Health at a Glance 2019

OECD INDICATORS

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Foreword

Health at a Glance compares key indicators for population health and health system performance across OECD members, candidate and partner countries. This 2019 edition presents the latest comparable data across 80 indicators, reflecting differences across countries in health status, risk factors and health-seeking behaviour, access, quality of care, and the financial and physical resources available for health. Alongside indicator-by-indicator analysis, an overview chapter summarises the comparative performance of countries and major trends, including how much health spending is associated with staffing levels, access, quality, and health outcomes. This edition also includes a special chapter on patient-reported outcomes and experiences.

The production of *Health at a Glance* would not have been possible without the contribution of national data correspondents from OECD countries. The OECD gratefully acknowledges their effort in supplying most of the data contained in this publication, as well as their detailed feedback to a draft of the report. Special acknowledgement is extended to members of the Patient-reported Indicator Surveys (PaRIS) Working Groups on mental health, breast cancer care, and hip and knee replacement for their contribution to Chapter 2, especially those individuals from countries, registries and health care organisations that facilitated the provision of patient-reported data. The OECD also recognises the contribution of other international organisations, notably the World Health Organization and Eurostat, for providing data and comments. The European Union provided financial and substantive assistance for work related to PaRIS, but the opinions expressed and arguments employed herein do not necessarily reflect the official views of the OECD member countries or the European Union.

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Executive summary

Health at a Glance 2019 provides the latest comparable data and trends over time on population health and health system performance across OECD members, candidate and partner countries.

Gains in longevity are stalling; chronic diseases and mental ill health affect more and more people

- On average across OECD countries, a person born today can expect to live almost 81 years. But life expectancy gains have slowed recently across most OECD countries, especially in the United States, France and the Netherlands. 2015 was a particularly bad year, with life expectancy falling in 19 countries.

- The causes are multifaceted. Rising levels of obesity and diabetes have made it difficult to maintain previous progress in cutting deaths from heart disease and stroke. Respiratory diseases such as influenza and pneumonia have claimed more lives in recent years, notably amongst older people.

- In some countries the opioid crisis has caused more working-age adults to die from drug-related accidental poisoning. Opioid-related deaths have increased by about 20% since 2011, and have claimed about 400 000 lives in the United States alone. Opioid-related deaths are also relatively high in Canada, Estonia and Sweden.

- Heart attacks, stroke and other circulatory diseases caused about one in three deaths across the OECD; and one in four deaths were related to cancer. Better prevention and health care could have averted almost 3 million premature deaths.

- Almost one in ten adults consider themselves to be in bad health. This reflects in part the burden of chronic diseases – almost a third of adults live with two or more chronic conditions. Mental ill health also takes its toll, with an estimated one in two people experiencing a mental health problem in their lifetime.

Smoking, drinking and obesity continue to cause people to die prematurely and worsen quality of life

- Unhealthy lifestyles – notably smoking, harmful alcohol use and obesity – are the root cause of many chronic health conditions, cutting lives short and worsening quality of life.

- Whilst smoking rates are declining, 18% of adults still smoke daily.

- Alcohol consumption averaged 9 litres of pure alcohol per person per year across OECD countries, equivalent to almost 100 bottles of wine. Nearly 4% of adults were alcohol dependent.

- Obesity rates continue to rise in most OECD countries, with 56% of adults overweight or obese and almost one-third of children aged 5-9 overweight.
- Air pollution caused about 40 deaths per 100 000 people, across OECD countries. Death rates were much higher in partner countries India and China, at around 140 deaths per 100 000 people.

Barriers to access persist, particularly amongst the less well-off

- An estimated one in five adults who needed to see a doctor did not do so, with worse access for the less well-off. Uptake of cancer screening is also lower amongst poorer individuals, even though most OECD countries provide screening programmes at no cost.
- Direct payments by households (out-of-pocket payments) make up just over a fifth of all health spending on average, and over 40% in Latvia and Mexico. Cost concerns lead people to delay or not seek care, with the least well-off three times more likely than wealthier individuals to have unmet need for financial reasons.
- Waiting times and transportation difficulties hinder access in some countries. For example, waiting times for a knee replacement were over a year in Chile, Estonia and Poland.
- Such access constraints occur despite most OECD countries having universal or near-universal coverage for a core set of services. Parts of the explanation are high cost sharing, exclusion of services from benefit packages or implicit rationing of services. Limitations in health literacy, imperfect communication strategies and low quality of care are also contributing factors.

Quality of care is improving in terms of safety and effectiveness, but more attention should be placed on patient-reported outcomes and experiences

- Patient safety has improved across many indicators, but more needs to be done. For example, 5% of hospitalised patients had a health-care associated infection.
- Strong primary care systems keep people well and can treat most uncomplicated cases. They also relieve pressure on hospitals: avoidable admissions for chronic conditions have fallen in most OECD countries, particularly in Korea, Lithuania, Mexico and Sweden.
- In terms of acute care, fewer people are dying following a heart attack or stroke, with Norway and Iceland having low case-fatality rates for both conditions. Alongside adherence to evidence-based medicine, timely care is critical.
- Survival rates for a range of cancers have also improved, reflecting better quality preventive and curative care. Across all OECD countries, for example, women diagnosed early for breast cancer have a 90% or higher probability of surviving their cancer for at least five years.
- A deeper understanding of quality of care requires measuring what matters to people. Yet few health systems routinely ask patients about the outcomes and experiences of their care. Preliminary results show improvements in patient-reported outcomes. For

example, following hip replacement, an individual's quality of life – in terms of mobility, self-care, activity, pain and depression – improved on average by around 20%.

Countries spend a lot on health, but they do not always spend it as well as they could

- Spending on health was about USD 4 000 per person (adjusted for purchasing powers), on average across OECD countries. The United States spent more than all other countries by a considerable margin, at over USD 10 000 per resident. Mexico spent the least, at around USD 1 150 per resident.

- Health expenditure has largely outpaced economic growth in the past, and despite a slowdown in recent years, is expected to do so in the future. New estimates point to health spending reaching 10.2% of GDP by 2030 across OECD countries, up from 8.8% in 2018. This raises sustainability concerns, particularly as most countries draw funding largely from public sources.

- Reforms to improve economic efficiency are critical. Increased use of generics has generated cost-savings, though generics only represent around half of the volume of pharmaceuticals sold across OECD countries. Increases in day surgery, lower hospitalisation rates and shorter stays may also indicate a more efficient use of expensive hospital resources.

- In OECD countries, health and social systems employ more workers now than at any other time in history, with about one in every ten jobs found in health or social care. Shifting tasks from doctors to nurses and other health professionals can alleviate cost pressures and improve efficiency.

- Population ageing increases demand for health services, particularly for long-term care. This places more pressure on family members, particularly women, with around 13% of people aged 50 and over providing informal care at least once a week for a dependent relative or friend. By 2050, the share of the population aged 80 and over will more than double.

Reader's guide

Health at a Glance 2019: OECD Indicators compares key indicators for population health and health system performance across the 36 OECD member countries. Candidate and partner countries are also included where possible – Brazil, People's Republic of China (China), Colombia, Costa Rica, India, Indonesia, the Russian Federation (Russia) and South Africa. On 25 May 2018, the OECD Council invited Colombia to become a Member. At the time of preparation of this publication, the deposit of Colombia's instrument of accession to the OECD Convention was pending and therefore Colombia does not appear in the list of OECD Members and is not included in the OECD zone aggregates.

Data presented in this publication come from official national statistics, unless otherwise stated.

Conceptual framework

The conceptual framework underlying *Health at a Glance* assesses health system performance within the context of a broad view of the determinants of health (Figure 1). It builds on the framework endorsed by the OECD work stream on health care quality and outcomes, which recognises that the ultimate goal of health systems is to improve people's health.

Many factors outside the health system influence health status, notably income, education, the physical environment in which an individual lives, and the degree to which people adopt healthy lifestyles. The demographic, economic and social context also affects the demand for and supply of health services, and ultimately health status.

At the same time, the performance of a health care system has a strong impact on a population's health. When health services are of high quality and are accessible to all, people's health outcomes are better. Achieving access and quality goals, and ultimately better health outcomes, depends critically on there being sufficient spending on health. Health spending pays for health workers to provide needed care, as well as the goods and services required to prevent and treat illness. However, these resources also need to be spent wisely, so that value-for-money is maximised.

Structure of the publication

Health at a Glance 2019 compares OECD countries on each component of this general framework. It is structured around eleven chapters. The first chapter presents an ***overview of health and health system performance***, based on a subset of core indicators from the report. Country dashboards shed light on the relative strengths and weaknesses of OECD countries' health systems, alongside OECD-wide summary data. Linkages between how much a country spends on health and outcomes that matter to people are also illustrated.

Figure 1. **Mapping of Health at a Glance indicators into conceptual framework for health system performance assessment**
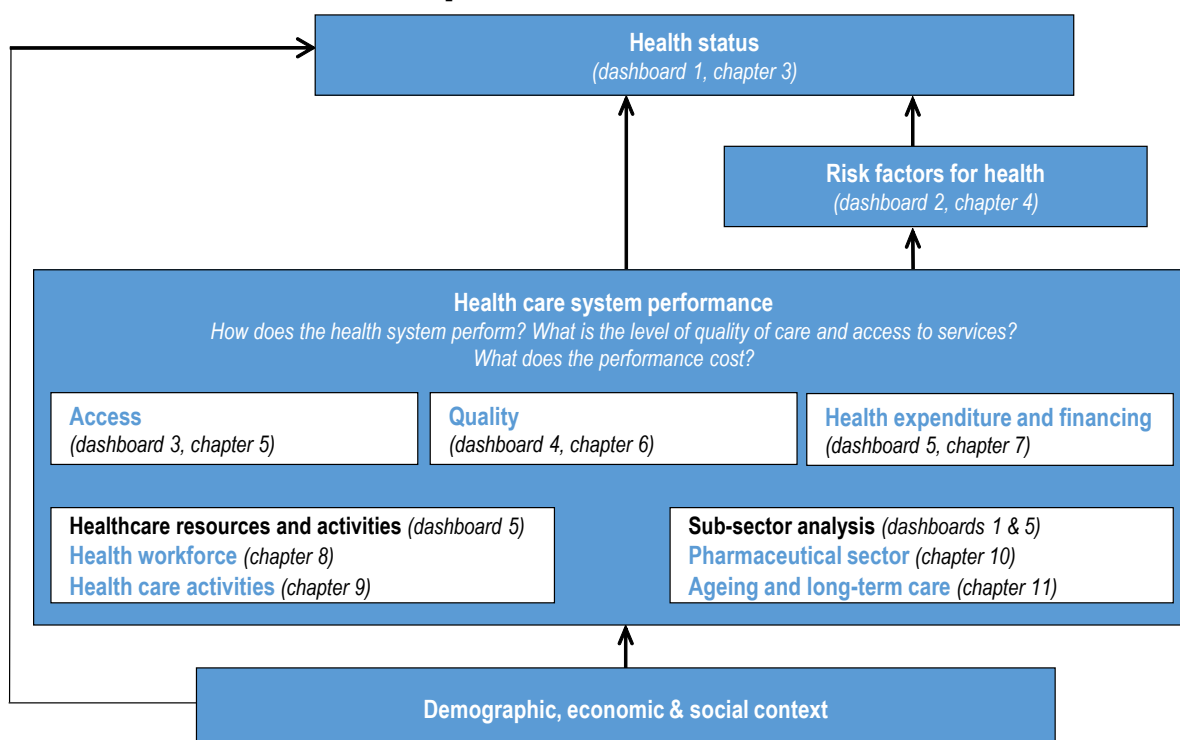
Source: Adapted from Carinci, F. et al. (2015), "Towards Actionable International Comparisons of Health System Performance: Expert Revision of the OECD Framework and Quality Indicators", *International Journal for Quality in Health Care*, Vol. 27, No. 2, pp. 137-146.

The second chapter provides a special focus on **patient-reported outcomes and experiences**, indicators that offer better measures of what matters to patients. It describes the rationale for collecting and using information reported by patients. It also provides preliminary results from a small number of countries in three clinical areas: elective hip and knee replacement; breast cancer care; and mental health.

The next nine chapters then provide detailed country comparisons across a range of health indicators, including where possible time trend analysis and data disaggregated by demographic and socioeconomic characteristics.

Chapter 3 on **health status** highlights variations across countries in life expectancy, the main causes of mortality, disease incidence and other indicators of population health. This chapter also includes measures of inequality in health status by education and income level for key indicators such as life expectancy and self-assessed health.

Chapter 4 analyses **risk factors for health**. The focus is on an individual's health-related behaviours, most of which effective public health and prevention policies can modify. These include the major risk factors for non-communicable diseases of smoking, alcohol and obesity; and new data on opioids use. Healthy lifestyles and population exposure to air pollution and extreme temperatures are also analysed.

Chapter 5 on **access to care** investigates the extent to which people can access needed services, with special attention paid to socioeconomic inequalities. Overall measures of

population coverage are also presented, as are the financial consequences for households of accessing services.

Chapter 6 assesses **quality and outcomes of care** in terms of patient safety, clinical effectiveness and the person responsiveness of care. Indicators across the full lifecycle of care are included, from prevention to primary, chronic and acute care. This includes analysis of prescribing practices, management of chronic conditions, acute care for heart attacks and stroke, mental health, cancer care and prevention of communicable diseases.

Chapter 7 on **health expenditure and financing** compares how much countries spend on health per person and in relation to GDP. It then analyses differences in prices paid, the extent to which countries finance health through prepayment schemes or household out-of-pocket payments, and the public-private funding mix. Spending by type of service and health provider are also explored. Finally, projections estimate spending to 2030 under different policy scenarios.

Chapter 8 examines 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. Indicators on the international migration of doctors and nurses compare countries in terms of their reliance on foreign-trained workers.

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. The chapter then compares the use and supply of hospital services, in terms of discharges, number of beds and average length of stay. Utilisation of medical technologies, common surgical procedures, and the increased use of ambulatory surgery are also analysed.

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, as does spending on research and development. The number of pharmacists and pharmacies, consumption of certain high-volume drugs, and the use of generics and bio-similars, are also compared.

Chapter 11 focuses on **ageing and long-term care**. It assesses key factors affecting the demand for long-term care, such as demographic trends and health status indicators for elderly populations. Dementia prevalence and the quality of dementia care is compared, as is the safety of care for elderly populations. Recipients of long-term care, and the formal and informal workers providing care for these people, are also assessed, along with trends in spending and unit costs.

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, highlights key findings conveyed by the data and related policy insights, and signals any significant national variation in methodology that might affect data comparability. A few key references are also provided.

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 the online database *OECD Health Statistics* on OECD.Stat at *https:// oe.cd/ds/health-statistics*. 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 the *UN Demographic Yearbook* and *UN World Population Prospects* (various editions) or national estimates for non-European OECD countries (data extracted as of early June 2019). Mid-year estimates are used. 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 territories. These populations are generally excluded. However, the calculation of GDP per capita and other economic measures may 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	Lithuania	LTU
Canada	CAN	Luxembourg	LUX
Chile	CHL	Mexico	MEX
Czech Republic	CZE	Netherlands	NLD
Denmark	DNK	New Zealand	NZL
Estonia	EST	Norway	NOR
Finland	FIN	Poland	POL
France	FRA	Portugal	PRT
Germany	DEU	Slovak Republic	SVK
Greece	GRC	Slovenia	SVN
Hungary	HUN	Spain	ESP
Iceland	ISL	Sweden	SWE
Ireland	IRL	Switzerland	CHE
Israel	ISR	Turkey	TUR
Italy	ITA	United Kingdom	GBR
Japan	JPN	United States	USA

Partner country ISO codes

Brazil	BRA	India	IND
China (People's Republic of)	CHN	Indonesia	IDN
Colombia	COL	Russia	RUS
Costa Rica	CRI	South Africa	ZAF

Chapter 1

Indicator overview: comparative performance of countries and major trends

This chapter analyses a core set of indicators on health and health systems. Country dashboards shed light on how OECD countries compare across five dimensions: health status, risk factors for health, access, quality and outcomes, and health care resources. OECD snapshots summarise the extent of variation in performance across countries, as well as time trends. Finally, quadrant charts illustrate how much health spending is associated with staffing, access, quality and health outcomes.

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Introduction

Health indicators offer a useful 'at a glance' perspective on how healthy populations are and how well health systems perform. This introductory chapter provides a comparative overview of OECD countries across 20 core indicators. It also explores how much health spending is associated with staffing, access, quality and health outcomes.

Such comparative analysis does not indicate which countries have the best performing health systems overall. Rather, it identifies some of the relative strengths and weaknesses of different OECD countries. This can help policymakers determine priority action areas for their country, with subsequent chapters in Health at a Glance providing a more detailed suite of indicators, organised by topic area.

Five dimensions of health and health systems are analysed in this chapter, covering core aspects of population health and health system performance. For each of these dimensions, four summary indicators are analysed (Table 1.1). These indicators are selected from the publication based on how relevant and actionable they are from a public policy perspective; as well as the more practical consideration of data availability across countries.

Table 1.1. **Population health and health system performance: summary indicators**

Dimension	Indicator
Health status (chapters 3 and 11)	Life expectancy – years of life at birth Avoidable mortality – deaths per 100 000 people (age standardised) Chronic disease morbidity – diabetes prevalence (% adults, age standardised) Self-rated health – population in poor health (% population aged 15+)
Risk factors for health (chapter 4)	Smoking – daily smokers (% population aged 15+) Alcohol – litres consumed per capita (population aged 15+) Overweight/obese – population with BMI>=25 kg/m2 (% population aged 15+) Air pollution – deaths due to pollution (per 100 000 population)
Access to care (chapter 5)	Population coverage – population eligible for core services (% population) Financial protection – expenditure covered by prepayment schemes (% total expenditure) Service coverage, primary care – needs-adjusted probability of visiting a doctor (% population aged 15+) Service coverage, preventive care – probability of cervical cancer screening (% population aged 15+)
Quality of care (chapter 6)	Safe prescribing – antibiotics prescribed (defined daily dose per 1 000 people) Effective primary care – avoidable asthma/COPD admissions (per 100 000 people, age-sex standardised) Effective secondary care – 30-day mortality following AMI (per 100 000 people, age-sex standardised) Effective cancer care – breast cancer 5-year net survival (%, age-standardised)
Health care resources (chapters 7-10)	Health spending – per capita (US dollars based on purchasing power parities) Health spending share – as a % of GDP Doctors – number of practising physicians (per 1 000 people) Nurses – number of practising nurses (per 1 000 people)

Note: AMI = acute myocardial infarction (heart attack); BMI = body mass index; COPD = chronic obstructive pulmonary disease.

Based on these indicators, *country dashboards* are produced for each of these five dimensions. These compare a country's performance to others and to the OECD average. Country classification for each indicator is into one of three colour-coded groups:

● Blue, when the country's performance is close to 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 1.6), where indicators cannot be strictly classified as showing 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 has considerably less or more of a given health care resource than the OECD average.

