Health at a Glance: Europe 2018

STATE OF HEALTH IN THE EU CYCLE

OECD

European Commission

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Please cite this publication as:
OECD/EU (2018), *Health at a Glance: Europe 2018: State of Health in the EU Cycle*, OECD Publishing, Paris.
https://doi.org/10.1787/health_glance_eur-2018-en

ISBN 978-92-64-30334-8 (print)
ISBN 978-92-64-30335-5 (PDF)
ISBN 978-92-64-30686-8 (HTML)
ISBN 978-92-64-30685-1 (epub)

Series: Health at a Glance: Europe
ISSN 2305-607X (print)
ISSN 2305-6088 (online)

European Union
ISBN 978-92-79-88852-6 (print)
ISBN 978-92-79-88853-3 (PDF)
Catalogue number: EW-01-18-697-EN-C (print)
Catalogue number: EW-01-18-697-EN-N (PDF)

Revised version, February 2019.
Details of revisions available at:
www.oecd.org/about/publishing/Corrigendum_Health_at_a_Glance_Europe_2018.pdf

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Foreword

This 2018 edition of Health at a Glance: Europe *marks the start of a new* State of Health in the EU *cycle by the European Commission designed to assist EU Member States in improving the health of their citizens and the performance of their health systems.*

Two overarching trends warrant special mention. First, the steady increase in life expectancy has slowed considerably in many EU countries due to a slower rate of reduction of cardiovascular deaths and an increase in the number of deaths among the elderly during winter months in recent years. Second, large inequality in life expectancy persists. Across the EU, people with a low level of education can expect to live six years less than those with a high level of education.

We need more protection and prevention. *More than 1.2 million people die prematurely every year in EU countries – this could be avoided through better disease prevention policies and more effective health care interventions. On the one hand, we must tackle the misinformation about vaccines and address population hesitancy about childhood vaccination, as outlined in the recommendation proposed to the Council of the EU earlier this year. At the same time, many lives could be saved by redoubling efforts to prevent unhealthy lifestyles. Some 790 000 EU citizens die prematurely each year from tobacco smoking, alcohol consumption, unhealthy diets and lack of physical activity. Policies to control tobacco and harmful consumption of alcohol or to halt obesity therefore need to be actively pursued.*

This edition of Health at a Glance: Europe *also makes a strong case for promoting mental health and preventing mental illness. The total costs of mental health problems – which include the costs to health systems and social security programmes, but also lower employment and worker productivity – are estimated to amount to more than 4% of GDP across EU countries, equivalent to over EUR 600 billion per year. Promoting mental health and improving access to treatment for people with poor mental health should be a priority.*

We need more effective and people-centred health systems. *Health systems have achieved remarkable progress in treating life-threatening diseases such as heart attacks, strokes and various cancers, yet wide disparities in survival rates persist not only between countries but also among hospitals and health care providers within each country.*

It is not enough to only collect data on mortality. Health care needs to place people at the centre, which requires asking patients more systematically whether they are better, or worse, following different health care interventions. We must also measure how well the primary care sector is managing the growing number of people living with one or more chronic conditions. The OECD and the European Commission are working together with countries to fill these critical data gaps on patient-reported experience and outcome measures.

We need to improve access to health care. *Universal health coverage – a key* Sustainable Development Goal *– and timely access to affordable, preventive and curative health care – a key principle of the* European Pillar of Social Rights *– should remain central to policy action. Recent data on the unmet health care needs are encouraging; fewer EU citizens report foregoing care due to*

financial reasons, distance from services or waiting times. The gap between the poor and the wealthy, however, remains too large. Poor Europeans are on average five times more likely to have problems accessing health care than richer ones, and policies must prioritise financial protection for disadvantaged groups.

Finally, we need more resilient health systems. *As health systems evolve, they must become more resilient and adapted to rapidly changing environments and needs. In this edition of* Health at a Glance: Europe, *we highlight the importance of reducing wasteful spending, and the potential gains for efficiency and sustainability of health systems. Evidence from various countries suggests that up to one-fifth of health spending is wasteful and could be reallocated to better use. For example, too many hospital admissions reflect failures in the management of health problems in the community and consume over 37 million bed days each year across the EU. The digital transformation of health and care, a key component of the EU's* Digital Single Market, *offers tremendous potential for improving the prevention, detection and management of chronic diseases, as well as improving health system management and research.*

The OECD and the European Commission will work closely together with policymakers and other key stakeholders throughout the State of Health in the EU *cycle, to help promote policies that will deliver both longer and healthier lives for all EU citizens.*

Angel Gurría
Secretary-General
Organisation for Economic Co-operation and Development

Vytenis Andriukaitis
European Commissioner for Health and Food Safety

Acknowledgements

Health at a Glance: Europe 2018, the first step in the *State of Health in the EU* cycle, is the result of close co-operation between the OECD and the European Commission. The preparation of this publication was led by the OECD, and the Commission provided guidance and technical support throughout the process.

This publication would not have been possible without the effort of national data correspondents from the 36 countries who have provided most of the data and the metadata presented in this report, and financial support provided by the European Union. This publication also benefitted from many useful comments from members of the Commission's Expert Group on Health Information (EGHI), as well as from several officials in the European Centre for Disease Prevention and Control (ECDC), the Joint Research Centre (JRC) and the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA).

