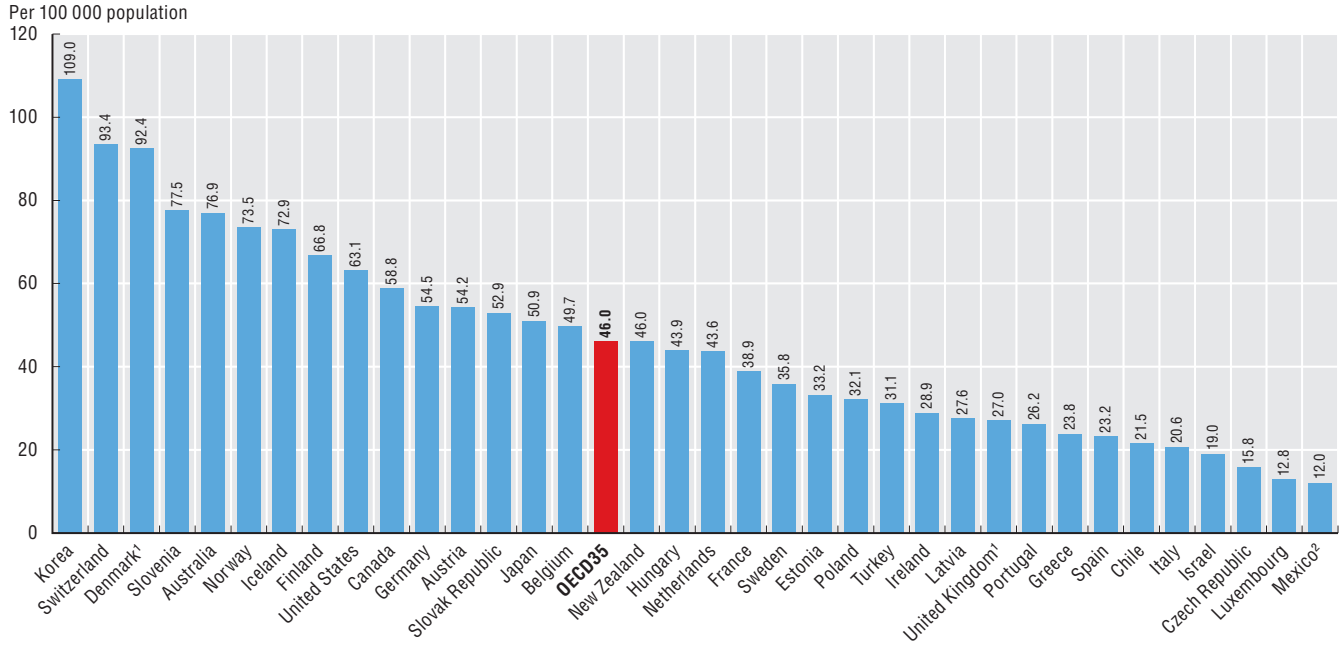
The data for Denmark and the United Kingdom are based on the number of new nurses receiving an authorisation to practice.

References

Cassier-Woidasky, A.-K. (2013), *Nursing Education in Germany – Challenges and Obstacles in Professionalisation*, DHBW, Stuttgart.

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

8.14. Nursing graduates, 2015 (or nearest year)

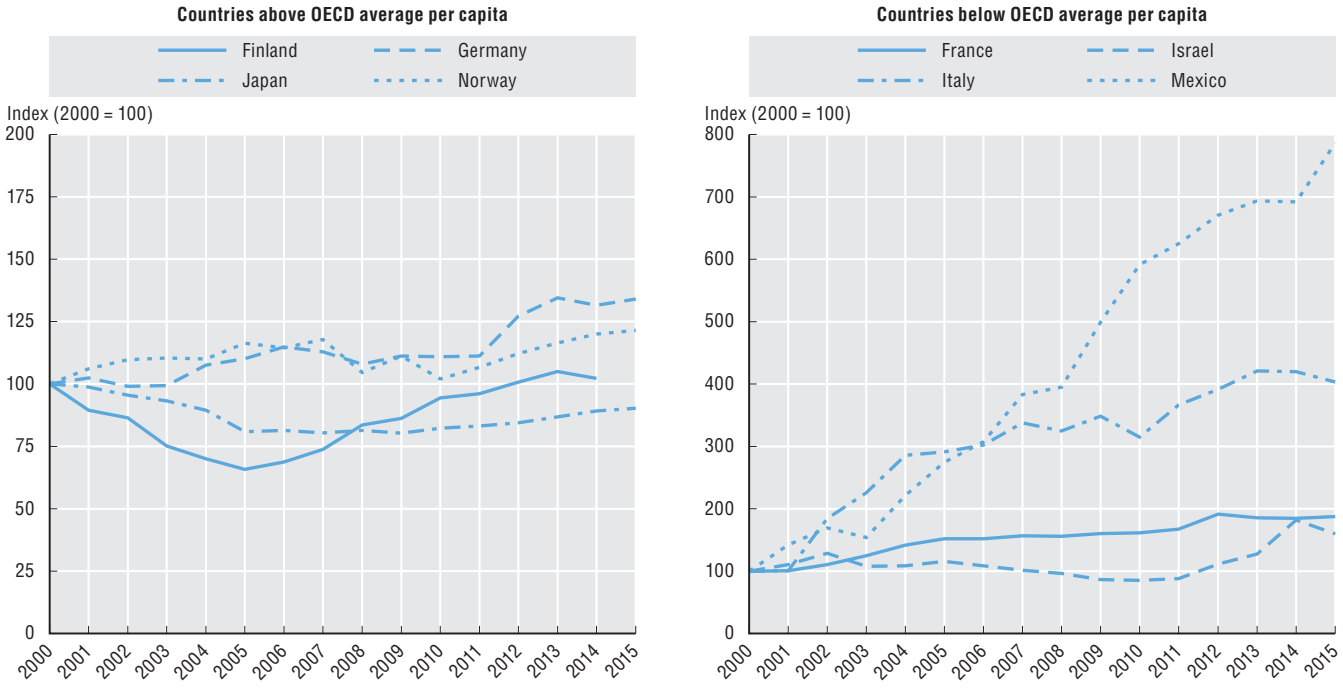


1. In Denmark and the United Kingdom, the numbers refer to new nurses receiving an authorisation to practice, which may result in an over-estimation if these include foreign-trained nurses.
2. In Mexico, the data include professional nursing graduates only.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604780

8.15. Evolution in the number of nursing graduates, selected OECD countries, 2000 to 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604799

Remuneration of nurses

The remuneration level of nurses is one of the factors affecting their job satisfaction and the attractiveness of the profession. It also has a sizeable impact on costs, since wages of nurses represent one of the largest spending items in health systems.

The data presented in this section generally focus on the remuneration of nurses working in hospitals, although the data coverage differs for some countries (see the box below on "Definition and comparability").

The data are presented in two ways. First, it is compared with the average wage of all workers in each country, providing some indication of the relative financial attractiveness of nursing compared to other occupations. Second, the remuneration level in each country is converted into a common currency, the US dollar, and adjusted for purchasing power parity, to provide an indication of the relative economic well-being of nurses compared with their counterparts in other countries.

In most OECD countries, the remuneration of hospital nurses was at or slightly above the average wage of all workers in 2015 (Figure 8.16). In Mexico and Chile, the hospital nurses earned almost twice the average wage, while in Israel, Luxembourg and Spain, the wages of nurses were respectively 49%, 38% and 28% greater than the average wage. In New Zealand, the United States, Greece and Australia, it was about 20% greater than the average wage. In most of the other countries, the wage of hospital nurses was roughly equal to the average wage in the economy, while in Hungary it was about 10% and in Latvia about 20% lower.

When converted to a common currency (and adjusted for purchasing power parity), the remuneration of nurses was about five times higher in Luxembourg than in Hungary and Latvia (Figure 8.17). Nurses in the United States also had relatively high earnings compared with their counterparts in other countries, which explains, at least partly, the ability of the United States to attract many nurses from other countries.

The economic crisis in 2008 has had a varying impact on the remuneration of nurses (Figure 8.18). The Netherlands, for example, has seen a steady growth in remuneration for nurses. Some Central and Eastern European countries have introduced a series of measures in recent years to increase the retention of nurses and other health workers, including pay raises despite tight budget constraints. In Hungary, a staged increase of 20% in the salaries of nurses and doctors was introduced in 2012, phased over a three-year period. In the Czech Republic, nurses also benefitted from a pay increase following protests of hospital workers in 2011 (although their pay raise was lower than that for doctors), accompanied by some improvement in other aspects of their working conditions (OECD, 2016).

Following the recession, the remuneration of nurses was cut down in some countries such as in Italy, which has frozen wage increase over the past few years. In Greece, the remuneration of nurses has been reduced significantly, by as much as 25% in real terms between 2009 and 2015.

Definition and comparability

The remuneration of nurses refers to average *gross* annual income, including social security contributions and income taxes payable by the employee. It should normally include all extra formal payments, such as bonuses and payments for night shifts and overtime. In most countries, the data relate specifically to nurses working in hospitals, although in Canada the data also cover nurses working in other settings. In some federal states, such as Australia, Canada and the United States, the level and structure of nurse remuneration is determined at the sub-national level, which may contribute to variations across jurisdictions.

Data refer only to registered ("professional") nurses in Chile, Ireland and the United States, resulting in an over-estimation compared to other countries where lower-level nurses ("associate professional") are also included. Data for Canada include registered ("professional") nurses and unregistered nursing graduates. Data for New Zealand include all nurses employed by publically funded district health boards, registered and otherwise, and includes health assistants who have a different and significantly lower salary structure than registered nurses.

The data relate to nurses working full time, with the exception of Belgium where part-time nurses are also included (resulting in an under-estimation). The data for some countries do not include additional income such as overtime payments and bonuses (e.g. Italy and Slovenia). Informal payments, which in some countries represent a significant part of total income, are not reported.

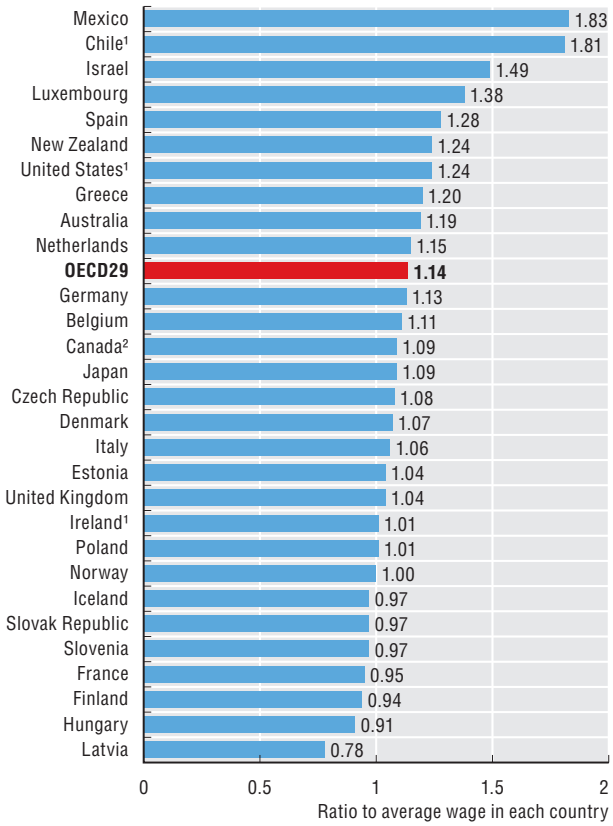
The income of nurses is compared to the average wage of full-time employees in all sectors in the country. The source for the average wage of workers in the economy is the *OECD Employment Database*. For the calculation of remuneration trends in real terms, economy-wide GDP deflators are used.

References

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

OECD (2015), *Fiscal Sustainability of Health Systems: Bridging Health and Finance Perspectives*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264233386-en*.

8.16. Remuneration of hospital nurses, ratio to average wage, 2015 (or nearest year)

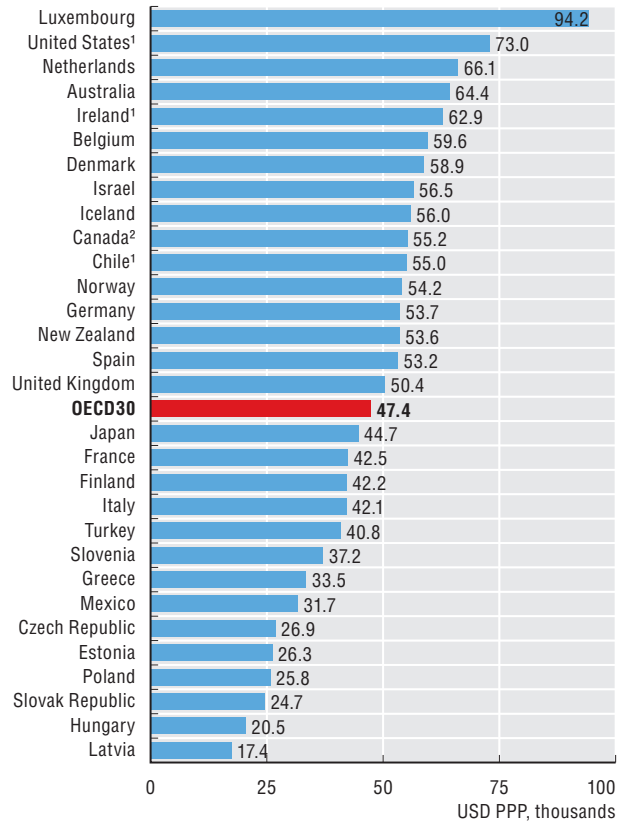


1. Data refer to registered ("professional") nurses in Chile, the United States and Ireland (resulting in an over-estimation).
2. Data refer to registered ("professional") nurses and unregistered nursing graduates.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604818

8.17. Remuneration of hospital nurses, USD PPP, 2015 (or nearest year)

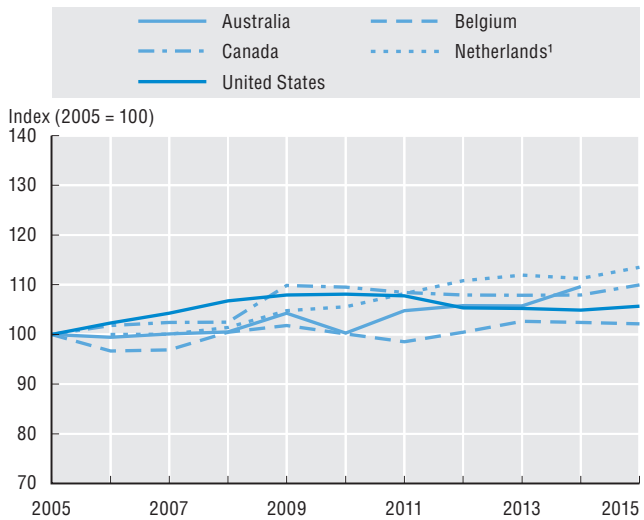


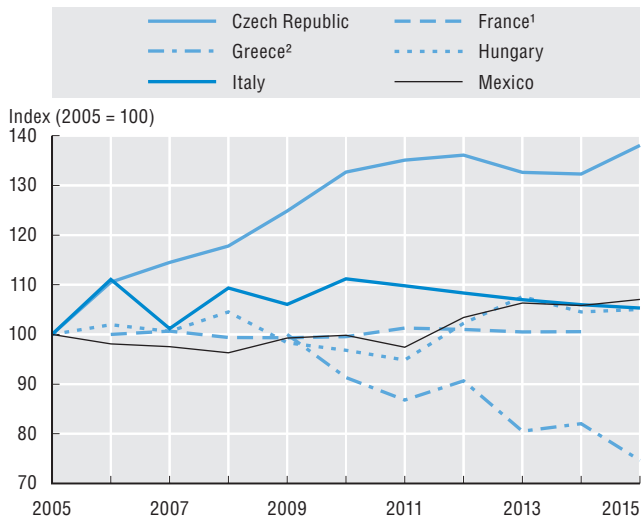
1. Data refer to registered ("professional") nurses in the United States, Ireland and Chile (resulting in an over-estimation).
2. Data refer to registered ("professional") nurses and unregistered nursing graduates.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604837

8.18. Trend in the remuneration of hospital nurses in real terms, selected OECD countries, 2005-15





1. Index for France and the Netherlands, 2006 = 100.
2. Index for Greece, 2009 = 100.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604856

Foreign-trained doctors and nurses

International migration of doctors and nurses is not a new phenomenon, but it has drawn considerable attention in recent years due to concerns that it might exacerbate shortages of skilled health workers in some countries. The Global Code of Practice on the International Recruitment of Health Personnel, adopted by the World Health Assembly in May 2010, was designed to respond to these concerns. It provides an instrument for countries to promote a more ethical recruitment of health personnel, encouraging countries to achieve greater "self-sufficiency" in the training of health workers, while recognising the basic human right of every person to migrate.

In 2015, the share of foreign-trained doctors ranged from 3% or less in Estonia, the Slovak Republic, the Netherlands, Poland, Italy and Turkey, to more than 30% in Israel, New Zealand, Ireland, Norway and Australia (Figure 8.19). The very high proportion of foreign-trained doctors in Israel reflects not only the importance of immigration in this country, but also that about one third of new licenses are issued to people born in Israel but trained abroad. In Norway, roughly half of foreign-trained doctors are people who were born in the country but went to pursue their medical studies in another country. In Luxembourg, all doctors are foreign-trained, in the absence of a medical school in the country.

Since 2000, the number and share of foreign-trained doctors has increased in many OECD countries (Figure 8.21). In the United States, the share has remained relatively stable over time, but the absolute number of doctors trained abroad has continued to increase (OECD, 2016). Sweden has experienced a strong rise in the number and share of foreign-trained doctors, with most of these doctors coming from Germany, Poland and Iraq. The number and share of foreign-trained doctors has also increased in France and Germany, though at a slower pace. In France, the rise is partly due to a fuller recognition of qualifications of foreign-trained doctors who were already working in the country, as well as the inflow of doctors from new EU member states.

In nearly all OECD countries, the proportion of foreign-trained nurses is much lower than that of foreign-trained doctors. However, given that the overall number of nurses is usually much greater than the number of doctors, the absolute number of foreign-trained nurses tends to be greater than for doctors (OECD, 2016). OECD countries vary widely in the number and share of foreign-trained nurses working in their health system (Figure 8.20). While there were almost no foreign-trained nurses working in Slovenia, Turkey, the Netherlands and Estonia in 2015, they make up over 25% of the nursing workforce in New Zealand, and between 10% and 20% in Switzerland, Australia and the United Kingdom.

The number and share of foreign-trained nurses has increased over the past ten years in several OECD countries, including New Zealand, Australia and Canada (Figure 8.22). In Italy, an increase in the immigration of foreign-trained nurses between 2000 and 2008 was primarily driven by the arrival of many nurses trained in Romania, who now account for nearly half of all foreign-trained nurses. In France the share of nurses trained abroad remains low, but their numbers have been increasing, and many of these foreign-trained nurses are French citizens who received their diploma from Belgium. Israel has shown a steady decline in the share of nurses trained abroad while increasing the number of domestic nursing graduates (see the indicator on "Nursing graduates").

Definition and comparability

The data relate to foreign-trained doctors and nurses working in OECD countries measured in terms of total stocks. The OECD health database also includes data on the annual flows for most of the countries shown here, as well as by country of origin. The data sources in most countries are professional registries or other administrative sources.

The main comparability limitation relates to differences in the activity status of doctors and nurses. Some registries are regularly updated, making it possible to distinguish doctors and nurses who are still actively working in health systems, while other sources include all doctors and nurses licensed to practice, regardless of whether they are still active or not. The latter will tend to over-estimate not only the number of foreign-trained doctors and nurses, but also the total number of doctors and nurses (including the domestically-trained), making the impact on the share unclear.

The data source in some countries includes interns and residents, while these physicians in training are not included in other countries. Because foreign-trained doctors are often over-represented in the categories of interns and residents, this may result in an under-estimation of the share of foreign-trained doctors in countries where they are not included (e.g., Austria, France and Switzerland).

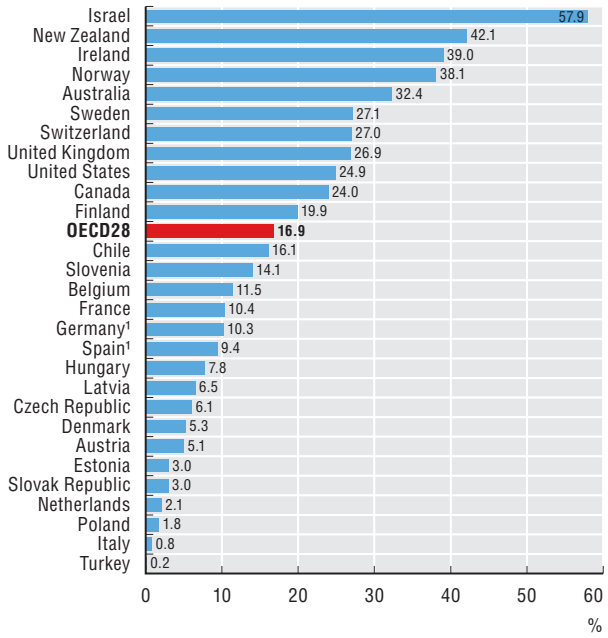
The data for Germany (on foreign-trained doctors) and some regions in Spain are based on nationality (or place of birth in the case of Spain), not on the place of training.

References

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

UN High-Level Commission on Health Employment and Economic Growth (2016), "Working for Health and Growth: Investing in the Health Workforce", WHO, Geneva, retrieved from *http://www.who.int/hrh/com-heeg/reports*.

8.19. Share of foreign-trained doctors, 2015 (or nearest year)

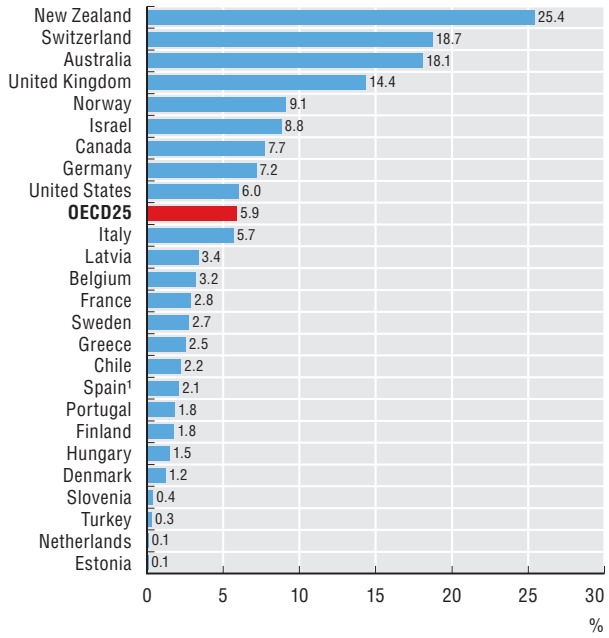


1. In Germany and some regions in Spain, the data are based on nationality (or place of birth in the case of Spain), not on the place of training.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604875

8.20. Share of foreign-trained nurses, 2015 (or nearest year)

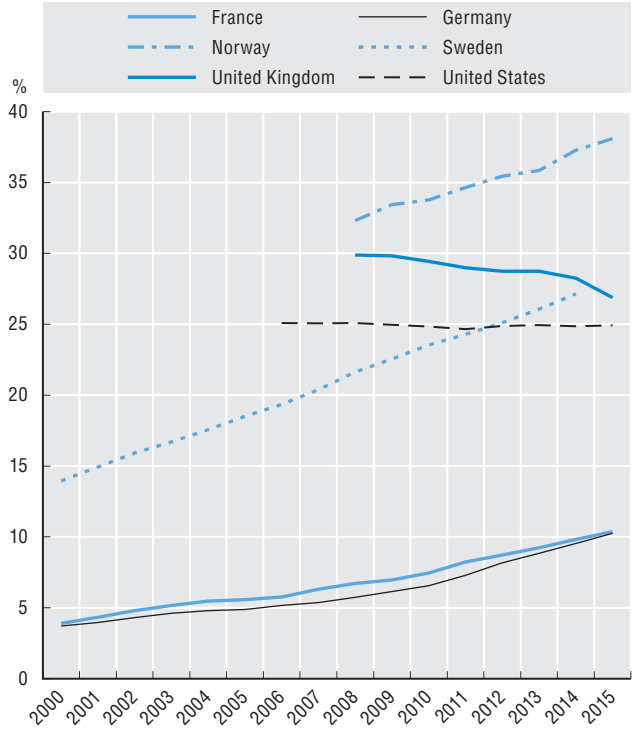


1. The data for some regions in Spain are based on nationality or place of birth, not on the place of training.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604894

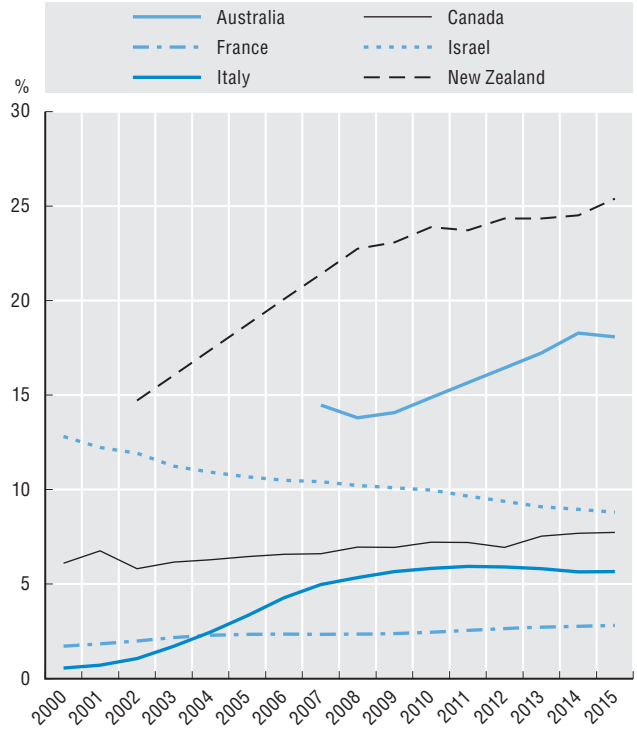
8.21. Evolution in the share of foreign-trained doctors, selected OECD countries, 2000 to 2015



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604913

8.22. Evolution in the share of foreign-trained nurses, selected OECD countries, 2000 to 2015



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604932

AESTHETIC
SURGICAL

9. HEALTH CARE ACTIVITIES

Consultations with doctors

Medical technologies

Hospital beds

Hospital discharges

Average length of stay in hospitals

Hip and knee replacement

Caesarean sections

Ambulatory surgery

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Consultations with doctors

Consultations with doctors can take place in doctors' offices or clinics, in hospital outpatient departments or, in some cases, in patients' own homes. In many European countries (e.g., Denmark, Italy, Netherlands, Norway, Portugal, Slovak Republic, Spain and the United Kingdom), patients are required or even incentivised to first consult a general practitioner (GP) about any new episode of illness. The GP may then refer them on to a specialist, if indicated. In other countries, patients may approach specialists directly.

In 2015, the number of doctor consultations per person ranged from less than 3 in Mexico and Sweden, to almost 13 and 16 in Japan and Korea respectively (Figure 9.1). The OECD average was 6.9 consultations per person per year, with most countries reporting between four and eight consultations. Cultural factors can play a role in explaining some of the variations across countries, although certain health system characteristics may also be important. Provider payment methods and the level of co-payments are particularly relevant. For example, some countries where doctors are paid on a fee-for-service basis tend to have above-average consultation rates (e.g. Japan and Korea), while countries with mostly salaried doctors tend to have below-average rates (e.g. Mexico, Finland and Sweden). However, there are examples of countries such as Switzerland and the United States where doctors are paid mainly by fee-for-service and where consultation rates are below average. In these countries, patient co-payments can be high, which may result in patients not consulting a doctor because of the cost of care (see the indicator on "Unmet needs for health care due to cost" in Chapter 5).

In Sweden and Finland, the low number of doctor consultations may also be explained partly by the fact that nurses and other health professionals play a more important role in providing primary care to patients in health centres, lessening the need for consultations with doctors (Delamaire and Lafortune, 2010).

The average number of doctor consultations per person across the OECD has remained relatively stable since 2000 (from 6.5 to 6.9). But in some countries there have been large increases over time (Korea, Turkey). In some other countries, the number of doctor consultations per person fell. This was the case in Japan, the Czech Republic and the Slovak Republic, although the numbers remains well above average in these three countries.

Information on the number of doctor consultations per person can be used to estimate the annual numbers of consultations per doctor. This indicator should not be taken as a measure of doctors' productivity, since consultations can vary in length and effectiveness, and because it excludes the services doctors might deliver for hospital inpatients, as well as on administration and research. Keeping this in mind, the estimated number of consultations per doctor is highest in Korea and Japan, followed by Turkey and Hungary (Figure 9.2). On the other hand, the estimated number of consultations per doctor was lowest in Sweden and Norway, where consultations with doctors in both primary care and hospital settings tend to be focused towards patients with more severe and complex cases.

The number and type of doctor consultations can vary among different socio-economic groups in each country. An OECD study found that the probability of a visit to the GP tends to be equally distributed in most countries, but in nearly all countries, higher income people are more likely to see a specialist than those with low income, and also more frequently (Devaux and de Looper, 2012).