OECD snapshots provide accompanying summary statistics for each of these indicators. They complement the country dashboards by providing an OECD-wide overview for each indicator. Highest and lowest values per indicator, alongside the OECD average, provide a general sense of the degree of cross-country variation. Countries with comparatively large improvements over time in a given indicator are also shown.

Finally, *quadrant charts* illustrate basic associations between how much countries spend on health and how effectively health systems function. That is, they show the extent to which spending more on health translates into better health outcomes, higher quality of care and improved access to care, across OECD countries; whilst also recognising the importance of major risk factors. The relationship between spending and the number of health professionals is also explored. These quadrant charts only show simple associations at a macro level between indicators rather than causal relationships. That is, their purpose is to stimulate deeper discussions on policy priority setting, by highlighting areas where countries could potentially do better. The centre of each quadrant chart is the OECD average, with health expenditure on the *x*-axis and the other variable of interest on the *y*-axis. Figure 1.1 shows the basic interpretation of each quadrant, taking health outcome variables as an example.

Figure 1.1. **Interpretation of quadrant charts: Health expenditure and health outcome variables**
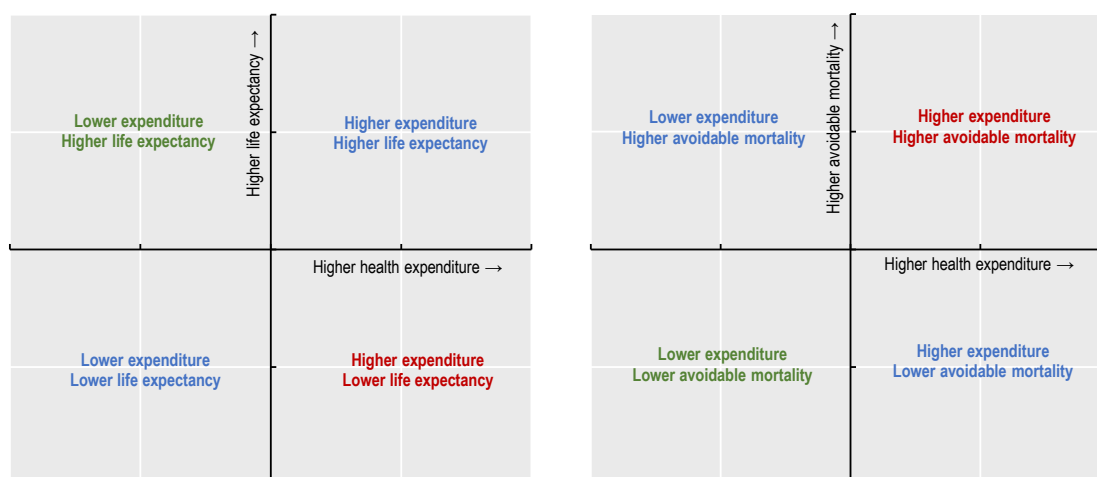
Methodology, interpretation and use

Country dashboards

The classification of countries being close to, better or worse than the OECD average is based on an indicator's standard deviation (a common statistical measure of dispersion). This method is preferred to using a fixed percentage or fixed number of countries per category, since it reflects the degree of variation, i.e. how far a country is from the OECD average. Countries are classified as "close to the OECD average" (blue) whenever the value for an indicator is within one standard deviation from the OECD average for the latest year. Particularly large outliers (values larger than three standard deviations) are excluded from the calculation of the standard deviation in order to avoid statistical distortions. These exclusions are noted under the relevant dashboards.

For a typical indicator, about 65% of the countries (24-25 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), it means that cross-country variation is relatively low (high) for that indicator. For example, for obesity rates, 27 countries are close to the OECD average. In contrast, for avoidable mortality, only 16 countries are close to the OECD average.

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. Countries with comparatively large improvements over time in a given indicator are also shown.

Quadrant charts

Quadrant charts plot health expenditure per capita against another indicator of interest (on health outcomes, quality of care, access and physical resources). These show the percentage difference of each indicator as compared with OECD averages. The intersection of the axes represents the OECD average for both indicators, so deviations from the midpoint show countries that perform above or below average compared to the OECD average. A simple correlation line is also included. Each country is colour-coded based on a simple (unweighted) risk factors index averaging smoking, alcohol and obesity variables (with blue, green and red having the same interpretation as in country dashboards).

Data from the latest available year are used for both variables in a given quadrant chart. A limitation of this approach is that lagged effects are not taken into account – for example, it may take a few years before higher health spending translates into longer life expectancy, or risk factors translate into higher avoidable mortality rates.

Health status

Four health status indicators reflect core aspects of both the quality and quantity of life. Life expectancy is a key indicator for the overall health of a population; avoidable mortality focuses on premature deaths that could have been prevented or treated. Diabetes prevalence shows morbidity for a major chronic disease; self-rated health offers a more holistic measure of mental and physical health. Figure 1.2 provides a snapshot on health status across the OECD and Table 1.2 provide more detailed country comparisons.

Figure 1.2. **Snapshot on health status across the OECD**
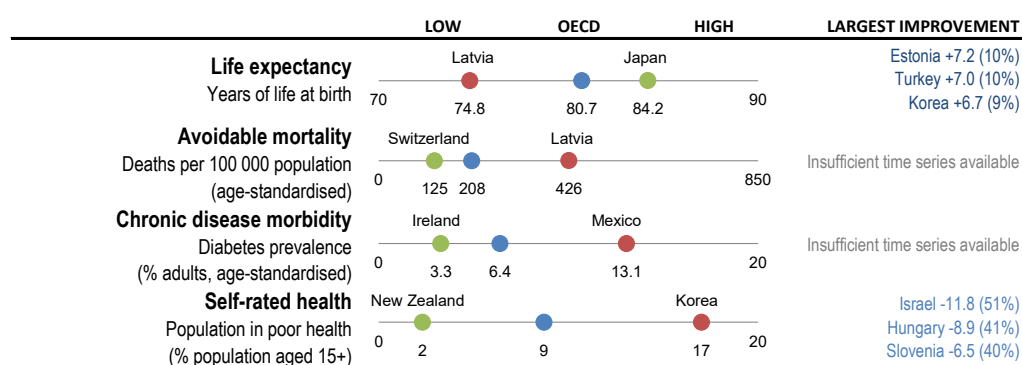
Note: Largest improvement shows countries with largest changes in value over time (% change in brackets).
Source: OECD Health Statistics 2019.

Across these indicators, Japan, Spain, Switzerland and the Netherlands generally have the best overall health outcomes. Hungary, Latvia, Mexico, Poland and the Slovak Republic are consistently below the OECD average for these indicators. Stronger health systems contribute to gains in health outcomes, by offering more accessible and higher quality care. Differences in risk factors such as smoking, alcohol and obesity also explain cross-country variation in health outcomes. Wider determinants of health matter too, notably rising incomes, better education and improved living environments.

Japan, Switzerland and Spain lead a large group of 26 OECD countries in which life expectancy at birth exceeds 80 years. A second group, including the United States and a number of central and eastern European countries, has a life expectancy between 77 and 80 years. Latvia, Lithuania, Mexico and Hungary have the lowest life expectancy, at less than 76 years in 2017. Across the OECD, whilst life expectancy has increased steadily over time, there has been a slowdown in longevity gains in recent years.

Avoidable mortality rates (from preventable and treatable causes) were lowest in Switzerland, Iceland, Japan, Sweden and Norway, where less than 300 per 100 000 people died prematurely. Latvia, Lithuania and Hungary had the highest avoidable mortality rates, at over 800 premature deaths per 100 000 people.

Diabetes prevalence is highest in Mexico, Turkey and the United States, with over 10% of adults living with diabetes (age-standardised data). Age-standardised diabetes prevalence rates have stabilised in many OECD countries, especially in Western Europe, but increased markedly in Turkey. Such upward trends are due in part to rising rates of obesity and physical inactivity, and their interactions with population ageing.

Almost 9% of adults consider themselves to be in bad health, on average across the OECD. This ranges from over 15% in Korea, Lithuania, Latvia and Portugal to under 4% in

Table 1.2. **Dashboard on health status**

	Life expectancy		Avoidable mortality		Chronic disease morbidity		Self-rated health	
	Years of life at birth		Deaths per 100 000 people (age-standardised)		Diabetes prevalence (% adults, age-standardised)		Population in poor health (% population aged 15+)	
OECD	80.7	◉	208	◉	6.4	◉	8.7	◉
Australia	82.6	◉	145	☑	5.1	◉	3.7	☑
Austria	81.7	◉	175	◉	6.4	◉	8.1	◉
Belgium	81.6	◉	172	◉	4.3	☑	8.6	◉
Canada	82.0	◉	176	◉	7.4	◉	3.2	☑
Chile	80.2	◉	206	◉	8.5	☒	6.6	◉
Czech Republic	79.1	◉	245	◉	6.8	◉	10.7	◉
Denmark	81.2	◉	184	◉	6.4	◉	7.5	◉
Estonia	78.2	☒	297	☒	4.0	☑	14.6	☒
Finland	81.7	◉	184	◉	5.8	◉	5.7	◉
France	82.6	◉	154	☑	4.8	◉	8.3	◉
Germany	81.1	◉	186	◉	8.3	☒	8.4	◉
Greece	81.4	◉	187	◉	4.6	☑	10.4	◉
Hungary	75.9	☒	388	☒	7.6	◉	11.9	◉
Iceland	82.7	◉	140	☑	5.3	◉	6.4	◉
Ireland	82.2	◉	172	◉	3.3	☑	3.4	☑
Israel	82.6	◉	134	☑	6.7	◉	10.9	◉
Italy	83.0	◉	143	☑	4.8	◉	5.8	◉
Japan	84.2	☑	138	☑	5.7	◉	14.1	☒
Korea	82.7	◉	159	◉	6.8	◉	17.0	☒
Latvia	74.8	☒	426	☒	4.9	◉	15.5	☒
Lithuania	75.6	☒	385	☒	3.7	☑	16.4	☒
Luxembourg	82.2	◉	152	☑	4.4	☑	9.3	◉
Mexico	75.4	☒	367	☒	13.1	☒	–	
Netherlands	81.8	◉	153	☑	5.3	◉	4.6	☑
New Zealand	81.9	◉	178	◉	8.1	◉	2.3	☑
Norway	82.7	◉	145	☑	5.3	◉	7.2	◉
Poland	77.9	☒	268	☒	5.9	◉	13.6	☒
Portugal	81.5	◉	180	◉	9.9	☒	15.3	☒
Slovak Republic	77.3	☒	323	☒	7.3	◉	11.3	◉
Slovenia	81.1	◉	210	◉	7.3	◉	9.7	◉
Spain	83.4	☑	146	☑	7.2	◉	6.6	◉
Sweden	82.5	◉	144	☑	4.8	◉	5.7	◉
Switzerland	83.6	☑	125	☑	5.6	◉	4.1	☑
Turkey	78.1	☒	257	◉	12.1	☒	9.4	◉
United Kingdom	81.3	◉	189	◉	4.3	☑	7.1	◉
United States	78.6	◉	262	☒	10.8	☒	2.6	☑

Note: ☑ Better than OECD average; ◉ Close to OECD average; ☒ Worse than OECD average. Hungary, Latvia and Lithuania excluded from the standard deviation calculation for avoidable mortality, while Mexico and Turkey excluded from diabetes prevalence.

New Zealand, the United States, Canada, Ireland and Australia. However, socio-cultural differences, the share of older people and differences in survey design affect cross-country comparability. People with lower incomes are generally less positive about their health as compared with people on higher incomes, in all OECD countries.

Risk factors for health

Smoking, alcohol consumption and obesity are the three major risk factors for non-communicable diseases, contributing to a large share of worldwide deaths. Air pollution is also a critical non-medical determinant of health. Figure 1.3 provides a snapshot on risk factors for health across the OECD and Table 1.3 provides more detailed country comparisons.

Figure 1.3. **Snapshot on risk factors for health across the OECD**
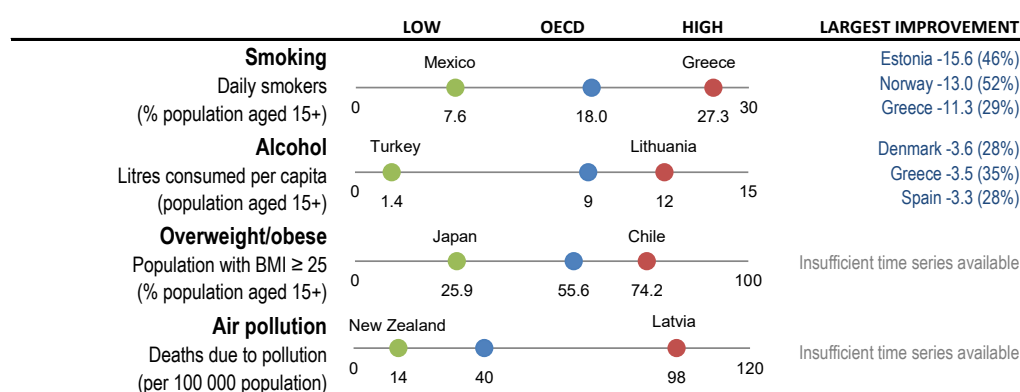
Note: Largest improvement shows countries with largest changes in value over time (% change in brackets).
Source: OECD Health Statistics 2019, WHO Global Health Observatory.

Norway and Sweden perform well across these indicators. Smoking causes multiple diseases – the World Health Organization estimates tobacco smoking kills 7 million people in the world every year. Smoking rates range from over 25% in Greece, Turkey and Hungary, to below 10% in Mexico and Iceland. Daily smoking rates have decreased in most OECD countries over the last decade, from an average of 23% in 2007 to 18% in 2017. In the Slovak Republic and Austria, though, smoking rates have risen slightly.

Alcohol use is a leading cause of death and disability worldwide, particularly in those of working age. Measured through sales data, Lithuania reported the highest consumption (12.3 litres of pure alcohol per person per year), followed by Austria, France, the Czech Republic, Luxembourg, Ireland, Latvia and Hungary, all with over 11 litres per person. Turkey, Israel and Mexico have comparatively low consumption levels (under 5 litres). Average consumption fell in 27 OECD countries since 2007. Harmful drinking is of particular concern in certain countries, notably Latvia, Hungary and the Russian Federation.

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 56% of the population being overweight or obese. Obesity rates are considerably higher than the OECD average in Chile, Mexico, the United States, Finland, Portugal and New Zealand. Obesity is lowest in Japan, Korea, and Switzerland. The measure reported here for overweight (including obese) adults is based on both measured and self-reported data. Caution should be taken when comparing countries with reporting differences, since measured data are generally higher.

Air pollution is not only a major environmental threat, but also worsens health. OECD projections estimate that outdoor air pollution may cause 6 to 9 million premature deaths a

Table 1.3. **Dashboard on risk factors for health**

|	Smoking		Alcohol		Overweight / obese		Air pollution	
	Daily smokers (% population aged 15+)		Litres consumed per capita (population aged 15+)		Population with BMI ≥ 25 (% population aged 15+)		Deaths due to pollution (per 100 000 people)	
OECD	18.0	◉	8.9	◉	55.6	◉	39.6	◉
Australia	12.4	☑	9.4	◉	65.2	◉	16.8	☑
Austria	24.3	☒	11.8	☒	46.7*	◉	38.7	◉
Belgium	18.9	◉	10.4	◉	51.0	◉	39.4	◉
Canada	12.0	☑	8.1	◉	59.1	◉	14.7	☑
Chile	24.5	☒	7.9	◉	74.2	☒	34.8	◉
Czech Republic	18.4	◉	11.6	☒	55.0	◉	64.3	☒
Denmark	16.9	◉	9.1	◉	51.0*	◉	30.4	◉
Estonia	17.2	◉	10.3	◉	51.3	◉	59.9	☒
Finland	14.0	◉	8.4	◉	67.6	☒	18.7	☑
France	25.4	☒	11.7	☒	49.0	◉	25.2	◉
Germany	18.8	◉	10.9	◉	60.0	◉	45.3	◉
Greece	27.3	☒	6.5	◉	55.0*	◉	76.7	☒
Hungary	25.8	☒	11.1	◉	62.3	◉	82.7	☒
Iceland	8.6	☑	7.7	◉	65.4*	◉	16.9	☑
Ireland	17.0	◉	11.2	◉	62.0	◉	20.2	☑
Israel	16.9	◉	2.6	☑	50.9	◉	23.2	◉
Italy	19.9	◉	7.6	◉	46.0*	◉	48.7	◉
Japan	17.7	◉	7.2	◉	25.9	☑	42.9	◉
Korea	17.5	◉	8.7	◉	33.7	☑	35.0	◉
Latvia	24.1	☒	11.2	◉	54.6	◉	97.8	☒
Lithuania	20.3	◉	12.3	☒	53.3*	◉	82.1	☒
Luxembourg	14.5	◉	11.3	◉	58.1	◉	22.6	◉
Mexico	7.6	☑	4.4	☑	72.5	☒	33.0	◉
Netherlands	16.8	◉	8.3	◉	47.3*	◉	31.3	◉
New Zealand	13.8	◉	8.8	◉	66.6	☒	13.6	☑
Norway	12.0	☑	6.0	☑	46.0*	◉	18.7	☑
Poland	22.7	◉	10.6	◉	53.3*	◉	76.3	☒
Portugal	16.8	◉	10.7	◉	67.6	☒	28.3	◉
Slovak Republic	22.9	◉	9.7	◉	51.5	◉	59.1	☒
Slovenia	18.9	◉	10.1	◉	55.6*	◉	56.8	◉
Spain	22.1	◉	8.6	◉	53.0*	◉	27.1	◉
Sweden	10.4	☑	7.1	◉	48.2*	◉	18.5	☑
Switzerland	19.1	◉	9.2	◉	41.8*	☑	25.2	◉
Turkey	26.5	☒	1.4	☑	64.4	◉	46.2	◉
United Kingdom	17.2	◉	9.7	◉	64.3	◉	32.1	◉
United States	10.5	☑	8.9	◉	71.0	☒	24.1	◉

Note: ☑ Better than OECD average; ◉ Close to OECD average; ☒ Worse than OECD average. Hungary, Latvia and Lithuania excluded from standard deviation calculation for air pollution. * Likely under-estimate of obesity as self-reported.

year worldwide by 2060. Death rates in 2016 ranged from over 80 deaths in Latvia, Hungary and Lithuania, to 15 deaths or less per 100 000 people in New Zealand and Canada.

Access to care

Ensuring equitable access is critical for inclusive societies and high performing health systems. Population coverage, measured by the share of the population eligible for a core set of services, offers an initial assessment of access to care. The share of spending covered by prepayment schemes provides further insight on financial protection. The probability of visiting a doctor, adjusted for need, and the share of women aged 20-69 screened for cervical cancer measure use of needed services. Figure 1.4 provides a snapshot on access to care across the OECD and Table 1.4 provides more detailed country comparisons.