This report was prepared by a team from the OECD Health Division under the co-ordination of Gaétan Lafortune. Chapter 1 on mental health promotion was prepared by Emily Hewlett, Gaétan Lafortune, Eileen Rocard and David Morgan. The preparation of Chapter 2 on strategies to reduce wasteful spending in health systems was led by Agnès Couffinhal, Ruth Lopert and Gaétan Lafortune, with inputs by Elina Suzuki, Michael Padget, Gaëlle Balestat, Eileen Rocard, Marie-Clémence Canaud and Roi Meshulam. Chapter 3 on the health status of populations was prepared by Eileen Rocard and Gaétan Lafortune. Chapter 4 on risk factors to health was prepared by Marion Devaux and Ivan Tzintzun, with inputs by Joao Matias and Katerina Skarupova from the EMCDDA for indicators related to alcohol consumption among children and illegal drug consumption among both children and adults, and with inputs from Marta Buoncristiano and Joao Breda from WHO Europe for the indicator on childhood obesity. Michael Mueller, James Cooper, David Morgan and Jens Wilkens prepared Chapter 5 on health expenditure and financing, with input by Sebastiano Lustig. Chapter 6 on effectiveness (including quality of care and patient experience) was prepared by Rie Fujisawa, with inputs by Eileen Rocard and Gaétan Lafortune for the indicator on avoidable mortality, by Yuka Nishina for the indicators on cancer care and by Michael Padget from the OECD Health Division and Carl Suetens from the ECDC for the indicator related to health care-associated infections. Chapter 7 on accessibility was prepared by Gaétan Lafortune, Gaëlle Balestat, Michael Mueller and Marie-Clémence Canaud, with input by Jon Cylus, Sarah Thomson and Tamas Evetovits from the European Observatory on Health Systems and Policies for the indicator related to the financial burden of out-of-pocket spending for health services and goods. Chapter 8 on the resilience of health systems was prepared by Luke Slawomirski, Gaétan Lafortune, David Morgan and Gaëlle Balestat, with inputs by Marc Struelens and Katrin Leitmeyer from the ECDC for the indicator related to public health laboratory capacity. Editorial assistance was provided by Ruth Lopert, Marie-Clémence Canaud, Lucy Hulett and Kate Cornford (on Chapter 1). This

publication also benefited from useful comments from Francesca Colombo, Chris James and Valérie Paris from the OECD Health Division.

Many useful comments were also received from the European Commission. Special thanks go to DG SANTE's *State of Health in the EU* team for their advice during the project and the co-ordination of inputs from different officials across the Commission.

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Executive summary

Health at a Glance: Europe 2018 presents comparative analyses of the health status of EU citizens and the performance of the health systems of the 28 EU Member States, 5 candidate countries and 3 EFTA countries. It is the first step in the *State of Health in the EU* cycle of knowledge brokering. This publication has two parts. Part I comprises two thematic chapters, the first focusing on the need for concerted efforts to promote better mental health, the second outlining possible strategies for reducing wasteful spending in health. In Part II, the most recent trends in key indicators of health status, risk factors and health spending are presented, together with a discussion of progress in improving the effectiveness, accessibility and resilience of European health systems.

Making the case for greater priority to improving mental health

- Mental health is critical to individual well-being, as well as for social and economic participation. Yet, according to recent estimates, more than one in six people across EU countries had a mental health issue in 2016, equivalent to about 84 million people. Moreover, in 2015 the deaths of more than 84 000 people in EU countries were attributed to mental illness or suicide.

"The total costs of mental ill-health are estimated at more than 4% of GDP – or over EUR 600 billion – across the 28 EU countries"

- The economic and social costs of mental illness are substantial. The total costs of mental ill-health are estimated at more than 4% of GDP – or over EUR 600 billion – across the 28 EU countries. EUR 190 billion (or 1.3% of GDP) reflects direct spending on health care, another EUR 170 billion (1.2% of GDP) is spent on social security programmes, while a further EUR 240 billion (1.6% of GDP) represents indirect costs to the labour market due to lower employment and productivity.
- The heavy individual, economic and social burdens of mental illness are not inevitable. Many European countries have in place policies and programmes to address mental illness at different ages. However, much more can be done to manage and promote mental health.

Reducing wasteful spending to make health systems more effective and resilient

"Evidence from various countries suggests that up to one-fifth of health spending is wasteful and could be reallocated to better use"

- Wasteful spending occurs when patients receive unnecessary tests or treatments or when care could have been provided with fewer and less costly resources. Evidence from various countries suggests that as much as one-fifth of health spending is wasteful and could be reduced or eliminated without undermining quality of care. Reducing wasteful

spending not only contributes to health system resilience, but helps achieve and maintain universal access to effective care.

- When it comes to hospitals, many admissions could be avoided with better management of chronic conditions in the community. Potentially avoidable admissions for conditions such as asthma and diabetes consume over 37 million bed days each year across the EU. Unnecessarily delayed discharges are also costly for hospitals, and many discharge-ready patients occupy beds that could be used for patients with greater needs.
- When it comes to pharmaceuticals, minimising waste and optimising the value derived from medicine spending are also critical to achieving efficient and sustainable health systems. A mix of policy levers can support this goal, including: 1) ensuring value for money in the selection and coverage, procurement and pricing of pharmaceuticals through Health Technology Assessment; 2) exploiting the potential savings from generics and biosimilars; 3) encouraging rational prescribing; and 4) improving patient adherence.

Gains in life expectancy have slowed in many EU countries, and large inequalities persist

- While life expectancy increased by at least 2 to 3 years over the decade from 2001 to 2011 in all EU countries, the gains have slowed down markedly since 2011 in many countries particularly in Western Europe, increasing by less than half a year between 2011 and 2016. This slowdown appears to have been driven by a slowdown in the rate of reduction of deaths from circulatory diseases and periodical increases in mortality rates among elderly people due partly to bad flu seasons in some years.

"People with a low level of education can expect to live six years less than those with a high level of education"

- Large disparities in life expectancy persist not only by gender, but also by socioeconomic status. On average across the EU, 30-year-old men with a low level of education can expect to live about 8 years less than those with a university degree (or the equivalent), while the "education gap" among women is narrower, at about 4 years. These gaps largely reflect differences in exposure to risk factors, but also indicate disparities in access to care.