Definition and comparability

Consultations with doctors refer to the number of contacts with physicians, including both generalists and specialists. There are variations across countries in the coverage of these consultations, notably in outpatient departments of hospitals. The data come mainly from administrative sources, although in some countries (Ireland, Italy, Netherlands, New Zealand, Spain and Switzerland) the data come from health interview surveys. Estimates from administrative sources tend to be higher than those from surveys because of problems with recall and non-response rates.

In Hungary, the figures include consultations for diagnostic exams such as CT and MRI scans (resulting in an over-estimation). The figures for the Netherlands exclude contacts for maternal and child care. The data for Portugal exclude visits to private practitioners (resulting in an under estimation). 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 under-estimation). Telephone contacts are included in a few countries (e.g. Spain). In Turkey, a majority of consultations with doctors occur in outpatient departments in hospitals.

References

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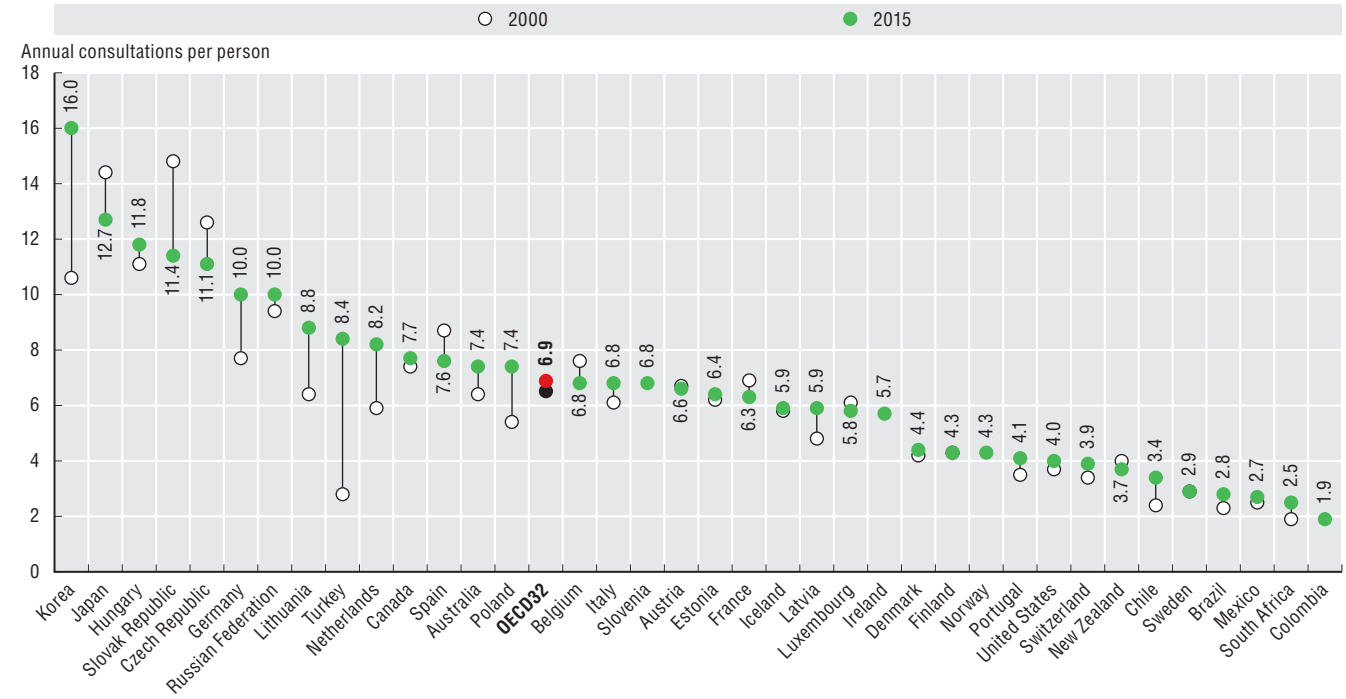
Devaux, M. and M. de Looper (2012), "Income-related Inequalities in Health Service Utilisation in 19 OECD Countries", *OECD Health Working Papers*, No. 58, OECD Publishing, Paris, *http://dx.doi.org/10.1787/5k95xd6stnxt-en*.

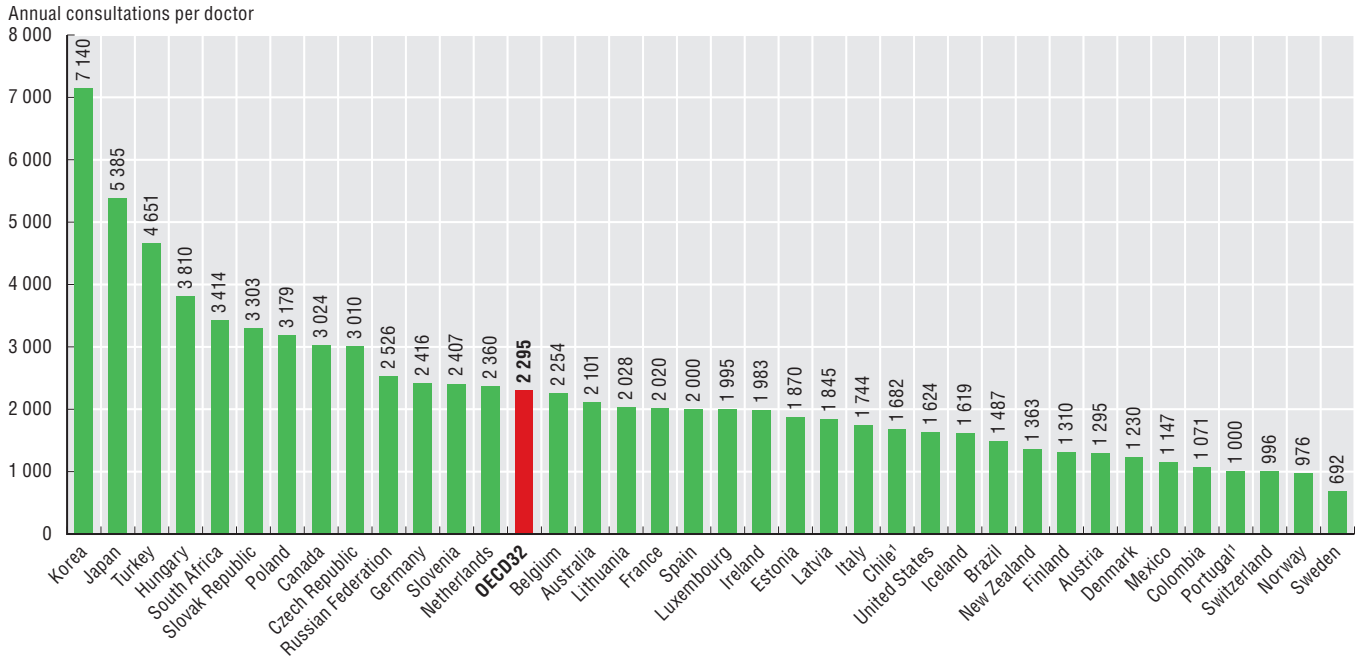
9.1. Number of doctor consultations per person, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604951

9.2. Estimated number of consultations per doctor, 2015 (or nearest year)



1. In Chile and Portugal, data for the denominator include all doctors licensed to practice.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604970

Medical technologies

New medical technologies are improving diagnosis and treatment, but they are also increasing health spending. This section presents data on the availability and use of two diagnostic imaging technologies: computed tomography (CT) scanners and magnetic resonance imaging (MRI) units. CT and MRI exams help physicians diagnose a range of conditions. Unlike conventional radiography and CT scanning, MRI exams do not expose patients to ionising radiation.

The availability of CT scanners and MRI units has increased rapidly in most OECD countries over the past two decades. Japan has, by far, the highest number of MRI and CT scanners per capita, followed by the United States for MRI units and by Australia for CT scanners (Figures 9.3 and 9.4). Germany, Greece, Iceland, Italy, Korea and Switzerland also have significantly more MRI and CT scanners per capita than the OECD average. The number of MRI units and CT scanners per population is the lowest in Mexico, Hungary, Israel and the United Kingdom.

There is no general guideline or benchmark regarding the ideal number of CT scanners or MRI units per population. However, if there are too few units, this may lead to access problems in terms of geographic proximity or waiting times. If there are too many, this may result in an overuse of these costly diagnostic procedures, with little if any benefits for patients.

Data on the use of these diagnostic scanners are available for a smaller group of countries. Based on this more limited country coverage, the number of MRI exams per capita is highest in Turkey, Germany, the United States, Japan and France, all of which have more than 100 MRI exams per 1 000 population (Figure 9.5). In the United States, the (absolute) number of MRI exams more than doubled between 2000 and 2015. In Turkey, it has grown even faster, by three times between 2008 and 2015. In this country, there is growing evidence that MRI exams are being systematically prescribed for patients with various health problems, resulting in overuse of these tests. The number of CT exams per capita is highest in the United States, followed by Japan and Luxembourg (Figure 9.6).

There are large variations in the use of CT and MRI scanners not only across countries, but also within countries. For example, in Belgium, there was almost a two-fold variation in MRI and CT exams between provinces with the highest and lowest rates in 2010. In the United Kingdom (England), the utilisation of both types of diagnostic exams is generally much lower, but the variation across regions is greater, with almost a four-fold difference between the Primary Care Trusts that had the highest rates and lowest rates of MRI and CT exams in 2010/11. In Canada, there has been a strong rise in the use of both MRI and CT exams in all parts of the country over the past decade, but there continues to be wide variations across provinces (OECD, 2014).

Clinical guidelines have been developed in several OECD countries to promote a more rational use of MRI and CT exams. In the United Kingdom, the National Institute for Health and Clinical Excellence (NICE) has issued a number of guidelines on the appropriate use of MRI and CT exams (NICE, 2012). In the United States, a "Choosing Wisely" campaign has developed clear guidelines for doctors and patients to reduce the use of unnecessary diagnostic tests and procedures. The guidelines include, for instance, avoiding imaging studies such as MRI, CT or X-rays for acute low back pain without specific indications (Choosing Wisely, 2015). A similar "Choosing Wisely" campaign was launched in Canada in 2014, and work has also started in several other OECD countries to produce similar clear guidelines and recommendations to promote a more efficient use of diagnostic tests and other procedures. It is still too early to tell to what extent these campaigns will succeed in reducing the overuse of MRI and CT exams.

Definition and comparability

The data in most countries cover MRI units and CT scanners installed both in hospitals and the ambulatory sector, but the coverage is more limited in some countries. MRI units and CT scanners outside hospitals are not included in Belgium, Portugal, Sweden and Switzerland (for MRI units). For the United Kingdom, the data only include equipment in the public sector. For Australia and Hungary, the number of MRI units and CT scanners includes only those eligible for public reimbursement.

Similarly, MRI and CT exams performed outside hospitals are not included in Austria, Portugal, Switzerland and the United Kingdom. In Australia, the data only include exams for private patients (in or out of hospitals); while in Korea and the Netherlands they only include publicly-financed exams.

References

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NICE – National Institute for Health and Care Excellence (2012), *Published Diagnostics Guidance*, available at *guidance.nice.org.uk/DT/Published*.

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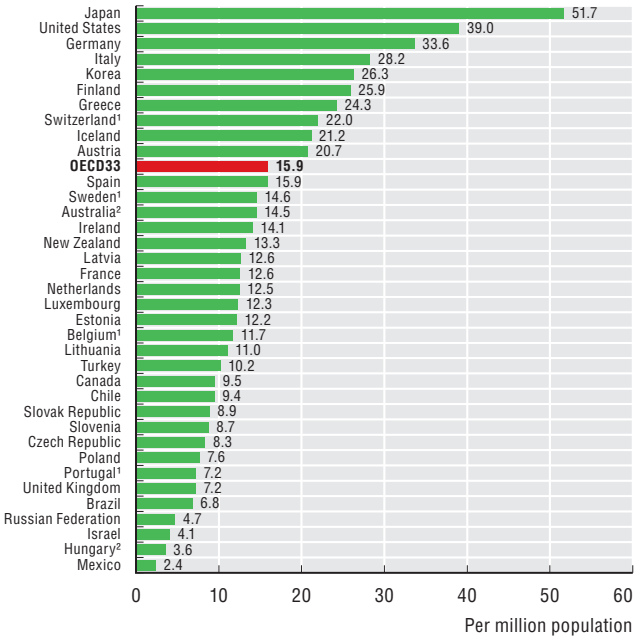
9.3. MRI units, 2015 (or nearest year)

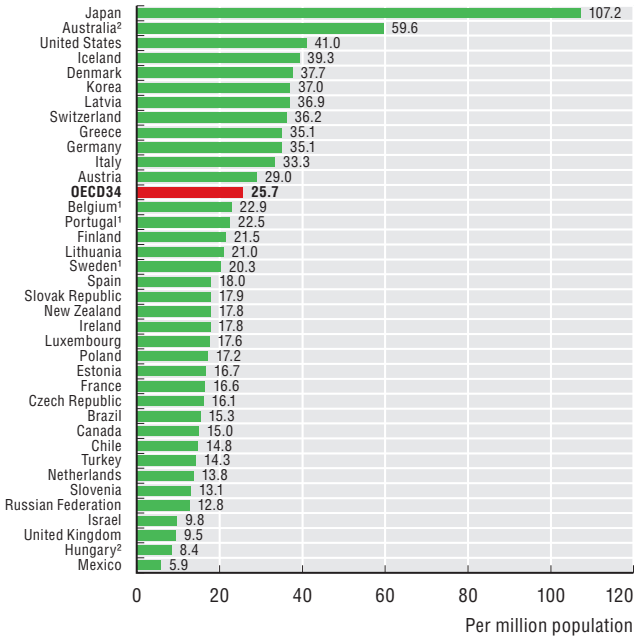


1. Equipment outside hospital not included.
2. Only equipment eligible for public reimbursement.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933604989

9.4. CT scanners, 2015 (or nearest year)

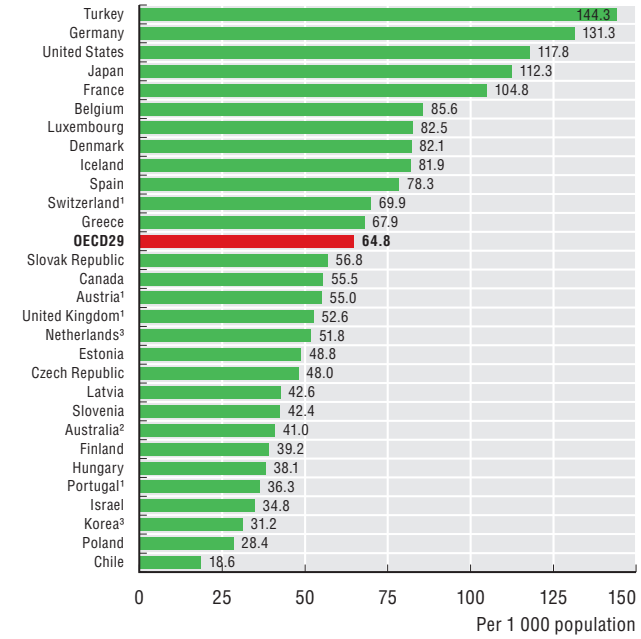


1. Equipment outside hospital not included.
2. Only equipment eligible for public reimbursement.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605008

9.5. MRI exams, 2015 (or nearest year)

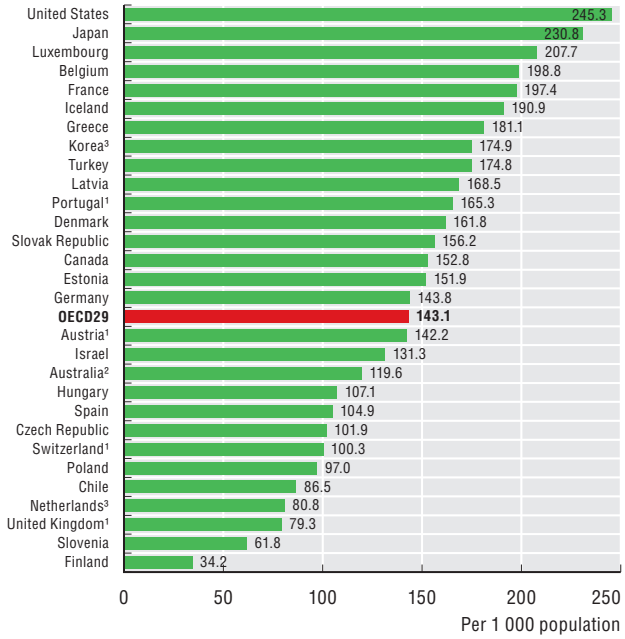


1. Exams outside hospital not included.
2. Exams on public patients not included.
3. Exams privately-funded not included.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605027

9.6. CT exams, 2015 (or nearest year)



1. Exams outside hospital not included.
2. Exams on public patients not included.
3. Exams privately-funded not included.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605046

Hospital beds

The number of hospital beds provides a measurement of the resources available for delivering services to inpatients in hospitals. This section presents data on the number of overall hospital beds in 2000 and 2015 and for different types of care (curative care, rehabilitative care, long-term care and other functions). It also presents an indicator of bed occupancy rates over time, focussing on curative care beds.

Among OECD countries, the number of hospital beds per capita remains highest in Japan and Korea, with 13.2 and 11.5 beds per 1 000 population in 2015 (Figure 9.7). In both countries, hospitals have so-called "social admissions", that is, a significant part of hospital beds are devoted to long-term care to tackle the increasing number of ageing population. The number of hospital beds is also well above the OECD average in the Russian Federation, Germany and Austria. On the other hand, some of the key partner countries in Asia (India and Indonesia) have very few hospital beds compared to the OECD average. This is also the case for countries in Latin America (Mexico, Colombia, Chile and Brazil).

The number of hospital beds per capita has decreased over the past decade in most OECD countries, falling on average from 5.6 per 1 000 population in 2000 to 4.7 in 2015. This reduction is part of a voluntary effort in most countries, partly driven by progress in medical technology, which has enabled a move to day surgery for a number of procedures and a reduced need for hospitalisation. In many European countries, the financial and economic crisis, which started in 2008, provided an additional stimulus to reduce hospital capacity in line with policies to reduce public spending on health. Only in Korea, China and Turkey have the numbers of hospital beds per capita grown since 2000. Generally, the largest decreases in the number of beds over time have been observed in countries with an initially high number of beds in 2000.

On average, about three-quarters of hospital beds (77%) are allocated for curative care across OECD countries (Figure 9.8). The rest are distributed between long-term care (12%), rehabilitation (9%), and other types of care (2%). However, in some countries, the share of beds allocated for rehabilitation and long-term care is much greater than the average. In Korea and Japan, for the reasons previously mentioned, 37% and 20% of hospital beds, respectively, are allocated for long-term care. In Finland, this share is also relatively high (28%), as local governments (municipalities) use beds in health care centres (which are defined as hospitals) for at least some of the institutional long-term care needs. In France, Germany and Poland, around a quarter of all hospital beds are devoted to rehabilitative care.

In several countries, the reduction in the number of hospital beds has been accompanied by an increase in their occupancy rates. The occupancy rate of curative care beds stood at 76% on average across OECD countries in 2015, only slightly above the 2000 level (Figure 9.9). This is because the general increase in occupancy rates (driven by the reduction in number of beds) is offset by a few large decreases in occupancy rates observed in Norway, Japan and Latvia, along with some smaller decreases in Switzerland, Germany, the Slovak Republic, Korea and more. Ireland and Israel had the highest rate of hospital bed occupancy at approximately 94%, followed by Canada at 92% and the United Kingdom at 84%.

Definition and comparability

Hospital beds are defined as all beds that are regularly maintained and staffed and are immediately available for use. They include beds in general hospitals, mental health and substance abuse hospitals, and other specialty hospitals. Beds in residential long-term care facilities are excluded (OECD, 2017).

Curative care beds accommodate patients where the principal intent is to do one or more of the following: cure illness or provide definitive treatment of injury, perform surgery, relieve symptoms of illness or injury (excluding palliative care), reduce severity of illness or injury, protect against exacerbation and/or complication of illness and/or injury which could threaten life or normal functions, perform diagnostic or therapeutic procedures, manage labour (obstetric). In some countries, these beds include all (curative and non-curative) psychiatric care beds.

Rehabilitative care beds accommodate patients with the principal intent to stabilise, improve or restore impaired body functions.

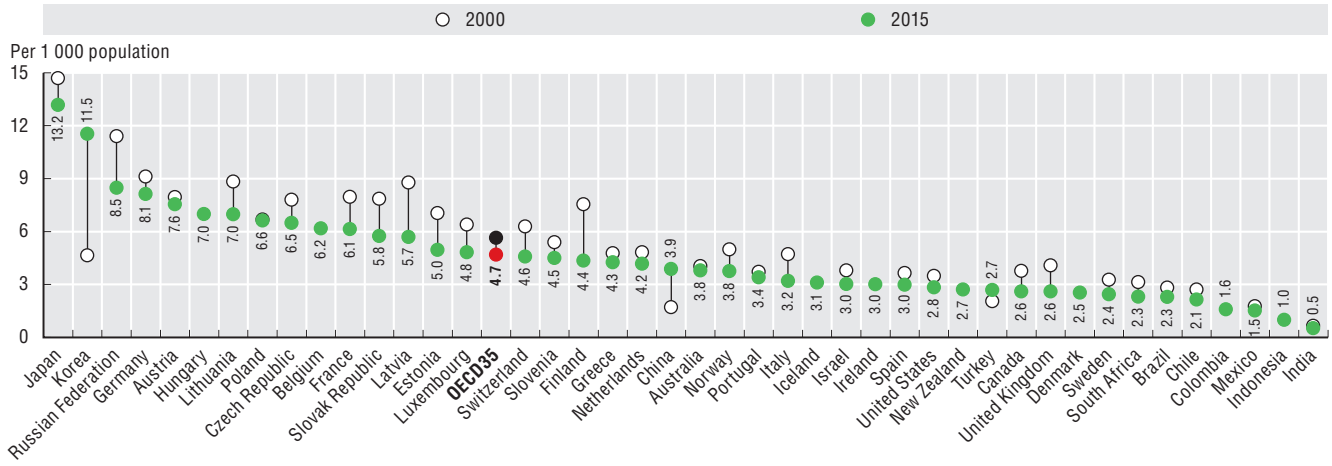
Long-term care beds are hospital beds accommodating patients requiring long-term care due to chronic impairments and a reduced degree of independence in activities of daily living. They include beds in long-term care departments of general hospitals, beds for long-term care in specialty hospitals, and beds for palliative care.

The occupancy rate for curative (acute) care beds is calculated as the number of hospital bed-days related to curative care divided by the number of available curative care beds (multiplied by 365).

References

OECD (2017), *OECD Health Statistics 2017*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/health-data-en*.

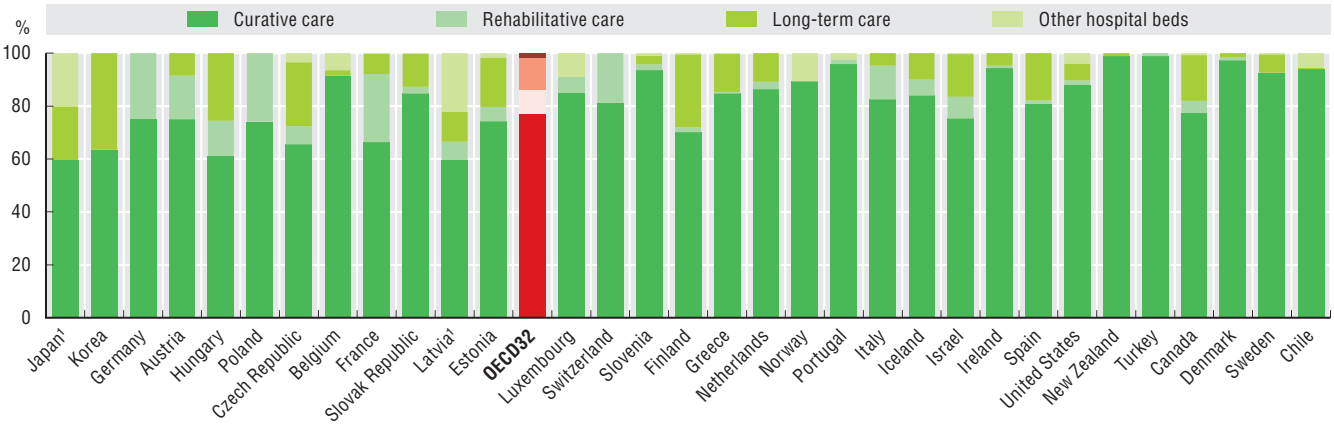
9.7. Hospital beds per 1 000 population, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605065

9.8. Hospital beds by function of health care, 2015 (or nearest year)



Note: Countries are ranked from highest to lowest total number of hospital beds per capita.
1. In Japan and Latvia, psychiatric care beds are reported in "other beds" rather than in the more specific categories.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605084

9.9. Occupancy rate of curative (acute) care beds, 2000 and 2015 (or nearest year)

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605103

Hospital discharges

Hospital discharge rates measure the number of patients who leave a hospital after staying at least one night. Together with the average length of stay, they are important indicators of hospital activities. Hospital activities are affected by a number of factors, including the capacity of hospitals to treat patients, the ability of the primary care sector to prevent avoidable hospital admissions, and the availability of post-acute care settings to provide rehabilitative and long-term care services.

In 2015, hospital discharge rates were highest in Austria and Germany, followed by Lithuania and the Russian Federation (Figure 9.10). They were the lowest in Colombia, Mexico, Brazil and Canada. In general, those countries that have more hospital beds tend to have higher discharge rates. For example, the number of hospital beds per capita in Austria and Germany is more than two-times greater than in Canada and Spain, and discharge rates are also more than two-times larger (see indicator on "Hospital beds").

Across OECD countries, the main conditions leading to hospitalisation in 2015 were circulatory diseases, pregnancy and childbirth, injuries and other external causes, diseases of the digestive system, cancers, and respiratory diseases.

Germany, Austria, Hungary and Latvia have the highest discharge rates for circulatory diseases; with Austria, Greece, Germany and Hungary the highest for cancers (Figures 9.11 and 9.12). While the high rates of hospital discharges for circulatory diseases in Hungary are associated with lots of people having heart and other circulatory diseases (see indicator on "Mortality from circulatory diseases" in Chapter 3), this is not the case for Germany and Austria. Similarly, cancer incidence is not higher in Austria, Germany or Greece than in most other OECD countries (see indicator on "Cancer incidence" in Chapter 3). In Austria, the high discharge rate is associated with a high rate of hospital readmissions for further investigation and treatment of cancer patients (European Commission, 2008).

Trends in hospital discharge rates vary widely across OECD countries. Since 2000, discharge rates have increased in some countries where discharge rates were low in 2000 and have increased rapidly since then (e.g. Korea, Turkey and China) as well as in other countries such as Germany where it was already above-average. In other countries (e.g. France, Portugal and the United States), they have remained relatively stable, while in other countries (e.g. Finland, Hungary, Iceland, Italy and Latvia), discharge rates fell between 2000 and 2015.

Trends in hospital discharges reflect the interaction of several factors. Demand for hospitalisation may grow as populations' age, given that older population groups account for a disproportionately high percentage of hospital discharges. However, population ageing alone may be a less important factor in explaining trends in hospitalisation rates than changes in medical technologies and clinical practices. The diffusion of new medical interventions often gradually extends to older population groups, as interventions become safer and more effective for people at older ages. But the diffusion of new medical technologies may also involve a reduction in hospitalisation if it involves a shift from procedures requiring overnight stays in hospitals to same-day procedures. In the group of countries where discharge rates have decreased since 2000, there has been a strong rise in the number of day surgeries (see indicator on "Ambulatory surgery"). The number of beds available in a hospital might also affect the timing of patient discharges, which in turn affects the average length of stay (see indicator on "Average length of stay in hospitals").

Hospital discharge rates vary not only across countries, but also within countries. In several OECD countries (e.g., Canada, Finland, Germany, Italy, Portugal, Spain and the United Kingdom), hospital medical admissions (excluding admissions for surgical interventions) vary by more than two-times across different regions in the country (OECD, 2014).

Definition and comparability

Discharge is defined as the release of a patient who has stayed at least one night in hospital. It includes deaths in hospital following inpatient care. Same-day discharges are usually excluded, with the exceptions of Chile, Japan, Norway, the Slovak Republic and the United States which include some same-day separations.

Healthy babies born in hospitals are excluded from hospital discharge rates in several countries (Australia, Austria, Canada, Chile, Estonia, Finland, Greece, Ireland, Luxembourg, Mexico, Norway). These comprise around 3 to 10% of all discharges. Data for some countries do not cover all hospitals. For instance, data for Mexico, New Zealand and the United Kingdom are restricted to public or publicly-funded hospitals only. Data for Ireland cover public acute and psychiatric (public and private) hospitals. Data for Canada and the United States include only acute care/short-stay hospitals.