Figure 1.4. **Snapshot on access to care across the OECD**
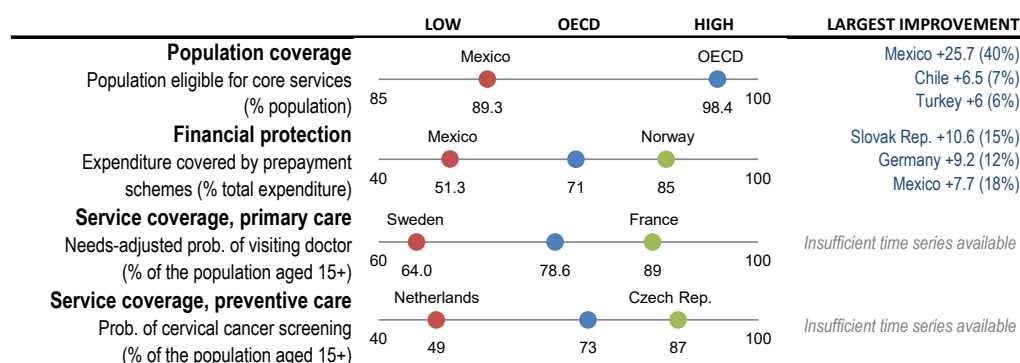
Note: Largest improvement shows countries with largest changes in value over time (% change in brackets).
Source: OECD Health Statistics 2019.

Austria, the Czech Republic, France, Germany and Luxembourg perform well across these indicators, In terms of population coverage, most OECD countries have achieved universal (or near-universal) coverage for a core set of services. However, in seven countries coverage remains below 95% – Chile, Estonia, Hungary, 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. Across the OECD, almost three-quarters of all health care costs are covered by government or compulsory health insurance schemes. However, in Mexico, Latvia and Korea less than 60% of all costs are covered by publicly mandated schemes. Mexico, though, has significantly expanded population coverage and financial protection over the last decade.

One in five people report not seeing a doctor despite having medical need. Cross-country differences in utilisation are large, with need-adjusted probabilities of visiting a doctor ranging from around 65% in Sweden and the United States to 89% in France. Excepting Denmark and the Slovak Republic, wealthier individuals are more likely to see a doctor than individuals in the lowest income quintile, for a comparable level of need.

Uptake of cancer screening is also lower amongst the less well-off. This is despite most OECD countries providing screening programmes at no cost. Overall uptake of cervical cancer screening ranged from just under 50% of women aged 20 to 69 in the Netherlands, to over 85% in the Czech Republic and Austria.

Table 1.4. **Dashboard on access to care**

	Population coverage		Financial protection		Service coverage, primary care		Service coverage, preventive care	
	Population eligible for core services (% population)		Expenditure covered by prepayment schemes (% total expenditure)		Needs-adjusted prob. of visiting doctor (% pop 15+)		Prob. of cervical cancer screening (% pop 15+)	
OECD	98.4	◉	71.2	◉	78	◉	73	◉
Australia	100	◉	68.6	◉	–		–	
Austria	99.9	◉	74.0	◉	86	☑	87	☑
Belgium	98.7	◉	77.2	◉	86	☑	76	◉
Canada	100	◉	73.0	◉	75	◉	76	◉
Chile	94.0	☒	50.1	☒	–		72	◉
Czech Republic	100	◉	82.1	◉	85	☑	87	☑
Denmark	100	◉	84.0	☑	81	◉	64	☒
Estonia	94.1	☒	74.7	◉	75	◉	58	☒
Finland	100	◉	76.7	◉	74	◉	79	◉
France	99.9	◉	77.1	◉	89	☑	82	☑
Germany	100	◉	77.7	◉	86	☑	81	◉
Greece	100	◉	60.8	◉	76	◉	76	◉
Hungary	94.0	☒	68.7	◉	84	◉	71	◉
Iceland	100	◉	81.8	◉	75	◉	80	◉
Ireland	100	◉	73.3	◉	75	◉	69	◉
Israel	100	◉	63.6	◉	–		–	
Italy	100	◉	73.9	◉	80	◉	68	◉
Japan	100	◉	84.0	☑	–		–	
Korea	100	◉	57.4	☒	–		–	
Latvia	100	◉	57.2	☒	76	◉	78	◉
Lithuania	98.1	◉	65.5	◉	76	◉	62	☒
Luxembourg	–		84.9	☑	88	☑	84	☑
Mexico	89.3	☒	51.3	☒	–		–	
Netherlands	99.9	◉	81.5	◉	75	◉	49	☒
New Zealand	100	◉	78.6	◉	–		–	
Norway	100	◉	85.5	☑	77	◉	66	◉
Poland	92.6	☒	69.0	◉	80	◉	72	◉
Portugal	100	◉	66.3	◉	86	☑	71	◉
Slovak Republic	94.6	☒	79.9	◉	74	◉	69	◉
Slovenia	100	◉	71.8	◉	71	☒	78	◉
Spain	99.9	◉	70.6	◉	84	◉	69	◉
Sweden	100	◉	83.7	☑	64	☒	81	◉
Switzerland	100	◉	30.5	☒	–		–	
Turkey	99.2	◉	77.7	◉	–		–	
United Kingdom	100	◉	79.4	◉	76	◉	63	☒
United States	90.8	☒	50.2	☒	65	☒	80	◉

Note: ☑ Better than OECD average; ◉ Close to OECD average; ☒ Worse than OECD average.

Quality of care

Good quality care requires health services to be safe, appropriate, clinically effective and responsive to patient needs. Antibiotics prescriptions and avoidable hospital admissions for asthma and chronic obstructive pulmonary disease (COPD) measure the safety and appropriateness of primary care. 30-day mortality following acute myocardial infarction (AMI) and breast cancer survival are indicators of clinical effectiveness of secondary and cancer care. Figure 1.5 provides a snapshot on quality and outcome of care across the OECD and Table 1.5 provides more detailed country comparisons.

Figure 1.5. **Snapshot on quality of care across the OECD**

	LOW	OECD	HIGH	LARGEST IMPROVEMENT
Safe prescribing Antibiotics prescribed (defined daily dose per 1 000 people)	Estonia 0 — 10.1 — 18.5		Greece 32.1 — 40	Insufficient time series available
Effective primary care Asthma/COPD admissions (per 100 000 people, age-sex standardised)	Japan 0 — 58 — 225		Hungary 428 — 500	Insufficient time series available
Effective secondary care AMI 30-day mortality (per 100 000 people, age-sex standardised)	Iceland 0 — 2.3 — 6.9		Mexico 27.5 — 30	Slovak Republic -5.7 (49%) Chile -5.6 (41%) Netherlands -5.3 (60%)
Effective cancer care Breast cancer 5-year net survival (%, age-standardised)	Lithuania 60 — 74	85	United States 90 — 100	Lithuania +8.9 (14%) Latvia +7.6 (11%) Korea +7.1 (9%)

Note: Largest improvement shows countries with largest changes in value over time (% change in brackets).
Source: OECD Health Statistics 2019.

The overuse, underuse or misuse of antibiotics and other prescription medicines contribute to increased antimicrobial resistance and represent wasteful spending. Total volumes of antibiotics prescribed vary more than three-fold across countries, with Estonia and Sweden reporting the lowest volumes, whereas Italy and Greece report the highest volumes. Across the OECD, the number of antibiotics prescribed has increased slightly over time.

Asthma and COPD are conditions for which effective treatment at the primary care level is well established – and hospital admissions for these conditions may signal quality issues in primary care. Admission rates for asthma vary 12-fold across countries with Mexico, Italy, and Colombia reporting the lowest rates and Latvia, Turkey and Poland reporting rates over twice the OECD average. International variation in admissions for COPD is 15-fold across OECD countries, with Japan, Italy and Mexico reporting the lowest rates and Hungary, Turkey and Australia the highest rates. Combined, there is a lower 7-fold variation across countries for these two respiratory conditions.

Mortality following acute myocardial infarction (AMI) 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 has by far the highest 30-day mortality following AMI (28 deaths per 100 admissions); rates are also relatively high in Latvia, Japan, Korea and Estonia. The lowest rates are found in Iceland, Denmark, Norway, Netherlands, Australia and Sweden (all 4% or less).

Breast cancer survival is an important measure of clinical effectiveness, with generally high survival across the OECD. Some of the best survival rates are found in Australia, Japan

Table 1.5. **Dashboard on quality of care**

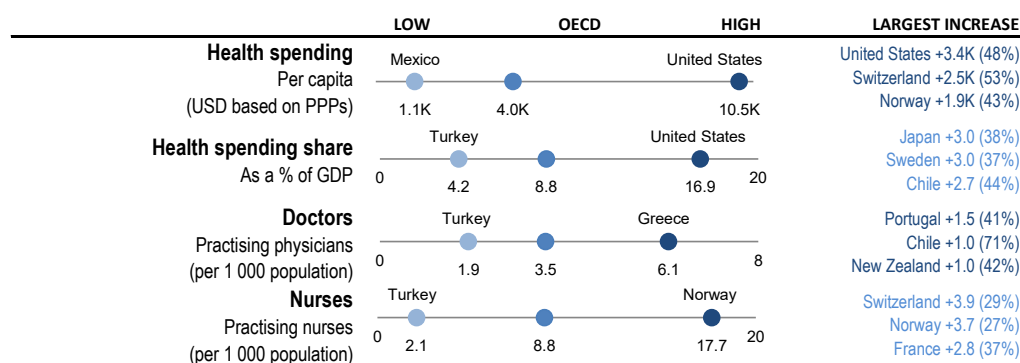|	Safe prescribing		Effective primary care		Effective secondary care		Effective cancer care	
	Antibiotics prescribed (defined daily dose per 1 000 people)		Avoidable asthma / COPD admissions (per 100 000 people, age-sex standardised)		30-day mortality following AMI (per 100 000 people, age-sex standardised)		Breast cancer 5-year net survival (%, age-standardised)	
OECD	17.8	◉	225	◉	6.9	◉	84.5	◉
Australia	23.5	◉	403	☒	3.8	☑	89.5	☑
Austria	12.1	☑	248	◉	6.2	◉	84.8	◉
Belgium	15.9	◉	291	◉	6.8	◉	86.4	◉
Canada	14.8	◉	253	◉	4.8	◉	88.6	◉
Chile	–		98	☑	8.2	◉	75.5	☒
Czech Republic	19.6	◉	174	◉	6.2	◉	81.4	◉
Denmark	13.9	◉	325	☒	3.2	☑	86.1	◉
Estonia	10.1	☑	122	☑	9.6	☒	76.6	☒
Finland	12.6	◉	182	◉	8.0	◉	88.5	◉
France	23.0	◉	150	◉	5.6	◉	86.7	◉
Germany	12.3	☑	289	◉	8.5	◉	86.0	◉
Greece	32.1	☒	–		–		–	
Hungary	13.4	◉	428	☒	–		–	
Iceland	24.6	☒	201	◉	2.3	☑	89.1	◉
Ireland	24.6	☒	329	☒	5.4	◉	82.0	◉
Israel	20.5	◉	214	◉	5.5	◉	88.0	◉
Italy	28.3	☒	64	☑	5.4	◉	86.0	◉
Japan	–		58	☑	9.7	☒	89.4	☑
Korea	26.5	☒	263	◉	9.6	☒	86.6	◉
Latvia	12.1	☑	242	◉	13.4	☒	76.9	☒
Lithuania	13.6	◉	263	◉	8.6	◉	73.5	☒
Luxembourg	25.3	☒	203	◉	8.5	◉	–	
Mexico	–		85	☑	27.5	☒	–	
Netherlands	14.3	◉	236	◉	3.5	☑	86.6	◉
New Zealand	25.8	☒	363	☒	4.7	◉	87.6	◉
Norway	14.6	◉	244	◉	3.5	☑	87.2	◉
Poland	23.8	◉	236	◉	4.1	☑	76.5	☒
Portugal	16.4	◉	90	☑	7.3	◉	87.6	◉
Slovak Republic	23.6	◉	209	◉	5.9	◉	75.5	☒
Slovenia	19.0	◉	128	◉	4.1	☑	83.5	◉
Spain	12.6	◉	210	◉	6.5	◉	85.3	◉
Sweden	10.2	☑	169	◉	3.9	☑	88.8	◉
Switzerland	–		138	◉	–		86.2	◉
Turkey	16.6	◉	425	☒	6.8	◉	82.1	◉
United Kingdom	17.5	◉	281	◉	7.0	◉	85.6	◉
United States	–		268	◉	5.0	◉	90.2	☑

Note: ☑ Better than OECD average; ◉ Close to OECD average; ☒ Worse than OECD average. Mexico excluded from standard deviation calculation for AMI mortality.

and the United States, while rates significantly below the OECD average are found in Chile, Estonia, Latvia, Lithuania, Poland and the Slovak Republic.

Health care resources

Having sufficient health care resources is critical to a well-functioning health system. More resources, though, do not automatically translate into better health outcomes – the effectiveness of spending is also important. Health spending per capita and as a share of GDP summarise overall resource availability. The number of practising doctors and nurses provide further information on the supply of health workers. Figure 1.6 provides a snapshot on health care resources across the OECD and Table 1.6 provide more detailed country comparisons.

Figure 1.6. **Snapshot on health resources across the OECD**

	LOW	OECD	HIGH	LARGEST INCREASE
Health spending Per capita (USD based on PPPs)	Mexico 1.1K	4.0K	United States 10.5K	United States +3.4K (48%) Switzerland +2.5K (53%) Norway +1.9K (43%)
Health spending share As a % of GDP	Turkey 4.2	8.8	United States 16.9	Japan +3.0 (38%) Sweden +3.0 (37%) Chile +2.7 (44%)
Doctors Practising physicians (per 1 000 population)	Turkey 1.9	3.5	Greece 6.1	Portugal +1.5 (41%) Chile +1.0 (71%) New Zealand +1.0 (42%)
Nurses Practising nurses (per 1 000 population)	Turkey 2.1	8.8	Norway 17.7	Switzerland +3.9 (29%) Norway +3.7 (27%) France +2.8 (37%)

Note: Largest improvement shows countries with largest changes in value over time (% change in brackets).
Source: OECD Health Statistics 2019.

Overall, 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 amount of resources invested is not a perfect predictor of better outcomes – efficient use of health resources and the wider social determinants of health are also critical. The next section will further investigate the associations between health spending and staffing, access, quality and health outcomes.

The United States spends considerably more than any other country (over USD 10 000 per person, adjusted for purchasing power). Health care spending per capita is also high in Switzerland, Norway and Germany. Mexico and Turkey spend the least, at around a quarter of the OECD average. Health spending has grown consistently across most countries over the past decades, other than a temporary slowdown following the 2008 financial crisis. Rising incomes, new technologies and ageing populations are key drivers of health spending growth.

In terms of health spending as a share of GDP, the United States spends by far the most on health care, equivalent to 16.9% of its GDP - well above Switzerland, the next highest spending country, at 12.2%. Germany, France, Sweden and Japan devote the next highest shares of GDP to health. A large group of OECD countries spanning Europe, but also Australia, New Zealand, Chile and Korea, spend between 8-10% of GDP. A few OECD countries spend less than 6% of their GDP on health care, including Mexico, Latvia, Luxembourg, and Turkey at 4.2%.

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 ranged from about two per 1 000

Table 1.6. **Dashboard on health resources**

	Health spending		Health spending share		Doctors		Nurses	
	Per capita (USD based on purchasing power parities)		As a % of Gross Domestic Product (GDP)		Practising physicians (per 1 000 population)		Practising nurses (per 1 000 population)	
OECD	3 994	◉	8.8	◉	3.5	◉	8.8	◉
Australia	5 005	◉	9.3	◉	3.7	◉	11.7	◉
Austria	5 395	◉	10.3	◉	5.2	⋂	6.9	◉
Belgium	4 944	◉	10.4	◉	3.1	◉	11.0	◉
Canada	4 974	◉	10.7	◉	2.7	◉	10.0	◉
Chile	2 182	◔	8.9	◉	2.5	◔	2.7	◔
Czech Republic	3 058	◉	7.5	◉	3.7	◉	8.1	◉
Denmark	5 299	◉	10.5	◉	4.0	◉	10.0	◉
Estonia	2 231	◔	6.4	◔	3.5	◉	6.2	◉
Finland	4 228	◉	9.1	◉	3.2	◉	14.3	⋂
France	4 965	◉	11.2	⋂	3.2	◉	10.5	◉
Germany	5 986	⋂	11.2	⋂	4.3	◉	12.9	⋂
Greece	2 238	◔	7.8	◉	6.1*	⋂	3.3	◔
Hungary	2 047	◔	6.6	◔	3.3	◉	6.5	◉
Iceland	4 349	◉	8.3	◉	3.9	◉	14.5	⋂
Ireland	4 915	◉	7.1	◉	3.1	◉	12.2	◉
Israel	2 780	◉	7.5	◉	3.1	◉	5.1	◉
Italy	3 428	◉	8.8	◉	4.0	◉	5.8	◉
Japan	4 766	◉	10.9	⋂	2.4	◔	11.3	◉
Korea	3 192	◉	8.1	◉	2.3	◔	6.9	◉
Latvia	1 749	◔	5.9	◔	3.2	◉	4.6	◔
Lithuania	2 416	◔	6.8	◔	4.6	⋂	7.7	◉
Luxembourg	5 070	◉	5.4	◔	3.0	◉	11.7	◉
Mexico	1 138	◔	5.5	◔	2.4	◔	2.9	◔
Netherlands	5 288	◉	9.9	◉	3.6	◉	10.9	◉
New Zealand	3 923	◉	9.3	◉	3.3	◉	10.2	◉
Norway	6 187	⋂	10.2	◉	4.7	⋂	17.7	⋂
Poland	2 056	◔	6.3	◔	2.4	◔	5.1	◉
Portugal	2 861	◉	9.1	◉	5.0*	⋂	6.7	◉
Slovak Republic	2 290	◔	6.7	◔	3.4	◉	5.7	◉
Slovenia	2 859	◉	7.9	◉	3.1	◉	9.9	◉
Spain	3 323	◉	8.9	◉	3.9	◉	5.7	◉
Sweden	5 447	◉	11.0	⋂	4.1	◉	10.9	◉
Switzerland	7 317	⋂	12.2	⋂	4.3	◉	17.2	⋂
Turkey	1 227	◔	4.2	◔	1.9	◔	2.1	◔
United Kingdom	4 070	◉	9.8	◉	2.8	◉	7.8	◉
United States	10 586	⋂	16.9	⋂	2.6	◉	11.7	◉

Note: ⋂ Above OECD average; ◉ Close to OECD average; ◔ Below OECD average. United States excluded from standard deviation calculation for both health expenditure indicators. *Includes all doctors licensed to practice, resulting in a large over-estimation.

population in Turkey, Japan, Chile, and Korea, to five or more in Portugal, Austria, and Greece. However, numbers in Portugal and Greece are over-estimated as they include all doctors licensed to practise. There were just under nine nurses per 1 000 population in OECD countries in 2017, ranging from about two per 1 000 in Turkey to more than 17 per 1 000 in Norway and Switzerland.