Putting a greater focus on preventing risk factors

- While smoking rates in both children and adults have declined in most EU countries, about one-fifth of adults still smoke every day, and as many as one in four in countries with less advanced tobacco control policies.
- Alcohol control policies have reduced overall alcohol consumption in several countries, but heavy alcohol consumption among adolescents and adults remains an important public health issue. In EU countries, nearly 40% of adolescents report at least one "binge drinking" event in the preceding month, and more than 40% of young men aged 20-29 also report heavy episodic drinking.

"At least one in six adults are obese across EU countries, with wide disparities by socioeconomic status"

- The prevalence of obesity continues to increase among adults in most EU countries, with at least one in six defined as obese. Inequality in obesity remains marked: 20% of adults with a lower education level are obese compared with 12% of those with a higher education.

Strengthening the effectiveness of health systems can reduce premature mortality

"More than 1.2 million deaths could have been avoided in EU countries in 2015 through better public health policies or more effective and timely health care"

- More than 1.2 million people in EU countries died in 2015 from diseases and injuries that could have been avoided either through stronger public health policies or more effective and timely health care.
- Vaccine-preventable diseases have resurged in some parts of Europe in recent years, pointing to the importance of promoting effective vaccination coverage for all children across all EU countries.
- It is estimated that 790 000 people in EU countries died prematurely in 2016 due to tobacco smoking, harmful consumption of alcohol, unhealthy diets and lack of physical activity.
- The quality of acute care for life-threatening conditions has improved in most countries over the past decade. Fewer people die following a hospital admission for acute myocardial infarction (a 30% reduction on average between 2005 and 2015) or stroke (a reduction of over 20% during this same period). However, wide disparities in the quality of acute care persist not only between countries but also between hospitals within each country.
- Remarkable progress has also been achieved in cancer management through the implementation of population-based screening programmes and the provision of more effective and timely care. Survival rates for various cancers have never been higher, yet there is still considerable room for further improvement in cancer management in many countries.

Ensuring universal access to care is critical to reducing health inequalities

"Unmet health care needs are generally low in EU countries, but low-income households are five times more likely to report unmet needs than high-income households"

- Unmet health care needs are an important measure of accessibility. Recent survey data show that in most EU countries the share of the population reporting unmet care needs is generally low and has declined over the past ten years. Yet, low-income households are still five times more likely to report unmet care needs than high-income households, mainly for financial reasons.
- In addition to being affordable, health services must also be accessible when and where people need them. While the numbers of doctors and nurses in nearly all EU countries have increased over the past decade, shortages of general practitioners are common, particularly in rural and remote areas.
- Long waiting times for elective surgery is an important policy issue in many EU countries as it impedes timely access to care. In many of these countries, waiting times have worsened in recent years as the demand for surgery has increased more rapidly than the supply.

Strengthening the resilience of health systems

- Health systems need to respond more efficiently to changing health care needs driven by demographic changes and exploit more fully the potential of new digital technologies to strengthen prevention and care.

- In 2017, health spending accounted for 9.6% of GDP in the EU as a whole, up from 8.8% in 2008. Population ageing means not only that health care needs will increase in the future, but also that there will be increasing demand for long-term care. Indeed, spending on long-term care is expected to grow faster than spending on health care.

"New digital technologies have the potential to promote more healthy ageing and more people-centred care"

- New digital technologies offer great opportunities to promote healthy ageing and achieve more efficient and people-centred care. The use of Electronic Medical Records and ePrescribing is growing across EU countries, and growing numbers of EU residents use the internet to obtain health information and access health services, although there are disparities by age and socioeconomic groups.
- Population ageing requires profound transformations in health systems, from a focus on acute care in hospitals to more integrated and people-centred care in the community. Many EU countries began this transformation over a decade ago – for example by reducing hospital capacity and average length of stay, and strengthening community care – but the process still requires ongoing, long-term effort.

Monitoring and improving the State of Health in the EU

Health at a Glance: Europe 2018 is the result of ongoing and close collaboration between the OECD and the European Commission to improve country-specific and EU-wide knowledge on health issues as part of the Commission's *State of Health in the EU* cycle.

In 2016, the European Commission launched the *State of Health in the EU* cycle to assist EU Member States in improving the health of their citizens and the performance of their health systems. *Health at a Glance: Europe* is the first product of the two-year cycle, presenting every even-numbered year extensive data and comparative analyses that can be used to identify both the strengths and the opportunities for improvement in health and health systems.

The second step in the cycle is the *Country Health Profiles* for all EU countries. The next edition of these profiles will be published in 2019 jointly with the European Observatory on Health Systems and Policies, and will highlight the particular characteristics and challenges for each country. After a *Companion Report* that the European Commission presents along with the profiles, the final step in the cycle is a series of *Voluntary Exchanges* with Member States. These are opportunities to discuss in more detail some of the challenges and potential policy responses.

Info: *ec.europa.eu/health/state*.

Readers' guide

Health at a Glance: Europe 2018 presents key data and analysis of health and health systems in the 28 EU member states, 5 candidate countries and 3 European Free Trade Association countries.

The publication is divided in two parts. Part I contains two thematic chapters focussing on important, but often neglected, public health and health care issues. The first chapter assesses the health and economic burden of mental health problems across EU countries, making the case for greater efforts to promote better mental health at all ages. The second chapter looks at wasteful spending in health systems, focussing in particular on hospitals and pharmaceuticals, and reviewing possible strategies to reduce waste to promote a better allocation of resources.

Part II includes six chapters providing an overview of key indicators of health and health systems, based to a large extent on the European Core Health Indicators (ECHI) shortlist (*https://ec.europa.eu/health/indicators/echi/list_en*). The structure of the last three chapters is based on the 2014 Commission Communication on effective, accessible and resilient health systems (*https://ec.europa.eu/health/sites/health/files/healthcare/docs/com2014_215_final_en.pdf*). New indicators have been included in this edition to reflect different aspects of the effectiveness, accessibility and resilience of health systems.