References

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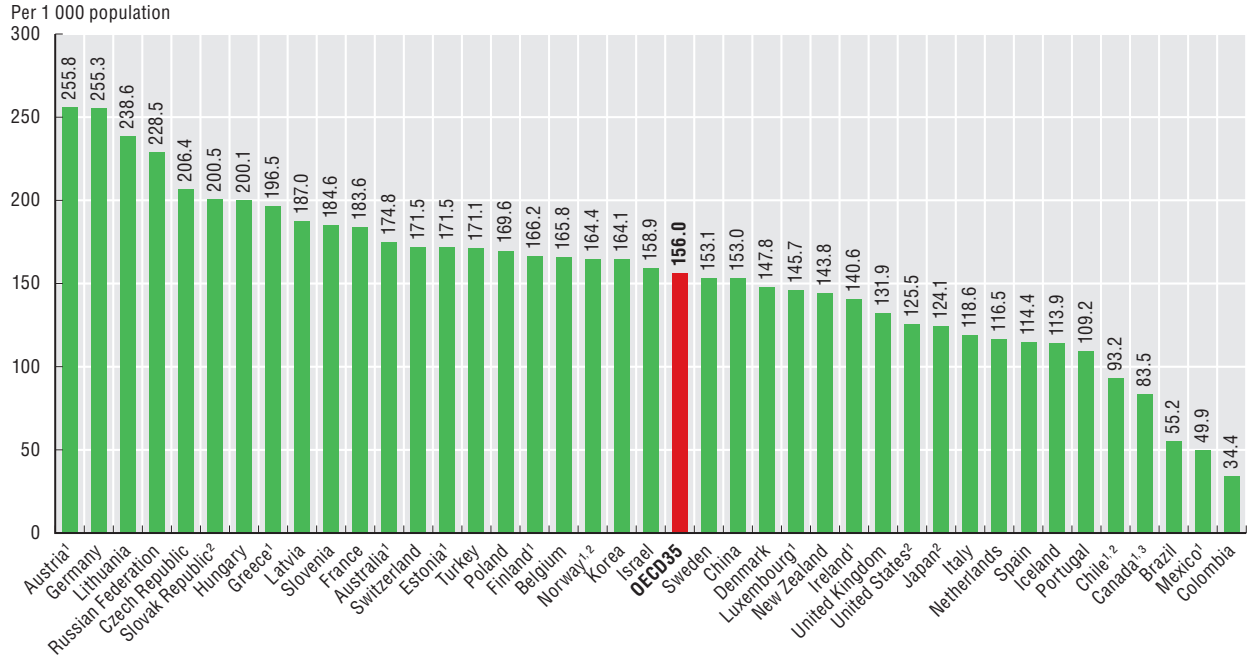
OECD (2014), *Geographic Variations in Health Care: What Do We Know and What Can Be Done to Improve Health System Performance?*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264216594-en*.

9.10. Hospital discharges, 2015 (or nearest year)

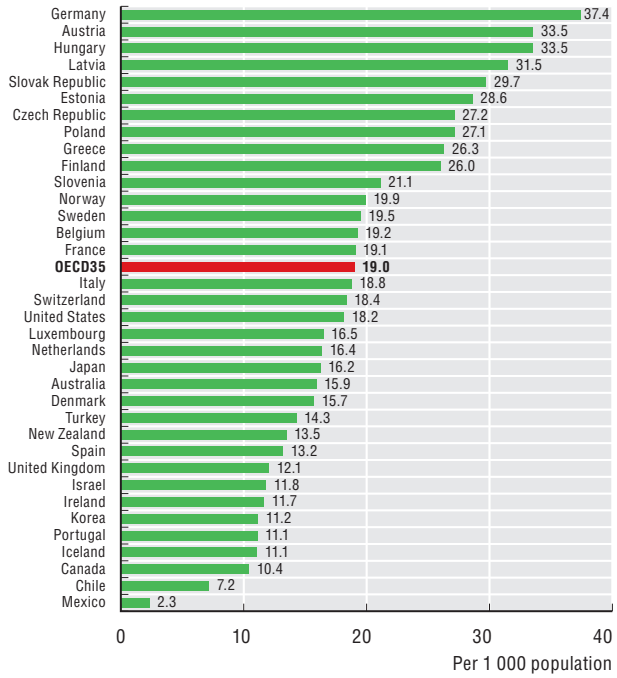


1. Data exclude discharges of healthy babies born in hospital (between 3-10% of all discharges).
2. Data include same-day discharges.
3. Data for Canada include discharges for curative (acute) care only.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605122

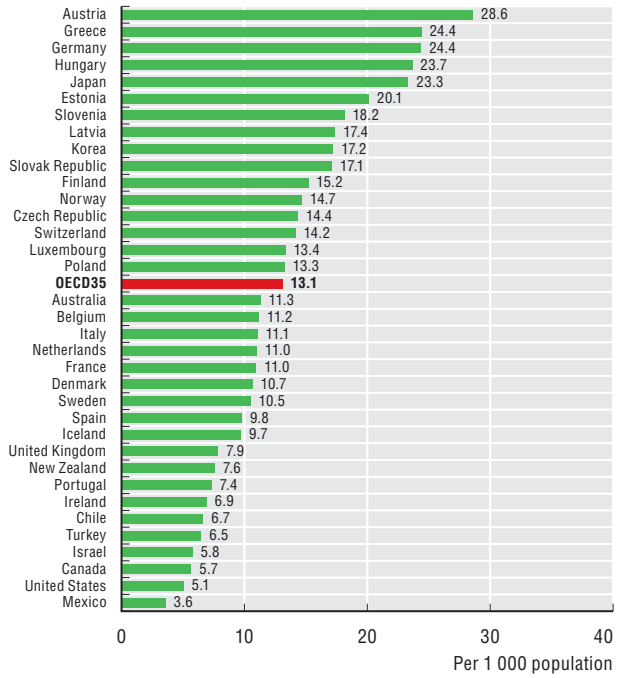
9.11. Hospital discharges for circulatory diseases, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605141

9.12. Hospital discharges for cancers, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605160

Average length of stay in hospitals

The average length of stay in hospitals is often regarded as an indicator of efficiency. All else being equal, a shorter stay will reduce the cost per discharge and shift care from inpatient to less expensive post-acute settings. Longer stays can be indicative of poor-value care: inefficient hospital processes may cause delays in providing treatment; errors and poor-quality care may mean patients need further treatment or recovery time; poor care co-ordination may leave people stuck in hospital waiting for ongoing care to be arranged. At the same time, some people may be discharged too early, when staying in hospital longer could have improved their outcomes or reduced chances of re-admission.

In 2015, the average length of stay in hospitals for all causes across OECD countries was about eight days (Figure 9.13). Turkey and Mexico had the shortest stays, with about four days, whereas Japan and Korea had the longest stays, with over 16 days. In most countries, the average length of stay has fallen since 2000, with reductions particularly large in Japan, Switzerland, the United Kingdom and Israel. However, the average length of stay increased in Korea and Hungary, with very slight increases in Italy, Canada and South Africa.

Focusing on specific diseases or conditions can remove some of the effect of different case mix and severity. Average length of stay following birth by normal delivery was slightly less than three days on average in 2015 (Figure 9.14). This ranged from less than two days in Mexico, Turkey, the United Kingdom, Canada, Iceland and the Netherlands, to around five days in the Slovak Republic and Hungary. In almost all OECD countries, the average length of stay following a delivery has fallen since 2000.

The average length of stay following acute myocardial infarction was 6.5 days on average in 2015. It was shortest in Scandinavian countries (Norway, Denmark and Sweden), Turkey and the Slovak Republic, at fewer than five days, and highest in Chile and Germany, at more than ten days (Figure 9.15). Average length of stay following acute myocardial infarction has fallen in all OECD countries since 2000, with reductions particularly marked in Austria, Finland and the Slovak Republic.

Beyond differences in clinical need, several factors can explain these cross-country variations. The combination of an abundant supply of beds with the structure of hospital payments may provide hospitals with incentives to keep patients longer. A growing number of countries (France, Germany, Poland) have moved to prospective payment methods, often based on diagnosis-related groups (DRGs), to set payments based on the estimated cost of hospital care in advance of service provision. These payment methods encourage providers to reduce the cost of each episode of care. In Switzerland, cantons which moved from per diem payments to DRG-based payments have experienced a reduction in their lengths of stay (OECD and WHO, 2011).

Strategic reductions in hospital bed numbers alongside development of community care services can also be expected to shorten average length of stay, as seen in Denmark's quality-driven reforms of the hospital sector (OECD, 2013). Other options include promoting the uptake of less invasive surgical procedures, the expansion of early discharge programmes which enable patients to return home to receive follow-up care, and support for hospitals to improve care co-ordination.

A few countries also collect data on delayed discharges – the number of days that people stay in hospital after a doctor declares them ready to be discharged or transferred. This provides a more precise measure of when a stay in a hospital is unnecessarily long. Denmark reported just under 10 additional bed days per 1 000 population in 2014, a figure that has been relatively stable over time. Norway saw a sharp drop in delayed discharges, from 28 additional bed days per 1 000 population in 2011 to about 12 in 2015. Within the United Kingdom, England saw a significant increase since 2013, reaching over 30 additional bed days per 1 000 population in 2015. In England, this increase largely reflects ongoing health or social care services not being ready to receive patients (OECD 2017).

Definition and comparability

Average length of stay refers to the average number of days that patients spend in hospital. It is generally measured by dividing the total number of days stayed by all inpatients during a year by the number of admissions or discharges. Day cases are excluded. The data cover all inpatient cases (including not only curative/acute care cases) for most countries, with the exceptions of Canada, Japan and the Netherlands where the data refer to curative/acute care only (resulting in an under-estimation).

Healthy babies born in hospitals are excluded from hospital discharge rates in several countries (Australia, Austria, Canada, Chile, Estonia, Finland, Greece, Ireland, Luxembourg, Norway, Mexico), resulting in a slight over-estimation of the length of stay (e.g. the inclusion of healthy newborns would reduce the ALOS by 0.5 days in Canada). These comprise around 3 to 10% of all discharges.

Data for normal delivery refer to ICD-10 code O80; for AMI they refer to ICD-10 codes I21-I22.

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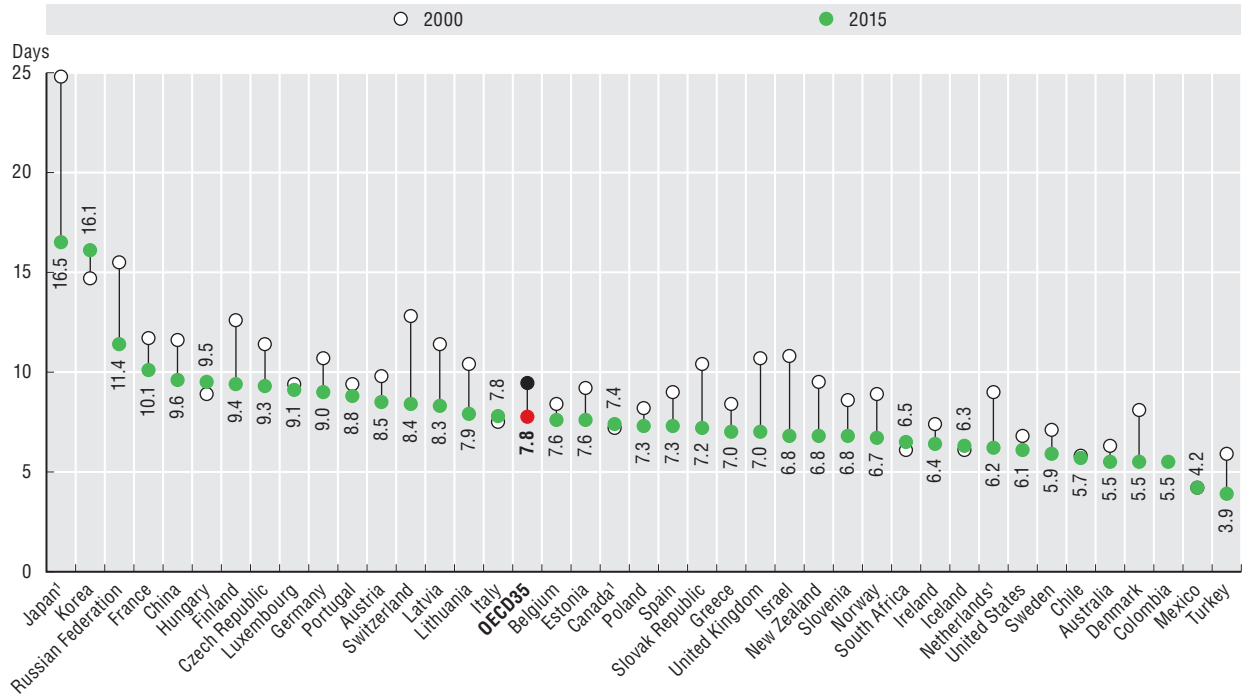
9.13. Average length of stay in hospital, 2000 and 2015 (or nearest year)

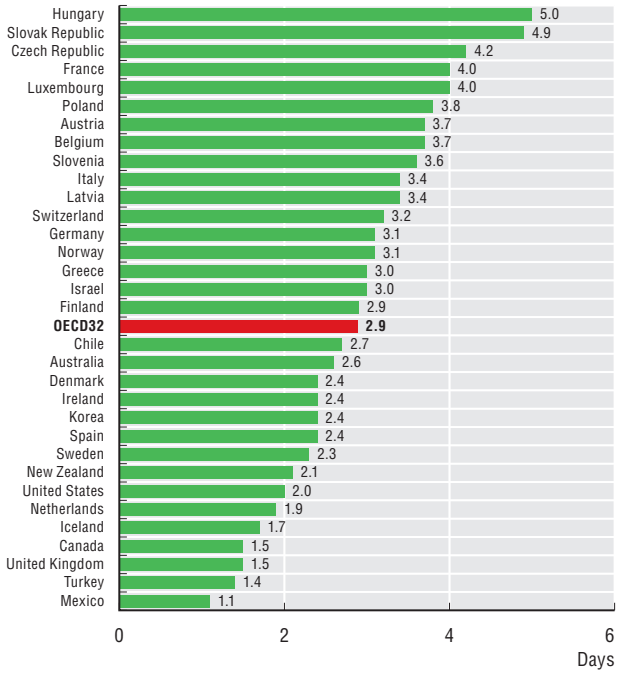


1. Data refer to average length of stay for curative (acute) care (resulting in an under-estimation). In Japan, the average length of stay for all inpatient care was 29 days in 2015 (down from 39 days in 2000).

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605179

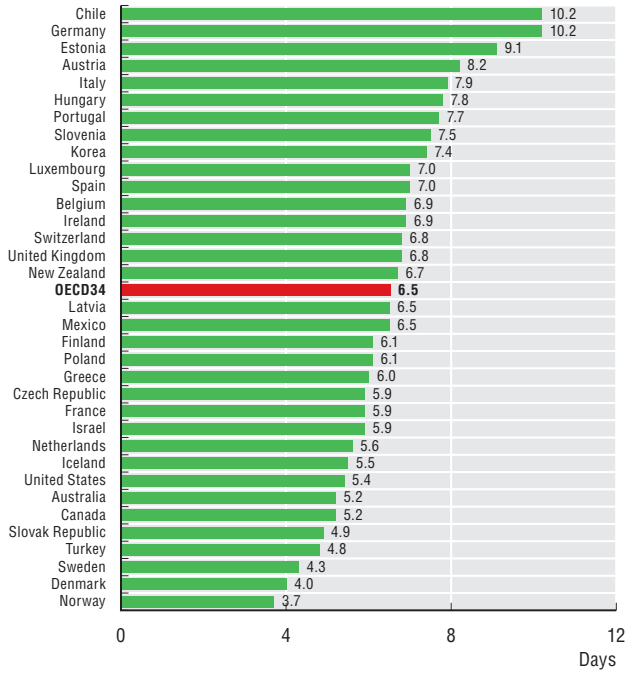
9.14. Average length of stay for normal delivery, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605198

9.15. Average length of stay for acute myocardial infarction (AMI), 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605217

Hip and knee replacement

Significant advances in surgical treatment have provided effective options to reduce the pain and disability associated with certain musculoskeletal conditions. Joint replacement surgery (hip and knee replacement) is considered the most effective intervention for severe osteoarthritis and hip fractures, reducing pain and disability and restoring some patients to near normal function.

Osteoarthritis is one of the ten most disabling diseases in developed countries. Worldwide, estimates show that 10% of men and 18% of women aged over 60 years have symptomatic osteoarthritis, including moderate and severe forms (WHO, 2014). Age is the strongest predictor of the development and progression of osteoarthritis. It is more common in women, increasing after the age of 50 especially in the hand and knee. Other risk factors include obesity, physical inactivity, smoking, excessive alcohol consumption and injuries. While joint replacement surgery is mainly carried out among people aged 60 and over, it can also be performed on people at younger ages.

In 2015, Switzerland, Germany, Austria and Belgium had the highest rates for both of hip and knee replacement (Figures 9.16 and 9.17). In Mexico and Chile, the rates of hip and knee replacement are particularly low, with less than 40 hip replacements and less than 10 knee replacements per 100 000 population. Differences in population structure may explain part of this variation across countries, and age standardisation reduces it to some extent. Still, large differences persist and the country ranking does not change significantly after age standardisation (McPherson et al., 2013; OECD 2014).

National averages can mask important variation in hip and knee replacement rates within countries. In Australia, Canada, Germany, France and Italy, the rate of knee replacement is more than two times higher in certain regions compared with others, even after age-standardisation (OECD, 2014).

The number of hip and knee replacements has increased rapidly since 2000 in most OECD countries (Figures 9.18 and 9.19). On average, the rate of hip replacement increased by 30% between 2000 and 2015 and the rate of knee replacement nearly doubled. For hip replacement, most OECD countries show increasing trends of varying degrees, but countries like Ireland and Portugal show much slower growth than the average, with Ireland being the only OECD country to show a decrease in hip replacement rates from 2000. Similarly, knee surgeries have seen a large increase in the past decades in all OECD countries, with the exception of Chile and Estonia, which showed small decreases in the past few years.

Definition and comparability

Hip replacement is a surgical procedure in which the hip joint is replaced by a prosthetic implant. It is generally conducted to relieve arthritis pain or treat severe physical joint damage following hip fracture.

Knee replacement is a surgical procedure to replace the weight-bearing surfaces of the knee joint in order to relieve the pain and disability of osteoarthritis. It may also be performed for other knee diseases such as rheumatoid arthritis.

Classification systems and registration practices vary across countries, which may affect the comparability of the data. While most countries include both total and partial replacement, some countries only include total hip replacement. In Ireland, Mexico, New Zealand and the United Kingdom, the data only include activities in publicly-funded hospitals, therefore underestimating the number of total procedures presented here (for example, approximately 15% of all hospital activity in Ireland is undertaken in private hospitals). Data for Portugal relate only to public hospitals on the mainland. Data for Spain only partially include activities in private hospitals.

References

McPherson, K., G. Gon and M. Scott (2013), "International Variations in a Selected Number of Surgical Procedures", *OECD Health Working Papers*, No. 61, OECD Publishing, Paris, *http://dx.doi.org/10.1787/5k49h4p5g9mw-en*.

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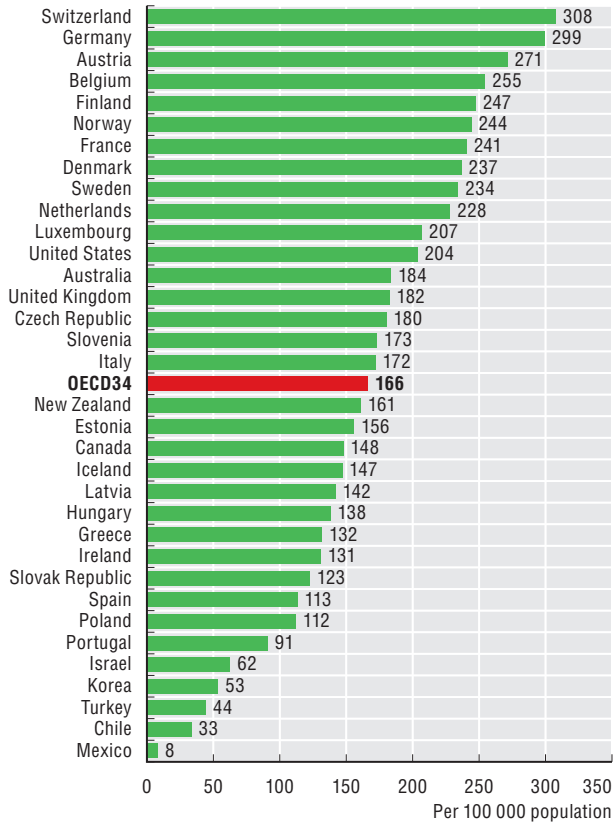
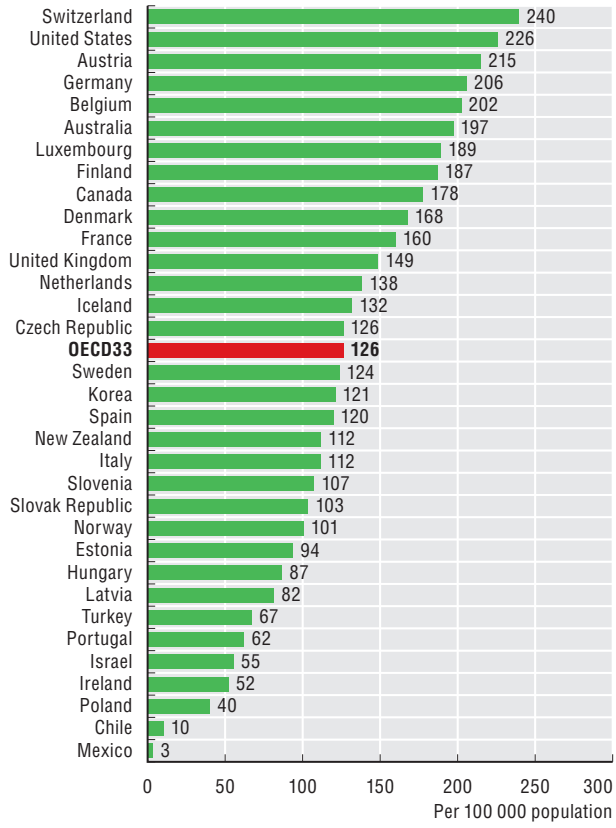
9.16. Hip replacement surgery, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605236

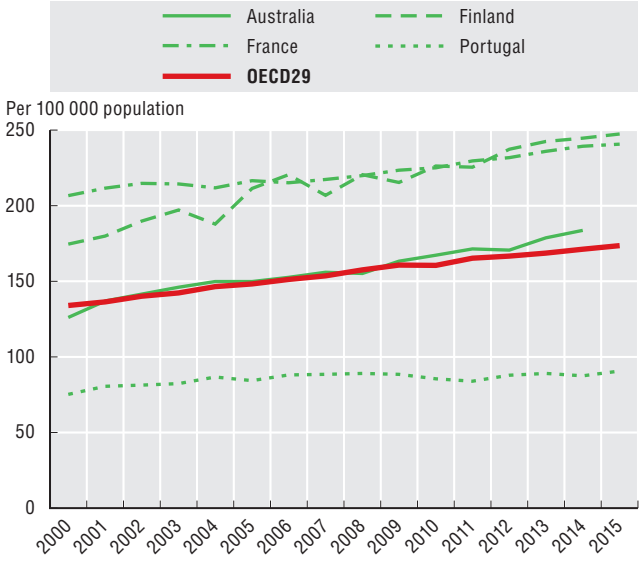
9.17. Knee replacement surgery, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605255

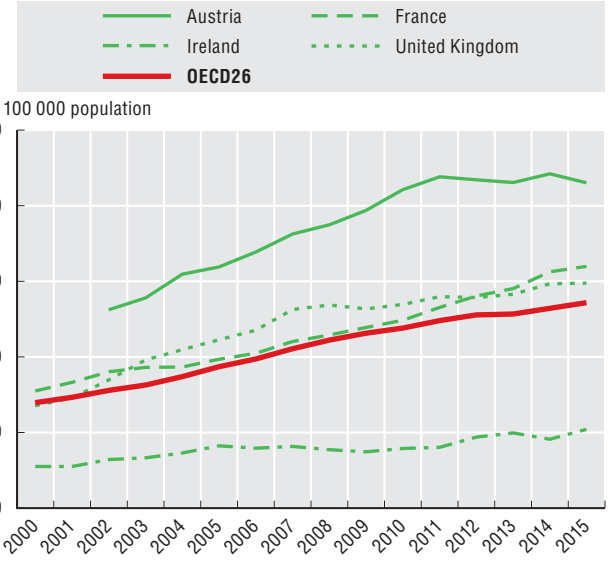
9.18. Hip replacement surgery trends, 2000 to 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605274

9.19. Knee replacement surgery trends, 2000 to 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605293

Caesarean sections

Rates of caesarean delivery have increased over time in nearly all OECD countries, although in a few countries this trend has reversed, at least slightly, in the past few years. Reasons for the increase include the rise in first births among older women and in multiple births resulting from assisted reproduction, malpractice liability concerns, scheduling convenience for both physicians and patients, and the increasing preference of some women to have a caesarean delivery. Nonetheless, caesarean delivery continues to result in increased maternal mortality, maternal and infant morbidity, and increased complications for subsequent deliveries, raising questions about the appropriateness of caesarean deliveries that may not be medically required.

In 2015, much as in previous years, caesarean section rates were lowest in Nordic countries (Iceland, Finland, Sweden and Norway), Israel and the Netherlands, with rates ranging from 15% to 17% of all live births (Figure 9.20). They were highest in Turkey, Mexico and Chile, with around one out of two live births delivered by caesarean section.

Caesarean rates have increased since 2000 in most OECD countries, with the average rising from 20% in 2000 to 28% in 2015, although the rate of growth seems to have slowed over the past 5 years (Figure 9.21). Growth rates have been particularly rapid in Poland, the Slovak Republic and the Czech Republic which have historically had relatively low rates, as well as some of the countries with the highest rates today (Turkey, Korea). In other countries, the growth rate has shown a notable slowing since the mid-2000s, such as in Israel, Finland and Sweden. In Italy, caesarean rates have come down significantly in recent years, although they remain among the highest in Europe.

There can be substantial variations in caesarean rates across regions and hospitals within the same country. In Italy, there continue to be huge variations in caesarean rates, mainly driven by the southern regions of the country. Spain shows similar large variations across its regions (OECD, 2014).

In several countries, there is evidence that private hospitals tend to perform more caesarean sections than public hospitals. In France, private for-profit hospitals authorised to provide maternity care for pregnancies without complications have caesarean rates as high as public hospitals which have to deal with more complicated cases (FHF, 2008). In Switzerland, caesarean sections have been found to be substantially higher in private clinics (41%) than in public hospitals (30.5%) (OFSP, 2013).

A number of countries have taken different measures to reduce unnecessary caesarean sections. Public reporting, provider feedback, the development of clearer clinical guidelines, and adjustments to financial incentives have been used to try to reduce the inappropriate use of caesareans. In Australia, where caesarean section rates are high relative to most OECD countries, a number of States have developed clinical guidelines and required reporting of hospital caesarean section rates, including investigation of performance against the guidelines. These measures have discouraged variations in practice and contributed to slowing down the rise in caesarean sections. Other countries have reduced the gap in hospital payment rates between a caesarean section and a normal delivery, with the aim to discourage the inappropriate use of caesareans (OECD, 2014).

Definition and comparability

The caesarean section rate is the number of total caesarean deliveries performed per 100 live births.

In Ireland, Mexico, New Zealand and the United Kingdom, the data only include activities in publicly-funded hospitals (though for Ireland all of maternity units are located in publicly-funded hospitals). This may lead to an underestimate of caesarean section rates in these countries, since there is some evidence that private hospitals tend to perform more caesarean sections than public hospitals.

References

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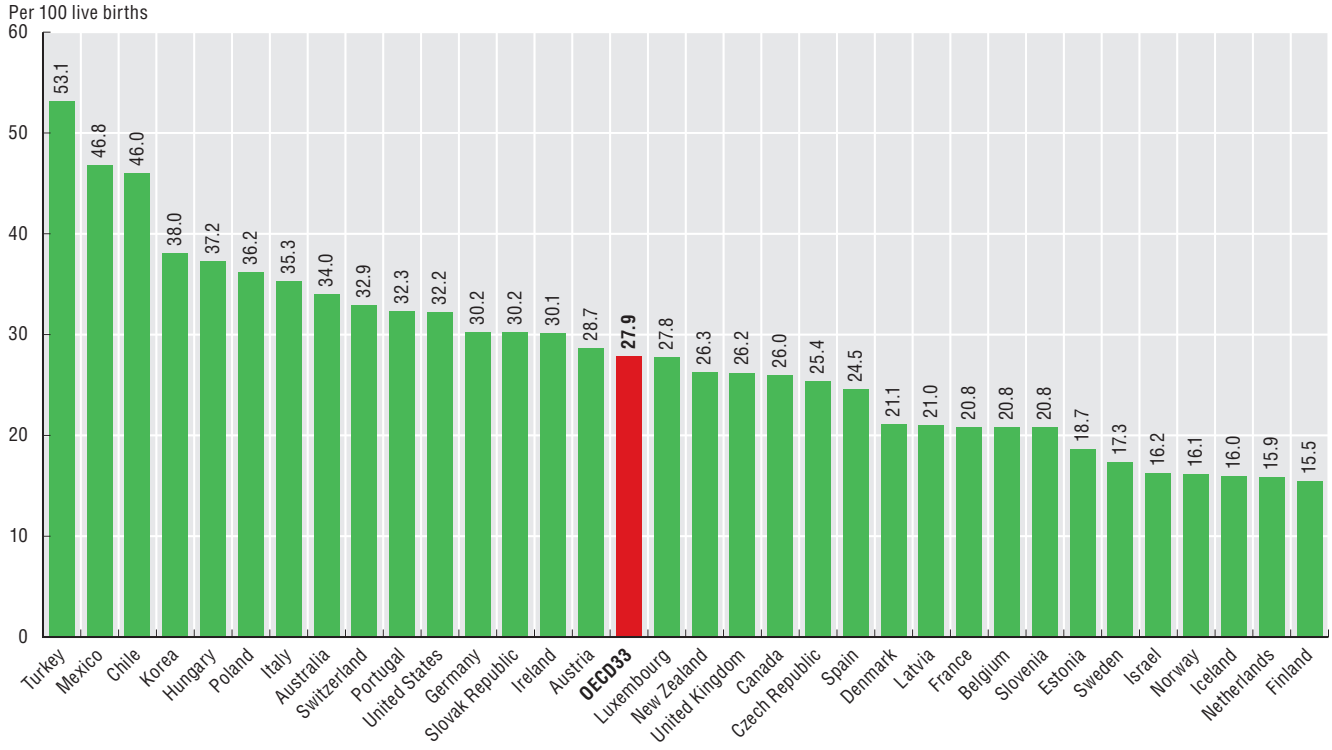
OECD (2014), *Geographic Variations in Health Care: What Do We Know and What Can Be Done to Improve Health System Performance?*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264216594-en*.