To what extent does health spending translate into better access, quality and health outcomes, and more health professionals?

Quadrant charts plot the association between health spending and another variable of interest. They illustrate the extent to which spending more on health translates into stronger performance across four dimensions: health outcomes, quality of care, access, and more health professionals. Note, though, that only a small subset of indicators for these four dimensions are compared against health spending. Quadrant charts also show pure statistical correlations, they do not imply causality.

The midpoint of a quadrant chart represents the OECD average, with dots the relative position of countries across health spending and the given indicator analysed. Each country is also colour-coded, based on a simple risk factors index (RFI) of smoking, alcohol and obesity indicators. Green dots indicate countries with a relatively low RFI (e.g. Israel, Norway), blue dots countries with a RFI close to the OECD average, and red dots countries with a relatively high RFI (e.g. Chile, Hungary). The RFI is an unweighted average of these three risk factors. Hence, the United States, for example, is coloured blue despite having high obesity rates, because of relatively low smoking rates and alcohol consumption. See box on "methodology, interpretation and use" for further methodological details.

Health spending and health outcomes

These quadrant charts illustrate the extent to which countries that spend more on health have better health outcomes (noting such associations do not guarantee a causal relationship).

There is a clear positive association between health spending per capita and life expectancy (Figure 1.7). Amongst the 36 OECD countries, 17 countries spend more and have higher life expectancy than the OECD average (top right quadrant). A further 10 countries spend less and have lower life expectancy at birth (bottom left quadrant).

Of particular interest are countries that deviate from this basic relationship. Eight countries spend less than average but achieve higher life expectancy overall (top left quadrant). These countries are Italy, Korea, Portugal, Spain, Slovenia, Greece, Israel and New Zealand. The only country in the bottom right quadrant is the United States, with much higher spending than in all other OECD countries, but lower life expectancy than the OECD average.

Most countries with high overall risk factors (red dots) have lower life expectancy than the OECD average. They are also typically below the trend line, which shows the average spending to life expectancy ratio across OECD countries. The converse generally holds for countries with low risk factors (green dots).

For avoidable mortality, there is also a clear association in the expected direction (Figure 1.8). Amongst 36 countries with comparable data, 16 countries spend more and have lower avoidable mortality rates (bottom right quadrant). A further nine countries spend less and have more deaths that could have been avoided (top left quadrant). Seven countries spend less than average but achieve lower avoidable mortality rates – for example, Italy, Israel and Spain (bottom left quadrant). The United States spends more than the OECD average and has worse avoidable mortality rates. Consistent with life expectancy, countries with higher (lower) risk factors (respectively in red and green dots) typically have higher (lower) avoidable mortality rates.
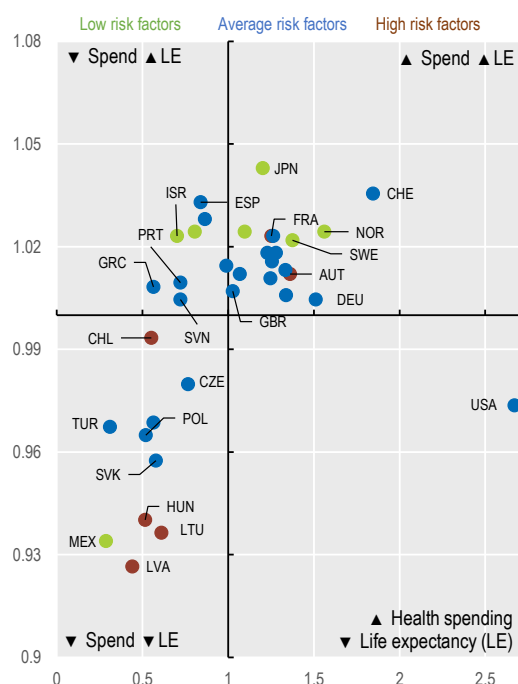
Figure 1.7. **Life expectancy and health expenditure**

Figure 1.8. **Avoidable mortality (preventable and treatable) and health expenditure**

Health spending, access and quality of care

These quadrant charts illustrate the extent to which countries that spend more on health deliver more accessible and better quality care (noting such associations do not guarantee a causal relationship).

In terms of access, Figure 1.9 shows that universal (or near-universal) coverage of a core set of services can be achieved even with comparatively low health spending levels – for example, Turkey and Latvia spend under USD 2 000 per person (less than half the OECD average) and still achieve universal population coverage.

Still, six of the seven countries with population coverage rates below 95% do spend relatively less – Mexico, Poland, Chile, Estonia, the Slovak Republic and Hungary (bottom left quadrant). The one OECD country with high spending levels and lower population coverage is the United States. Replacing health expenditure per person with spending by government or compulsory insurance, or spending as a share of GDP, results in very similar patterns.

In terms of quality of care, Figure 1.10 shows the relationship between health spending and breast cancer five-year net survival (an indicator reflecting the quality of both prevention and curative care). There is a clear positive association: among 32 OECD countries, 16 countries spend more on health and have better net survival (top right quadrant); and nine countries spend less and have lower net survival (bottom left quadrant). Six countries have relatively high breast cancer survival despite spending less than the OECD average (Israel, Italy, Korea, Portugal, New Zealand and Spain). In Ireland, health spending is almost 25% higher than the OECD average, yet net survival is slightly below the OECD average.

Figure 1.9. **Population coverage for a core set of services and health expenditure**
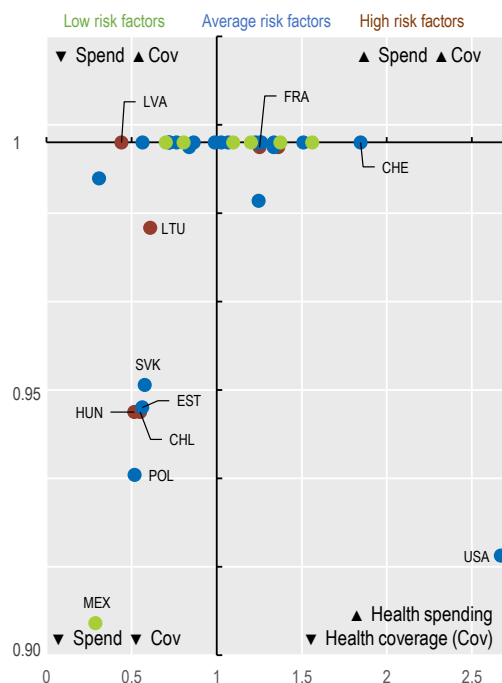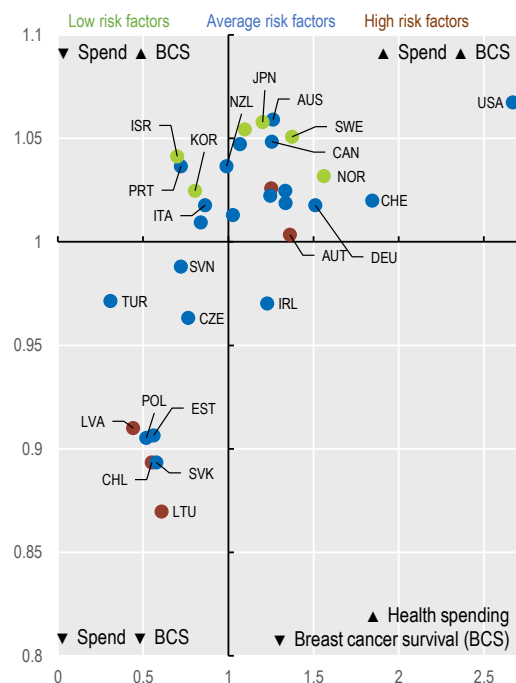

Figure 1.10. **Breast cancer survival and health expenditure**

Health spending and number of health professionals

These quadrant charts illustrate the extent to which countries that spend more on health also have more doctors and nurses (noting such associations do not guarantee a causal relationship).

There is only a weak positive association between spending on health and number of doctors (Figure 1.11). Nine countries spend more than the OECD average yet have fewer doctors (e.g. Canada, Luxembourg, United States); a further six countries spend relatively little yet have more doctors than average (Czech Republic, Greece, Italy, Lithuania, Portugal, Spain). However, numbers in Portugal and Greece are over-estimated as they include all doctors licensed to practise. Such divergences may also reflect differences in remuneration levels, staff composition and the prominence given to nurse practitioners and other health professionals (as compared with doctors).

The positive association between health spending and number of nurses is much more clear-cut (Figure 1.12). Amongst the 36 OECD countries, 16 countries spent more than the OECD average and also had more nurses per 1 000 people. Likewise, 16 countries spent relatively little and had fewer nurses. Only two countries spent less than the OECD average and had more nurses (Slovenia and, to a lesser extent, New Zealand). Two other countries had comparatively high spending but fewer nurses (Austria and the United Kingdom).

Figure 1.11. **Number of doctors and health expenditure**

Figure 1.12. **Number of nurses and health expenditure**

Chapter 2

Measuring what matters for people-centred health systems

The key objective of a health system is to improve the health of patients and populations. However, few health systems routinely ask patients about the outcomes and the experience of their care. This chapter presents patient-reported outcomes following hip and knee replacement, and breast cancer surgery, as well as patient-reported experiences of people with mental health problems, from a subset of OECD countries. Patients who underwent joint replacement surgery reported, on average, improved function and quality of life with hip replacements generating slightly higher gains. Women who underwent autologous breast reconstruction surgery reported, on average, better outcomes than women who underwent implant reconstruction. Meanwhile results of a 2016 Commonwealth Fund survey of 11 countries suggest that people with a mental health problem report a worse experience in some aspects of care. Such information is valuable for other health service users, for clinicians, providers, payers and policymakers.

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.

Introduction

The primary objective of any health system, service or organisation is to maximise the health of the individuals and populations they serve, and to do so in an equitable way within budgetary parameters.

Good health is not just important in its own right. It also promotes personal, social and economic well-being. Healthy people create healthy communities and contribute towards a well-functioning, prosperous and more productive society. For example, good health can enhance a person's lifetime earnings by up to 25% (OECD, 2017[1]; OECD, 2018[2]).

Yet very few health systems assess their impacts on health and well-being from the perspective of the people they serve. While the concept of health-related quality of life (QoL) has existed for almost three decades, it is not measured or reported systematically. Performance metrics in health tend to focus principally on inputs and outputs. Outcomes such as life expectancy are important, but they are silent on a range of other things valued by patients, including pain, function and QoL as well as the experience of care itself. This means that the picture of health care and health system performance is missing an essential part.

The patient perspective on the outcomes and experience of their care is essential in driving continuous quality improvement of health services. It is also increasingly relevant in overcoming the broader demographic, epidemiological and economic challenges faced by all health systems. The rise of chronic conditions as the main source of disease burden, coupled with better but also more expensive technologies to manage them and prolong life, heightens the need for a more people-centred approach to both policy and practice. But people-centred health systems remain an empty promise without more information on how health care and health policy actually affect the lives of individual patients.

This chapter presents the results of a preliminary data collection on patient-reported outcomes from a sample of OECD countries. The areas covered are joint replacement surgery and breast cancer surgery. The next section discusses the importance of using patient-reported data in mental health. These areas of work are part of a broader OECD initiative – the Patient-Reported Indicator Surveys (PaRIS) – which aims to promote systematic use of these important metrics in health systems (see *https://www.oecd.org/health/paris.htm*).

A people-centred health system needs to measure what matters to patients

People's assessment of their health, and the outcomes of their care, go beyond whether they survive a disease or medical intervention. A range of inter-related physical and mental health domains including pain, mobility, fatigue, anxiety and depression all contribute to person's health-related QoL. Patients also value their care experience, which includes having one's autonomy respected, feeling invited and empowered to participate in decisions about one's care, and if organisational aspects of the care pathway are well co-ordinated or disjointed and burdensome.

It makes sense to capture this knowledge in a way that is systematic and useful for decision-making. Yet the health sector has been remiss at measuring the effects of its activities on outcomes and experiences as reported by patients. Forward thinking provider organisations, disease registries and in some health systems have been collecting this information for some conditions or procedures. However, coherent and systematic patient reporting across the entire range of health system activities and interventions is not yet in place.

Outputs provide only a partial picture of health system performance

Processes and activities, on the other hand, are routinely collected and reported. While these are an important part of the overall picture, in isolation they reveal quite little about performance, quality and value. For example, the average rate of total knee replacement in OECD countries doubled between 2000 and 2016 (Figure 2.1). Rates also vary up to 5-fold between and within countries (OECD, 2014[3]). Are the increased rates and the variation warranted? Do these operations make a difference to people's lives, or are some of them performed unnecessarily? What is the effect of waiting times for knee replacement, and patient's age at surgery? Are some patients better off choosing other treatments for their symptoms?

Figure 2.1. **Total knee replacement rates have doubled since 2000**

Total knee replacement rates per 100 000 population – adjusted for population ageing – selected countries and OECD average
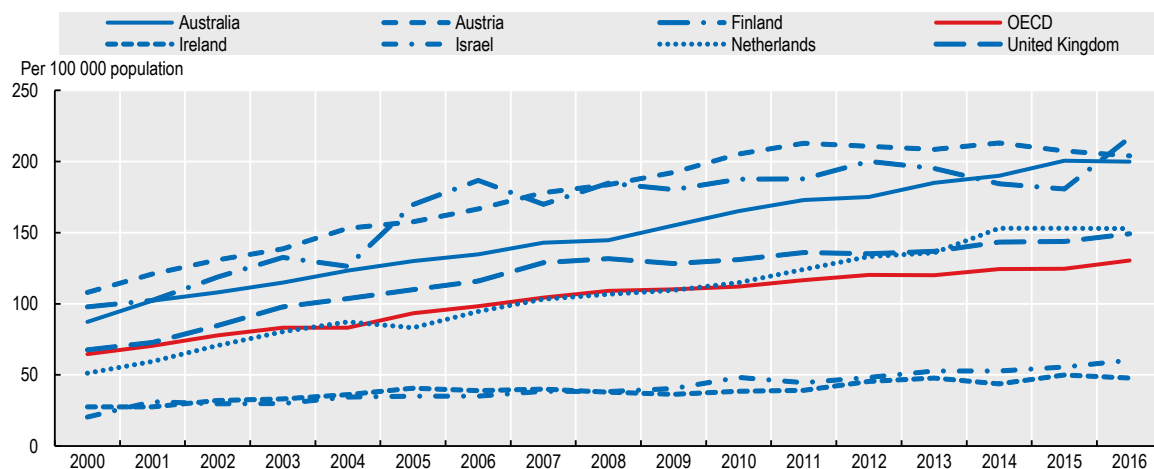
Note: OECD is age-adjusted rate of countries submitting data. Countries chosen based on data availability over this period.
Source: OECD Health Statistics 2019.

StatLink https://doi.org/10.1787/888934014574

Such questions cannot be answered without knowing care outcomes. Case fatality or hospital re-admission are useful measures but are becoming rare in routine procedures such as joint replacement. They are also silent on other outcomes valued by these patients such as reduction in pain, and increase of mobility and function.

We know how medicine treats diseases but what about the patient's quality of life?

Traditional outcome measures like survival or mortality will remain useful but cannot capture more subtle yet important effects. For example, people diagnosed with cancer

value survival highly, but therapeutic success entails more than just survival (Abahussin et al., 2018[4]). Survival and mortality say little about nausea, pain, sleep quality, body image, sexual function, independence and time spent with loved ones. Also, for some conditions, mortality and survival are now similar between OECD countries (Figure 2.2), with little separating the 'best from the rest'. This hinders continued learning about best therapeutic approaches, techniques and interventions (Donovan et al., 2016[5]; Hamdy et al., 2016[6]).

Figure 2.2. **Cancer survival is similar between countries**

Breast cancer age-standardised five-year survival of patients diagnosed from 2010-2014

Age-standardised five-year net survival (%)
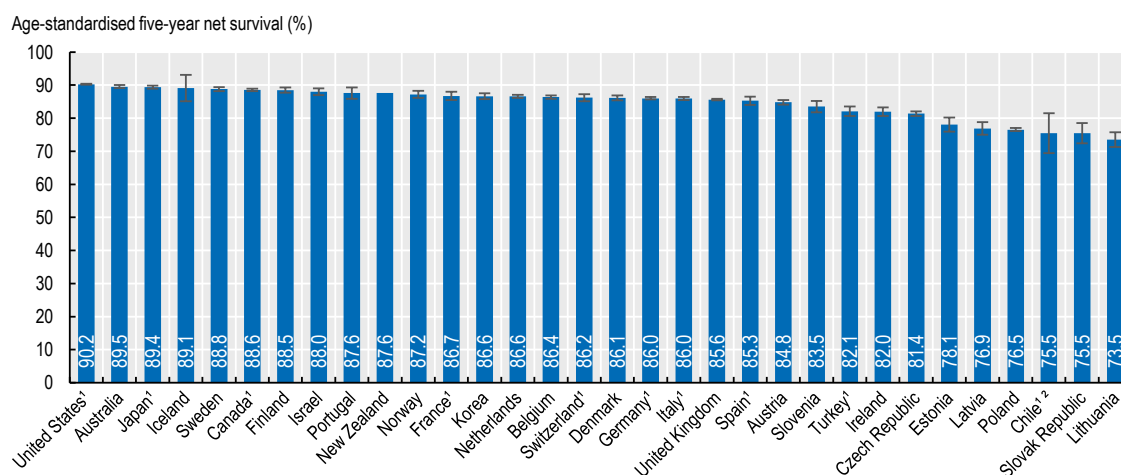
Note: H lines show 95% confidence intervals. 1. Coverage less than 100% of national population. 2. Survival estimates considered less reliable.

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

StatLink 🖳 *https://doi.org/10.1787/888934014593*

That medicine has become quite successful at treating disease should be celebrated. However, continual improvement must include assessment of the impact treatments have on people's lives. This makes outcomes valued by patients a key indicator of success. Men diagnosed with prostate cancer are now very likely to survive this condition. Beyond survival they also highly value preserving erectile function and avoiding incontinence (Nag et al., 2018[7]) – outcomes of significant interest to patients, providers as well as policymakers.

A good care experience contributes to better outcomes and is also an end in itself

In addition to outcomes, *how* people are treated also matters. This includes being treated with respect and compassion and being supported, listened to and involved in decision-making. It also means that care is better integrated across teams who communicate well with each other and with the patient.

A positive care experience is a strong signal of quality care and is instrumental in outcomes achieved, especially for those who manage multiple chronic conditions (Stein et al., 2014[8]; Trzeciak et al., 2016[9]; Luxford, Safran and Delbanco, 2011[10]). In mental health, for example, a positive care experience influences the relationship with the care team, manifesting in better communication, therapeutic continuity, adherence and health outcomes (Wong et al., 2019[11]). But it is also an important end in itself. All patients expect

and deserve to be treated with respect. In some sectors, such as palliative care, being cared for with compassion and dignity are among the most important components of care.