The data presented in this publication come mostly from official national statistics, and have been collected in many cases through the administration of joint questionnaires by the OECD, Eurostat and WHO. The data have been validated by the three organisations to ensure that they meet high standards of data quality and comparability. Some data also come from European surveys co-ordinated by Eurostat, notably the European Union Statistics on Income and Living Conditions Survey (EU-SILC) and the second wave of the European Health Interview Survey (EHIS), as well as from the European Centre for Disease Prevention and Control (ECDC), the European Commission's Joint Research Centre (JRC), and other sources.

Presentation of indicators and calculation of EU averages

With the exception of the first two thematic chapters, all indicators in the rest of the publication are presented over two pages. The first page provides a brief commentary highlighting the key findings conveyed by the data, defines the indicator and signals any significant data comparability limitation. On the facing page is a set of figures. These typically show current levels of the indicator and, where possible, trends over time. For those countries that have a relatively small population (less than 1 million), three-year averages are often calculated to minimise random errors due to small numbers.

The average in the figures includes only EU member states and is generally calculated as a *population-weighted average* of all the EU member states presented (up to 28 if there is full data coverage). In some cases, the average is calculated based on the unweighted

average of EU countries, notably when there is missing data for several countries or when the data owners have already calculated and reported unweighted EU averages.

Population figures

The population figures used to calculate rates per capita and the population-weighted EU averages come from the Eurostat demographics database. The data were extracted in early June 2018 and relate to mid-year estimates (calculated as the average between the beginning and end of the year). Population estimates are subject to revision, so they may differ from the latest population figures released by Eurostat or national statistical offices.

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 underneath the charts.

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 contained in *OECD Health Statistics* for all OECD member countries, including 23 EU member states and four additional countries (Iceland, Norway, Switzerland and Turkey). This information is available in OECD.Stat (*http://stats.oecd.org/index.aspx?DataSetCode=HEALTH*). For the nine other countries (Albania, Bulgaria, Croatia, Cyprus, the Former Yugoslav Republic of Macedonia, Malta, Montenegro, Romania and Serbia), readers are invited to consult the Eurostat database for more information on sources and methods: *http://ec.europa.eu/eurostat/data/database*.

Readers interested in an interactive presentation of the European Core Health Indicators (ECHI) can consult DG SANTE's ECHI data tool at *http://ec.europa.eu/health/indicators/indicators/index_en.htm*.

Readers interested in indicators that quantify the burden of cancer in Europe can also visit the JRC's European Cancer Information System (ECIS): *https://ecis.jrc.ec.europa.eu/*.

PART I

Thematic chapters on public health and health care issues

PART I

Chapter 1

Promoting mental health in Europe: Why and how?

Good mental health is a critical part of individual well-being, and the foundation for happy, fulfilled, productive lives. However, this chapter finds that more than one in six people across EU countries had a mental health problem in 2016. Living with mental ill-health means that individuals are less able to succeed at school and work, are more likely to be unemployed, and may suffer worse physical health. For some, mental illnesses lead to premature mortality: over 84 000 people died of mental health problems and suicides across EU countries in 2015.

The economic costs of mental illness are also significant. This chapter estimates total costs related to mental ill-health at more than 4% of GDP – or over EUR 600 billion – across the 28 EU countries in 2015. EUR 190 billion (or 1.3% of GDP) is direct spending on health care, another EUR 170 billion (1.2% of GDP) is spending on social security programmes, while a further EUR 240 billion (1.6% of GDP) is caused by indirect costs in the labour market, driven by lower employment rates and reduced productivity due to mental illness.

The heavy economic, social and individual burden of mental illness is not inevitable, and more must be done to prevent and treat mental disorders, and to foster good mental health. The latter part of this chapter explores some effective ways by which European countries are promoting mental well-being and preventing mental illness, and identifies critical gaps where more action is needed.

Introduction

Good mental health is a critical part of individual well-being, and the foundation for happy, fulfilled, productive lives. Mental ill-health, meanwhile, will affect everyone at some point in their lives – whether experiencing mental illness themselves, or as a family member, friend or colleague of someone living with a mental disorder. Mental ill-health can affect women and men of all ages and backgrounds. Without effective prevention and treatment, mental illnesses can have profound effects on people's ability to carry out their daily lives and often result in poorer physical health. The impact of poor mental health can affect people throughout their lifetime. Children and adolescents with poor mental health have worse educational outcomes and job opportunities. Adults with mental health problems are less productive at work and more likely to be unemployed. Elderly people with mental problems are more likely to be isolated and be less active in their community.

Mental health problems cover a wide range of illnesses, including disorders such as mild or moderate anxiety and depression, drug and alcohol use disorders, and severe disorders such as severe depression, bipolar disorders and schizophrenia. Comorbidity of mental disorders and physical illnesses, and multiple mental health problems, is common. Some mental disorders may affect individuals for only a short time, while others affect individuals their entire life. Mental health problems often result from a complex interplay of many factors, including genetic, social and economic factors, and can be provoked or worsened by behavioural and environmental factors such as alcohol and drug abuse, poverty and debt, trauma, or physical ill-health.

The burden of mental health problems in Europe is very high, both in terms of morbidity and mortality. Tens of millions of people across the EU experience at least one mental health problem at any point in time, and tens of thousands die each year either directly from mental health disorders or from suicide (which in many cases are linked to mental health problems, although other factors can also play a role). The economic burden, too, is significant. This chapter estimates total costs related to mental ill-health at more than 4% of GDP – or over EUR 600 billion – across the 28 EU countries in 2015. EUR 190 billion (or 1.3% of GDP) is direct spending on health care, another EUR 170 billion (1.2% of GDP) is spending on social security programmes, while a further EUR 240 billion (1.6% of GDP) is caused by indirect costs in the labour market, driven by lower employment rates and reduced productivity due to mental illness.