OFSP – Office fédéral de la santé publique (2013), *Accouchements par césarienne en Suisse* [Births by caesareans in Switzerland], Bern.

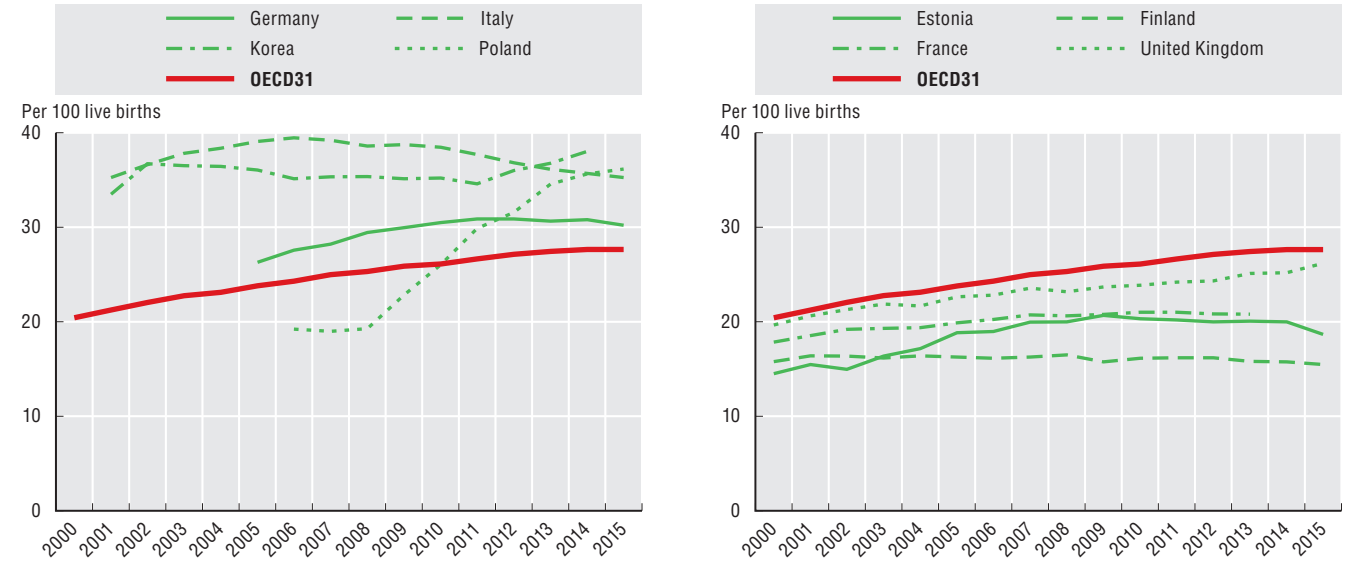
9.20. Caesarean section rates, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605312

9.21. Caesarian section trends in selected OECD countries, 2000 to 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605331

Ambulatory surgery

In the past few decades, the number of surgical procedures carried out on a same-day basis has markedly increased in OECD countries. Advances in medical technologies – in particular the diffusion of less invasive surgical interventions – and better anaesthetics have made this development possible. These innovations have improved patient safety and health outcomes, and have also, in many cases, reduced the unit cost per intervention by shortening the length of stay in hospitals. However, the impact of the rise in same-day surgeries on overall health spending may not be straightforward since the reduction in unit cost (compared to inpatient surgery), may be offset by the overall growth in the volume of procedures performed. There is also a need to take into account any additional cost related to post-acute care and community health services following the interventions.

Cataract surgery and tonsillectomy provide good examples of high-volume surgeries which are now carried out mainly on a same-day basis in many OECD countries.

Day surgery now accounts for 90% or more of all cataract surgeries in a majority of OECD countries (Figure 9.22). In several countries, nearly all cataract surgeries are performed as day cases. However, the use of day surgery is still relatively low in Poland, Turkey, Hungary, the Slovak Republic and Mexico, where they still account for less than two thirds of all cataract surgeries. While this may be partly explained by limitations in the data coverage of outpatient activities in hospital or outside hospital, this may also reflect more advantageous reimbursement for inpatient stays or constraints on the development of day surgery.

The number of cataract surgeries performed on a same-day basis has grown very rapidly since 2000 in many countries, such as Portugal and Austria (Figure 9.22). Whereas fewer than 10% of cataract surgeries in Portugal were performed on a same-day basis in 2000, this proportion has increased to 97% by 2015. In Austria, the share of cataract surgeries performed as day cases increased from 1% only in 2000 to 75% in 2015. The number of cataract surgeries carried out as day cases has also risen rapidly in many other countries, with many of them carrying out 90% or more cases as ambulatory in 2015.

Tonsillectomy is one of the most frequent surgical procedures on children, usually performed on children suffering from repeated or chronic infections of the tonsils or suffering from breathing problems or obstructive sleep apnea due to large tonsils. Although the operation is performed under general anaesthesia, it is now carried out mainly as a same-day surgery in several countries, with children returning home the same day (Figure 9.23). However, the percentage of cases is not yet as high as for cataract, with a 34% OECD average and a maximum of 86% in Finland. Many countries still lag behind, but show signs of catching up. These large differences in the share of same-day surgery may reflect variations in the perceived risks of postoperative complications, or simply clinical traditions of keeping children for at least one night in hospital after the operation.

Financial incentives can affect the extent to which minor surgeries are conducted on a same-day basis. In Hungary, budget caps for same-day surgery financially discouraged the practice. A recent policy change to abolish this budget cap is expected to increase the rates of same-day surgeries for cataracts and other minor surgeries. In Denmark and France, diagnostic-related group (DRG) systems have been adjusted to incentivise same-day surgery. In the United Kingdom, a financial incentive of approximately GBP 300 per case was awarded for selected surgical procedures if the patient was managed on a day-case basis (OECD, 2017).

Definition and comparability

Cataract surgery consists of removing the lens of the eye because of the presence of cataracts which are partially or completely clouding the lens, and replacing it with an artificial lens. It is mainly performed on elderly people. Tonsillectomy consists of removing the tonsils, glands at the back of the throat. It is mainly performed on children.

The data for several countries do not include outpatient cases in hospital or outside hospital (i.e., patients who are not formally admitted and discharged), leading to some under-estimation. In Ireland, Mexico, New Zealand and the United Kingdom, the data only include cataract surgeries carried out in public or publicly-funded hospitals, excluding any procedures performed in private hospitals (in Ireland, it is estimated that approximately 15% of all hospital activity is undertaken in private hospitals). Data for Portugal relate only to public hospitals on the mainland. Data for Spain only partially include activities in private hospitals.

References

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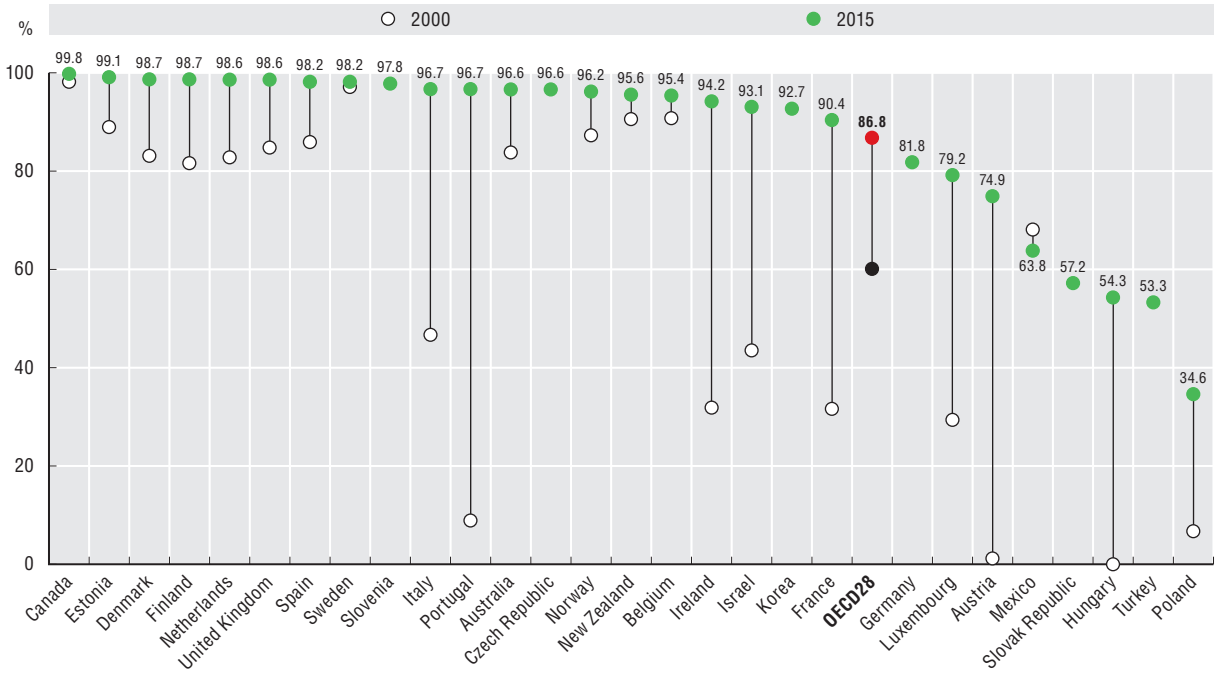
9.22. Share of cataract surgeries carried out as ambulatory cases, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

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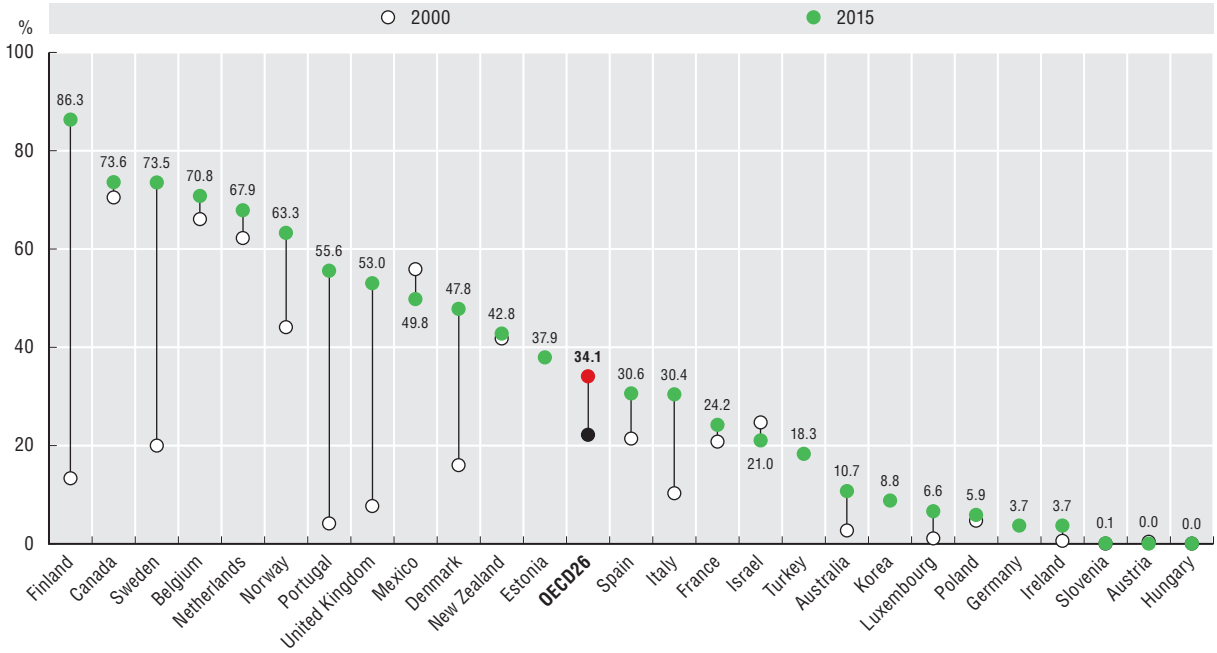
9.23. Share of tonsillectomy carried out as ambulatory cases, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

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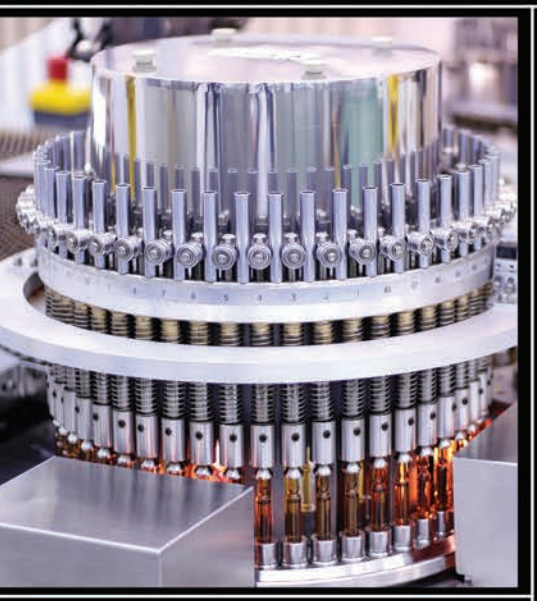

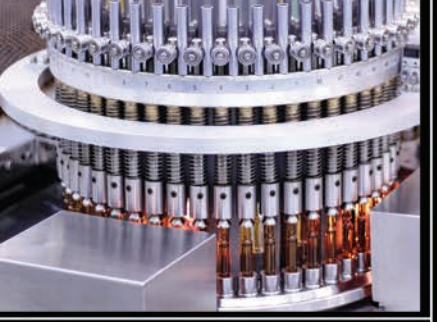

10. PHARMACEUTICAL SECTOR

Pharmaceutical expenditure

Pharmacists and pharmacies

Pharmaceutical consumption

Share of generic market

Research and development in the pharmaceutical sector

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Pharmaceutical expenditure

Pharmaceuticals play a vital role in the health system. Policymakers need to balance access for new medicines while providing the right incentives to industry and acknowledging that health care budgets are limited. After inpatient and outpatient care, pharmaceuticals represent the third largest expenditure item of health care spending; accounting for more than a sixth (16%) of health expenditure on average across OECD countries in 2015 (not taking into account spending on pharmaceuticals in hospitals).

Similar to other health care functions, the cost of pharmaceuticals is predominantly covered by government financing or compulsory insurance schemes (Figure 10.1). Across OECD countries, these schemes cover on average around 57% of all retail pharmaceutical spending, with out-of-pocket payments (39%) and voluntary private insurance (4%) financing the remaining part. Coverage is most generous in Germany and Luxembourg where government and compulsory insurance schemes pay for 80% or more of all pharmaceutical costs. In eight OECD countries, public or mandatory schemes cover less than half the amount spent on medicines. This is the case in Poland (34%), Latvia (35%), Canada and the United States (both 36%). In these countries, voluntary private insurance or out-of-pocket payments play a much bigger role in financing pharmaceuticals.

The total retail pharmaceutical bill across OECD countries was more than USD 800 billion in 2015. However, there are wide variations in pharmaceutical spending per capita across countries, reflecting differences in volume, patterns of consumption and pharmaceutical prices, as well as in the use of generics (Figure 10.2). The United States spent far more on pharmaceuticals than any other OECD country on a per capita basis (USD 1 162), and more than double the OECD average. Switzerland (USD 982) and Japan (USD 798) also spent significantly more on medicines per capita than other OECD countries. At the other end of the scale, Denmark (USD 282), Israel (USD 313) and Estonia (USD 326) had relatively low spending levels.

Around 80% of total retail pharmaceutical spending is for prescribed medicines, with the rest spent on over-the-counter medicines (OTC). OTC medicines are pharmaceuticals that can generally be bought without prescription and their costs are in most cases fully borne by patients. The share of OTC medicines is particularly high in Poland, accounting for half of pharmaceutical spending, but also in Spain (34%) and Australia (31%).

Average annual pharmaceutical spending growth in the 2009-15 period has been much lower compared with pre-crisis years (Figure 10.3). Between 2009 and 2015, expenditure on pharmaceuticals dropped by 0.5% per year on average across the OECD – mainly driven by cuts in spending by government or compulsory schemes and patent expiry of some "blockbuster" pharmaceuticals – while it increased by 2.3% each year in the 2003-09 period. The reduction was particularly steep in European countries that were affected by the economic and financial crisis, such as Greece (-6.5%), Portugal (-5.9%) and Ireland (-4.4%). As a response to mounting pressures on public budgets, many governments made reducing pharmaceutical expenditure a priority to rein in public spending. The policy measures included the de-listing of products (i.e. excluding them from reimbursement) and the introduction or increase of user charges for retail prescription drugs (Belloni et al., 2016).

In more recent years a number of countries, including Germany, Switzerland, Belgium and the United States have seen the return of higher pharmaceutical spending growth again, partly due to steep increases in spending for certain high cost drugs such as Hepatitis C drugs or oncology drugs.

Definition and comparability

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. Final expenditure on pharmaceuticals includes wholesale and retail margins and value-added tax. 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 (data available suggests that their inclusion would add another 10-20% to pharmaceutical spending). Comparability issues exist with regards to the administration and dispensing of pharmaceuticals for outpatients in hospitals. In some countries the costs are included under curative care whereas in others under pharmaceuticals.

Pharmaceutical expenditure per capita is adjusted to take account of differences in purchasing power.

References

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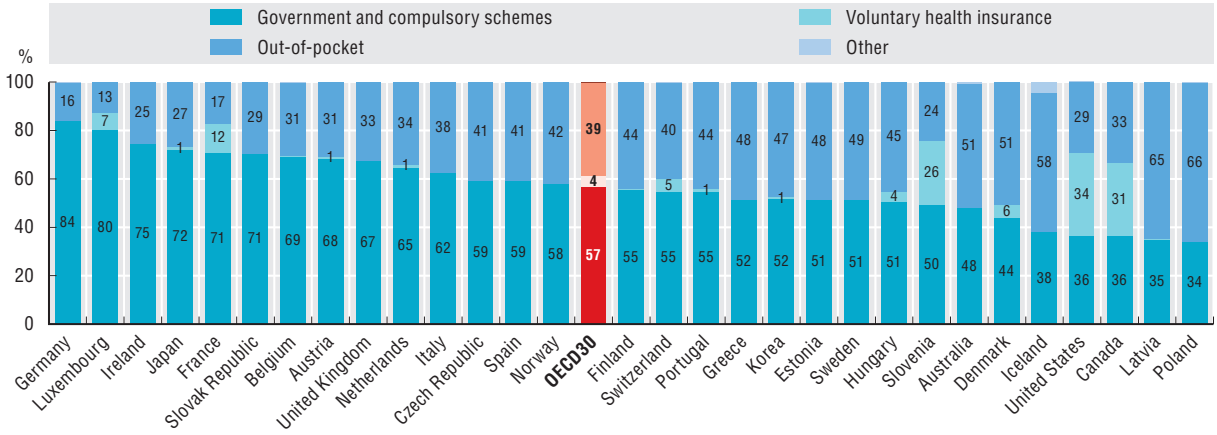
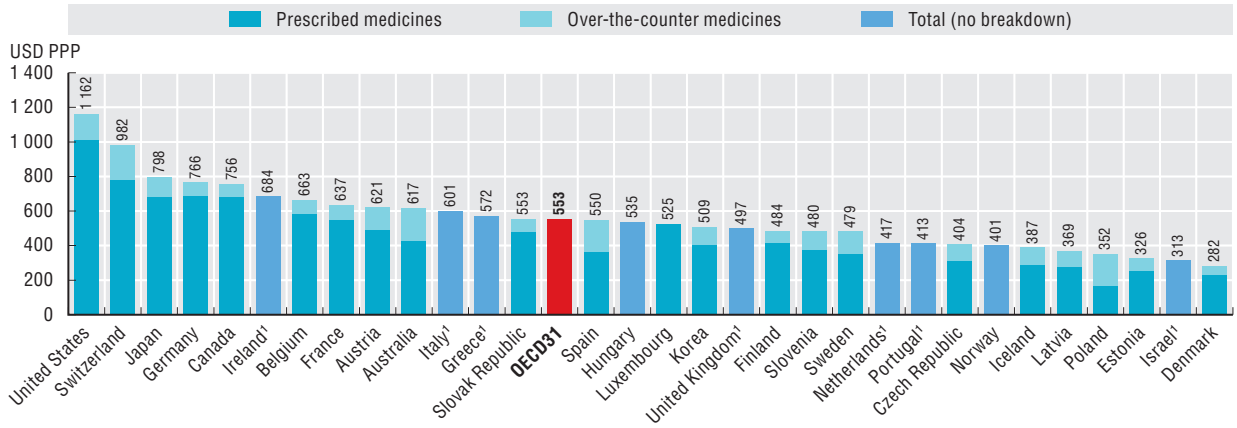
10.1. Expenditure on retail pharmaceuticals[1] by type of financing, 2015 (or nearest year)



Note: "Other" includes financing from non-profit-schemes, enterprises and the rest of the world.
1. Includes medical non-durables.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605388

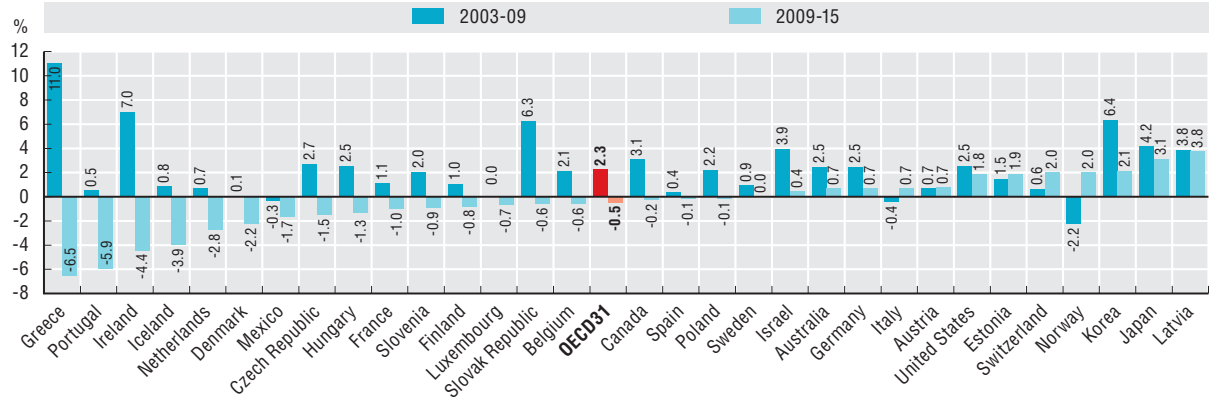
10.2. Expenditure on retail pharmaceuticals per capita, 2015 (or nearest year)



1. Includes medical non-durables (resulting in an overestimation of around 5-10%).
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605407

10.3. Average annual growth in retail pharmaceutical expenditure[1] per capita, in real terms, 2003-09 and 2009-15 (or nearest period)



1. Includes medical non-durables.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605426

Pharmacists and pharmacies

Pharmacists are educated and trained health care professionals who manage the distribution of medicines to consumers/patients and help ensure their safe and efficacious use. The role of the pharmacist has changed over recent years. Although their main role is to dispense medications in retail pharmacies, pharmacists are increasingly providing direct care to patients (e.g. flu vaccinations in Ireland and New Zealand, medicine adherence support in Australia, Japan, England and New Zealand), both in community pharmacies and as part of integrated health care provider teams.

Between 2000 and 2015, the number of pharmacists has increased by 30% in OECD countries. Japan has by far the highest density of pharmacists, at twice the OECD average, while the density of pharmacists is low in Turkey, Chile and the Netherlands (Figure 10.4). Between 2000 and 2015, the number of pharmacists per capita has increased in nearly all OECD countries, with the exception of Switzerland. It increased most rapidly in Portugal, Spain, Slovenia and the Slovak Republic.

In Japan, the increase in the number of pharmacists can be largely attributed to the government's efforts to separate more clearly drug prescribing by doctors from drug dispensing by pharmacists (the Bungyo system). Traditionally, the vast majority of prescription drugs in Japan were dispensed directly by doctors. However, in recent decades, the Japanese government has taken a number of steps to encourage the separation of drug prescribing from dispensing.

Most pharmacists work in community retail pharmacies, but some also work in hospital, industry, research and academia (FIP, 2015). For instance, in Canada more than three-quarters of practising pharmacists worked in a community pharmacy, while about 20% worked in hospitals and other health care facilities in 2012 (CIHI, 2015). In Japan, around 55% of pharmacists worked in community pharmacies in 2014, while around 20% worked in hospitals or clinics and the other 25% worked in other settings (Survey of Physicians, Dentists and Pharmacists 2014).

Variation in the number of community pharmacies across OECD countries (Figure 10.5) can be explained by the different dispensing channels for medicines. In addition to community pharmacies, medicines can be dispensed through hospital pharmacies (both for inpatient and outpatient use) or can be provided directly by doctors in some countries. For example, the relatively low number of community pharmacies in the Netherlands may be partly explained by the fact that patients can also purchase their prescription drugs directly from some doctors (Vogler et al., 2012). Denmark has fewer community pharmacies, but these are often large, including branch pharmacies and supplementary pharmacy units attached to the main pharmacy (Vogler et al., 2012).

The range of products and services provided by the pharmacies varies across countries. In most European countries, for example, pharmacies can also sell cosmetics, food supplements, medical devices and homeopathic products. In a few countries pharmacies can also sell reading glasses and didactic toys (Martins et al., 2015).

Definition and comparability

Practising pharmacists are defined as the number of pharmacists who are licensed to practice and provide direct services to clients/patients. They can be either salaried or self-employed, and work in community pharmacies, hospitals and other settings. Assistant pharmacists and the other employees of pharmacies are normally excluded.

In Ireland, the figures include all pharmacists registered with the Pharmaceutical Society of Ireland, possibly including some pharmacists who are not in activity. Assistant pharmacists are included in Iceland.

Community pharmacies are premises which in accordance to the local legal provisions and definitions may operate as a facility in the provision of pharmacy services in the community settings. The number of community pharmacies reported are the number of premises where dispensing of medicines happened under the supervision of a pharmacist.

References

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FIP – International Pharmaceutical Fededation (2015), "Global Trends Shaping Pharmacy – Regulatory Frameworks, Distribution of Medicines and Professional Services. 2013-2015".

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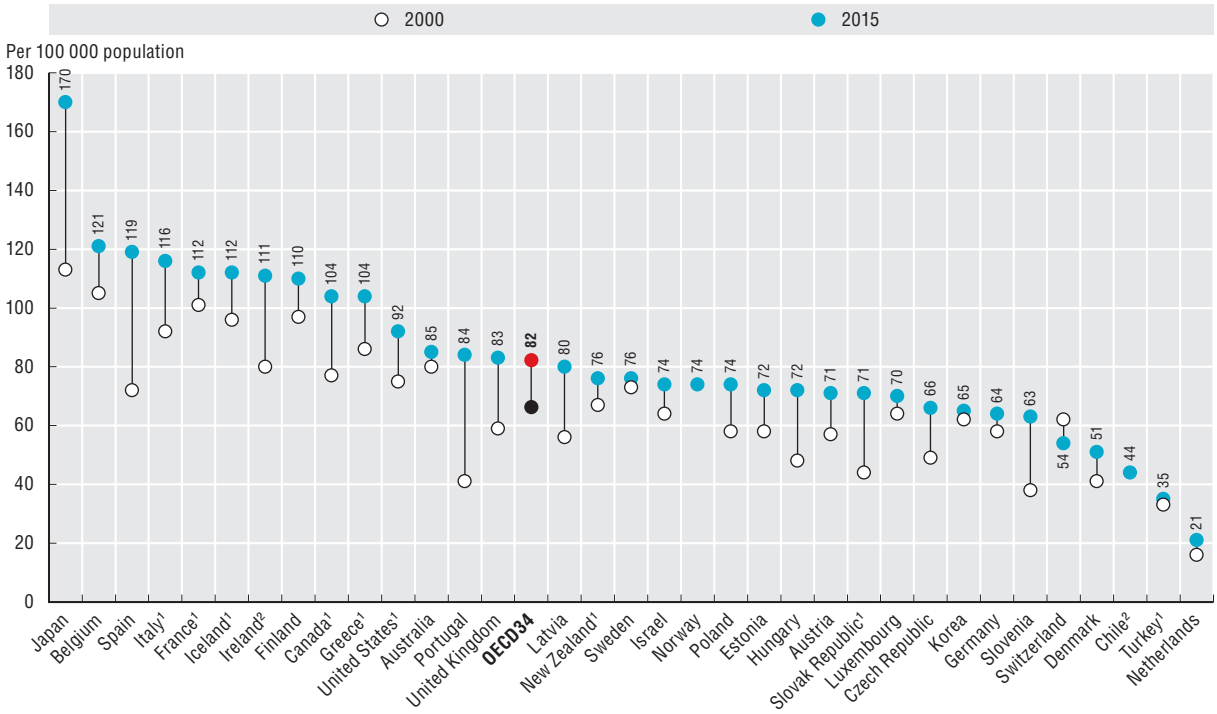
Vogler, S. et al. (2012), "Impact of Pharmacy Deregulation and Regulation in European Countries", Gesundheit Österreich GmbH, Vienna.