Yet despite considerable progress in some specific cases, the care experience is not captured systematically. This needs to change, given the growing importance of this dimension of service delivery.

Shared decision making requires patient-reporting

In the clinical setting, measuring patient-reported metrics helps to focus the health care interaction on the needs of the individual. The discussion moves from 'what's the matter *with* you?' to 'what matters *to* you?' – a critical first step in shared decision making, a core principle of people-centred care. Aggregated patient-reported outcomes can inform care decisions and help choose the right therapeutic option where various interventions (including 'watchful waiting') are available (Veroff, Marr and Wennberg, 2013[12]). People see what the most likely outcomes of an intervention may be and can decide accordingly.

Regular reporting by patients throughout their care journey adds structure and rigour to assessment, decision-making and action. Care can be better tailored to individual needs, and enables a rapid and accurate response to clinical deterioration. For example, reporting of symptoms by patients during chemotherapy has been found to significantly prolong survival and reduce hospitalisation (Basch, 2017[13]; Basch et al., 2017[14]).

Knowledge derived from patient-reported data can be used to develop decision aids and update clinical practice guidelines. It also informs providers on how their work affects patient health and well-being. Patient-reported outcome measures, for example, provide a way to measure clinical progress more objectively. They can complement other metrics to provide a fuller assessment of performance of therapies and services. If implemented well, benchmarking and even public reporting can be a powerful driver of quality improvement (Greenhalgh et al., 2017[15]).

Data generated by patients can also contribute towards assessing the performance of medical products, combination therapies, care pathways, health services and the health system as a whole. Combined with other data, these can furnish researchers, regulators, health technology agencies, payers, researchers and policy makers with the knowledge to make more informed decisions to maximise health system performance, and meet the expectations of patients, citizens and communities (Calvert, O'Connor and Basch, 2019[16]).

Patient-reported measures are robust and reliable

The ability to elicit information from individuals on their health status, quality of life and care experience is now decades old. The available instruments and surveys have undergone rigorous psychometric testing and statistical validation, with results published in the peer-reviewed literature. The field is mature and evidence supports that these instruments reliably measure what is intended (Black, 2013[17]). Box 2.1 outlines the different types of patient-reported outcome and experience measures (PROMs and PREMs) as well as some of the technical aspects of how these are collected, interpreted and used.

In the end, no single data source can provide information for a complete assessment of how a highly complex, adaptive health system performs. Patient-reported data need to be interpreted in the context of other metrics on health system activity and performance. They are not meant to supplant but to complement existing data that are collected in an effort to avoid tunnel vision and generate a more complete picture of performance for all involved: patients, providers, regulators and policy makers. In order for patient-reported

> ## Box 2.1. **Measuring patient-reported outcomes and experiences of care**
>
> Instruments to elicit information from patients on self-reported health status, outcomes and experiences of care typically comprise questionnaires of varying length and format. These are administered in a range of ways (verbally, electronically or on paper). The two main categories of patient-reported outcome measures (PROMs) are condition-specific PROM instruments and health-related Quality of Life (QoL) instruments – commonly termed 'generic' PROMs.
>
> **Condition-specific PROMs**
>
> These are designed specifically for a condition (e.g. osteoarthritis) or a procedure (e.g. joint replacement). These PROMs are tailored to the symptoms of a specific condition, or those that a specific procedure tries to address. As such their advantage is sensitivity and specificity. Their key limitation is a lack of generalisability – that is, their results cannot be directly compared with results from instruments designed for other conditions or procedures, unless validated mapping algorithms ('crosswalks') exist to convert scores between one and the other.
>
> **Health-related QoL instruments ('generic' PROMs)**
>
> 'Generic' PROMs instruments attempt to capture a broader range of physical and psychosocial domains that are considered important determinants of health-related QoL. Their advantage is that they can be compared across different conditions, procedures and interventions. For this reason they are often used in cost-utility analysis and health technology assessment (HTA).
>
> **Patient-reported experience measures (PREMs)**
>
> The patient experience is also measured using surveys or questionnaires. These can be administered in various ways and a number of approaches and questions have been developed. Questions can be tailored to a certain setting (e.g. primary, hospital, long-term care) or assess a specific aspect of care (e.g. continuity, autonomy, information provision). PREMs are now sophisticated and anchored to objective events, having moved well beyond the more subjective patient 'satisfaction' surveys of the past. They elicit scaled data across a range of dimensions including accessibility, communication, continuity and confidence. These data are now used to inform assessment and international comparisons of health systems (Schneider W, 2017[18]).
>
> **Collecting and using patient-reported data**
>
> A range of factors influence the outcomes of care as reported by patients. These factors include behaviour, adherence, age and comorbidities. But more traditional outcome measures such as readmission and mortality are subject to the same confounding variables. All data, whether patient-reported or not, have limitations and should be interpreted with the necessary caution. Like any outcome data that are used for benchmarking, confounders for patient-reported indicators should usually be adjusted in order to enable meaningful comparisons (Nuttall, Parkin and Devlin, 2013[19]).

measures to fulfil their promise in service provision, research and policy, standardisation of methods for data collection, analysis and reporting are essential. This relies heavily on international collaboration (Calvert, O'Connor and Basch, 2019[16]).

Joint replacement rates are rising but are patients reporting improvement?

Each year, over 2.2 million people undergo an elective hip or knee replacement in OECD countries. Knee replacement rates have doubled since the year 2000 (Figure 2.1), while hip replacements have increased by 30%. Inter- and intra-country variation in rates can be as high as 5-fold (OECD, 2014[3]).

Patients typically undergo these procedures to manage symptoms of osteoarthritis such as pain and loss of mobility and function, which have a considerable impact on health-related QoL. Both procedures are invasive and, like all surgery, involve a degree of risk. They require a long period of rehabilitation. They are also expensive. In Australia, for example, they account for over 2% of total health expenditure.[1]

Given that alternative non-surgical ways of managing hip and knee pain exist (physical therapy, exercise and medication) patients should be able to base their decision to proceed with surgery on the expected outcomes including pain, mobility and capacity to perform daily activities following a period of recovery. Payers should expect that the procedures represent value compared to the alternatives.

The orthopaedic community has been among the most active in encouraging the collection of patient-reported data. Nevertheless, national-level reporting is the exception. Most patient-reported data collections are part of regional and local programmes, or voluntary registries covering a subset of a country's providers and hospitals.

A range of instruments measuring dimensions such as pain, function and QoL are in use around the world. Questionnaires are typically completed by the patient pre-surgery and then at a specified time point after the operation (usually 6 or 12 months). The numerical difference between the pre-operative and post-operative scores is the key value of interest.

The OECD has been working with a range of stakeholders and experts, including patients and clinicians, to collect PROM data internationally. Ten programmes across eight countries contributed to a recent pilot data collection. These included national initiatives (England, Netherlands, Sweden), regional (Canada – Alberta and Manitoba, Switzerland – Geneva), sub-national registries (the Australian Clinical Outcomes Registry – ACORN – which collects data from providers in two States) and single hospitals (Coxa hospital, Finland;[2] the Galeazzi Institute Italy). Various PROM instruments are used among the contributing programmes, and the post-operative data were collected at either 6 or 12 months.

Adult patients with a diagnosis of osteoarthritis[3] who underwent a unilateral, primary elective total replacement procedure were included in the data collection. The three most recent years of data were collected and aggregated to provide one result per participating programme.

**On average, hip replacement patients reported improvement**

Hip replacement results derived from the generic instruments (EQ-5D-3L, EQ-5D-5L and SF12) are presented on a common scale – the EQ-5D-3L index with a United States-derived valuation (Shaw JW, 2005[20]). The maximum score on the EQ-5D scale, is 1.0 (denoting optimal health-related QoL) while a negative score suggests health-related QoL rated as worse than death (Box 2.2).

Figure 2.3 presents the average difference between the pre- and post-operative scores[4] – i.e. the mean change in QoL – adjusted for patients' age, sex and pre-operative score (Box 2.2).[5] Results suggest that the average patient in each programme reported improvement in their health-related QoL following a hip replacement. The average mean adjusted change across the programmes was +0.23, which equates to approximately 21% improvement on this index at the respective post-operative time points of 6 or 12 months.[6,7,8]

The adjusted changes between pre-and post-operative scores derived from condition-specific instruments (Oxford Hip Score, HOOS-PS)[9] are presented in Figure 2.4. These need to be displayed on separate axes because algorithms to convert scores from one to the other are not available at present. The Oxford scale ranges from 0 to 48, the HOOS-PS from 0 to 100. In both cases a higher value represents a more desirable outcome.[10] Results suggest, on average, improvement of similar magnitude in all programmes. The average adjusted

Figure 2.3. **Hip replacement: adjusted mean change between pre- and post-operative EQ-5D-3L scores (US valuation), 2013-16 (or nearest years)**

Adjusted mean change between pre- and post-op score
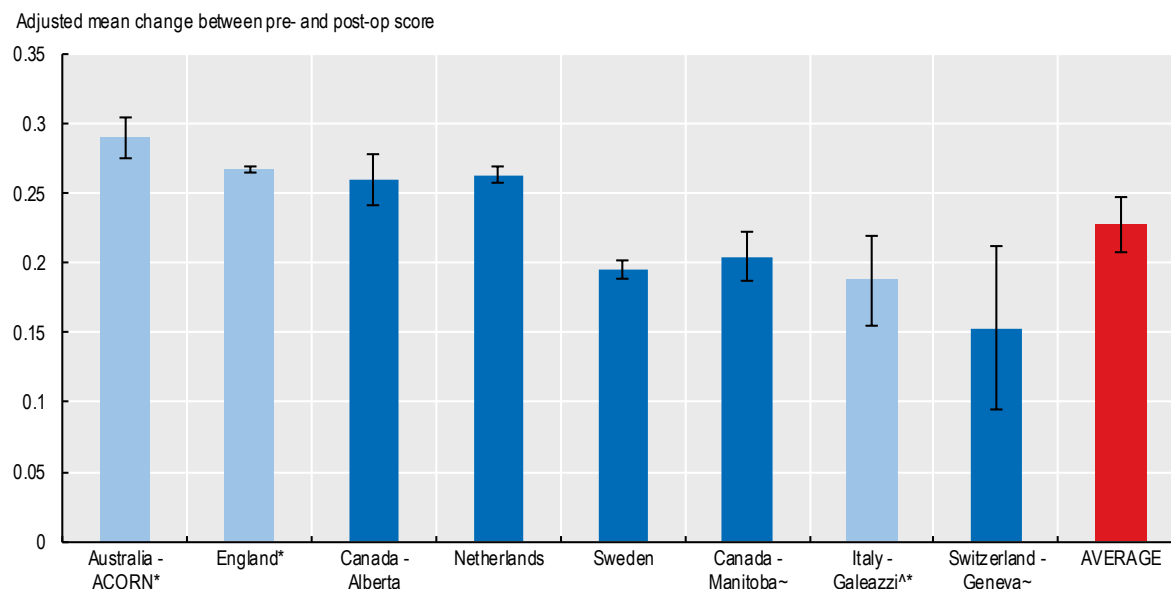
Note: ^ results converted from SF-12v1 instrument; ~converted from SF-12v2 instrument; *6-month post-op collection - lighter shade blue (all others are 12 months). H lines show 95% confidence intervals.
Source: PaRIS Hip/Knee Replacement Pilot Data Collection.

StatLink ᗏᔎ https://doi.org/10.1787/888934014612

mean change (not shown) was +23 on the Oxford scale and +32 on the HOOS-PS scale, which equates to about 48% and 32% improvement respectively.[11] More condition-specific results are provided in Chapter 6.

Improvements reported following knee replacement were more modest

The adjusted changes between pre-and post-operative knee replacement scores derived from condition-specific instruments are presented in Figure 2.5 (the scales are the same as for hip replacement). On average, patients in each programme reported improvement of similar magnitude. The average adjusted mean change (not shown) was +17 on the Oxford scale and +22 for KOOS-PS,[12] or 36% and 22% improvement respectively (the corresponding values for hip replacement were 48% and 32%).[13]

Knee replacement results derived from generic instruments are presented using the EQ-5D-3L index with US valuation (see Box 2.2). Data derived from EQ-5D-5L and SF-12 scales were converted using validated algorithms (van Hout et al., 2012[21]; Sullivan and Ghushchyan, 2006[22]; Le, 2013[23]). Figure 2.6 shows the mean changes between pre- and post-op scores, adjusted for age, sex and pre-operative score (Box 2.2). On average, patients in each programme reported improvement ranging from +0.08 to +0.22. The average adjusted mean change across all programmes was +0.18 (about 16% improvement).[14] In comparison, as shown above, the hip replacement equivalent value was +0.23 (21%), a statistically significant difference at the 95% level.

The EQ-5D results suggest that – all other things being equal – the average 65-year-old patient undergoing a knee replacement in the contributing programmes gained an additional (incremental) 3.3 quality adjusted life years (QALYs).[15] In other words, the gain

> ## Box 2.2. **The common EQ-5D index and data standardisation**
>
> Different instruments and measures of health-related QoL are used in the participant programmes and countries. Here, data derived from the EQ-5D-5L, and the SF-12 version 1 and version 2 instruments were converted to the EQ-5D-3L scale using validated mapping algorithms (van Hout et al., 2012[21]; Sullivan and Ghushchyan, 2006[22]; Le, 2013[23]).
>
> **The EQ-5D instrument**
>
> The EQ-5D health-related QoL instrument comprises questions covering five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. The patient rates each from 1-3 (on the 3L version) or 1-5 (on the 5L version) with 1 being best and 3 or 5 worst. The output is a five-digit 'health state' – e.g. 11111 (perfect health), 33333 or 55555 (worst possible state for 3L and 5L respectively) and a range of permutations in between.
>
> The health states are converted to a single index by referring to so-called valuations specific to a population or country. These valuations have been determined by asking a sample of that population about how they would rate a particular health state against being in perfect health (1.0) and death (0) using a method called time trade-off (TTO). The resulting function is called a valuation or value set. Currently, over a dozen national valuations exist for the 3L version, but fewer have been completed for the newer 5L. The functions can differ considerably between countries (Zhuo et al., 2018[24]). Some remain above zero, others decline into negative values at the worst possible health states. This means respondents rated these states as worse than death, and were willing to trade off time in good health to avoid that health state.
>
> The EQ-5D was designed to generate quality-adjusted life years (QALYs) - a measure that combines morbidity and mortality and is often used assess the effectiveness of medical interventions. For example, living in a health state of 0.8 on the index for 10 years equates to 8 QALYs.
>
> **The EQ-5D-3L index (US valuation) as the common scale**
>
> The EQ-5D-3L index was chosen as the common metric because (a) the majority of countries use this instrument; (b) algorithms exist to convert – or map – scores from other generic instruments to the EQ-5D-3L. Score conversions were conducted using patient-level data.
>
> 'Native' EQ-5D-3L health state valuations (see above) exist for most participation programmes. A single valuation, rather than a mix of respective native value sets, is preferred because it goes some way to mitigate cultural, demographic, socio-economic and other confounders of self-reported health status (Devlin, 2019[25]). It *de facto* presents results consistent with their underlying health state, and removes the additional variability created by a country's unique valuation of these states.
>
> The choice of the US valuation was pragmatic. It was the only 'end point' of the available algorithms to generate EQ-5D-3L scores from the other instruments used by the contributing programmes (van Hout et al., 2012[21]; Sullivan and Ghushchyan, 2006[22]; Le, 2013[23]).
>
> **Standardising results to enhance comparability**
>
> To enhance comparability and mitigate the effect of demographic and other variables, results shown (derived from both generic and condition-specific tools) were adjusted for <u>age, sex</u> as well as the reported <u>pre-operative PROM score</u>, to a population based on the pooled data of the contributing programmes. Three age categories and two pre-operative score categories were used. Differences between crude and adjusted results were small in the majority of cases. Results were not adjusted for co-morbidity or socio-economic status due to the lack of consistent data.

was the equivalent of 3.3 years with 'full' health-related QoL over the expected remainder of their life compared to the pre-operative status quo (i.e. a 'no intervention alternative). The corresponding figure for hip replacement is higher at 4.3 QALYs (Figure 2.7).[16] The difference between the procedures is consistent with existing literature (Konopka et al., 2018[26]). It should be noted, however, that knee replacement procedures typically have a longer recovery period than hip replacements. This may explain some of the difference.

Figure 2.4. **Adjusted mean change between pre- and post-operative Oxford Hip Score and HOOS-PS scores, 2013-16 (or nearest years)**
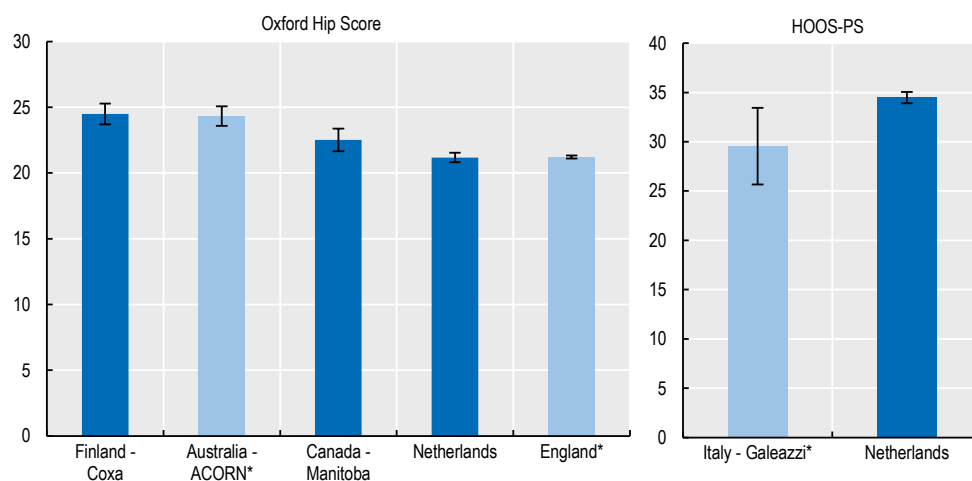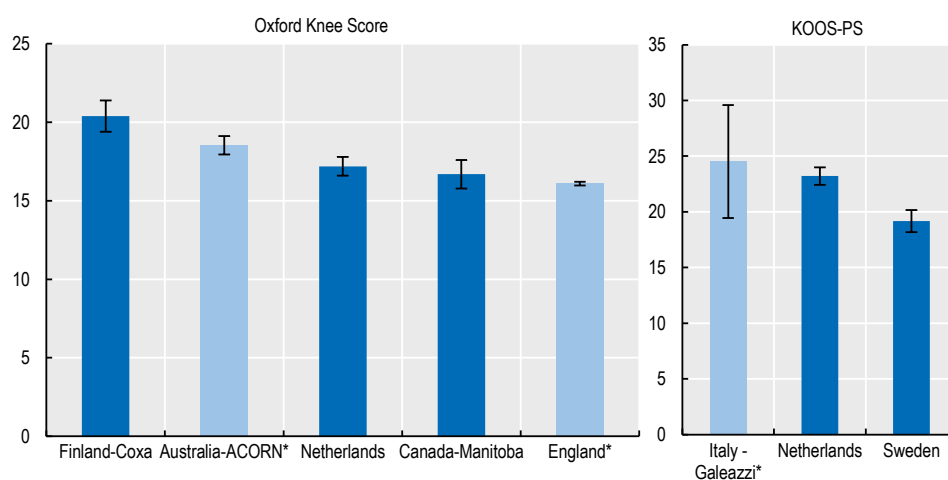

Note: *post-op collection at 6 months – lighter shade blue (all others at 12 months); Scales: Oxford 0-48; HOOS-PS 0-100. H lines show 95% confidence intervals.
Source: PaRIS Hip/Knee Replacement Pilot Data Collection.