In response to the health and economic impact of mental illness, European countries are taking actions to both prevent and treat mental illness when it occurs. The economic, societal and individual burden of mental illness is not a foregone conclusion – many interventions exist which can lessen the impact of mental ill-health. While the latter part of this chapter focuses mainly on effective interventions to prevent mental illness and promote mental well-being, improving access to early diagnosis, care and treatment for mental health conditions when they arise remains critical.

Carefully chosen and well-implemented actions to promote better mental health and prevent mental ill-health can lead to significant benefits over time, for individuals and their families, for society, and for economies. Cost-effective and sometimes even cost-saving interventions can help strengthen the mental well-being and resilience of mothers and infants, school-age children, workers, and older populations.

Box 1.1. **Defining mental health and mental illness**

The widely used definition established by the WHO emphasises the positive dimension that "mental health is a state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (WHO, 2001). The terms mental health and mental well-being in this chapter draw on this WHO definition of positive mental health.

Mental illness is the loss of mental health due to a mental disorder. Mental disorders are defined as those reaching the clinical threshold of a diagnosis according to psychiatric classification systems including disorders such as depression, anxiety, bipolar disorder and schizophrenia. In this chapter, mental illnesses will generally comprise all those included in Chapter 5 of the International Classification of Diseases (ICD-10) on mental and behavioural disorders with the exception of dementia (which is considered, along with Alzheimer's disease, the main form of dementia, as a neurological disorder). The broad terms "mental ill-health", "mental illness" and "mental health problems" are used interchangeably and refer to mental disorders but also include psychological distress, i.e. symptoms or conditions that do not reach the clinical threshold of a diagnosis within the classification systems but which can account for significant suffering and hardship, and can be enduring and disabling.

Mental illness affects tens of millions of Europeans every year

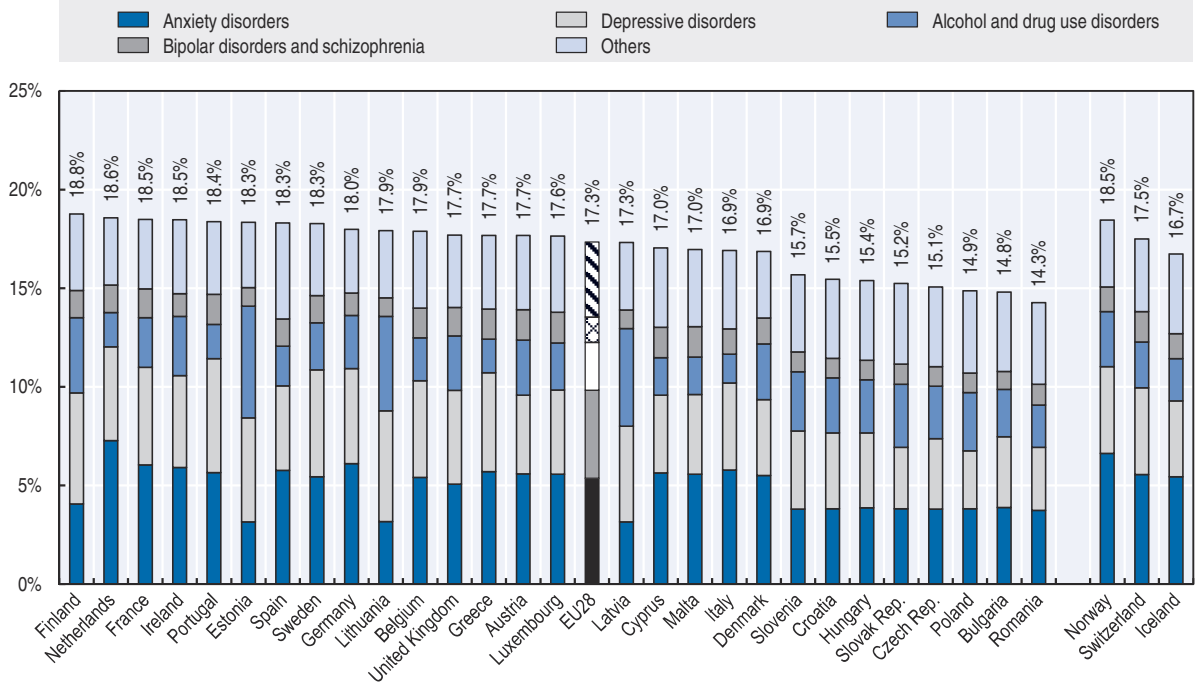
Mental health problems affect about 84 million people across EU countries

Although there are significant gaps in information about the prevalence of mental health problems across EU countries, all available evidence suggests that mental health problems affect tens of millions of Europeans every year. The data currently available from population-based surveys are often limited to a few specific mental health disorders, or specific age groups. However, the Institute for Health Metrics and Evaluation (IHME) provides estimates of the prevalence of a wide range of mental health disorders across all age groups based on a wide variety of data sources and a set of assumptions

According to the latest IHME estimates, more than one in six people across EU countries (17.3%) had a mental health problem in 2016 (Figure 1.1) – that is, nearly 84 million people.[1] The most common mental disorder across EU countries is anxiety disorder, with an estimated 25 million people (or 5.4% of the population) living with anxiety disorders, followed by depressive disorders, which affect over 21 million people (or 4.5% of the population). An estimated 11 million people across EU countries (2.4%) have drug and alcohol use disorders. Severe mental illnesses such as bipolar disorders affect almost 5 million people (1.0% of the population), while schizophrenic disorders affect another estimated 1.5 million people (0.3%).