10.4. Practising pharmacists, 2000 and 2015 (or nearest year)

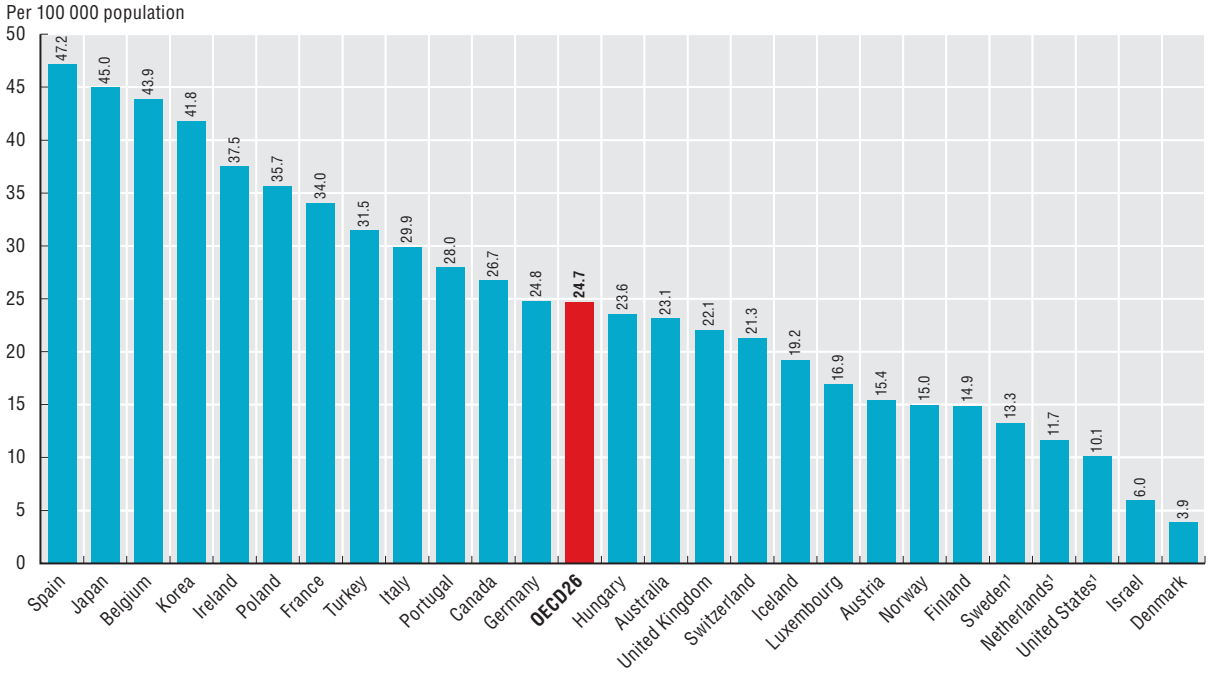


1. Data include not only pharmacists providing direct services to patients, but also those working in the health sector as researchers, for pharmaceutical companies, etc.
2. Data refer to all pharmacists licensed to practice.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605445

10.5. Community pharmacies, 2015 (or nearest year)



1. Estimates.

Source: FIP (2015), "Global Trends Shaping Pharmacy – Regulatory Frameworks, Distribution of Medicines and Professional Services. 2013-2015".

StatLink http://dx.doi.org/10.1787/888933605464

Pharmaceutical consumption

In general, pharmaceutical consumption continues to increase, partly driven by a growing need for drugs to treat ageing-related and chronic diseases, and by changes in clinical practice. This section examines consumption of four categories of pharmaceuticals: antihypertensive, cholesterol-lowering, antidiabetic and antidepressant drugs.

Consumption of antihypertensive drugs has nearly doubled in OECD countries between 2000 and 2015. It has nearly quadrupled in Luxembourg and Estonia (Figure 10.6). It is highest in Germany and Hungary, which report almost five times the consumption levels in Korea and Turkey. These variations reflect both differences in the prevalence of high blood pressure and in clinical practice.

The use of cholesterol-lowering drugs has nearly quadrupled in OECD countries between 2000 and 2015 (Figure 10.7). The Slovak Republic, Denmark and the United Kingdom report the highest consumption per capita in 2015. Across OECD countries, there is an eight fold variation in consumption levels of cholesterol-lowering drugs.

The use of antidiabetic drugs has almost doubled in OECD countries between 2000 and 2015 (Figure 10.8). This growth can be explained by the rising prevalence of diabetes, largely linked to increases in the prevalence of obesity (see indicators on overweight and obesity in Chapter 4), a major risk factor for the development of type 2 diabetes. In 2015, the consumption of antidiabetic drugs was highest in Finland, the Czech Republic and Greece.

Consumption of antidepressant drugs has doubled in OECD countries between 2000 and 2015 (Figure 10.9). This might reflect improved recognition of depression, availability of therapies, guidelines and changes in patient and provider attitudes (Mars et al., 2017). However, there is significant variation in consumption of antidepressants between countries. Iceland reports the highest level of consumption of antidepressants in 2015, twice the OECD average, followed by Australia, Portugal and the United Kingdom. Latvia, Korea and Estonia report the lowest consumption levels of antidepressants.

Definition and comparability

Defined daily dose (DDD) is the assumed average maintenance dose per day for a drug used for its main indication in adults. DDDs are assigned to each active ingredient(s) in a given therapeutic class by international expert consensus. For instance, the DDD for oral aspirin equals 3 grams, which is the assumed maintenance daily dose to treat pain in adults. DDDs do not necessarily reflect the average daily dose actually used in a given country. DDDs can be aggregated within and across therapeutic classes of the Anatomic-Therapeutic Classification (ATC). For more detail, see *www.whocc.no/atcddd*.

The volume of antihypertensive drugs consumption presented in Figure 10.6 refers to the sum of five ATC2 categories, which can all be prescribed for hypertension (Antihypertensives, Diuretics, Beta-blocking agents, Calcium channel blockers and Agents acting on the Renin-Angiotensin system).

Data generally refer to outpatient consumption only, except for Chile, the Czech Republic, Estonia, Finland, France, Iceland, Italy, Korea, Norway, the Slovak Republic and Sweden, where data also include hospital consumption. The data for Canada relate to three provinces only (British Columbia, Manitoba and Saskatchewan). The data for Luxembourg and Spain refer to outpatient consumption for prescribed drugs covered by the National Health System (public insurance). Data for Luxembourg are underestimated due to incomplete consideration of products with multiple active ingredients.

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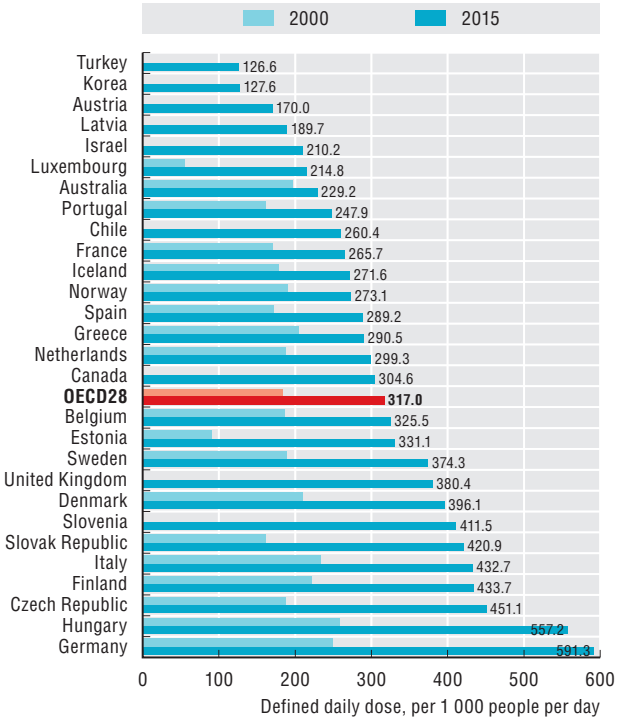
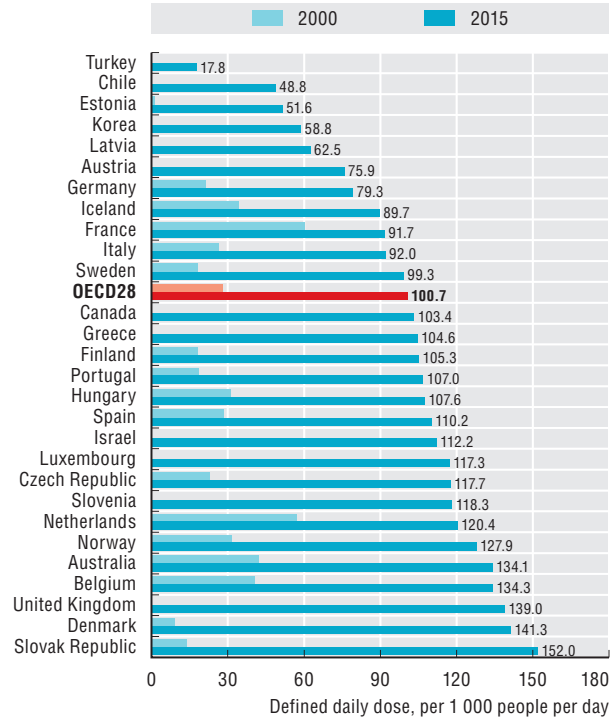
10.6. Antihypertensive drugs consumption, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605483

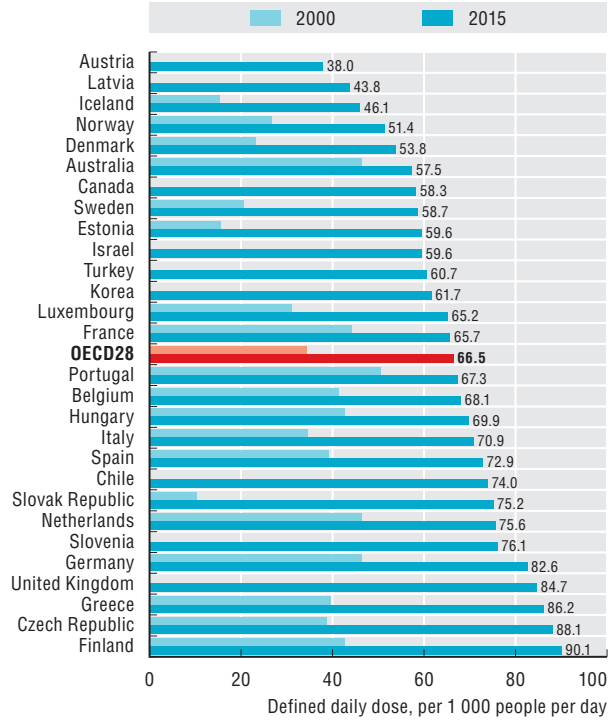
10.7. Cholesterol-lowering drugs consumption, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605502

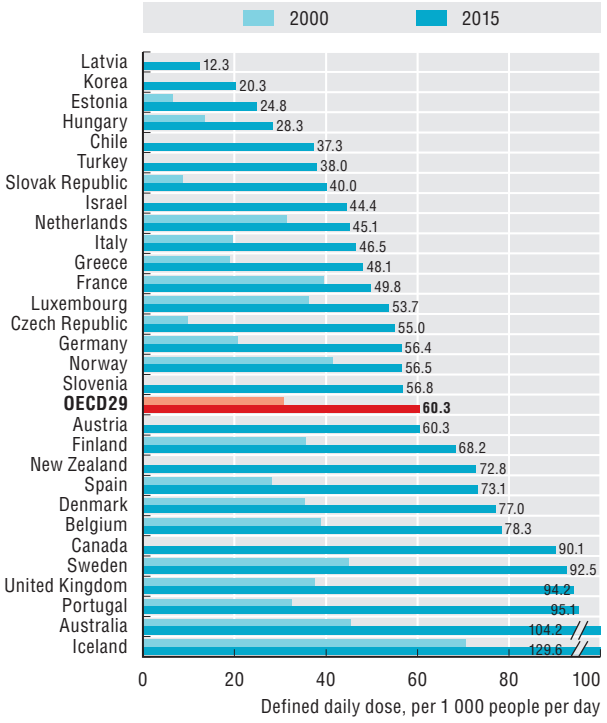
10.8. Antidiabetic drugs consumption, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605521

10.9. Antidepressant drugs consumption, 2000 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605540

Generics and biosimilars

All OECD countries view the development of generic markets as a good opportunity to increase efficiency in pharmaceutical spending, but many do not fully exploit the potential of generics (Figure 10.10). In 2015, generics accounted for more than three-quarters of the volume of pharmaceuticals sold in the United States, Chile, Germany, New Zealand and the United Kingdom, while they represented less than one-quarter of the market in Luxembourg, Italy, Switzerland and Greece.

Some of the differences in generic uptake can be explained by market structures, notably the number of off-patent medicines, and by prescribing practices, but generic uptake also depends on policies implemented by countries (EGA, 2011; Vogler, 2012). Several countries have expanded their efforts to encourage generic uptake since the onset of the economic crisis in 2008.

Financial incentives for physicians, pharmacists and patients have been implemented to boost the development of generic markets. For instance, France (in 2009 and 2012) introduced incentives for GPs to prescribe generics through a pay-for-performance scheme while in Japan (in 2012) payment bonuses also contributed to an increased share of generics in total prescribing. Pharmacies are often paid through mark-ups based on the price of medicines. This disincentive to substitute a generic for a more expensive drug has been addressed in some countries. France guarantees pharmacists an equivalent mark-up, while in Switzerland pharmacists receive a fee for generic substitution. Patients have a financial interest to choose cheaper drugs when their co-payment is lower for generic drugs than its equivalent. This is generally the case in all systems using reference prices (or fixed reimbursement amount) for clusters of products. In Greece, patients choosing originator over generic drugs are now required to pay for the difference.

A biosimilar is a biological medicine highly similar to another already approved biological medicine (the "reference medicine"). Biological medicines contain active substances from a biological source, such as living cells or organisms. The rationale behind the introduction of biosimilars is to increase price competition, thereby reducing prices. There is large variation in the uptake for two biosimilars – Epoetin and Anti-Tumour Necrosis Factor (Anti-TNF) – across OECD countries (Figure 10.11). Biosimilars have 100% of the Epoetin market share in Finland, Hungary, Poland, the Slovak Republic and the Czech Republic, whereas it is 2% in Belgium and 6% in the United Kingdom. For Anti-TNF, biosimilars have 90% and 82% of the market share in Denmark and Norway respectively, while it is 2% in Switzerland and 5% in Belgium and Ireland.

Definition and comparability

A generic is defined as a pharmaceutical product which has the same qualitative and quantitative composition in active substances and the same pharmaceutical form as the reference product, and whose bioequivalence with the reference product has been demonstrated. Generics can be classified in branded generics (generics with a specific trade name) and unbranded generics (which use the international non-proprietary name and the name of the company).

Countries were requested to provide data for the whole market. However many countries provided data covering only the community pharmaceutical market or the reimbursed pharmaceutical market (see Figure notes). The share of generic market expressed in value can be the turnover of pharmaceutical companies, the amount paid for pharmaceuticals by third-party payers, or the amount paid by all payers (third-party and consumers). The share of generic market in volume can be expressed in DDDs or as a number of packages/boxes or standard units.

A Biosimilar Medicinal Product is the product granted regulatory approval, demonstrating similarity to the Reference Medicinal Product in terms of quality characteristics, biological activity, safety and efficacy. Referenced Medicinal Product is the original product, which was granted market exclusivity at the start of its life, but once exclusivity has expired the product has been categorised as *referenced*. The biosimilar market share is the number of biosimilar treatment days as a share of biosimilar and referenced product(s) volume. Volume is measured in Defined Daily Dose which is a measure of the average dose prescribed as defined by the WHO.

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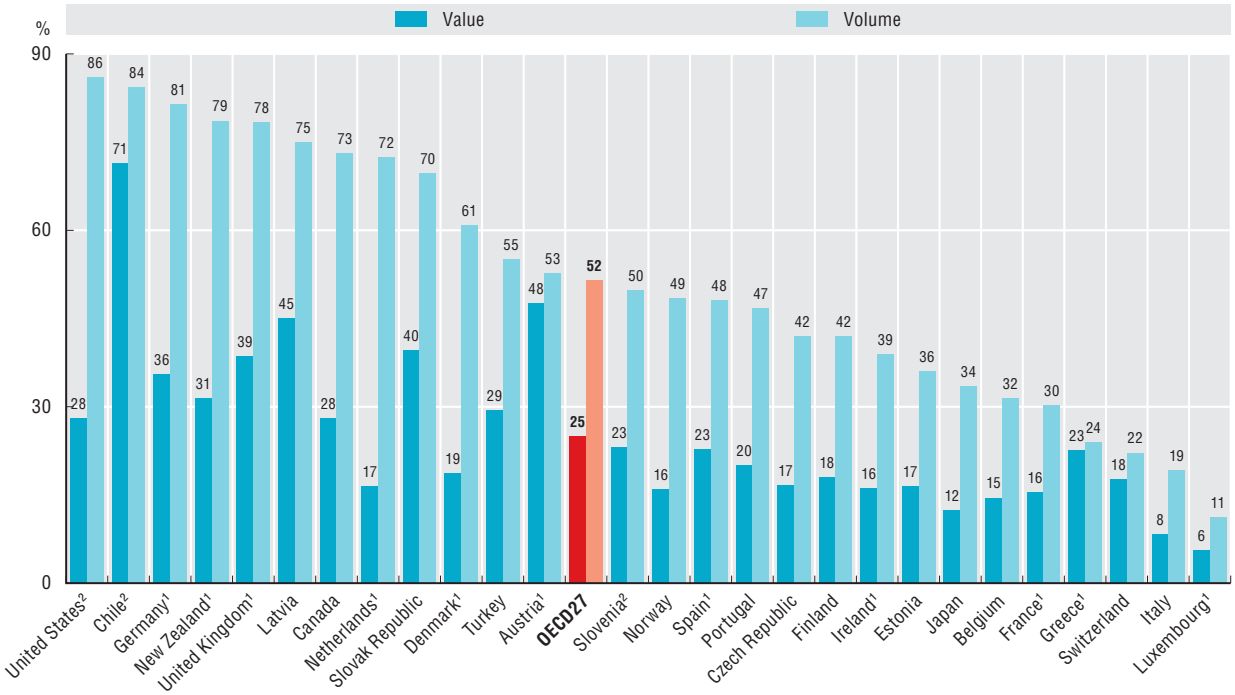
10.10. Share of generics in the total pharmaceutical market, 2015 (or nearest year)

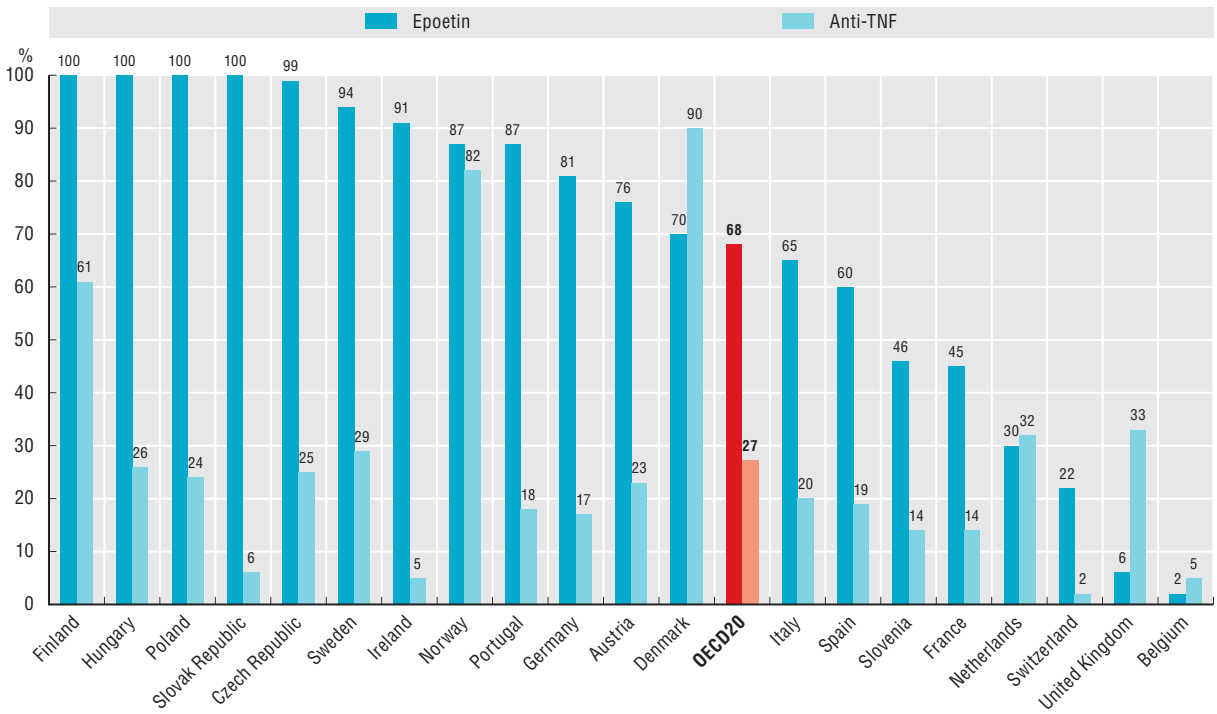


1. Reimbursed pharmaceutical market.
2. Community pharmacy market.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605559

10.11. Biosimilar market share (volume) for Epoetin and Anti-Tumour Necrosis Factor (Anti-TNF) vs reference product , 2015 (or nearest year)



Source: Quintiles IMS (2017), "The Impact of Biosimilar Competition in Europe", London.

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Research and development in the pharmaceutical sector

Funding for pharmaceutical research and development (R&D) is the result of a complex mix of private and public sources. Governments mainly support basic and early-stage research. Such funding is made through direct budget allocations, research grants, publicly-owned research institutions and funding of higher education institutions. The pharmaceutical industry translates and applies knowledge generated by basic research to develop products, and invests in large clinical trials required to gain market approval. The industry also receives direct R&D subsidies or tax credits in many countries.

In 2014, governments of OECD countries budgeted about USD 51 billion on health-related R&D (a broader category than pharmaceuticals). This figure understates total government support, since it excludes most tax incentive schemes or funding for higher education or publicly-owned corporations. Meanwhile, the pharmaceutical industry spent approximately USD 100 billion on R&D across OECD countries. In high-income countries, the business sector has been estimated to contribute 60% of all health-related research, while 30% comes from governments and 10% from other sources, including private not-for-profit organisations and universities' own funds (Røttingen et al., 2013).

Most pharmaceutical R&D takes place in OECD countries. However, the share of non-OECD countries in global industry R&D expenditure is increasing (Chakma et al., 2014), especially in China, where the industry spent approximately USD 11 billion on R&D in 2014 (0.05% of GDP). More than half of the spending in OECD countries (Figure 10.12) occurs in the United States, where the pharmaceutical industry spent about USD 56 billion (0.3% of GDP), and direct government budgets on health-related R&D were USD 33 billion (0.2% of GDP). Industry spent USD 26 billion (0.1% of GDP) and governments budgeted USD 11 billion (0.05% of GDP) in Europe; and USD 15 billion (0.3% of GDP) and USD 1.6 billion (0.03% of GDP) respectively in Japan. As a share of GDP, industry spending is highest in Switzerland (0.6%), Belgium (0.6%) and Slovenia (0.4%), smaller countries with relatively large pharmaceutical sectors.

The pharmaceutical industry is highly R&D intensive. On average across OECD countries, the industry spent some 14% of its gross value added on R&D. This is almost as high as in the air and spacecraft (18%) and electronics and optical products industries (17%), and considerably higher than the average across manufacturing as a whole (6%) (Figure 10.13).

Expenditure on R&D in the pharmaceutical industry in OECD countries grew by more than 50% in real terms between 2004 and 2014. However, this increase is not associated with higher output in terms of new drug approvals (NDAs). In the United States, the annual number of NDAs has remained relatively stable since the 1980s (Figure 10.14) while the number of approvals per inflation-adjusted R&D spending has declined steadily. Exceptions are the late 1990s, when a backlog of pending applications was cleared, and the years since 2010.

This pattern of constant output at increasing costs despite advances in technology ("Eroom's Law") is driven by a complex combination of factors. These include growing requirements to obtain market approval that have increased clinical trial costs and an ever-increasing "back catalogue" of effective drugs that has shifted research efforts to more complex conditions (Scannell et al., 2012). Rising R&D costs can be both a cause and a result of higher drug prices, as the acceptance of higher prices by payers can make increasingly expensive R&D financially viable. Increasing R&D costs can then in turn drive up prices.

Definitions and comparability

Business enterprise expenditure on R&D (BERD) covers R&D carried out by corporations, regardless of the origin of funding, which can include government subsidies. BERD is recorded in the country where the R&D activity took place, not the country providing funding. National statistical agencies collect data primarily through surveys and according to the *Frascati Manual* (OECD, 2015) but there is some variation in national practices. "Pharmaceutical R&D" refers to BERD by businesses classified in the pharmaceutical industry.

Government budgets for R&D (GBARD) capture both R&D performed directly by government and amounts paid to other institutions for R&D. "Health-related R&D" refers to GBARD aimed at protecting, promoting and restoring human health, including all aspects of medical and social care. It does not cover spending by public corporations or general university funding that is subsequently allocated to health.

The gross value added (GVA) of a sector equals gross output less intermediate consumption. It includes the cost of wages, consumption of fixed capital and taxes on production. Because GVA does not include intermediate consumption, it is less sensitive than gross output to sector-specific reliance on raw materials. OECD averages in Figure 10.13 are based on 15 countries for air and spacecraft, and 25-29 countries for all other industries.

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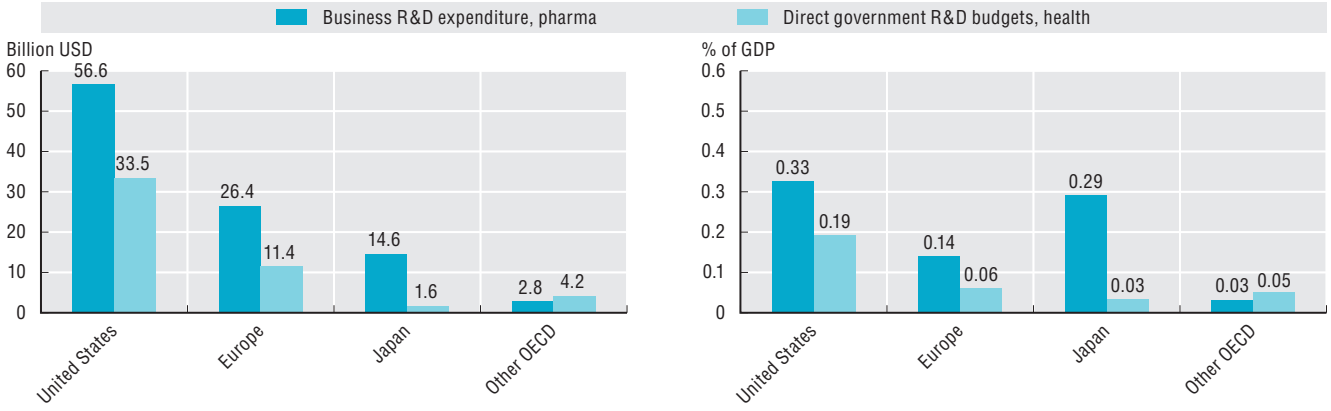
10.12. Business enterprise expenditure for pharmaceutical R&D (BERD) and government budgets for health-related R&D (GBARD), 2014 or nearest year



Note: 2012 BERD data for Switzerland and 2011 GBARD data for Mexico; all other countries 2014 or 2013. Europe includes 21 EU member countries that are also members of the OECD, Iceland, Norway and Switzerland; no BERD data available for Luxembourg and no GBARD data for Latvia.
Source: OECD Main Science and Technology Indicators and Research and Development Statistics Databases.