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Figure 2.5. **Adjusted mean change between pre- and post-operative Oxford Knee Score and KOOS-PS scores, 2013-16 (or nearest years)**

Note: *post-op collection at 6 months – lighter shade BLUE (all others at 12 months); Scales: Oxford 0-48; KOOS-PS 0-100. H lines show 95% confidence intervals.
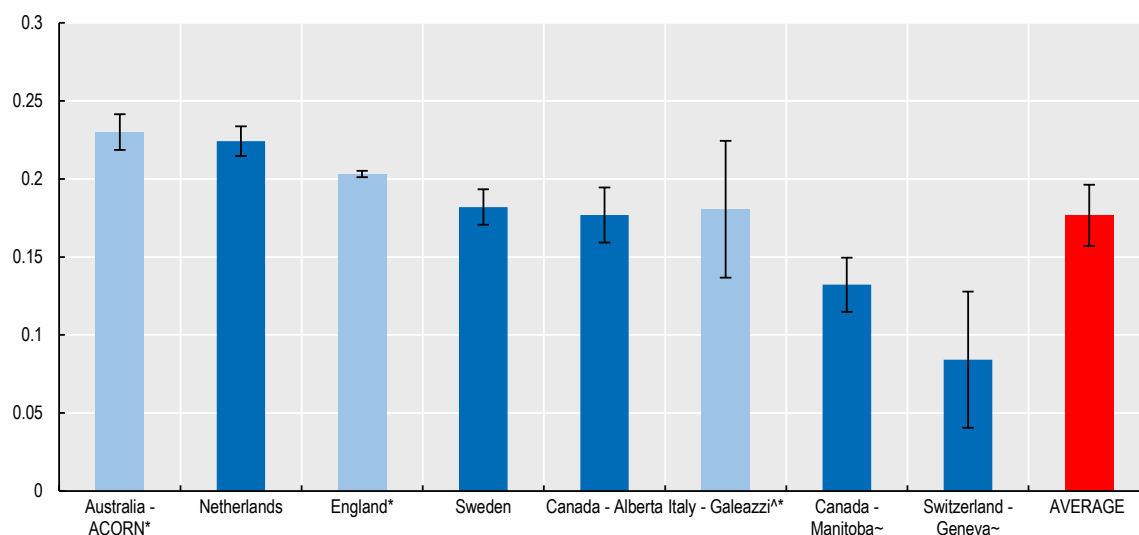Source: PaRIS Hip/Knee Replacement Pilot Data Collection.

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Results should be interpreted with caution

On average, patients undergoing hip or knee replacement procedures in the participating programmes reported an improvement in their symptoms and health-related QoL. This does not mean that all patients improved. In fact, a small but significant proportion reported no change or a worsening in their symptoms and health-related QoL for both procedures across the participating programmes. While this may still be a better

Figure 2.6. **Knee replacement: adjusted mean change between pre- and post-operative EQ-5D-3L scores (US valuation), 2013-16 (or nearest years)**
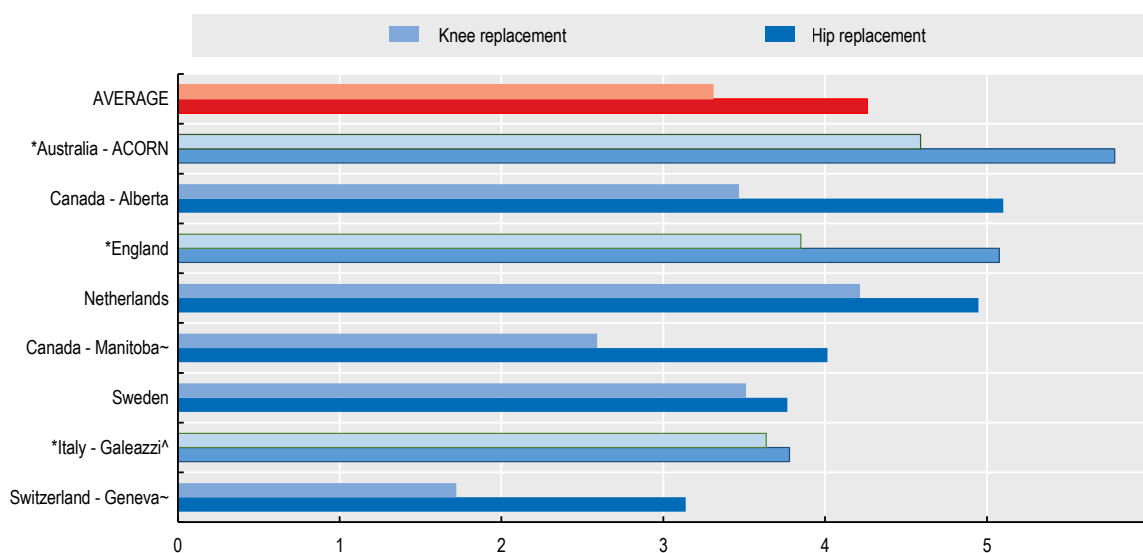

Note: ^ results converted from SF-12v1 instrument; ~converted from SF-12v2 instrument; *6-month post-op collection – lighter shade green (all others are 12 months). H lines show 95% confidence intervals.
Source: PaRIS Hip/Knee Replacement Pilot Data Collection.

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Figure 2.7. **Both hip and knee replacements generate additional QALYs for patients**

Note: ^ results converted from SF-12v1 instrument; ~converted from SF-12v2 instrument; *6-month post-op collection (all others are 12 months).
Source: PaRIS Hip/Knee Replacement Pilot Data Collection.

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outcome compared to the counterfactual (the status quo), receiving no intervention is unlikely given the availability of other treatment modalities in most health systems.

Results presented here are, in fact, silent on how the outcomes of hip and knee replacement surgery compare with other, more conservative surgical or non-surgical

treatments including exercise therapy and pharmaceuticals. This would require expanding the study cohort to patients who choose non-surgical therapy for joint pain. The literature suggests that non-surgical interventions indeed improve joint pain and function in people suffering from osteoarthritis, although joint replacement (followed by exercise therapy) results in greater patient-reported improvement (Skou, Bricca and Roos, 2018[27]; Skou et al., 2018[28]). However, joint replacement is associated with a higher number of serious adverse events such as infection than non-surgical treatment (Skou et al., 2015[29]).

Although results were standardised for age, sex and pre-operative score, a number of programme-specific variables limit their comparability. The number of patients differ considerably in each programme. Some of the contributing programmes collect post-operative scores at 6 months, others at 12 months. The latter is considered to be the optimal time for post-operative assessment as full recovery is expected 1 year after surgery. It is unknown how outcomes change beyond the respective time points when data are collected post-operatively. Programmes also deploy different modes of collecting data (paper, electronic, telephone) which is known to influence results. The response rates vary between programmes. Despite adjustment for pre-operative score, differences in wait times between countries may also influence results. Finally, results from three programmes were converted from, EQ-5D-5L and SF-12 to the EQ-5D-3L index (US valuation), which may bias the final results.

In addition, results have not been adjusted for casemix and co-morbidities because consistent data were not available across all programs. A range of cultural, demographic and socio-economic factors influence self-reported health status and will also influence the comparability of results, even when a common index and valuation are used.

Better information on breast cancer care outcomes helps patients facing difficult treatment choices

Breast cancer is the most prevalent form of cancer in women worldwide, with about 2.1 million newly diagnosed cases in 2018 accounting for almost 1 in 4 cancer cases among women (Bray et al., 2018[30]). While an increase in the incidence of breast cancer over the past decade has been observed, mortality has declined in most OECD countries. Early diagnosis as well as improved treatments have contributed to this result, with most OECD countries now having 5-year net survival rates of 80% (see earlier discussion and Figure 2.2).

Although surgery is the preferred local treatment for the majority of early breast cancer patients, a range treatment options exist when considering the specific approach for each women's care. For example, primary systemic treatment with chemotherapy or hormonal therapy can improve surgical options by reducing tumour size before surgery. Post-surgical radiation therapy, chemotherapy, and/or hormonal therapy can lower the risk of recurrence of the cancer.

The three main surgical interventions for breast cancer are:

- **Breast conserving therapy (BCT)** involves a surgical operation to remove the cancer while leaving as much of the breast as possible – commonly an option in early-stage cancer. This is the primary surgical choice for breast cancer, with 60%–80% of newly diagnosed cancers amenable to breast conservation at diagnosis or after primary systemic therapy for women in Western Europe (Cardoso et al., 2019[31]).

- **Mastectomy** involves complete removal of the breast surgically and is often undertaken when a woman cannot be treated with breast conserving therapy. However, a woman

may prefer a mastectomy over a breast conserving therapy and women at very high risk of getting a second cancer sometimes have both breasts removed.

- **Breast reconstruction** may be chosen by women who have had mastectomy of their breast to rebuild the shape and look of the breast. The two main types of breast reconstruction are: 1) **implant** reconstruction surgery which involves the insertion of a silicone implant after the removal of the woman's breast tissue; and 2) **autologous** reconstruction surgery, which uses tissue from other parts of the woman's body, such as her belly, back, thighs, or buttocks to rebuild the breast shape. This form of reconstruction is generally considered to look more natural and behave more like natural breast tissue than breast implants.

The choice of treatment and outcomes for women with cancer are influenced by a number of factors including the size and location of the tumour, biology or type and characteristic of the tumour, age, general health status, service availability, related health risks and patient preferences.

As such, the choice of surgical approach can influence a woman's subsequent quality of life. Women diagnosed with breast cancer can therefore face difficult decisions when considering treatment options. While factors such as age, general health status and the size and location of primary tumour are important to clinical decision making, the preferences of the patient are also central to the choice of treatment strategy (Cardoso et al., 2019[31]).

Beyond the overarching objective to stay alive, QoL is also a key consideration. In weighing treatment options, information about the outcomes of other women who have been in similar circumstances can potentially be of great help in the decision making process and ongoing reflection of progress during and after treatment and into survivorship.

The collection and use of PROMs in breast cancer care is growing

Motivated providers and patients across OECD countries are increasingly measuring patient-reported care outcomes to help inform difficult clinical decisions. The utility of such measurement is increasingly appreciated. For example, in the Netherlands breast cancer has been identified as one of the possible priority areas as part of a current national policy effort to measure patient-reported outcomes systematically and implement 'value-based' care (van Egdom et al., 2019[32]). Nevertheless, a variety of different PROM instruments are used, making comparability of outcomes more difficult. In addition, the scale of uptake is still largely localised and isolated to specific initiatives and clinical champions at specific sites.

In an effort to address this emerging priority, the OECD worked with a group of experts (including patients, clinicians, policymakers and industry representatives) and collaborating organisations to understand the current state of the art in breast cancer PROMS and to explore opportunities for international data collections and comparisons.

These efforts have culminated in a preliminary international data collection involving 10 clinical sites from 7 countries (Flinders Medical Centre, Adelaide, Australia; Charité – Universitätsmedizin Berlin, Germany; Erasmus Medical Center, Rotterdam, Netherlands; Capio St Göran Breast Unit, Södersjukhuset Bröstcentrum and Karolinska Univ.sjukhuset Bröst Endokrin och Sarkom, Stockholm, Sweden; Universitätspital Basel, Basel, Switzerland; Manchester University Hospitals NHS Foundation Trust, Manchester, UK; Memorial Sloan Kettering Cancer Center, New York, US and Brigham and Women's Hospital, Boston, US).

The postoperative breast satisfaction scale of the breast conserving therapy and breast reconstruction modules of the Breast Q tool was used. This is an internationally validated instrument used to measure breast surgery outcomes reported by patients (Pusic et al., 2009[33]) (Box 2.3).

The data collection involved women aged 15 years and older who received unilateral breast conserving therapy or a breast reconstruction following a mastectomy during the primary treatment of breast cancer. Women undergoing bilateral breast surgery were excluded, given the possible differential impact this surgery may have on breast satisfaction.

Box 2.3. Breast Q Postoperative Breast Satisfaction Scales

The Breast Q suite of tools is one of the more widely used amidst the range of instruments currently in use internationally to measure patient-reported outcomes from breast cancer surgery (Tevis et al., 2018[34]).

The breast satisfaction scales of the Breast Q tools measure body image in terms of a woman's satisfaction with her breasts and asks questions regarding how comfortably bras fit and how satisfied a woman is with her breast area both clothed and unclothed. Postoperative items ask about breast appearance (e.g., size, symmetry, softness), clothing issues (e.g., how bras fit; being able to wear fitted clothes) and location and appearance of scars. There are separate modules for lumpectomies, mastectomies and reconstructions, with each module consisting of multiple separate scales covering such issues as psychosocial wellbeing, sexual wellbeing, physical wellbeing, satisfaction with breasts and satisfaction with care. There are also implant-specific items, including the amount of rippling that can be seen or felt.

The scores from each scale of the breast conserving therapy and reconstruction scales, along with the other Breast Q scales can be transformed to an Equivalent Rasch Transformed Score of 1-100 to allow direct comparison between scales.

See *http://qportfolio.org/breast-q/breast-cancer/* for more details.

Results suggest higher breast satisfaction outcomes after breast conserving therapy in some, but not all sites

The crude (unadjusted) outcomes scores at 6-12 months following breast conserving therapy, breast reconstruction, and the aggregate of the two are provided in Figure 2.8. Results are from relatively small samples and are not intended to be representative of the outcomes of breast cancer patients across each country. However, they demonstrate the capacity for metrics of this kind to be reported internationally.

Crude data from sites that reported scores for breast conserving therapy and reconstruction suggest that women in most sites may have higher breast satisfaction outcomes after breast conserving therapy, aligning with conventional wisdom in this area (for example (Flanagan et al., 2019[35])). However, in some sites women may have higher satisfaction scores for reconstruction. Further work and more extensive data collection are needed to validate this observation and consider the generalisability of the data outcomes, but these early observations may provide some basis for further sharing and learning of outcomes across sites. For example, follow up beyond 6-12 months may be warranted, given the timing of outcomes for women can vary as a result of differences in the duration and impact of the usual treatment pathways for BCT and breast reconstruction.

A number of personal factors can influence a woman's postoperative satisfaction with the outcomes of her breast cancer surgery, including age, smoking, obesity, tumour burden, education level, cultural background and overall satisfaction with breasts and physical health before surgery. For example, smoking and obesity can impair tissue healing and

Figure 2.8. **Crude PROM scores for breast cancer point to variations in surgical outcomes**
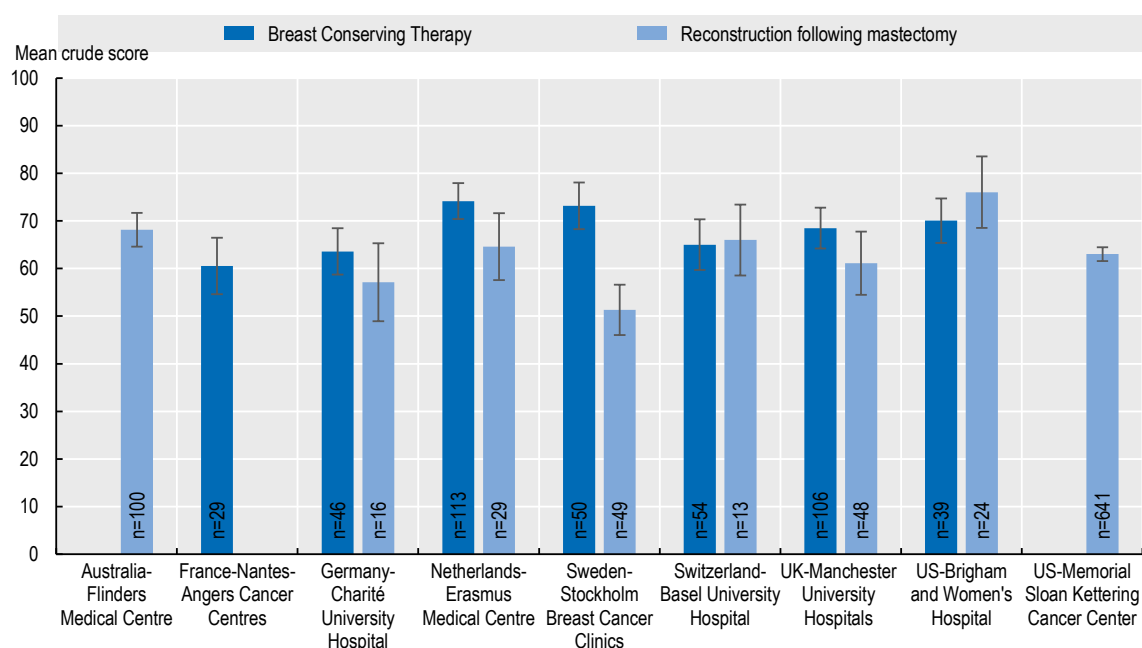
Note: Measurement extended beyond 12 months after surgery for sites in both Sweden and Switzerland. The data labels at the base of the histogram refer to the sample size at each site. H lines show 95% confidence intervals.
Source: PaRIS Breast Cancer PROMS Pilot Data Collection, 2019.

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have a negative impact on implant reconstruction results, including aesthetic outcomes (Kern et al., 2015[36]). These factors are largely outside of the health service's direct influence and their impact should ideally be taken into account when comparing the quality of care across sites. Data were collected from participating sites on key patient variables, including age, smoking and obesity but limitations on sample size and incomplete capacity for reporting by all sites prevented risk-adjusting results for the time being.

Women report slightly more satisfaction following autologous than implant breast reconstruction

Consolidated crude scores from the participating sites indicate that women are 6% more satisfied with their breasts after autologous reconstruction surgery than women after a breast implant (Figure 2.9). This result aligns with existing evidence (Matros et al., 2015[37]) and can be an important consideration where choice of surgical intervention is possible.