By country, the estimated prevalence of mental health disorders is highest in Finland, the Netherlands, France and Ireland (with rates of 18.5% or more of the population with at

Figure 1.1. **More than one in six people in EU countries have a mental health problem**



Source: IHME, 2018 (these estimates refer to 2016).

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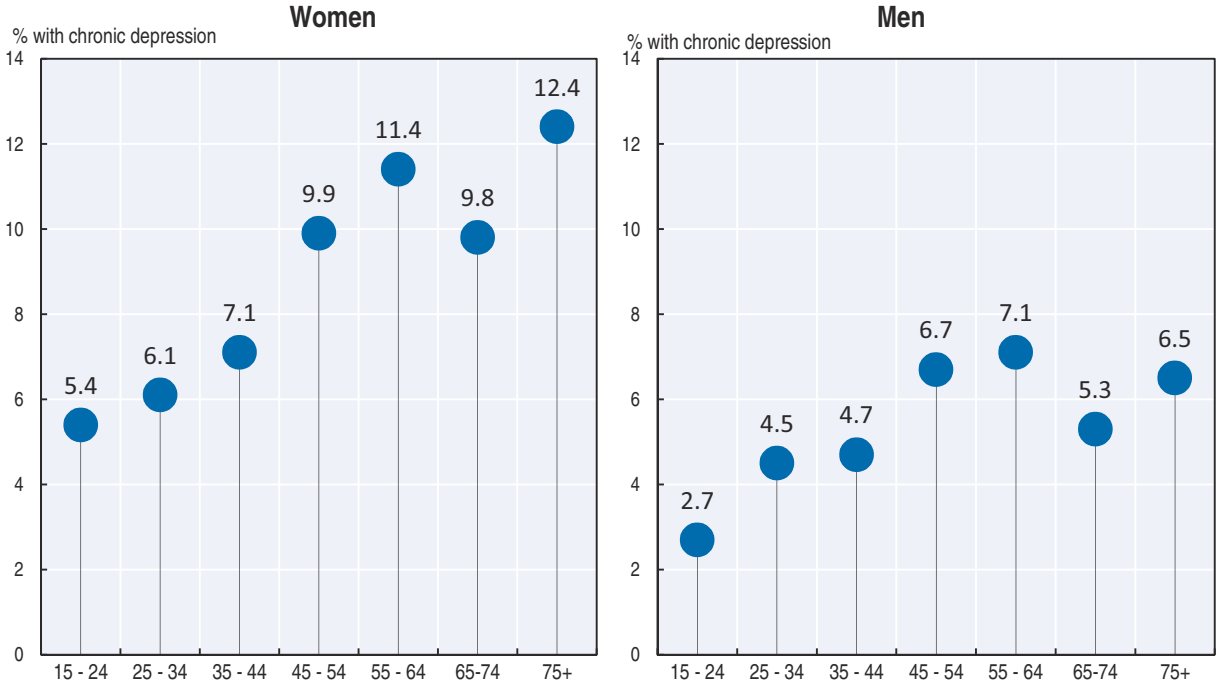
least one disorder), and lowest in Romania, Bulgaria and Poland (with rates of less than 15% of the population). Some of these cross-country differences may be due to the fact that people living in countries with greater awareness and less stigma associated with mental illness, as well as easier access to mental health services, may be diagnosed more easily or may be more likely to self-report mental ill-health. In many countries, there is still strong stigma associated with various mental health problems, and in some countries this stigma sits alongside a still-widespread belief that it is better to simply avoid talking about mental illness (Munizza et al., 2013).

Several mental illnesses are more common amongst women, including anxiety disorders, depressive disorders and bipolar disorders. Some of these gender gaps may be due to a greater propensity of women to report these problems. However, one exception is drug and alcohol use disorders, which are more than two times more likely to occur in men than women on average across EU countries (IHME, 2018).

Data from the 2014 European Health Interview Survey confirm a substantial gender gap in self-reported chronic depression, with more than one in twelve women (8.8%) indicating they experience chronic depression, compared with one in nineteen men (5.3%). The prevalence of chronic depression increases steadily with age among both women and men, and is particularly high in middle age (Figure 1.2). At age 55-64, more than 11.4% of women and 7.1% of men reported being chronically depressed across the EU as a whole in 2014. These rates decrease between the age 65 and 74, and then increase again in older ages. This increase in older ages may be partly explained by the fact that depression is often associated with poor physical health, frailty, perceived financial strain and lower social support (Grundy, van den Broek and Keenan, 2017).

Figure 1.2. **Chronic depression is more often reported by women and increases with age in EU countries**



Source: Eurostat Database (based on EHIS 2014).