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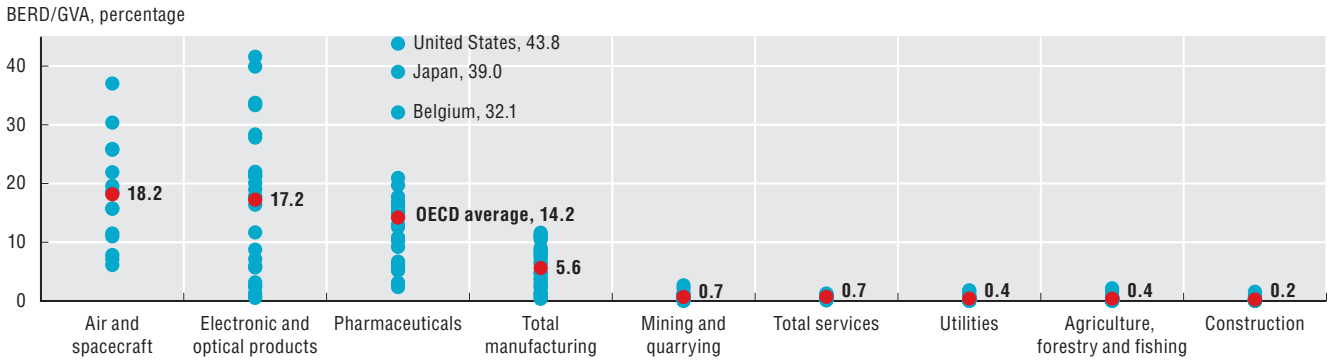
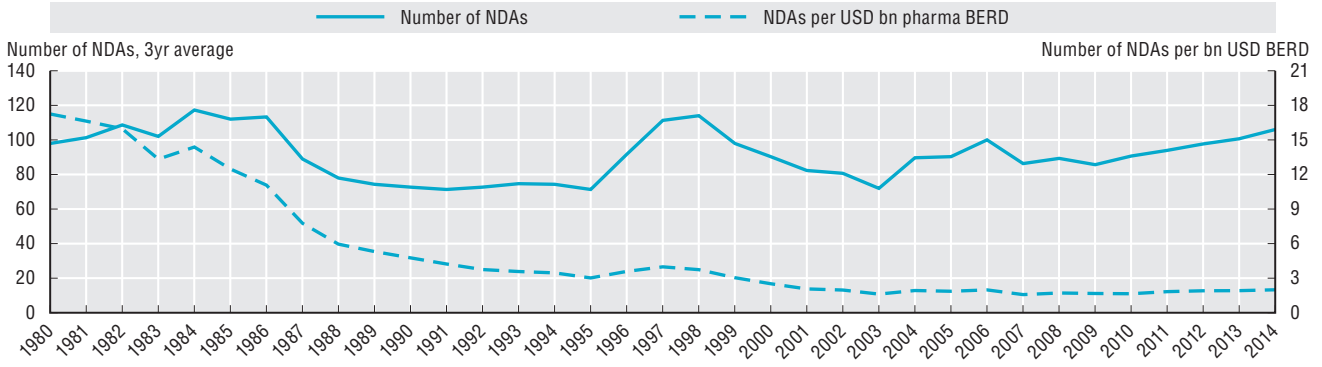
10.13. R&D intensity by industry: business enterprise R&D expenditure (BERD) as a proportion of gross value added (GVA), 2014 or nearest year



Note: The air & spacecraft, electronic & optical products and pharmaceutical industries are sub-categories of total manufacturing. All other industries are totals at the same level as total manufacturing.
Source: OECD Analytical Business Enterprise R&D (ANBERD), Structural Analysis (STAN) and System of National Accounts (SNA) Databases. National statistics offices for GVA in the pharmaceutical industry in Australia and the air & spacecraft industry in Canada.

StatLink http://dx.doi.org/10.1787/888933605616

10.14. Annual new drug approvals (NDAs) per billion USD pharmaceutical business expenditure on R&D in the United States, inflation-adjusted



Source: United States Food and Drug Administration (FDA); Pharmaceutical Research and Manufacturers of America (PhRMA).

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11. AGEING AND LONG-TERM CARE

Demographic trends

Life expectancy and healthy life expectancy at age 65

Self-reported health and disability at age 65

Dementia prevalence

Recipients of long-term care

Informal carers

Long-term care workers

Long-term care beds in institutions and hospitals

Long-term care expenditure

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Demographic trends

Longer life expectancies (see indicators on life expectancy in Chapter 3) and declining fertility rates mean that older people make up an ever-increasing proportion of the populations of OECD countries.

On average across OECD countries, the share of the population aged over 65 years increased from less than 9% in 1960 to 17% in 2015, and is expected to continue to increase, reaching 28% in 2050 (Figure 11.1, left panel). In more than two-thirds of OECD countries, at least one-quarter of the population will be over 65 years of age by 2050. This proportion is expected to be especially large in Japan, Spain, Portugal, Greece and Korea, where nearly 40% of the population will be aged over 65 years by 2050. Population ageing will also occur rapidly in China, where the share of the population over 65 is expected to nearly triple between 2015 and 2050, to reach a level just below the OECD average. Conversely, Israel, the United States and Mexico will see a more gradual increase in the share of the elderly population due to significant inflows of migrants or higher fertility rates.

The growth in the share of the population aged 80 years and over will be even more dramatic (Figure 11.1, right panel). On average across OECD countries, nearly 5% of the population was 80 years old and over in 2015. By 2050, the percentage will increase to more than 10%. In Italy, Spain, Portugal, and Germany, the proportion of the population aged over 80 is expected to more than double between 2015 and 2050. The rise will be even faster in Korea, where the share of the population aged over 80 years will grow from 3% to 14% over the next four decades.

Population ageing is a phenomenon affecting most countries around the world, but the speed of the process varies (Figure 11.2). The speed of population ageing has been particularly fast in Japan, where the share of the population aged 80 years and over increased from 2% in 1990 to nearly 8% in 2015, and is expected to rise to 15% by 2050. The population in Korea remains relatively young, but is expected to age rapidly in the coming decades, so that by 2050 the share of the population over 80 will be nearly the same as in Japan. The pace of population ageing has been slower in non-OECD countries, although it is expected to accelerate. In large partner countries including Brazil and China, less than 2% of the population was 80 years and over in 2015, though this share is expected to reach close to 7% in Brazil and more than 8% in China by 2050.

Although the pressure that this growing proportion of people aged 65 and 80 over will put on long-term care systems will depend on the health status of people as they reach these ages, population ageing will likely lead to greater demand for elderly care and contribute to increases in health spending. Nevertheless, most studies have found new technologies and rising incomes to be more significant drivers of health spending growth than population ageing (OECD, 2015).

As populations age, the potential supply of labour in the economy is expected to decline. On average across OECD countries, there were slightly more than four people of working age (15-64 years) for every person 65 years and older in 2012. This rate is projected to halve from 4.2 in 2012 to 2.1 on average across OECD countries over the next 40 years (OECD, 2013). Moreover, ageing may lead to shortfalls in certain revenue-raising mechanisms, particularly payroll taxes, making it more difficult for countries to maintain or increase government spending on health.

Definition and comparability

Data on the population structure have been extracted from the OECD historical population data and projections (1950-2050). The projections are based on the most recent "medium-variant" population projections from the United Nations, World Population Prospects – 2017 Revision.

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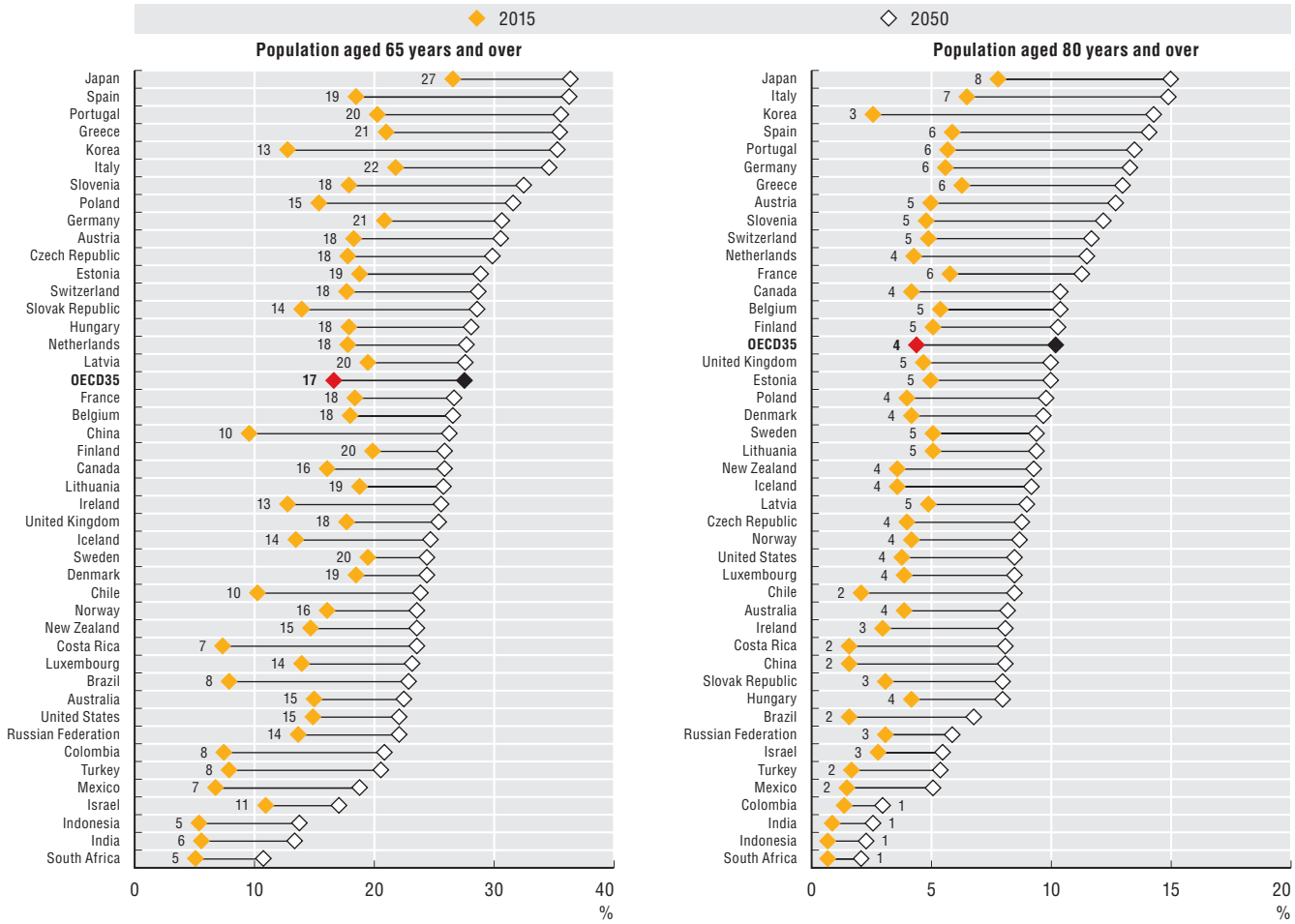
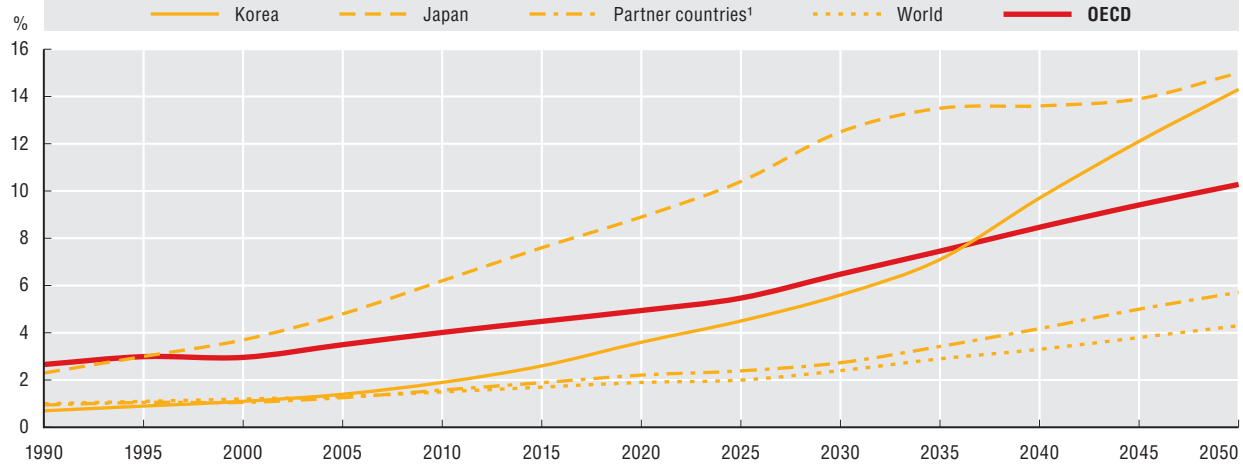
11.1. Share of the population aged over 65 and 80 years, 2015 and 2050



Source: OECD Health Statistics 2017, OECD Historical Population Data and Projections Database, 2017.

StatLink http://dx.doi.org/10.1787/888933605654

11.2. Trends in the share of the population aged over 80 years, 1990-2050



1. Partner countries include Brazil, China, Colombia, Costa Rica, India, Indonesia, Lithuania, the Russian Federation and South Africa.

Source: OECD Historical Population Data and Projections Database, 2017.

StatLink http://dx.doi.org/10.1787/888933605673

Life expectancy and healthy life expectancy at age 65

Life expectancy at age 65 has increased significantly for both men and women over the past few decades in OECD countries, rising by 5.4 years on average since 1970 (Figure 11.3). Some of the factors explaining these gains in life expectancy at age 65 include advances in medical care combined with greater access to health care, healthier lifestyles and improved living conditions before and after people reach age 65.

Japan and Korea have achieved the highest gains in life expectancy at age 65 since 1970, with an increase of about eight years. The gains have been much more modest in Hungary, the Slovak Republic and Mexico, with an increase of only about three years.

In 2015, people at age 65 in OECD countries could expect to live another 19.5 years: 21 years for women and 18 years for men (Figure 11.4). This gender gap of three years on average across OECD countries has been fairly stable over time. In 2015, life expectancy at age 65 was highest in Japan for women (24 years) and in Japan, Australia, and Iceland for men (nearly 20 years). Among OECD countries, it was lowest in Hungary for women (18 years) and in Latvia for men (14 years).

Countries' relative positions with respect to life expectancy at age 65 mirror closely their relative positions with regard to life expectancy at age 80. Life expectancy at age 80 in 2015 was highest in Japan for women (who can expect to live an additional 12 years) and highest in France for men (who can expect to live an additional 9 years).

Increased life expectancy at age 65 does not necessarily mean that the extra years lived are in good health. In Europe, an indicator of disability-free life expectancy known as "healthy life years" is calculated regularly, based on a general question about disability in the European Union Statistics on Income and Living Conditions (EU-SILC) survey. Among European countries participating in the survey, the average number of healthy life years at age 65 was almost the same for women and men, at 9.3 years for women and 9.4 years for men in 2015 (Figure 11.5). The absence of any significant gender gap in healthy life years means that many of the additional years of life that women experience relative to men are lived with some type of activity limitation. Nordic countries (with the exception of Finland) had the highest number of healthy life years at age 65 in 2015. In Sweden, women could expect to live an average of an additional 17 years, and men 16 years, free of disability.

Life expectancy and healthy life expectancy vary by educational status. For both men and women, highly educated people are likely to live longer and in better health. Differences in life expectancy by education level are particularly large in Central and Eastern European countries, especially for men. In the Slovak Republic, 65-year-old men with a high level of education could expect to live five years longer than those with a low education level in 2015. By contrast, differences in life expectancy by education level are much smaller (less than two years) in Nordic countries (Denmark, Finland, Norway and Sweden) and Portugal (see Eurostat Database 2017).

Definition and comparability

Life expectancy measures how long on average a person of a given age can expect to live, if current death rates do not change. However, the actual age-specific death rate of any particular birth cohort cannot be known in advance. If rates are falling, as has been the case over the past decades in OECD countries, actual life spans will be higher than life expectancy calculated using current death rates. The methodology used to calculate life expectancy can vary slightly between countries. This can change a country's estimates by a fraction of a year. Life expectancy at age 65 is the unweighted average of the life expectancy at age 65 of women and men.

Disability-free life expectancy (or "healthy life years") is defined as the number of years spent free of activity limitation. In Europe, this indicator is calculated annually by Eurostat for EU countries and some EFTA countries. The disability measure is based on the Global Activity Limitation Indicator (GALI) question, which comes from the European Union Statistics on Income and Living Conditions (EU-SILC) survey. The question asks: "For at least the past six months, have you been hampered because of a health problem in activities people usually do? Yes, strongly limited / Yes, limited / No, not limited". While healthy life years is the most comparable indicator to date, there are still problems with translation of the GALI question, although it does appear to satisfactorily reflect other health and disability measures (Jagger et al., 2010).

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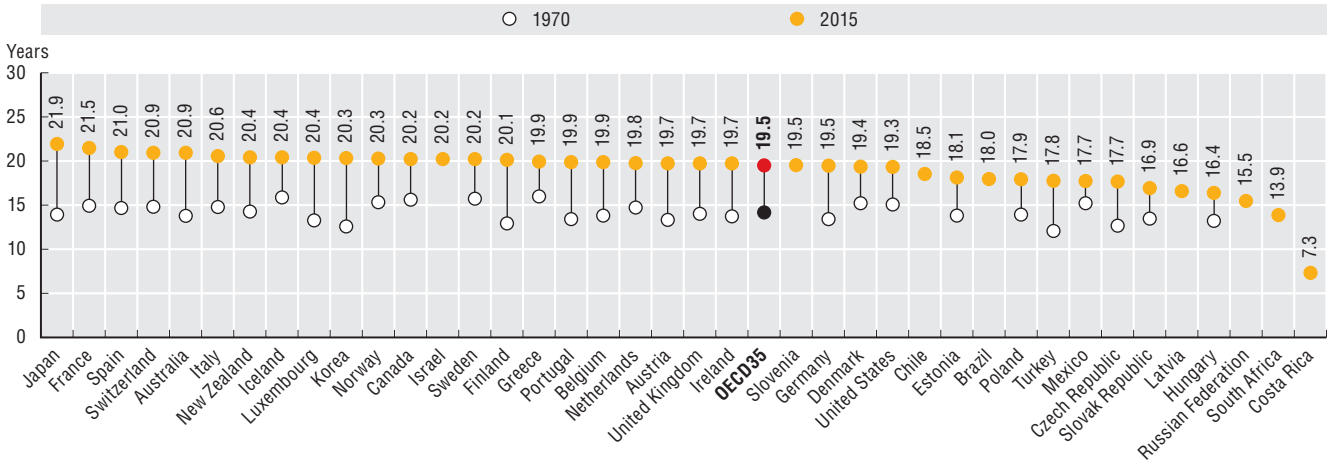
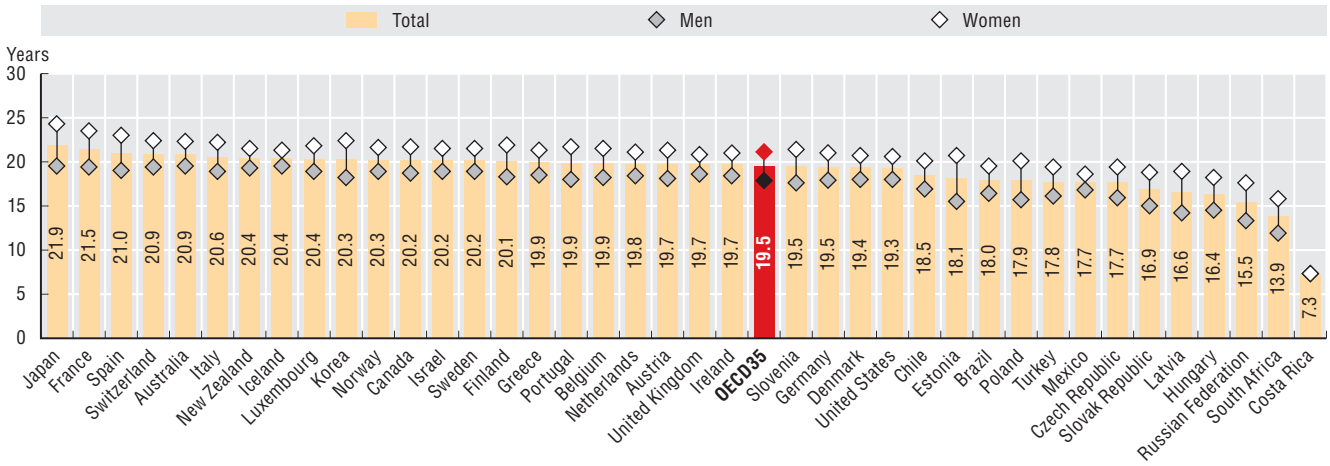
11.3. Life expectancy at age 65, 1970 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605692

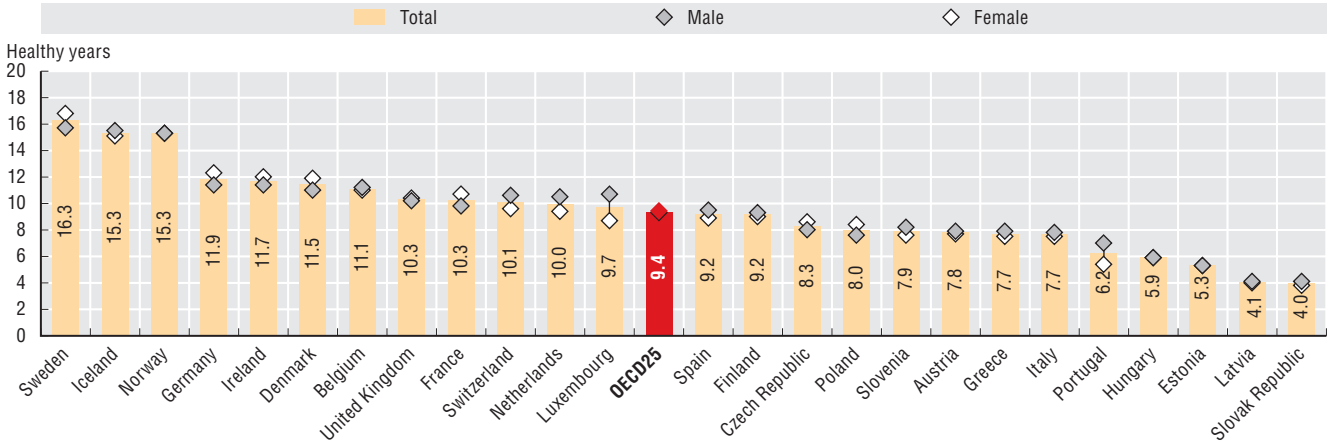
11.4. Life expectancy at age 65 by sex, 2015 (or nearest year)



Note: Countries are ranked in descending order of healthy life expectancy for the whole population.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605711

11.5. Healthy life years at age 65, European countries, 2015 (or nearest year)



Note: Countries are ranked in descending order of healthy life expectancy for the whole population.
Source: Eurostat Database 2017.

StatLink http://dx.doi.org/10.1787/888933605730

Self-reported health and disability at age 65

Most OECD countries conduct regular health surveys which allow respondents to report on different aspects of their health. These surveys often include a question on self-perceived health status, along the lines of: "How is your health in general?". Although these questions are subjective, indicators of perceived general health have been found to be a good predictor of future health care use and mortality (Hirosaki et al., 2017; Schnittker and Bacak, 2014). However, cross-country differences may be difficult to interpret, as survey questions may differ slightly and cultural factors can affect responses.

More than half of the population aged 65 years and over report being in good health in 14 of 34 OECD countries (Figure 11.6). In New Zealand, Canada and the United States, more than three-quarters of older people report good health, though the response categories offered to survey respondents in these three countries are different from those used in most other OECD countries (see "Definition and comparability" box). Among European countries, older people in Norway, Sweden, Ireland, Switzerland, and the Netherlands report the best health status, with more than 60% assessing their health to be good. At the other end of the scale, less than 15% of the population aged 65 years and over in Latvia and Portugal report being in good health. In nearly all countries, men over 65 were more likely than women to rate their health to be good. On average across OECD countries, 47% of men aged over 65 rated their health to be good or better, while 41% of women did so.

Self-reported health status varies substantially by income. Across OECD countries on average, less than one-third of people aged 65 years and older in the lowest income quintile considered their health to be good, compared with close to 60% of those in the highest income quintile (Figure 11.7). In Sweden, more than four-fifths of people aged 65 and older in the highest income quintile consider their health to be good, while fewer than half of people in the lowest income quintile say the same.

Although measures of disability are not fully standardised across countries, the European Union Statistics on Income and Living Conditions (EU-SILC) survey collects data on the limitations that people face in their daily activities (Figure 11.8). Such limitations often correspond to a need for long-term care. On average across 26 European countries, 51% of all over-65s reported that they were limited either to some extent or severely in their usual daily activities because of a health problem in 2015 (Figure 11.8). The lowest rates of disability were reported in Nordic countries, with around one in five over-65s reporting at least some limitation in daily activities in Sweden and Norway. The highest rates were found in Eastern European countries such as Latvia and the Slovak Republic, where three-quarters of over-65s reported at least some limitations.

Definition and comparability

Self-reported health reflects people's overall perception of their own health, including both physical and psychological dimensions. Typically, survey respondents are asked a question such as: "How is your health in general? Very good, good, fair, poor, very poor". *OECD Health Statistics* provides figures related to the proportion of people rating their health to be "good/very good" combined.

Caution is required in making cross-country comparisons of perceived health status, for at least two reasons. First, people's assessment of their health is subjective and can be affected by cultural factors. Second, there are variations in the question and answer categories used to measure perceived health across surveys/countries. In particular, the response scale used in Australia, Canada, New Zealand and the United States is asymmetric (skewed on the positive side), including the following response categories: "excellent, very good, good, fair, poor". The data reported in *OECD Health Statistics* refer to respondents answering one of the three positive responses ("excellent, very good or good"). By contrast, in most other OECD countries, the response scale is symmetric, with response categories being: "very good, good, fair, poor, very poor". The data reported from these countries refer only to the first two categories ("very good, good"). Such differences in response categories may introduce an upward bias in the results from those countries that are using an asymmetric scale.

Perceived general disability is measured by the Global Activity Limitation Indicator (GALI) question, which comes from the European Union Statistics on Income and Living Conditions (EU-SILC) survey. The question is: "For at least the past six months, have you been hampered because of a health problem in activities people usually do? Yes, strongly limited / Yes, limited / No, not limited". Persons in institutions are not surveyed, resulting in an under-estimation of disability prevalence. Again, the measure is subjective, and cultural factors may affect survey responses.

References

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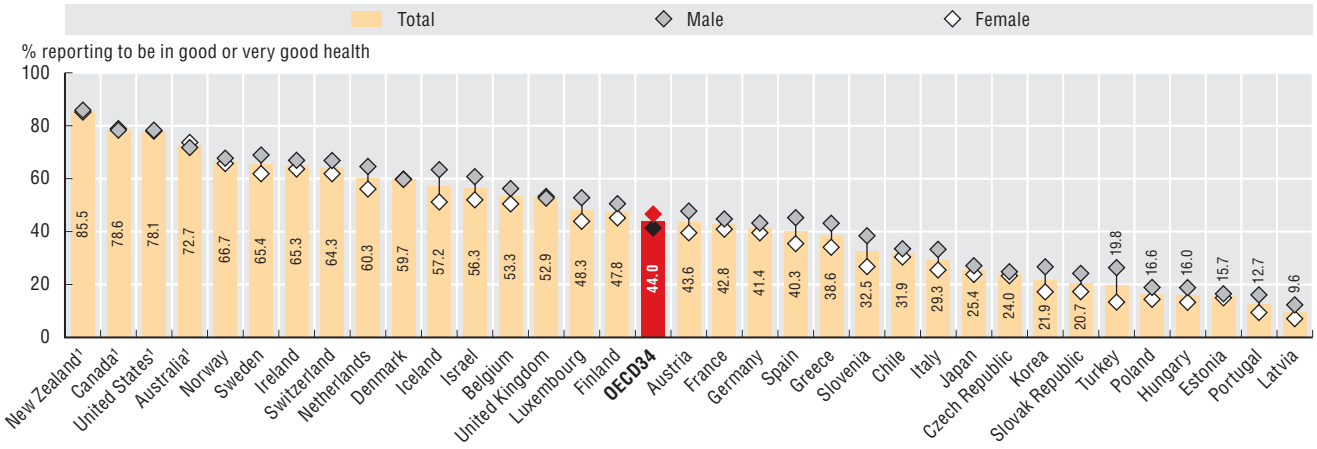
Schnittker, J. and V. Bacak (2014), "The Increasing Predictive Validity of Self-Rated Health, *PLoS ONE*, Vol. 9, No. 1, e84933, *https://doi.org/10.1371/journal.pone.0084933*.

11.6. Perceived health status in adults aged 65 years and over, 2015 (or nearest year)



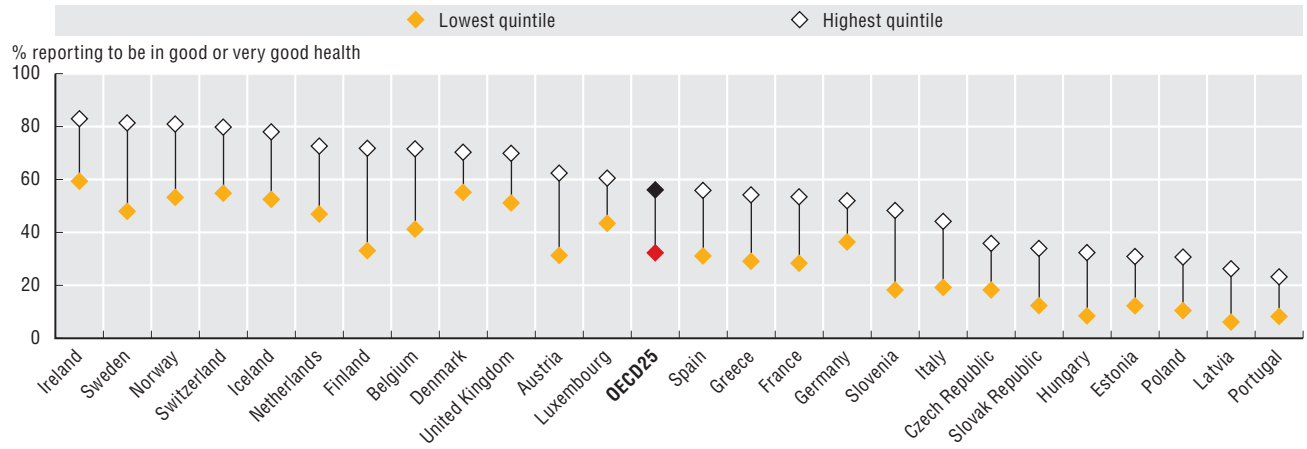
Note: Numbers are close together for males and females for New Zealand, the United States, Canada, the United Kingdom and Denmark.