It follows that the variation in breast satisfaction scores presented in Figure 2.8 may be influenced, among other factors, by the proportion of women undergoing autologous reconstruction surgery. Table 2.1 presents the sample size of women and the proportion undergoing autologous reconstruction reported by each site. The proportion ranges from 100% of women receiving autologous reconstructions (Dutch and Swiss sites) to 0% in the Swedish site, where all women would have received implant reconstructions. However, it is likely some sites have not included all women undergoing reconstruction. For example, data may have been only provided by the plastics surgery unit in some sites and so not include the implant reconstructions performed by the breast surgeons and vice versa.

Figure 2.9. **Crude patient-reported outcomes for implants and autologous reconstructions**

Self-reported satisfaction with breasts by type of reconstruction surgery, 2017-18 (or nearest years)
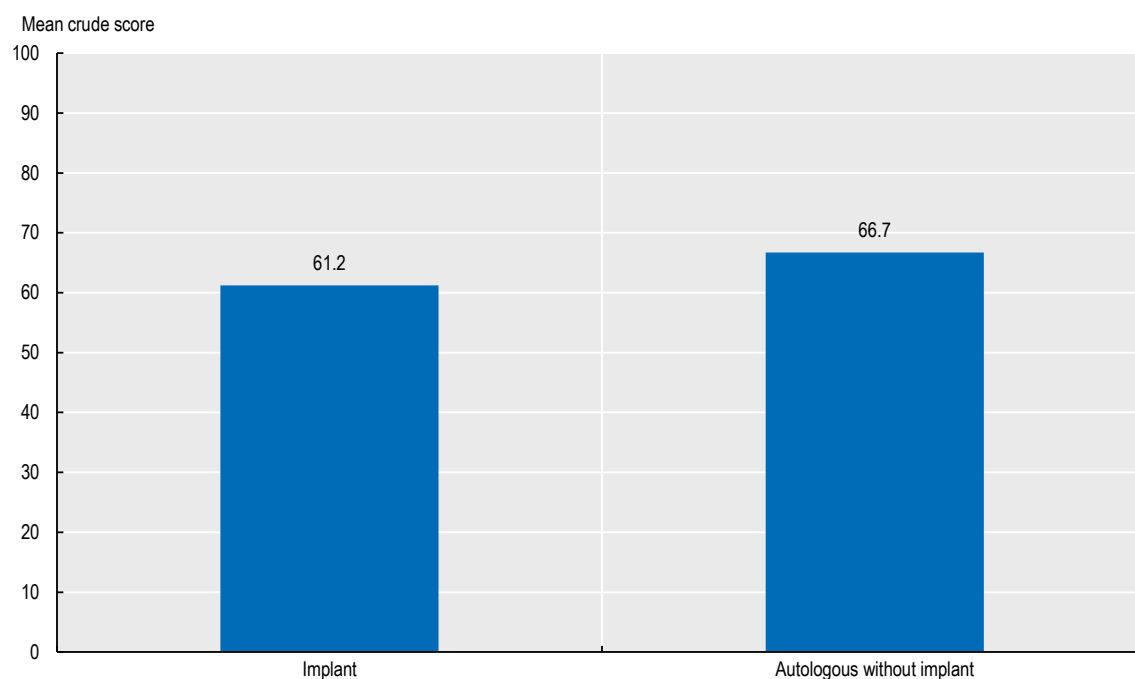
Note: Derived from consolidated data from all 11 participating sites.
Source: PaRIS Breast Cancer PROMS Pilot Data Collection, 2019.

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While no clear relationship between the proportion of women undergoing autologous reconstruction and the overall crude outcomes scores (Figure 2.8) is apparent, further consideration of the factors contributing to the observed wide variation across sites may be warranted, particularly given the conventional wisdom regarding care outcomes. For example, the role of each site within the broader service arrangements for women with breast cancer or the representativeness of the sites' data.

Table 2.1. **Total breast reconstructions and the proportion of autologous reconstructions by site**

	Total breast reconstructions	Autologous reconstructions without implant
	No. of Women	% of total reconstructions
Australia-Flinders Medical Centre	100	57% (57)
Germany-Charité University Hospital	16	19% (3)
Netherlands-Erasmus Medical Centre	29	100% (29)
Sweden-Stockholm Breast Cancer Clinics	49	0% (0)
Switzerland-Basel University Hospital	13	100% (13)
UK-Manchester University Hospitals	48	25% (12)
US-Brigham and Women's Hospital	24	38% (9)
US-Memorial Sloan Kettering Cancer Center	641	24% (153)

Source: PaRIS Breast Cancer PROMS Pilot Data Collection, 2019.

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**Recent use of PROMs indicates that autologous reconstruction may be cost-effective**

Significant variation in treatment pathways and practices persists for women with breast cancer, including the use of different surgical approaches, even in the face of established clinical practice guidelines (Cardoso et al., 2019[31]; OECD, 2013[38]). Figure 2.10 presents the rates, setting and mix of breast conserving therapy and mastectomy surgery across OECD countries. This Figure suggests that different treatment patterns are evident, even across countries showing a very similar level of cancer incidence. Data need of course to be interpreted cautiously as patients' cancer stages, comorbidity and pre-operative patient performance status may also vary.

Figure 2.10. **Breast cancer surgery type and setting (2017) and incidence (2012) per 100 000 women**

Source: OECD Health Statistics 2019.

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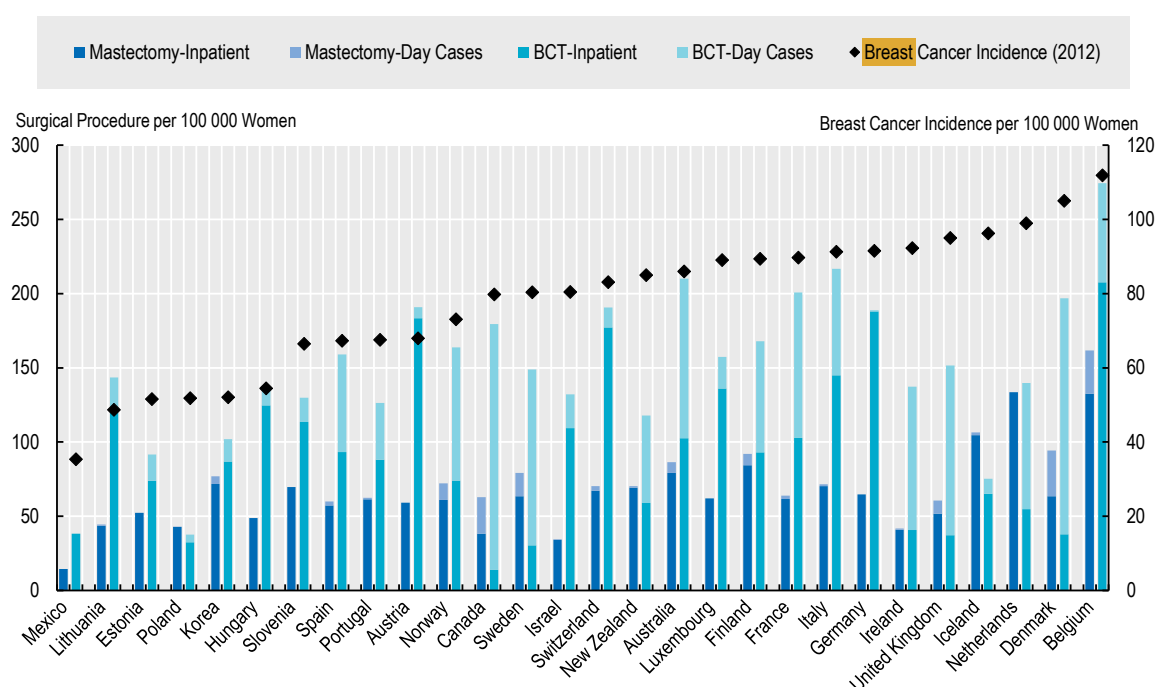
Variation in the treatment patterns can also be affected by a number of other factors. For example, regional differences in breast reconstruction surgery in Sweden have recently been attributed to variation in patient information, availability of plastic surgery services and the involvement of women in decision-making (Frisell, Lagergren and de Boniface, 2016[39]).

Treatment choices made by patients in consultation with their clinical teams have not only consequences for survival and QoL, but also financial implications. For example, after a mastectomy a woman faces the choice of whether to have breast reconstruction (as an immediate or delayed procedure) or not and if she proceeds with breast reconstructive surgery, what type of reconstruction she should have. While the outcomes in terms of survival of having a breast reconstruction or not after a mastectomy are generally

comparable (Platt et al., 2015[40]), the choice of reconstruction can lead to different outcomes that are important to women, such as quality of life or satisfaction with breasts as well as different costs faced by the women and the health system.

While autologous reconstructions appear to result in better patient outcomes than implant surgery, they tend to be more complex and expensive, raises questions about value for money (Scurci et al., 2017[41]). A recent study in the United States compared the Breast Q scores of patients who had implant and those who underwent autologous reconstructions and calculated the average additional cost for obtaining 1 year of perfect breast-related health for a unilateral autologous reconstruction at just under USD 12 000 in 2010, compared with implant reconstruction, with lower additional costs for younger patients and earlier stage breast cancer (Matros et al., 2015[37]).

Although society's value for a year of perfect breast-related quality of life is unknown, a threshold of USD 50 000 to USD 100 000 for a year in perfect overall health is commonly been used to classify interventions as cost-effective and considered as acceptable for adoption of new technologies or techniques in OECD countries (Cameron, Ubels and Norström, 2018[42]). On this basis, further consideration of the relative cost-effectiveness of autologous reconstructions may be warranted, along with broader economic evaluation of both BCT and breast reconstruction surgery.

Routine collection of data on outcomes that matter for breast cancer patients is useful not only for direct patient care but also for system improvement through better understanding of the impact of different care pathways. They complement traditional measures such as survival, mortality, complications and readmissions. Bringing measures of what matters to patients into the equation creates potential to evaluate alternative modes of treatment both in terms of outcome and value for patients, policy makers and third party payers (Cardoso et al., 2019[31]).

Existing mental health measures say little about experiences and outcomes of care

Mental health is a vital component of individual well-being as well as social and economic participation. However, many OECD countries consider that their mental health care is inadequate. It is estimated that about one in five people experience a mental health problem in any given year, while every second individual will experience a mental health problem in their lifetime (Institute for Health Metrics and Evaluation, 2019[43]). The most common mental health problems are anxiety disorder (5.1% of the population), followed by depressive disorders (4.5%), and drug and alcohol use disorders (2.9%) (ibid.).

The economic and social costs of mental ill-health are significant. Direct spending on mental health services was estimated to account for around 13% of total health spending – or 1.3% of GDP – across EU countries in 2015 (OECD/EU, 2018[44]). But larger costs are also borne outside of the health system. Lower employment rates and productivity of people with mental health issues incur economic impact equivalent to 1.6% of GDP in EU countries; with greater spending on social security programmes, such as disability benefits or paid sick leave, accounting for a further 1.2% of GDP (OECD/EU, 2018[44]).

Comparable cost estimates have been established in OECD countries beyond the EU. In Australia, for example, the total costs of mental ill-health amount to 4% of GDP, 45% of which are indirect costs (Australian Government - National Mental Health Commission, 2016[45]), Similar figures are reported in Canada and Japan (Sado et al., 2013[46]; Sado et al., 2013[47]; Mental Health Commission of Canada, 2012[48]).

The impact of mental health problems on individuals' lives, and on societies and economies, can be addressed through more effective policies and interventions to prevent and manage them. However, understanding of the impact that mental health care makes on service users' lives is still weak; there is a pressing need to measure the effects and impact of prevention and treatment approaches more consistently and methodically.

Traditional measures say little about the lasting impact that mental health care has on the patient. For example, inpatient suicide is a critical safety measure which indicates when something has gone terribly wrong (Figure 2.11), and is one of the limited measures of care quality that can currently be reported internationally. Thankfully inpatient suicide is very rare, which means for the vast majority of psychiatric patients we do not have a meaningful insight into their experience or outcomes of care.

Figure 2.11. **Inpatient suicide among patients with a psychiatric disorder, 2015-2017**
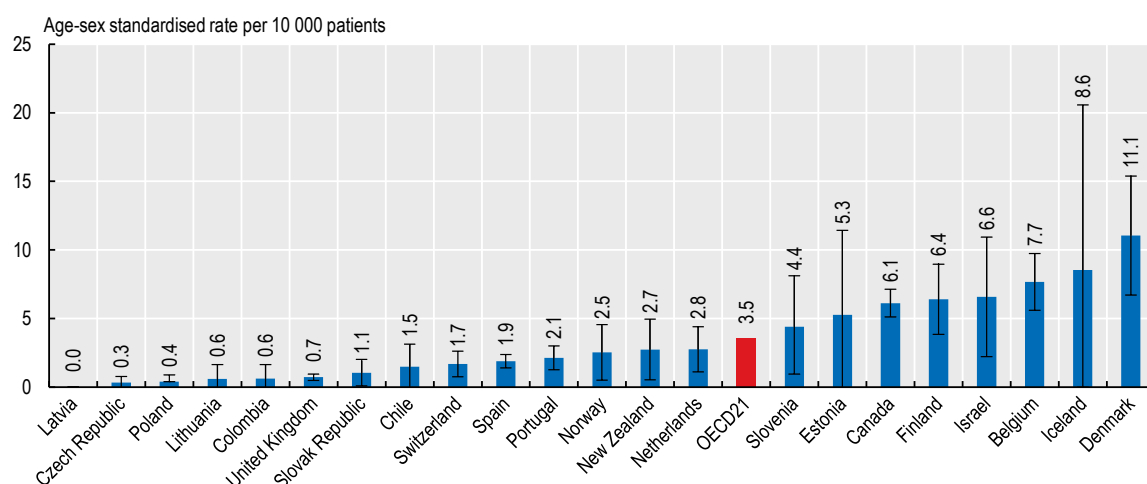
Note: H line shows 95% confidence intervals. Three year average except for New Zealand.
Source: OECD Health Statistics 2019.

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Patient-reported measures are a critical tool for improving policy and practice in mental health care. An example of how patient-reported measures (in this case PREMs) can shed light on potential problems with mental health care is provided in Box 2.4, which report survey data on the care experience of people who report having been told by a doctor that they have a mental health condition, compared to those who have not.

Collaboration to enhance patient-reporting in mental health

Given the health and economic impact of mental ill-health, it is important to assess the quality and outcomes of care in this area. Existing outcome and process indicators – while very useful in some circumstances – do not provide the entire picture of quality and performance. This information gap impedes efforts to improve care, practice and policy.

However, patient-reporting in mental health is still at a relatively nascent stage. Data collection is patchy, and routine reporting and use of the information is far from the norm. As of 2018, only five of the twelve countries surveyed (Australia, Israel, Netherlands, Sweden, United Kingdom – England) reported that PROMs and PREMs were collected regularly in the mental health setting. Only Australia, the Netherlands and England

Box 2.4. **The Commonwealth Fund International Health Policy Survey of Adults**

The Commonwealth Fund 2016 International Health Policy Survey of Adults (The Commonwealth Fund, 2016[49]) was conducted in 11 countries - Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States – with a total of 26 863 adults interviewed by phone about their experiences with their country's health care system, their health and well-being.

The survey included the question **"Have you ever been told by a doctor that you have depression, anxiety or other mental health problems".** While there are some methodological challenges in using the survey in this way, including around comparability of response groups and sample sizes, comparing responses across all the survey questions for respondents who answered 'yes' with those who responded 'no' to the mental health question can shed light on how people who manage a mental health condition in the participating countries experience their health care journey.

Respondents who answered 'yes' reported similar experiences to the remaining respondents in some areas of care. In others, their reported care experience appears to be inferior. In several countries, for example, people with a mental health problem were significantly more likely to report having received conflicting information from different health care professionals (Figure 2.12). The differences were most pronounced in Australia, Sweden and France.

Figure 2.12. **People who have been told by a doctor that they have depression, anxiety or other mental health problems are more likely to report receipt of conflicting information from health care professionals**
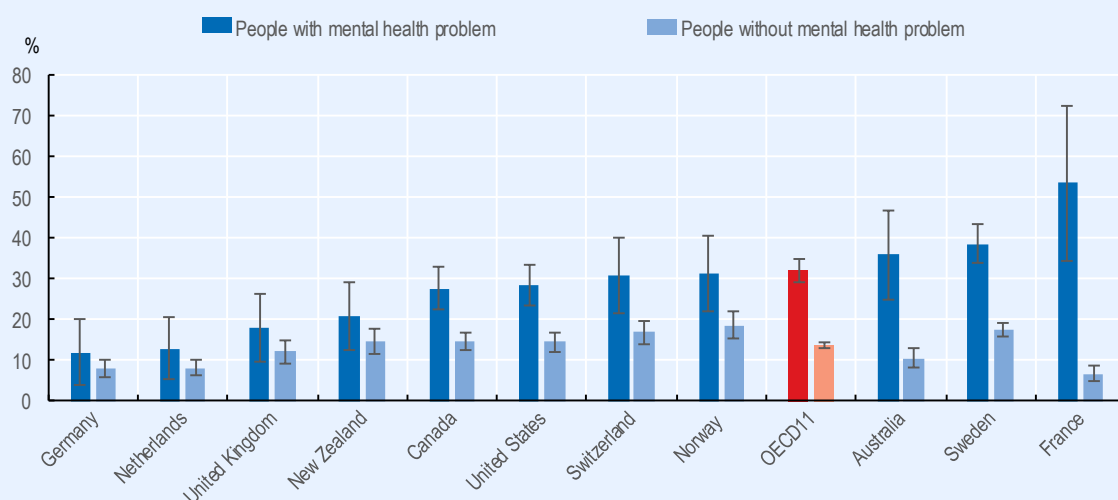
Note: 'People with a mental health problem' are the respondents who answered "yes" to the question "thinking about the past 2 years, when receiving care for a medical problem, was there EVER a time when you received conflicting information from different doctors or health care professionals?" Data limitations. The number of respondents in the 11 countries ranged from 1 000 (Germany) to 7 124 (Sweden). Lowest response rates were observed in Norway (10.9%), Sweden (16.9%), and the United States (18.1%) and the highest were in the New Zealand (31.1%), the Netherlands (32.4%) and Switzerland (46.9%). The sample sizes of respondents who answered 'yes' to the mental health question were therefore small, which is reflected in the large confidence intervals (H refers to 95% confidence intervals). In addition, the mental health survey question does not permit distinguishing between individuals who were suffering from a mental health problem at the time of the survey, and those who had experienced mental ill-health in the past but have since recovered. Cultural and linguistic differences in how the question was interpreted could also influence responses. Results have not been risk-adjusted for co-morbidities and socio-economic status.
Source: OECD analysis based on Commonwealth Fund 2016 International Health Policy Survey (The Commonwealth Fund, 2016[49]).

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reported collecting *and* routinely reporting both. As such, a limited pool of national data exists that are not readily comparable at an international level.