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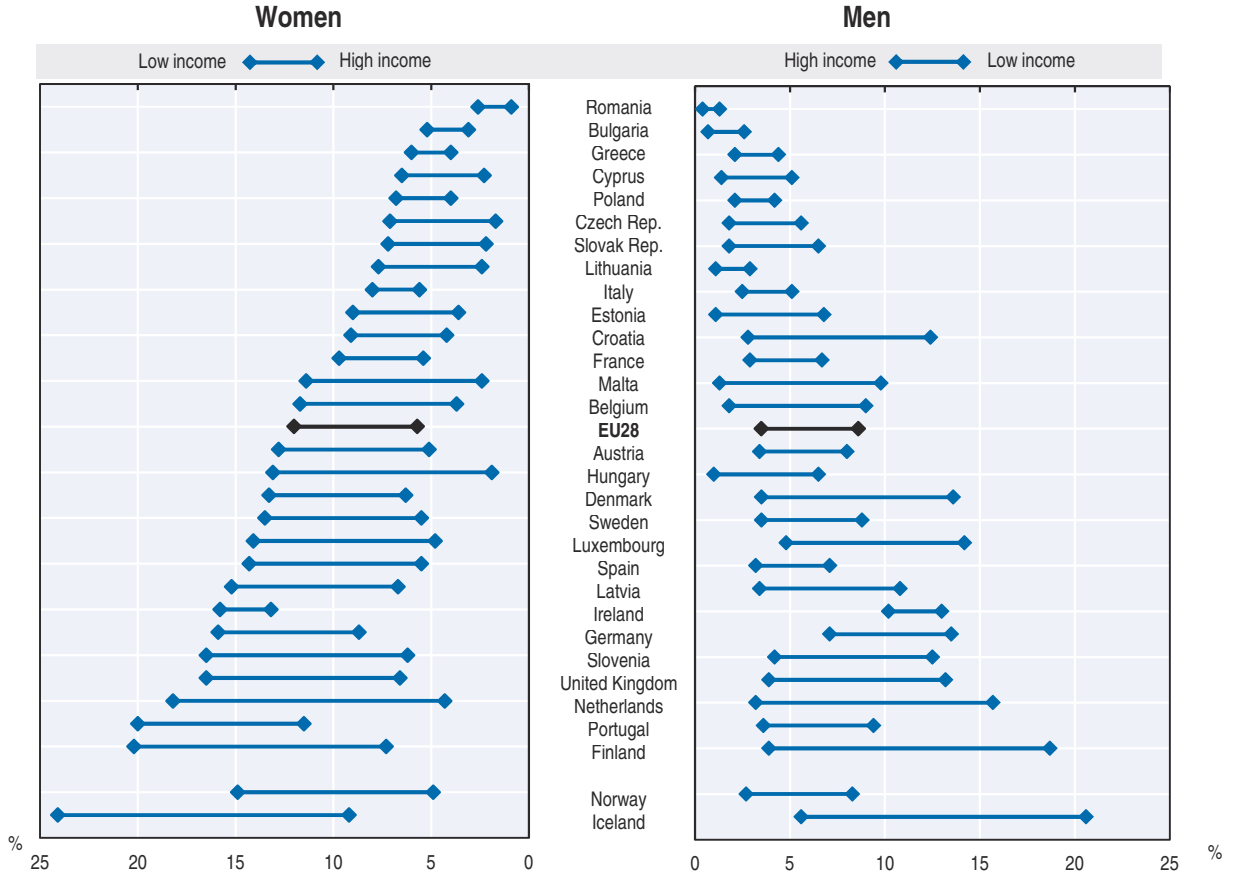
By level of education, people with at most lower secondary educational attainment are almost two-times more likely to report chronic depression compared to those with higher educational level. This is also the case for people in low-income groups. On average across EU countries, women and men living in the lowest income group are more than two times more likely to report chronic depression than those in the highest income group (Figure 1.3).

People who are employed generally report lower levels of depression than those who are not, and people with a mental disorder are more likely to be unemployed (OECD, 2015). People with depression or other mental health problems often see improvement in their condition after finding work, as their labour-force status increases their self-esteem and sense of worth in society, and losing a job generally contributes to worsened mental health (OECD, 2018).

A considerable number of children experience mental health problems which, unless they receive appropriate care and support, may have a lasting effect throughout their lives. Evidence suggests that many mental disorders begin at adolescence or even younger; most studies find that roughly half of all lifetime mental disorders start by the mid-teens (Kessler et al., 2007).

A 2010 study found that in five of the six EU countries covered (Bulgaria, Germany, Lithuania, the Netherlands and Romania), 10% to 15% of children aged 6-11 years old experience at least one mental health or behavioural disorder (i.e. conduct disorder, emotional disorder, hyperactivity or inattention disorder). Italy is the only country where prevalence was less than 10%, but about 8% of children still had a mental or behaviour disorder (Kovess-Masfety et al., 2016).

Figure 1.3. **Women and men in the lowest income group are more than two times more likely to report chronic depression than those in the highest income group across the EU**



Note: High income refers to people in the top income quintile (20% of the population with the highest income), whereas low income refers to people in the bottom income quintile (20% of the population with the lowest income). Countries are listed in order of rate of reported chronic depression by women (from lowest to highest). Data for Switzerland is not available.
Source: Eurostat Database (based on EHIS 2014).

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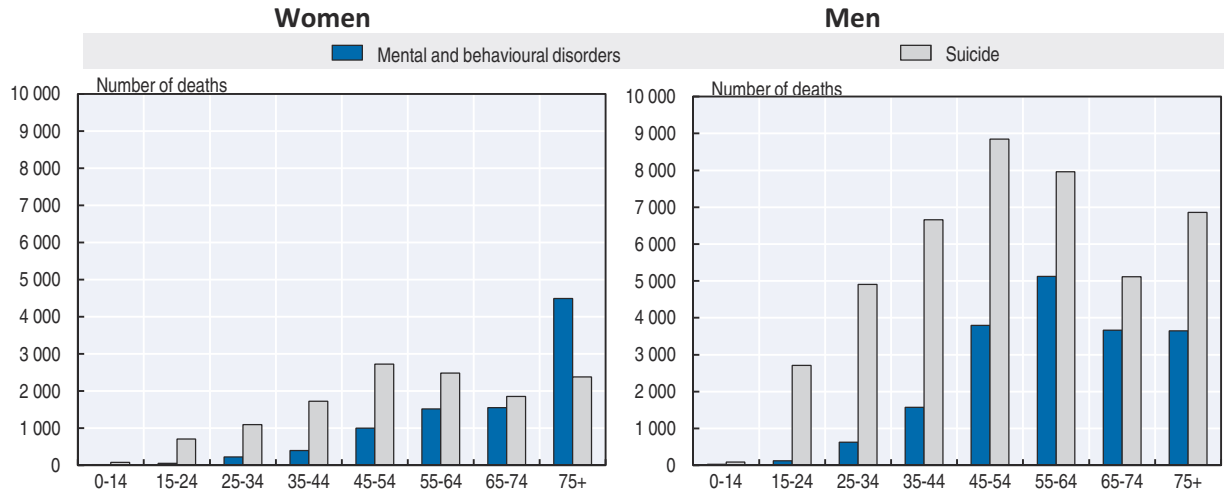
Mortality related to mental health problems and suicides is substantial