1. Data for New Zealand, Canada, the United States and Australia are biased upwards relative to other countries and so are not directly comparable.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605749

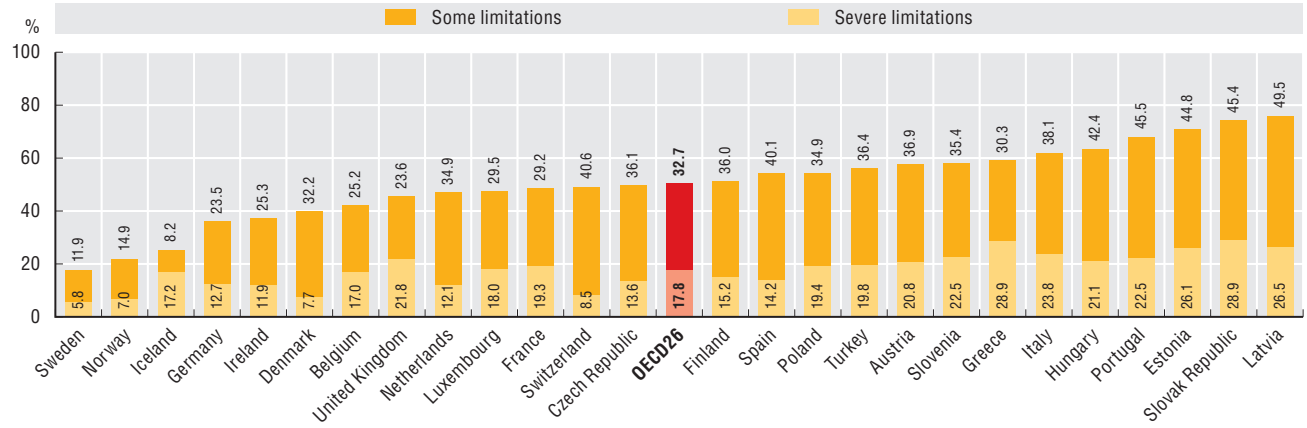
11.7. Perceived health status in adults aged 65 years and over by income quintile, European countries, 2015 (or nearest year)



Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933605768

11.8. Limitations in daily activities in adults aged 65 years and over, European countries, 2015 (or nearest year)



Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933605787

Dementia prevalence

Dementia describes a variety of brain disorders which progressively lead to brain damage and cause a gradual deterioration of the individual's functional capacity and social relations. Alzheimer's disease is the most common form of dementia, representing about 60% to 80% of cases. There is currently no cure or disease modifying treatment, but better policies can improve the lives of people with dementia by helping them and their families adjust to living with the condition and ensuring that they have access to high quality health and social care.

In 2017, there were an estimated 18.7 million people living with dementia in OECD countries. This is equivalent to around one in every 69 people in the population as a whole, but dementia prevalence increases rapidly with age. Across all OECD countries, around 2% of people aged 65-69 have dementia, compared with more than 40% of those aged over 90 (Figure 11.10). As a result, countries with older populations have more people with dementia: Japan, Italy, and Germany are estimated to have more than 20 people with dementia per 1 000 population, while the Slovak Republic, Turkey and Mexico have fewer than nine (Figure 11.9).

Ageing populations mean that dementia will become more common in the future, and the most rapidly ageing countries will see prevalence more than double in the next 20 years. This includes fast-ageing OECD countries (Korea and Chile) and partner countries such as Brazil, China, Colombia and Costa Rica. However, there is some evidence that the age-specific prevalence of dementia may be falling in some countries (Matthews et al., 2013) and it may be possible to reduce the risk of dementia through healthier lifestyles and preventive interventions. If such efforts are successful, the rise in prevalence may be less dramatic than these numbers suggest.

Behavioural and psychological symptoms affect many people with dementia and can make caring for them difficult. Antipsychotic drugs can reduce these symptoms, but the associated risks and ethical issues – and the availability of a range of effective non-pharmacological interventions – mean they are only recommended as a last resort. However, the inappropriate use of these drugs remains widespread and reducing their overuse is a policy priority for many OECD countries.

New data collected by the OECD show that rates of prescribing of antipsychotics to older people vary by more than a factor of two across OECD countries (Figure 11.12). In 2015, Sweden, Norway the Netherlands, France, Australia and Denmark prescribed antipsychotics to fewer than 35 in every thousand people aged over 65, with rates either falling or constant. At the other extreme, more than 70 in every thousand people aged over 65 in Slovenia had a prescription of antipsychotics, an increase of 14% since 2011.

Rates of antipsychotic prescribing rise with age (Figure 11.11). On average across 13 OECD countries, 3% of people aged 65-69 had a prescription for antipsychotics in 2015, compared to 12% of people aged over 90. This is likely to be driven in part by higher rates of dementia at older ages. However, the use of antipsychotics rises less steeply than dementia prevalence (Figure 11.10).

Definition and comparability

The prevalence estimates in Figure 11.9 are taken from the *World Alzheimer Report 2015*, which includes a systematic review of studies of dementia prevalence around the world. Prevalence by country has been estimated by applying these age-specific prevalence rates for the relevant region of the world to country-specific population estimates from the United Nations (World Population Prospects: The 2017 Revision). Differences between countries are therefore driven by the age structure of populations – i.e. older countries have more people with dementia. The *World Alzheimer Report 2015* analysis includes studies carried out since 1980, with the assumption that age-specific prevalence is constant over time. This assumption is retained in the construction of this indicator, so that fixed age-specific prevalence rates are applied for both 2017 and 2037. Although gender-specific prevalence rates were available for some regions, overall rates were used in this analysis.

Antipsychotics are defined consistently across countries using Anatomical Therapeutic Classification (ATC) codes. The numerator includes all patients on the medications register with a prescription for a drug within the ATC subgroup N05A. The denominator is the total number of people on the register. Most countries are unable to identify which prescriptions relate to people with dementia, so the antipsychotics indicator covers all people aged over 65. Some caution is needed when making inferences about the dementia population, since it is not certain that a higher rate of prescribing among all over-65s translates into more prescriptions for people with dementia. Nonetheless, measuring this indicator, exploring the reasons for variation and reducing inappropriate use can help to improve the quality of dementia care.

References

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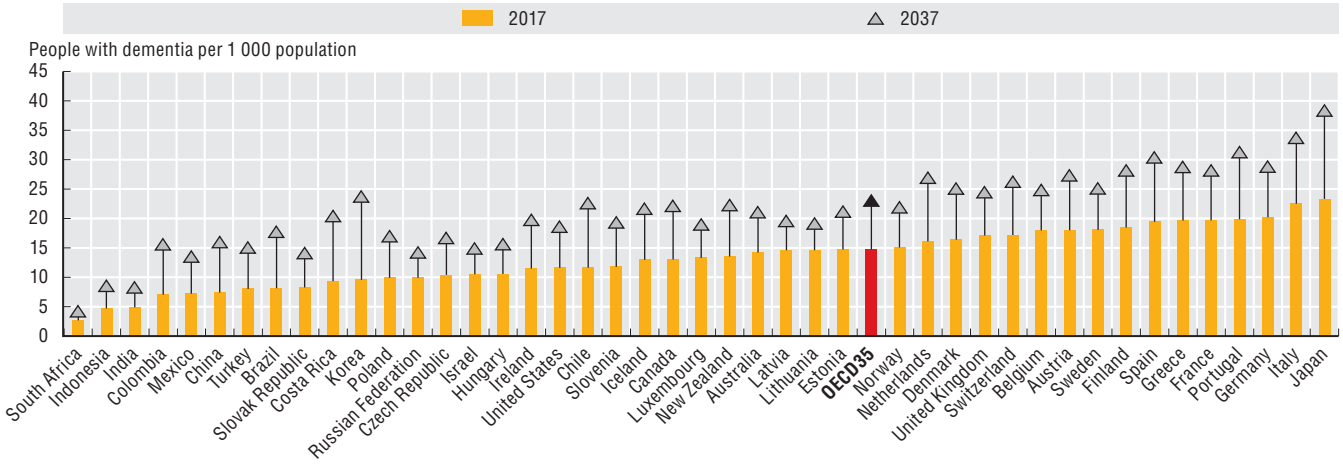
Prince, M. et al. (2015), *World Alzheimer Report 2015: The Global Impact of Dementia*, Alzheimer's Disease International.

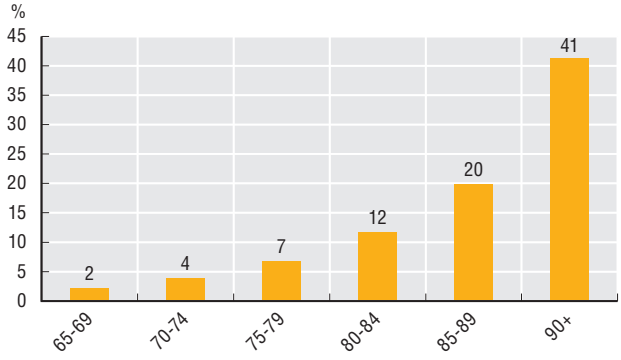
11.9 Dementia prevalence



Source: OECD analysis of data from *the World Alzheimer Report 2015* and the United Nations.

StatLink http://dx.doi.org/10.1787/888933605806

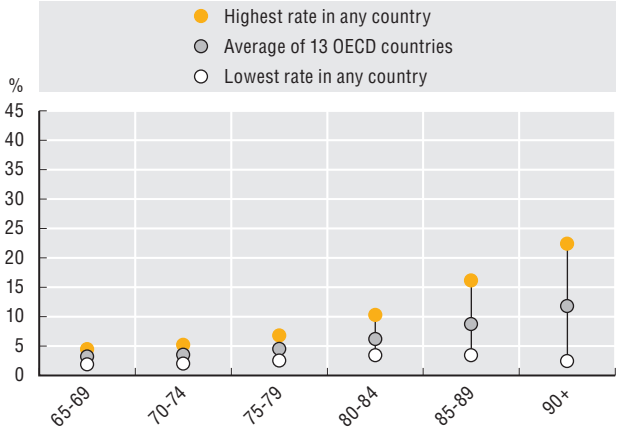
11.10 Prevalence of dementia across all OECD countries by age group, 2017



Source: OECD analysis of data from the *World Alzheimer Report 2015* and the United Nations.

StatLink http://dx.doi.org/10.1787/888933605825

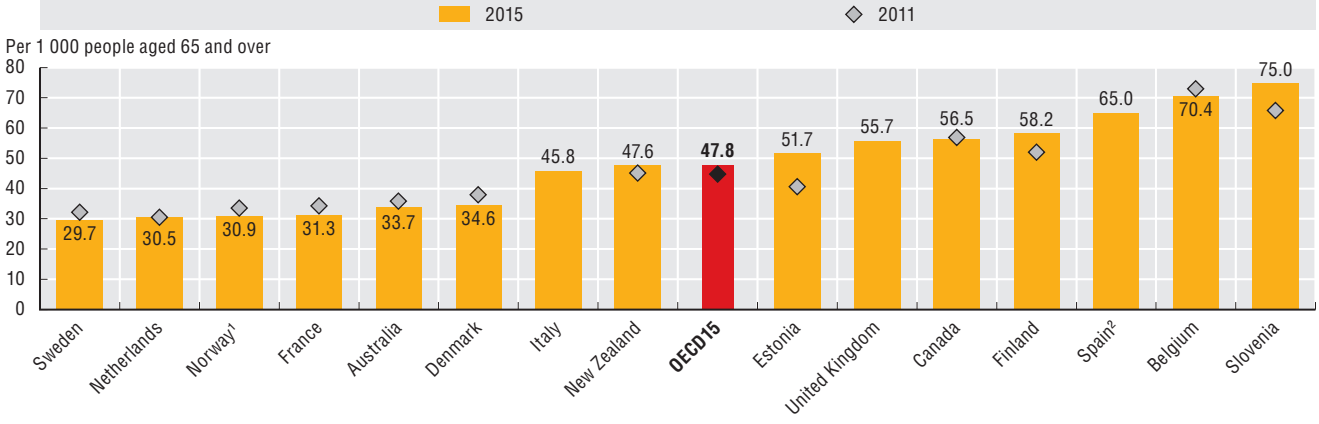
11.11 Proportion of population with a prescription of antipsychotics, by age group, 2015 or nearest year



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605844

11.12 People with a prescription of antipsychotics, 2015 or nearest year



1. Data for Norway do not include people in institutional care, so underestimate the use of antispychotics.
2. Data for Spain refer to 2014.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605863

Recipients of long-term care

As people age, they are more likely to develop disabilities and need support from family, friends and long-term care (LTC) services. As a result, while LTC services are delivered to younger disabled groups, the majority of LTC recipients are older people. On average across the OECD, 13% of people over 65 receive long-term care (Figure 11.13). The proportion of over-65s receiving long-term care varies from 2% in Portugal and 6% in Estonia to more than 20% in Israel and Switzerland.

People aged over 80 make up on average more than half of all LTC recipients, and almost two-thirds of LTC recipients in Japan, Denmark and Australia (Figure 11.14). As populations age, demand for LTC services is likely to increase – although this effect may be partially offset by improving health in old age. Nonetheless, a significant number of younger disabled people require long-term care, making up as many as a third of all LTC recipients in Norway, Slovenia and the Netherlands.

While population ageing is a significant driver of the growth in LTC users over time, it explains relatively little of the cross-country variation. For example, Israel has one of the youngest populations in the OECD but a greater than average proportion receiving LTC. A more important driver is the availability of publicly funded LTC services. However, data for people receiving care outside of public systems are more difficult to collect and may be underreported, meaning that figures for countries that rely more heavily on privately-funded care may be artificially low. Cultural norms around the degree to which families look after older people may also be an important driver of the utilisation of formal services (see indicator on "Informal carers").

In response to most people's preference to receive LTC services at home, many OECD countries have implemented programmes and benefits to support home-based care, in particular for older people. In most countries for which trend data are available, the proportion of LTC recipients aged 65 and over receiving long-term care at home has increased over the past ten years (Figure 11.15), with particularly large increases in Portugal and Sweden. In Portugal this reflects an expansion of home care services from a very low level in 2005. In Sweden it results from a deliberate policy to reduce institutional care capacity and encourage community care (Colombo et al., 2011).

While the proportion of LTC recipients living at home has increased over the past decade in most OECD countries, it has declined significantly in Finland and Estonia. In Finland, this has not been driven by an increase in traditional institutional care. Instead, there has been an increase in the use of "service housing" – where older people move into specially adapted houses where 24/7 care is available. Although this is classified as institutional care, it allows more independence and autonomy than a traditional care institution. In Estonia, there has been a significant increase in the use of institutional care, but there has been an even larger decrease in the number of "curators" appointed by local government to care for people at home.

Definition and comparability

LTC recipients are defined as persons receiving long-term care by paid providers, including nonprofessionals receiving cash payments under a social programme. They also include recipients of cash benefits such as consumer-choice programmes, care allowances or other social benefits which are granted with the primary goal of supporting people with long-term care needs. LTC institutions refer to nursing and residential care facilities which provide accommodation and long-term care as a package. LTC at home is defined as people with functional restrictions who receive most of their care at home. Home care also applies to the use of institutions on a temporary basis, community care and day-care centres and specially designed living arrangements. Data for Poland, the United States, Ireland, Canada, the Slovak Republic, Iceland and Belgium are only available for people receiving long-term care in institutions, so the total number of recipients will be underestimated. In Estonia, data on recipients of home care refer only to those who have a "curator" appointed by local government. Other social services, without a personal care component, are not included in the data. It is possible that some of the decrease in recipients reflects the replacement of curators with these other services.

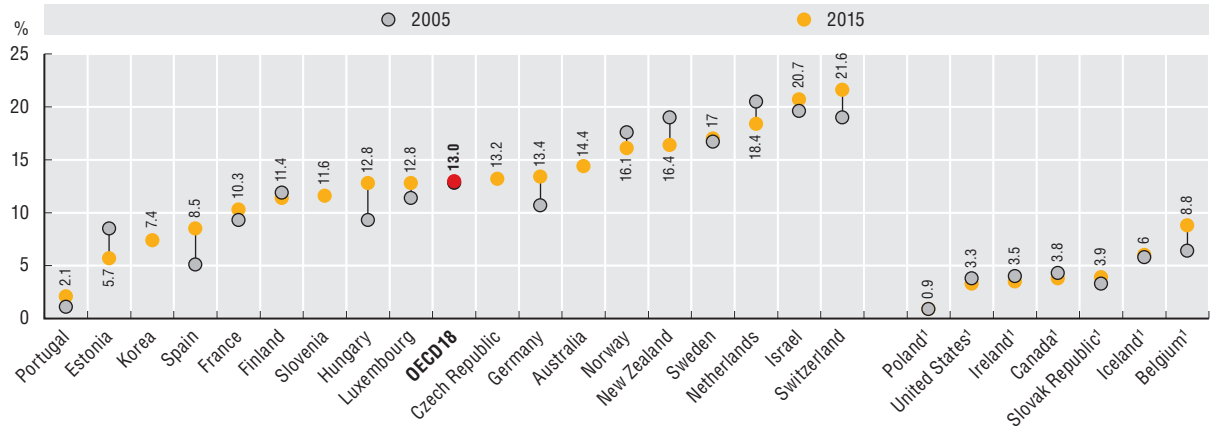
Data on LTC services is difficult to collect in many countries and there are some known limitations of the figures. Data for some countries refer only to people receiving publicly-funded care, while other countries include people who are paying for their own care. Data from France and the Czech Republic refer to the number of people claiming care benefits, which may not correspond directly to the number receiving services. Some countries use different age categories: instead of reporting people aged 65 and over, Belgium reports those aged 60 and over and Iceland those aged 66 and over.

References

Colombo, F. et al. (2011), *Help Wanted? Providing and Paying for Long-Term Care*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264097759-en*.

Muir, T. (2017), "Measuring Social Protection for Long-term Care", *OECD Health Working Papers*, No. 93, OECD Publishing, Paris, *http://dx.doi.org/10.1787/a411500a-en*.

11.13 Proportion of people aged 65 and over receiving long-term care, 2005 and 2015 (or nearest year)

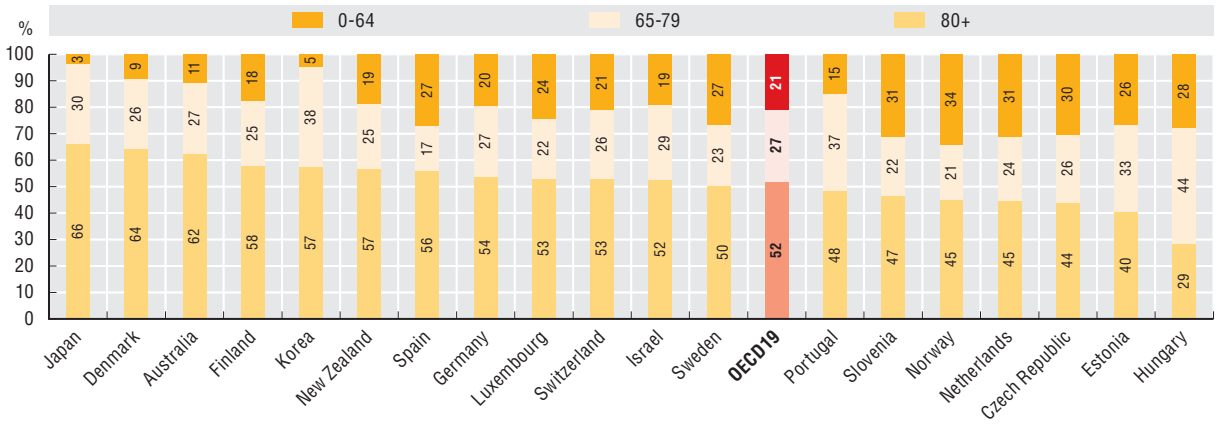


1. These values include only recipients of long-term care in institutions.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605882

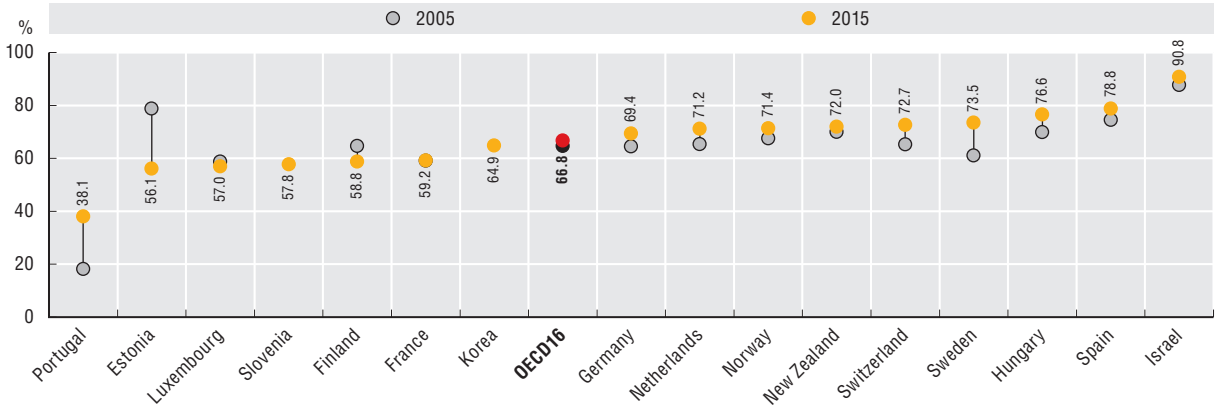
11.14 Share of long-term care recipients, by age, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605901

11.15 Share of long-term care recipients aged 65 years and over receiving care at home, 2005 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605920

Informal carers

Family and friends are the most important source of care for people with long-term care (LTC) needs in OECD countries. Because of the informal nature of care that they provide, it is not easy to get comparable data on the number of people caring for family and friends across countries, nor on the frequency of their caregiving. The data presented in this section come from national or international health surveys and refer to people aged 50 years and over who report providing care and assistance to family members and friends.

On average across OECD countries for which data is available, around 13% of people aged 50 and over report providing informal care at least weekly – but this figure is more than 20% in the Czech Republic and Belgium and less than 10% in Poland and Portugal (Figure 11.16). There is also variation in the intensity of the care provided. The lowest rates of daily care provision are found in Sweden, Switzerland, Denmark and the Netherlands – countries where the formal LTC sector is well-developed and public coverage is comprehensive.

Intensive caregiving is associated with a reduction in labour force attachment for caregivers of working age, higher poverty rates, and a higher prevalence of mental health problems. Many OECD countries have implemented policies to support family carers with a view to mitigating these negative impacts. These include paid care leave (e.g., Belgium), flexible work schedules (e.g., Australia and the United States), respite care (e.g., Austria, Denmark and Germany) and counselling/training services (e.g., Sweden). Moreover, a number of OECD countries provide cash benefits to family caregivers or cash-for-care allowances for recipients which can be used to pay informal caregivers (Colombo et al., 2011).

On average across OECD countries, 60% of those providing daily informal care are women (Figure 11.17). Poland and Portugal have the greatest gender imbalance, with 70% of informal carers being women. Sweden is the only country where more men than women report that they provide at least weekly informal care.

Around two thirds of carers are looking after a parent or a spouse, but patterns of caring vary for different age groups. Younger carers (aged between 50 and 65) are much more likely to be caring for a parent (Figure 11.18). They are more likely to be women – daughters provide much more care to their parents than sons – and may not be providing care every day. Carers aged over 65 are more likely to be caring for a spouse. Caring for a spouse tends to more intensive, requiring daily care, and men and women are equally likely to take on this role.

The fact that fewer people provide daily care in countries with stronger formal LTC systems suggests that there is a trade-off between informal and formal care. Declining family size, increased geographical mobility and rising participation rates of women in the labour market mean that there is a risk that fewer people will be willing and able to provide informal care in the future. Coupled with the effects of an ageing population, this could lead to higher demand for professional LTC services. Public LTC systems will need adequate resources to meet increased demand while maintaining access and quality.

Definition and comparability

Informal carers are defined as people providing any help to older family members, friends and people in their social network, living inside or outside of their household, who require help with everyday tasks. The data relate only to the population aged 50 and over, and are based on national surveys for Australia (Survey of Disability, Ageing and Carers, SDAC), the United Kingdom (English Longitudinal Study of Ageing, ELSA), the United States (Health and Retirement Survey, HRS) and an international survey for other European countries (Survey of Health, Ageing and Retirement in Europe, SHARE).

Questions about the intensity of care vary between surveys. In SHARE, carers are asked about how often they provided care in the last year and this indicator includes people who provided care at least weekly. In ELSA, people are asked if they have provided care in the last week, which may be broadly comparable with "at least weekly". Questions in HRS and SDAC are less comparable with SHARE. Carers in HRS are included if they provided more than 200 hours of care in the last year. In SDAC, a carer is defined as someone who has provided ongoing informal assistance for at least six months. People caring for disabled children have been excluded for European countries but are included for the United States and Australia. However, the United States data only include those caring for someone outside of their household. As a result, data for Australia and the United States may not be comparable with other countries.

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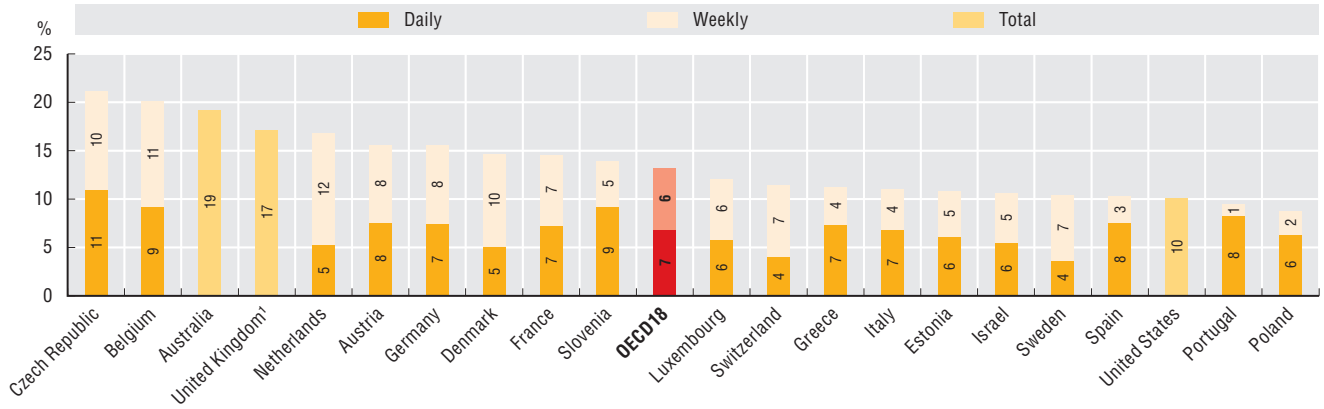
Colombo, F. et al. (2011), *Help Wanted? Providing and Paying for Long-Term Care*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264097759-en*.

11.16. Share of informal carers among population aged 50 and over, 2015 (or nearest year)



Note: The definition of informal carers differs between surveys (see Definition and comparability).
1. United Kingdom refers to England.
Source: Wave 6 of the Survey of Health, Ageing and Retirement in Europe (2015), Survey of Disability, Ageing and Carers for Australia (2015), wave 7 of the English Longitudinal Study of Ageing (2015), wave 12 of the Health and Retirement Survey for the United States (2014).