This needs to change, and the OECD has been working with patients, clinicians and policymakers and other experts from 13 countries to develop PREM and PROM data collection standards in mental health to enable international reporting, and foster the capacity to collect and use this important information in OECD countries.

Conclusion

A fundamental objective of health care is to improve the health and wellbeing of patients and populations. Yet, collecting information from patients on how successful health systems are in this endeavour is not the norm. In addition, emerging demographic, epidemiological and financial challenges are increasing the need to orient health systems around the needs of people and communities. This will not be possible without knowledge sourced directly from patients themselves to complement existing information on health system performance.

Results from preliminary data on patient-reported outcomes were presented in the areas of hip/knee replacement and breast cancer care, while work is underway in the area of mental health.

Over 2.2 million patients undergo a hip or a knee replacement each year in OECD countries. Since 2000, age-adjusted knee replacement rates have doubled in OECD countries, while hip replacement rates have grown by a third. The international landscape for collecting outcomes data from people undergoing hip or knee replacement is varied. Nevertheless, ten programmes from eight OECD countries contributed data reported by adult patients following an elective hip or knee replacement procedure. Results suggest that:

- In each country, both hip and knee replacement surgery improved the pain, function and health-related QoL as reported by patients, with results adjusted for age, sex and pre-operative score.
- Greater gains were reported by patients who underwent a hip replacement. If performed at age 65, hip replacement would, on average, generate an additional 4.3 QALYs compared to of 3.3 QALYs for the average knee replacement (although the longer recovery period following knee replacement surgery must be noted).
- Inter-country variation was modest, suggesting that methods to collect and analyse the pilot data were sound.

Public knowledge of these types of results are very important as a way to improve informed decision-making by patients, and to calibrate patients' goals and expectations when deciding to undergo elective procedures. Results also enable policy decisions and assessing the cost-effectiveness, cost-utility and value from the patient perspective. More patient-reported data will enable solid, temporal analysis and inter-country comparisons in the future. It is important that countries harmonise their data collection at national level.

Breast cancer is the most prevalent form of cancer in women worldwide. While an increase in the incidence has been observed over the past decade, most OECD countries display 5-year net survival rates of 80% or higher. A range of surgical interventions can be deployed to treat breast cancer but relatively little is known about their outcomes valued by women such as pain, breast satisfaction and QoL. Ten sites spanning 7 countries participated in a pilot collection of patient-reported outcomes data for women undergoing surgical breast cancer treatment. The preliminary results from this data collection - which have not been risk-adjusted - generate the following tentative observations:

● Postoperative breast satisfaction of women may vary by type of surgery (whether this be a mastectomy or breast conserving therapy) and by the site of surgery, with some sites reporting higher scores for lumpectomies and others higher scores for reconstructions. This may offer additional opportunities for sharing and learning across sites and countries.

● Of the women who had a breast reconstruction after a mastectomy, the women who underwent *autologous* breast reconstruction surgery reported, on average, slightly better outcomes to women who underwent *implant* reconstruction. This aligns with conventional wisdom, providing women with potentially greater assurance in the use of such information to help assess treatment options.

● Autologous reconstruction may be a cost-effective alternative to implant surgery, when the additional costs for an additional year of perfect breast-related health is compared with broadly accepted cost-effectiveness thresholds.

A number of clinical factors need to be taken into account when considering these observations and ongoing data collection and analytical refinement is required explore their veracity. However, these results illustrate how this type of information derived directly from patients can potentially be very useful for other women when making difficult decisions and trade-offs on the optimal treatment pathway for their individual needs and preferences, providers when assessing the 'success' of various interventions, and payers and policymakers when considering the comparative cost-effectiveness and cost-utility of various treatments.

Mental ill-health exerts a considerable health and economic burden across the world, but systematic collection of patient-reported outcomes and experiences in mental health is at a nascent stage. Despite limitations in the data, the 2016 Commonwealth Fund survey of 11 countries suggests that people with a mental health problem report a worse care experience than those without mental health problems in some aspects of health care, such as receiving consistent information from providers. The OECD is working with international stakeholders including patients, clinicians and policymaker to advance measurement of mental health outcomes and experiences.

Overall, these results demonstrate that presenting valid and comparable results from patient-reported data at international level is eminently possible. However, capacity within and among countries must be increased to collect and report these data in a consistent and harmonised way. OECD will continue to work with countries to promote consistent collection and reporting of these data, in partnership with national and international stakeholders including patients and health care professionals.

Notes

1. Based on 45 600 hip replacements and 49 500 knee replacements reported in 2016 and 2017 respectively, at a 'national efficient price' (NEP) -- the official price paid by the national payer for conducting these procedures in the public sector. The 2019-20 NEP is just under AUD 20 000 for each procedure (*https://www.ihpa.gov.au/publications/national-efficient-price-determination-2019-20*). The overall national figure is likely to be higher because approximately half of procedures are carried out in the private sector where higher prices are typically paid.

2. Coxa hospital has a patient catchment covering an entire region of Finland.

3. With the exception of Galeazzi, which included all principal diagnoses.

4. The value is derived by subtracting the pre-operative score from the post-operative score. A positive value therefore represents an improvement in QoL.

5. Charts showing the average pre- and post-operative results for each participating programme are presented in Chapter 6 (Section: Hip and knee surgery).

6. The degree of improvement was statistically significant at the 95% confidence level in all programmes and in aggregate.

7. The generic and condition-specific scales are not linear – i.e. a change from 0.2 to 0.3 is not necessarily the same magnitude in terms of health-related QoL than 0.7 to 0.8. The percentage improvements are provided for illustrative purposes and should be interpreted cautiously.

8. This does not mean that a joint replacement results in greater health gain than other, more conservative interventions for joint pain, which may be equivalent or even superior in this regard for some patients and on average. This comparison is beyond the scope of this chapter (Section: A good care experience contributes to better outcomes and is also an end in itself).

9. HOOS-PS: Hip disability and Osteoarthritis Outcome Score–Physical Function Shortform.

10. An alternative scoring system exists for both instruments where a *lower* value represents a *better* result.

11. See 6 and 7.

12. KOOS-PS: Knee injury and Osteoarthritis Outcome Score-Physical Function Shortform.

13. See 6 and 7.

14. See 6 and 7.

15. As valued by a US population sample (Shaw JW, 2005).

16. The incremental QALYs are derived by multiplying the adjusted mean change by 20.5 years -- the average life expectancy at age 65 in the countries of the contributing programs , minus one year to account for recovery and rehabilitation (OECD, 2019[50]).

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RESTING ECG

****** BORDERLINE ABNORMAL ****** D
702:Abnormal Q ?
210:Mild left axis deviation

Check abnormal Q-wave.
P-wave is unclear. Check P-wave.
serve progress if there is no symptom
ease.
Unconfirmed. MD must review. ****
WED BY
2-1-3 4-2

V1

aVL

V2

aVF

V3

3. HEALTH STATUS

Trends in life expectancy

Life expectancy by sex and education level

Main causes of mortality

Avoidable mortality (preventable and treatable)

Mortality from circulatory diseases

Cancer incidence and mortality

Chronic disease morbidity

Infant health

Mental health

Self-rated health

Trends in life expectancy

Life expectancy has increased in all OECD countries over the last few decades, although gains have slowed in recent years. In 2017, life expectancy at birth was 80.7 years on average across OECD countries, over 10 years higher than it was in 1970 (Figure 3.1).

Japan, Switzerland and Spain lead a large group of 26 OECD countries in which life expectancy at birth exceeds 80 years. A second group, including the United States and a number of central and eastern European countries, has a life expectancy between 77 and 80 years. Latvia, Mexico, Lithuania and Hungary have the lowest life expectancy, at less than 76 years in 2017.

Among OECD countries, Turkey, Korea and Chile have experienced the largest gains since 1970, with increases of 24, 20 and 18 years respectively. Stronger health systems have contributed to these gains, by offering more accessible and higher quality care. Wider determinants of health matter too – notably rising incomes, better education and improved living environments. Healthier lifestyles, influenced by policies within and beyond the health system, have also had a major impact (James, Devaux and Sassi, 2018[1]).

In partner countries, life expectancy remains well below the OECD average except in Costa Rica. Still, levels are converging rapidly towards the OECD average, with considerable gains in longevity since 1970 in India, China, Brazil, Indonesia, Colombia and Costa Rica. There has been less progress in the Russian Federation, due mainly to the impact of the economic transition in the 1990s and a rise in risky health behaviours among men. South Africa has also experienced slow progress, due mainly to the HIV/AIDS epidemic, although longevity gains over the last decade have been more rapid.

A closer look at trends in life expectancy at birth shows a considerable slowdown in gains in recent years. Comparing the last five years (2012-17) with a decade earlier (2002-07), 27 OECD countries experienced slower gains in life expectancy (Figure 3.2). This slowdown was most marked in the United States, France, the Netherlands, Germany and the United Kingdom. Longevity gains were slower for women than men in almost all OECD countries.

Indeed, life expectancy fell on average across OECD countries in 2015 – the first time this has happened since 1970. Nineteen countries recorded a reduction, widely attributed to a particularly severe influenza outbreak that killed many frail elderly people and other vulnerable groups (Figure 3.3). Most of these were European countries, with the exception of the United States and Israel. The largest reductions were in Italy (7.2 months) and Germany (6 months).

The causes of this slowdown in life expectancy gains are multifaceted (Raleigh, 2019[2]). Principal among them is slowing improvements in heart disease and stroke. Rising levels of obesity and diabetes, as well as population ageing, have made it difficult for countries to maintain previous progress in cutting deaths from such circulatory diseases. Respiratory diseases such as influenza and pneumonia have claimed more lives in recent years – most notably in 2015, but also in the winters of 2012-13 and 2016-17. In some countries, particularly the United States and Canada, the opioid crisis has caused more working-age adults to die from drug-related accidental poisoning.

More broadly, economic recessions and related austerity measures, as in the 2008 global economic crisis, have been linked to deteriorating mental health and increased suicide rates, but with a less clear-cut impact on overall mortality (Parmar, Stavropoulou and Ioannidis, 2016[3]). What is clear is that continued gains in longevity should not be taken for granted, with better protection of older people and other at-risk populations paramount to extending life expectancy.

Higher national income is generally associated with greater longevity, particularly at lower income levels. Life expectancy is also, on average, longer in countries that invest more in health systems – although this relationship tends to be less pronounced in countries with the highest health spending per capita (see Chapter 1 for further analysis).

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 few 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. 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.
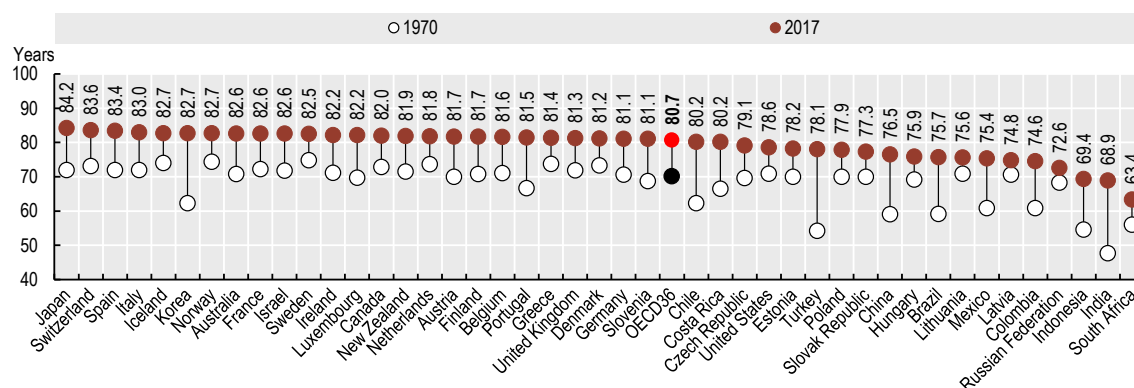
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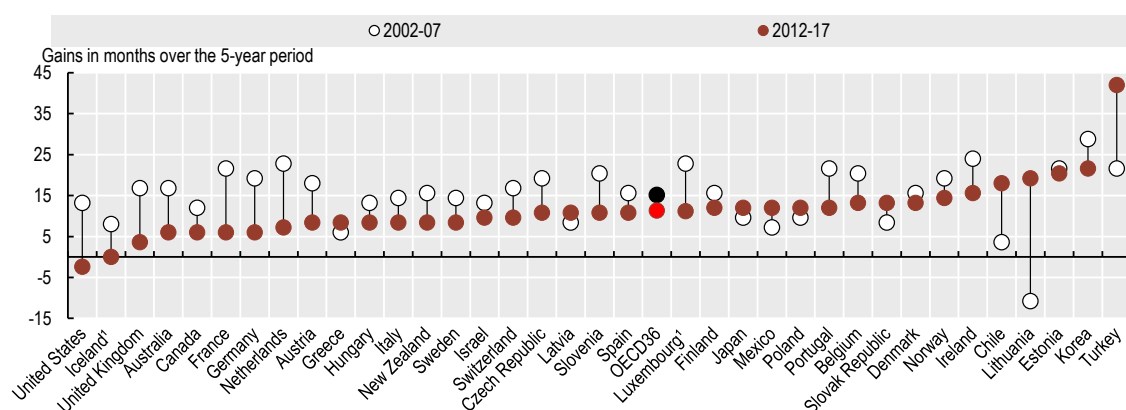Figure 3.1. **Life expectancy at birth, 1970 and 2017 (or nearest year)**

Source: OECD Health Statistics 2019.

StatLink https://doi.org/10.1787/888934014821

Figure 3.2. **Slowdown in life expectancy gains, 2012-17 and 2002-07**

1. Three-year average.
Source: OECD Health Statistics 2019.

StatLink https://doi.org/10.1787/888934014840

Figure 3.3. **Change in life expectancy at birth, 2014 to 2015**
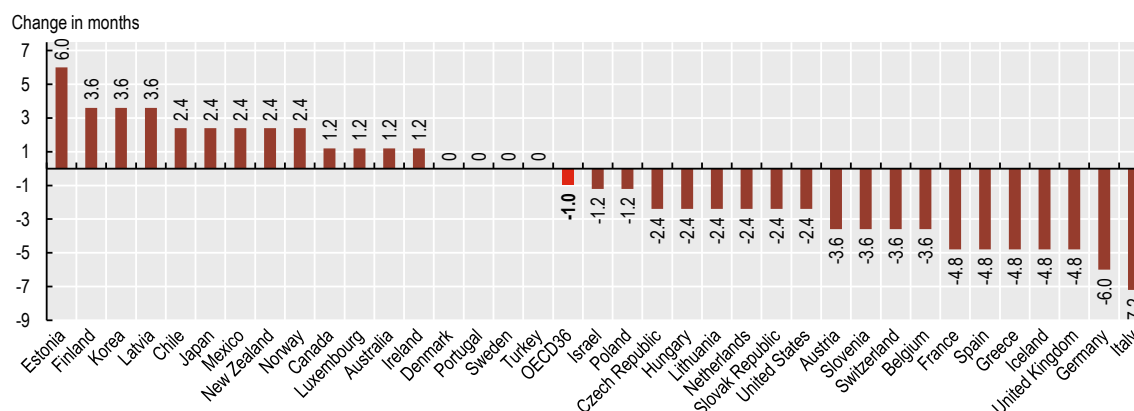
Source: OECD Health Statistics 2019.

StatLink https://doi.org/10.1787/888934014859

Life expectancy by sex and education level

Women live longer than men do in all OECD and partner countries. This gender gap averaged 5.3 years across OECD countries in 2017 – life expectancy at birth for women was 83.4 years, compared with 78.1 years for men (Figure 3.4). The gender gap in life expectancy, though, has narrowed by one year since 2000, reflecting more rapid gains in life expectancy among men in most countries.

In 2017, life expectancy at birth for men in OECD countries ranged from around 70 years in Latvia and Lithuania to 81 years or higher in Switzerland, Japan, Iceland and Norway. For women, life expectancy reached 87.3 years in Japan, but was less than 80 years in Mexico, Hungary and Latvia.

Gender gaps are relatively narrow in Iceland, the Netherlands, Norway, Sweden, New Zealand, Ireland, the United Kingdom and Denmark – at less than four years. However, there are large gender differences in many central and eastern European countries, most notably in Latvia and Lithuania (around ten years), Estonia (around nine years) and Poland (around eight years). In these countries, gains in longevity for men over the past few decades have been much more modest. This is partly due to greater exposure to risk factors among men – particularly greater tobacco use, excessive alcohol consumption and less healthy diets – resulting in more deaths from heart diseases, cancer and other diseases. For partner countries, the gender gap is around ten years in the Russian Federation, and just over seven years in Colombia, Brazil and South Africa. China and India have small gender gaps, of about three years.

Socioeconomic inequalities in life expectancy are also evident in all OECD countries with available data (Figure 3.5). On average among 26 OECD countries, a 30-year-old with less than an upper secondary education level can expect to live for 5.5 fewer years than a 30-year-old with tertiary education (a university degree or equivalent). These differences are higher among men, with an average gap of 6.9 years, compared with an average gap of 4.0 years among women.

Socioeconomic inequalities are particularly striking among men in many central and eastern European countries (Slovak Republic, Hungary, Poland, Czech Republic, Latvia), where the life expectancy gap between men with lower and higher education levels is over ten years. Gaps in life expectancy by education are relatively small in Turkey, Canada and Sweden.

More deaths amongst prime-age adults (25-64 years) with lower education levels drive much of this education gap in life expectancy. Mortality rates are almost four times higher for less educated prime-age men, and about twice as high for less educated prime-age women, compared to those with tertiary education (analysis based on data from 23 OECD countries). Differences in mortality rates among older men and women, while less marked, remain higher among the less educated, driven mainly by more deaths from circulatory diseases and cancer (Murtin et al, 2017[1]).

Higher smoking rates amongst disadvantaged socioeconomic groups is an important contributor to gaps in life expectancy by education or other measures of socioeconomic status. Other risk factors are also more prevalent among disadvantaged groups, notably excessive alcohol consumption among men, and higher obesity rates for men and women (see indicators in Chapter 4 on "Risk factors for health").

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. Data on life expectancy by sex comes from Eurostat for EU countries, and from national sources elsewhere.

For life expectancy by education level, data were provided directly to the OECD for Australia, Austria, Belgium, Canada, Chile, France, Iceland, Israel, Latvia, Mexico, Netherlands, New Zealand, Switzerland, Turkey and the United Kingdom. Data for the remaining European countries were extracted from the Eurostat database. The International Standard Classification of Education (ISCED) 2011 is the basis for defining education levels. The lowest education level – ISCED 0-2 – refers to people who have not completed their secondary education. The highest education level – ISCED 6-8 – refers to people who have completed a tertiary education (a university degree or equivalent).

Not all countries have information on education as part of their deaths statistics. In such cases, data linkage to another source (e.g. a census) containing information on education is required. Data disaggregated by education are only available for a subset of the population for Belgium, the Czech Republic and Norway. In these countries, the large share of the deceased population with missing information about their education level can affect the accuracy of the data.

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