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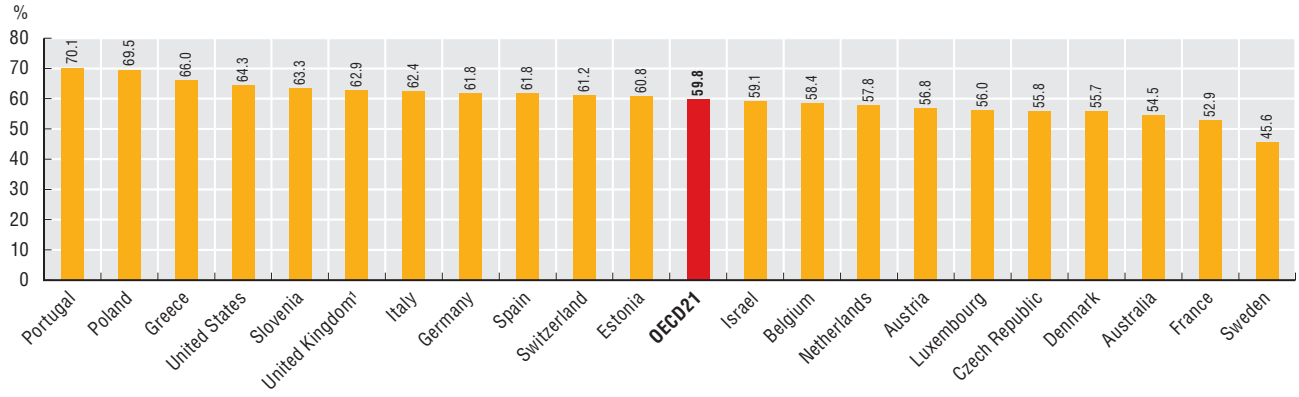
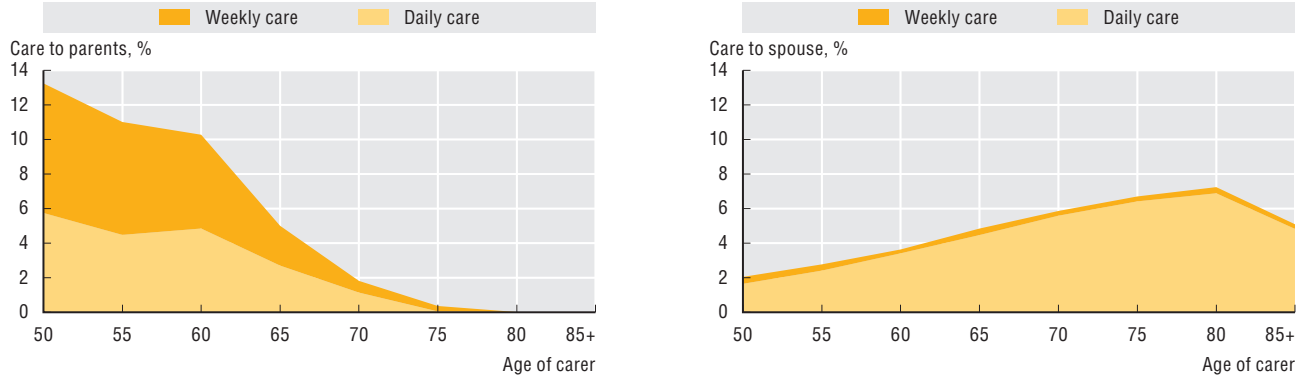
11.17. Share of women among informal daily carers aged 50 and over, 2015 (or nearest year)



Note: The definition of informal carers differs between surveys (see Definition and comparability).
1. United Kingdom refers to England.
Source: Wave 6 of the Survey of Health, Ageing and Retirement in Europe (2015), Survey of Disability, Ageing and Carers for Australia (2015), wave 7 of the English Longitudinal Study of Ageing (2015), wave 12 of the Health and Retirement Survey for the United States (2014).

StatLink http://dx.doi.org/10.1787/888933605958

11.18. Share of informal carers in European[1] population aged 50 and over, by recipients of care and age, daily and weekly, 2015



1. Data refer to population aged 50 and over for countries included in SHARE wave 6.
Source: Wave 6 of the Survey of Health, Ageing and Retirement in Europe (2015).

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Long-term care workers

Long-term care (LTC) is a labour-intensive service. Formal LTC workers are defined as paid staff, typically nurses and personal carers, providing care and/or assistance to people limited in their daily activities at home or in institutions, excluding hospitals. Formal care is complemented by informal, usually unpaid, support from family and friends, which accounts for a large part of care for older people in all OECD countries (see indicator on "Informal carers").

Relative to the population aged 65 and over, Norway, Sweden and the United States have the most LTC workers and the Slovak Republic and Portugal the fewest (Figure 11.19). In all countries except for Israel, Japan, Estonia and Korea, the majority of LTC staff work in institutions, even though the majority of recipients usually receive care at home (see indicator on care recipients). This reflects the fact that those in institutions often have more severe needs and require more intensive care.

Most LTC workers are women and work part-time. At least 90% of LTC workers are women in Korea, Denmark, the Slovak Republic, the Netherlands and Norway (Figure 11.20). Foreign-born workers also play an important role in LTC provision, though their presence is uneven across OECD countries. While Germany has very few foreign-born LTC workers, nearly one in four care workers in the United States is foreign-born (Colombo et al., 2011).

The LTC sector represents a small but growing share of total employment in OECD countries, averaging just over 2%. The number of LTC workers increased by more than 50% in Japan, Korea, and Israel between 2005 and 2015 (Figure 11.21). In Japan and Korea, this is related to the introduction of universal LTC insurance and the increasing professionalisation of LTC work. However, the Japanese and Korean populations are ageing rapidly and even with these changes, the growth in the LTC workforce has only just kept pace with the growth in the population aged over 80 – the people most likely to need LTC. In contrast, the number of long-term care workers decreased in Estonia, the Slovak Republic, and the Netherlands, despite large increases in the population aged 80+ over the same period (Figure 11.21).

On average, around one third LTC workers are nurses and the other two thirds are personal care workers (also referred to as nursing aides, health assistants in institutions or home-based care assistants) with less formal training. Many OECD countries have set educational and training requirements for personal care workers, although these vary substantially, especially where home-based care is concerned (OECD/European Commission, 2013).

As populations continue to age, demand for LTC workers is likely to rise. Responding to increasing demand will require policies to improve recruitment (e.g. encouraging more unemployed people to consider training and working in the LTC sector); improve retention (e.g. enhancing pay and work conditions); and increase productivity (e.g. through reorganisation of work processes and more effective use of new technologies) (Colombo et al., 2011; European Commission, 2013).

Definition and comparability

Long-term care workers are defined as paid workers who provide care at home or in institutions (outside hospitals). They include qualified nurses and personal care workers providing assistance with ADL and other personal support. Personal care workers include different categories of workers who may be called under different names in different countries. They may have some recognised qualification or not. Because personal care workers may not be part of recognised occupations, it is more difficult to collect comparable data for this category of LTC workers across countries. LTC workers also include family members or friends who are employed under a formal contract either by the care recipient, an agency, or public and private care service companies. They exclude nurses working in administration. The numbers are expressed as head counts, not full-time equivalent.

There are some differences in the methodologies that countries use to calculate the data, which could bias the results. Data for some countries refers only to workers employed in the public sector, while other countries include the private and non-profit sectors. Data from the Czech Republic and Japan are based on surveys of establishments, meaning that people who work in more than one establishment are double-counted.

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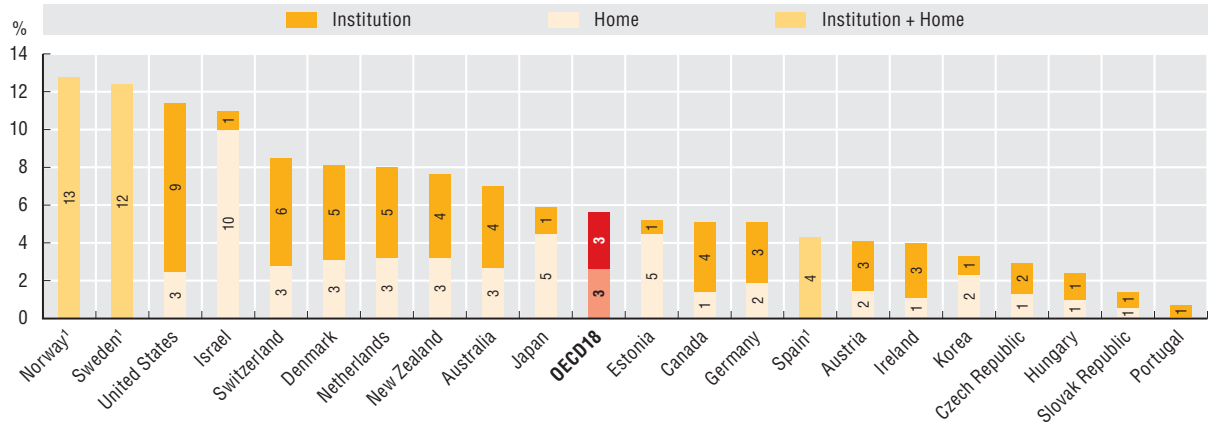
United Nations (2016), "The Growing Need for Long-term Care, Assumptions and Realities", Briefing Paper.

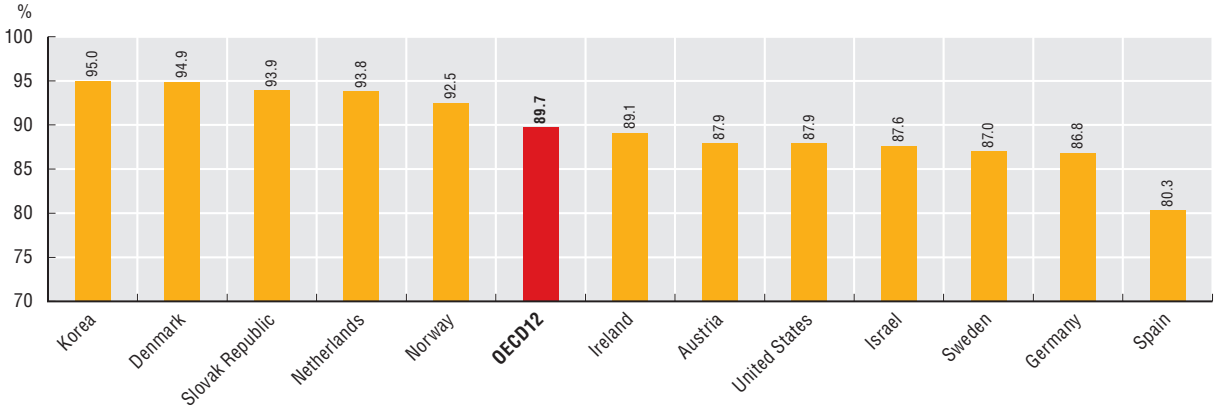
11.19. Long-term care workers per 100 people aged 65 and over, 2015 (or nearest year)



1. In Norway, Sweden and Spain it is not possible to distinguish LTC workers in institutions and at home. They are not included in the OECD average.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933605996

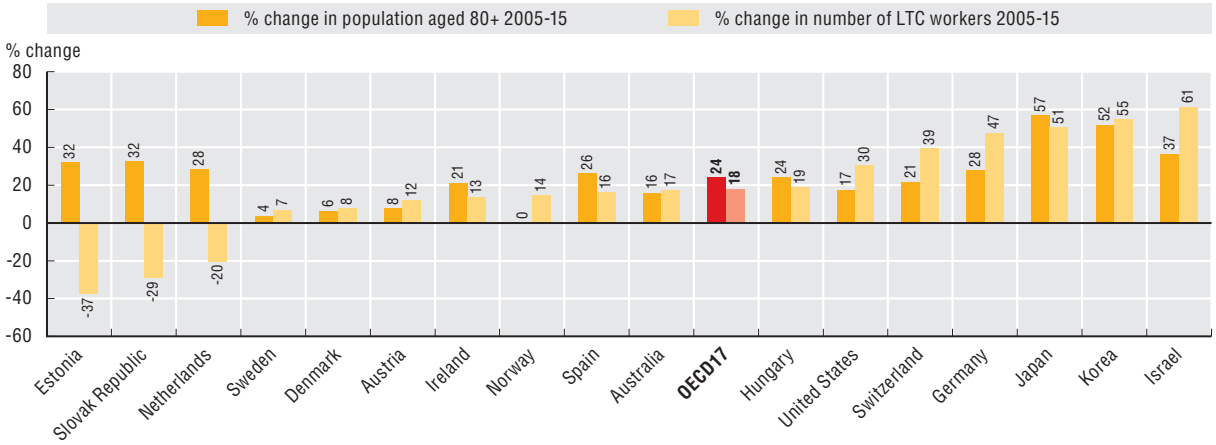
11.20. Proportion of long-term care workers who are women, 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933606015

11.21. Long term care workers and population aged 80 and over, 2005 and 2015 (or nearest year)



Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933606034

Long-term care beds in institutions and hospitals

The number of beds in long-term care (LTC) institutions and in LTC departments in hospitals provides a measure of the resources available for delivering LTC services to individuals outside of their home.

On average across OECD countries, there were 50 LTC beds per 1 000 people aged 65 and over in 2015 – 46 in LTC institutions and four beds in LTC departments in hospitals (Figure 11.22). The Netherlands had the highest number of LTC beds in 2015, with around 87 beds per 1 000 people aged 65 and over, the vast majority of which were in LTC institutions. On the other hand, there were fewer than 20 beds per 1 000 people aged 65 and over in Italy, Latvia, Poland, and Turkey.

On average, there has been almost no change in the number of LTC beds per 1 000 population over 65 since 2005, though this masks substantial variation between countries (Figure 11.23). At one extreme, some countries with well-established, comprehensive LTC systems have reduced residential LTC capacity. Between 2005 and 2015, Sweden reduced the number of LTC beds in institutions by 23.5 beds per 1 000 population over 65. These reductions are attributable to a drive to move LTC out of residential facilities and into the community (Colombo et al., 2011). Iceland, Canada and Norway have also made significant reductions in the number of beds available. In contrast, Korea has seen a massive increase in capacity, increasing the number of beds from 13 to 58 per 1 000 population over 65 between 2005 and 2015, with the increase particularly marked since the introduction of a public LTC insurance scheme in 2008.

While most countries allocate very few beds for LTC in hospitals, some still use hospital beds quite extensively for LTC purposes. Despite recent increases in the number of beds in LTC institutions in Korea, the majority of LTC beds are still in hospitals – although this may be driven in part by the reimbursement rules of the Korean LTC insurance, which require some facilities to be classified as hospitals. In Japan, many hospital beds are used for long-term care, though the number has decreased in recent years. Some European countries, such as Finland, Hungary and the Czech Republic, still have a significant number of LTC beds in hospitals, but in general there has been a move towards replacing hospital beds with institutional facilities, which are often cheaper and provide a better living environment for people with LTC needs.

Providing LTC in institutions can be more efficient than community care for people with intensive needs, due to economies of scale and the fact that care workers do not need to travel to each person separately. However, it often costs more to public budgets, since informal carers make less of a contribution and LTC systems often pick up board, lodging and care costs. Moreover, LTC users generally prefer to remain at home. Most countries have taken steps in recent years to support this preference and promote community care. However, depending on individual circumstances, a move to LTC institutions may be the most appropriate option, for example for people living alone and requiring round-the-clock care and supervision (Wiener et al., 2009) or people living in remote areas with limited home-care support. It is therefore important that countries retain an appropriate level of residential LTC capacity, and that care institutions develop and apply models of care that promote dignity and autonomy.

Definition and comparability

Long-term care institutions refer to nursing and residential care facilities which provide accommodation and long-term care as a package. They include specially designed institutions or hospital-like settings where the predominant service component is long-term care for people with moderate to severe functional restrictions. Beds in adapted living arrangements for persons who require help while guaranteeing a high degree of autonomy and self-control are not included. For international comparisons, beds in rehabilitation centers should not be included.

However, there are variations in data coverage across countries. Several countries only include beds in publicly-funded LTC institutions, while others also include private institutions (both profit and non-for-profit). Some countries also include beds in treatment centers for addicted people, psychiatric units of general or specialised hospitals, and rehabilitation centers.

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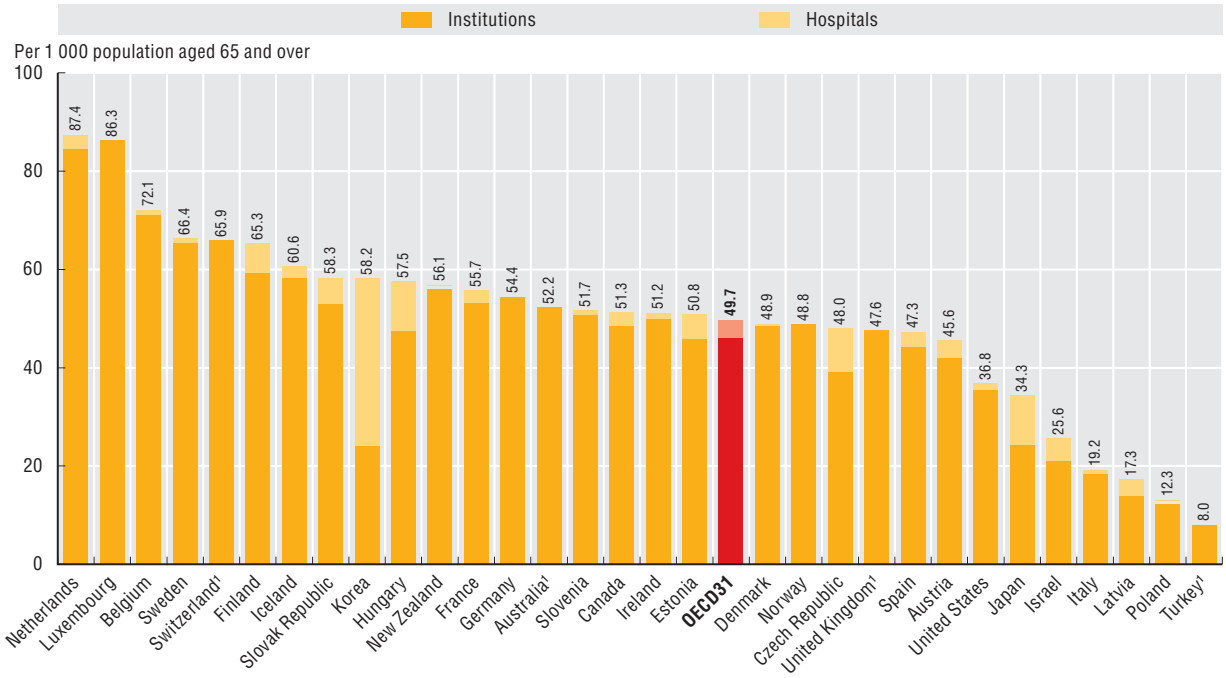
Wiener, J. et al. (2009), "Why Are Nursing Home Utilization Rates Declining", *Real Choice Systems Change Grant Program*, US Department of Health and Human Services, Centers for Medicare and Medicaid Services.

11.22. Long-term care beds in institutions and hospitals, 2015 (or nearest year)

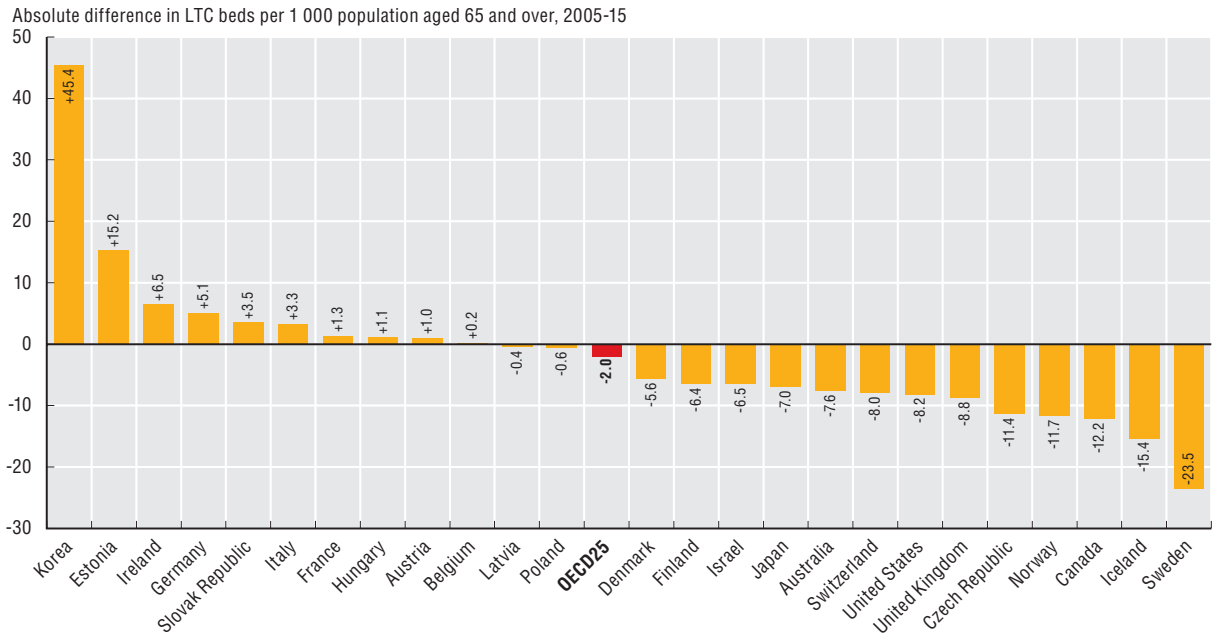


1. The numbers of long-term care beds in hospitals are not available for Australia, Switzerland, Turkey and the United Kingdom.

Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933606053

11.23. Trends in long-term care beds in institutions and hospitals, 2005-15 (or nearest year)



Source: OECD Health Statistics 2017.

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Long-term care expenditure

Long-term care (LTC) spending has seen the highest growth across the various functions (see Indicator on "Health expenditure by type of service") and is expected to rise further in the coming years. Population ageing leads to more people needing ongoing health and social care; rising incomes increase expectations on the quality of life in old age; the supply of informal care is potentially shrinking; and productivity gains are difficult to achieve in such a labour-intensive sector. All these factors create upward pressures on spending.

A significant share of LTC services is paid for out of government or compulsory insurance schemes. Total government/compulsory spending on LTC (including both the health and social care components) accounted for 1.7% of GDP on average across OECD countries in 2015 (Figure 11.24). At 3.7% of GDP, the highest spender was the Netherlands, where public expenditure on long-term care was around double the OECD average. At the other end of the scale, Hungary, Estonia, Poland, Israel and Latvia allocated less than 0.5% of their GDP, to the public provision of long-term care. This variation can partly reflect differences in the population structure, but mostly the development of formal LTC systems, as opposed to more informal arrangements based mainly on care provided by unpaid family members. Despite problems of underreporting which limit comparability, available data on privately-funded LTC expenditure suggests in some cases it can be substantial, playing a relatively large role in Switzerland (0.7% of GDP), Germany and the United Kingdom (both 0.6%). Consequently, the share of private spending – mainly out-of-pocket expenditure – in total spending on LTC accounts for more than 30% in those countries.

The boundaries between health and social LTC spending are still not fully consistent across countries, with some reporting particular components of LTC as health care, while others view it as social spending. Sweden and Norway spend 2.5% or more of their GDP on the health part of LTC financed from government/compulsory schemes, which is around double the OECD average (1.3%). With 1.3% of GDP, the Netherlands report the highest level of public spending on social LTC, much higher than the OECD average of 0.4%.

The way LTC is organised in countries affects the composition of LTC spending and may also have an impact on overall LTC spending. Across the OECD, two-thirds of government and compulsory spending on LTC (health) was for inpatient LTC in 2015. This is mainly provided in residential LTC facilities (Figure 11.25). Yet in Poland, Finland, Denmark, Austria and Germany, spending on home-based LTC accounts for more than 50% of all LTC (health) spending. Spending for home-based LTC can be either due to services provided by professional LTC workers or informal workers, when a care allowance exists which remunerates the caregiver for the LTC services provided.

Spending by government and compulsory insurance schemes on LTC has increased more rapidly than health care expenditure over the last decade. The annual growth rate was 4.6% between 2005 and 2015 across OECD countries (Figure 11.26). Spending growth stands out for Korea, which has implemented a number of measures to expand the coverage of their LTC systems in recent years, although total LTC spending still remains below the OECD average as a share of GDP.

Projection scenarios suggest that public resources allocated to LTC as a share of GDP could double or more by 2060 (De La Maisonneuve and Oliveira Martins, 2013). One of the main challenges in the future will be to strike the right balance between providing appropriate social protection to people with LTC needs and ensuring that this protection is fiscally sustainable.

Definition and comparability

LTC spending comprises both health and social services to LTC dependent people who need care on an on-going basis. Based on the System of Health Accounts (SHA), the health component of LTC spending relates to nursing and personal care services (i.e. help with activities of daily living (ADL)). It covers palliative care and care provided in LTC institutions or at home. LTC social expenditure primarily covers assistance with instrumental activities of daily living (IADL). Despite progress made in improving the general comparability of LTC spending in recent years there is still some variation in reporting practices between the health and social components for some LTC activities across countries. In addition, LTC expenditure funded by governments and compulsory insurance schemes is more suitable for international comparisons as there is more variation in the comprehensiveness in reporting of privately-funded LTC expenditure across OECD countries.

Finally, some countries (e.g. Estonia, Israel, and the United States) can only report spending data for institutional care, and hence underestimate the total amount of spending on long-term care services by government and compulsory insurance schemes.

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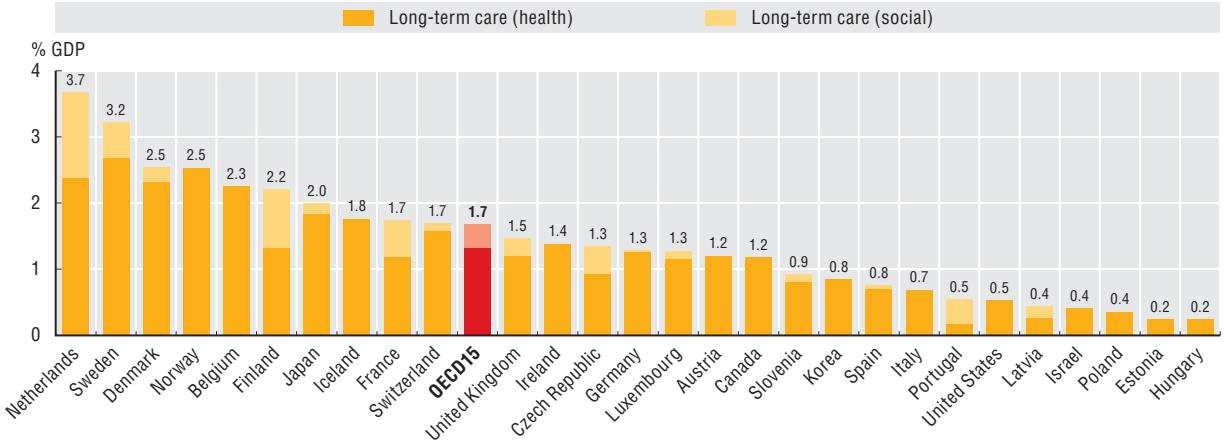
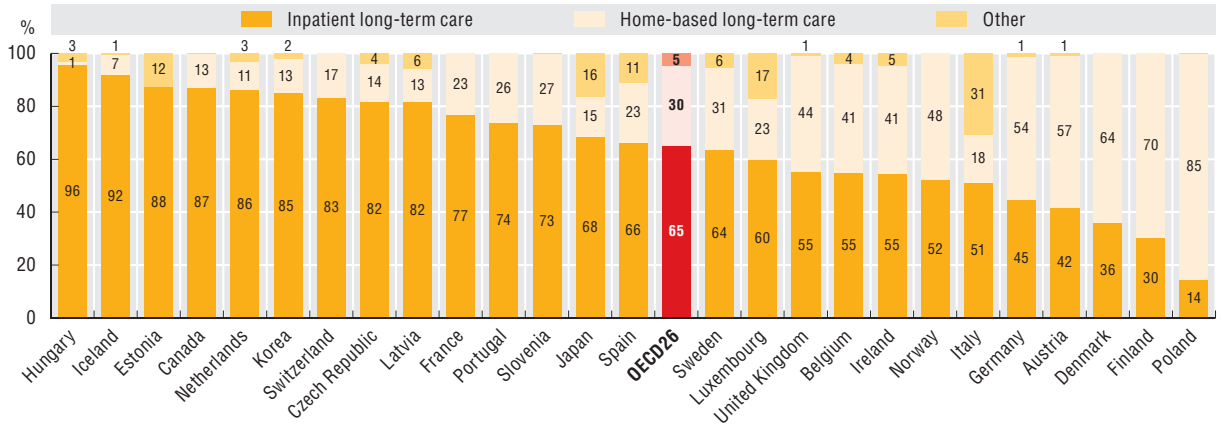
11.24. Long-term care expenditure (health and social components) by government and compulsory insurance schemes, as a share of GDP, 2015 (or nearest year)



Note: The OECD average only includes the 15 countries that report health and social LTC.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933606091

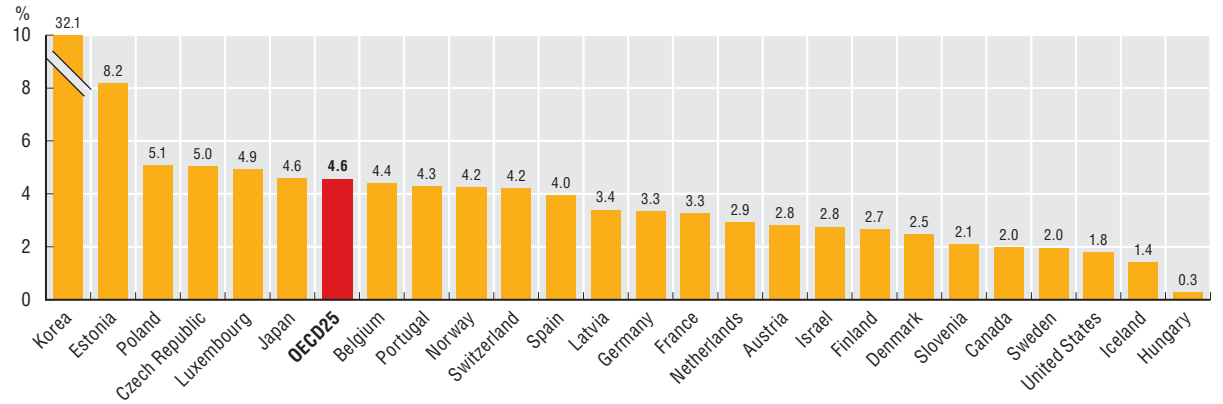
11.25. Government and compulsory insurance spending on LTC (health) by mode of provision, 2015 (or nearest year)



Note: "Other" includes LTC day cases and outpatient LTC.
Source: OECD Health Statistics 2017.

StatLink http://dx.doi.org/10.1787/888933606110

11.26. Annual growth rate in expenditure on LTC (health and social) by government and compulsory insurance schemes, in real terms, 2005-15 (or nearest year)



Source: OECD Health Statistics 2017.

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