Over 84 000 people died of mental health problems and suicides across EU countries in 2015, and this is an under-estimation as many people with mental health problems also die prematurely because of higher rates of physical health problems and chronic diseases that are not properly treated. "Excess mortality" for mental disorders – the gap between the mortality rate of the general population and the mortality rate for people with a mental disorder – is huge. For example, excess mortality amongst women who have been diagnosed with schizophrenia is above 6 in Finland, Norway and Sweden (OECD, 2018). Persons with severe mental illness die 10-20 years earlier than the general population (Liu et al., 2017; OECD, 2014; Coldefy and Gandré, 2018).

Of the 84 000 deaths directly related to mental health problems and suicides, most of these deaths were among men, mainly because of higher suicide rates among men (Figure 1.4). Some 43 000 men in EU countries died from suicide in 2015, compared with 13 000 women. However, the gender gap in suicide attempts is much smaller or even reversed in some countries, because women often use less fatal methods. For example, in France, while the completed suicide rate is more than three times greater among men than

Figure 1.4. **The number of deaths from mental health problems and suicides generally increases with age**



Note: Mental and behavioural disorders cover all the diseases in the related ICD-10 chapter with the exception of dementia.
Source: Eurostat Database (the data refer to 2015).

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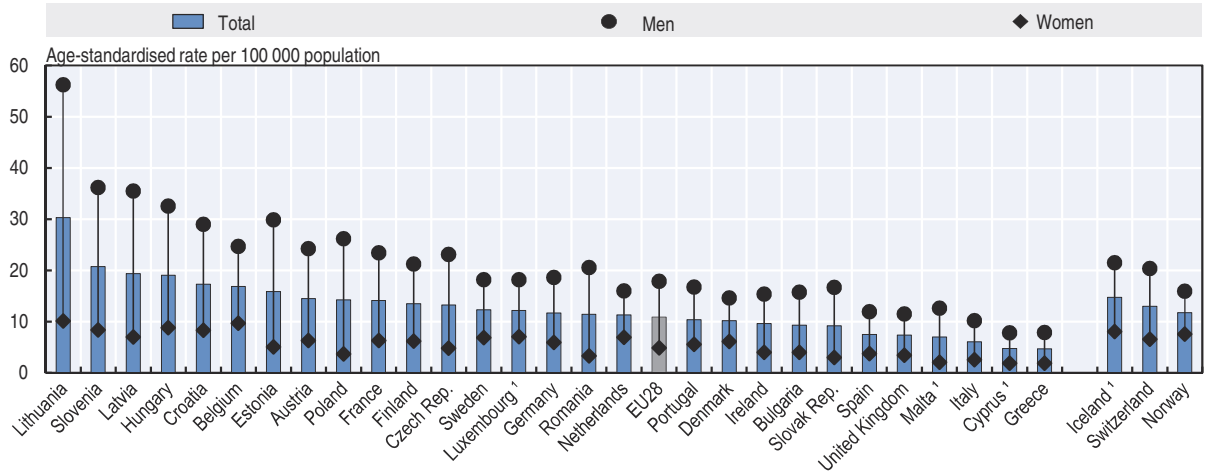
women, hospital discharge rate for suicide attempts was 52% greater among women in 2015 (Observatoire national du suicide, 2018). Many different factors may explain why some people are led to attempt or complete suicide, including major life events (such as the death of a loved one, a divorce or employment loss), social isolation, or socioeconomic or cultural context. However, a high proportion of people who have survived a suicide attempt or died from suicide have experienced a mental health disorder (Hoven, Mandell and Bertolote, 2010; Cavanagh et al., 2003; WHO, 2014). A cross-national analysis based on the WHO World Mental Health Surveys found that a wide range of mental disorders increased the odds of experiencing suicidal thoughts, and a smaller number of disorders increased the odds of acting on such thoughts (Nock et al., 2009).

The number of suicides increases steadily with age among both men and women, reaching a peak among 45-64 years-olds (Figure 1.4). Between ages 65 and 74 the number of suicides decreases at least slightly.

By country, the suicide rate among the population of all ages is highest, by far, in Lithuania, with (age-standardised) rates of 30 deaths per 100 000 population in 2015. Slovenia, Latvia and Hungary also have high rates at around 20 deaths per 100 000 population, which is almost two times greater than the EU average (11 per 100 000 population). The lowest rates are reported in Southern European countries (Greece, Cyprus, Italy, Malta and Spain) (Figure 1.5). Some caution is required in interpreting suicide rates as these may reflect, at least in part, differences in recording practices. On average across all countries, the suicide rate among men was 3.7 times greater than among women. This gender gap was largest in the four countries with the highest rate, but also in Estonia, Poland and Romania.

Despite the relatively low absolute number of suicides among younger age groups, suicide is nonetheless one of the leading causes of death among adolescents and young adults. Some 3 400 young people age 15-24 died from suicide in EU countries in 2015, making this the main cause of death in this age group after road traffic injuries. Young people are more likely to attempt suicide if they have a family history of alcohol and drug

Figure 1.5. **Men are more likely to die from suicide in all EU countries**



1. Three-year average (2013-15).
Source: Eurostat Database.

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abuse disorders, have access to firearms, and experience difficult life events at school or at home (McLoughlin, Gould and Malone, 2015). However, it is heartening to note that suicide rates among teenagers have decreased by 20% on average across EU countries between 2000 and 2015. There has been a notable decrease in Finland, reflecting the success of suicide prevention campaigns targeting this age group (see Box 1.5).

The costs of mental health problems exceed 4% of GDP

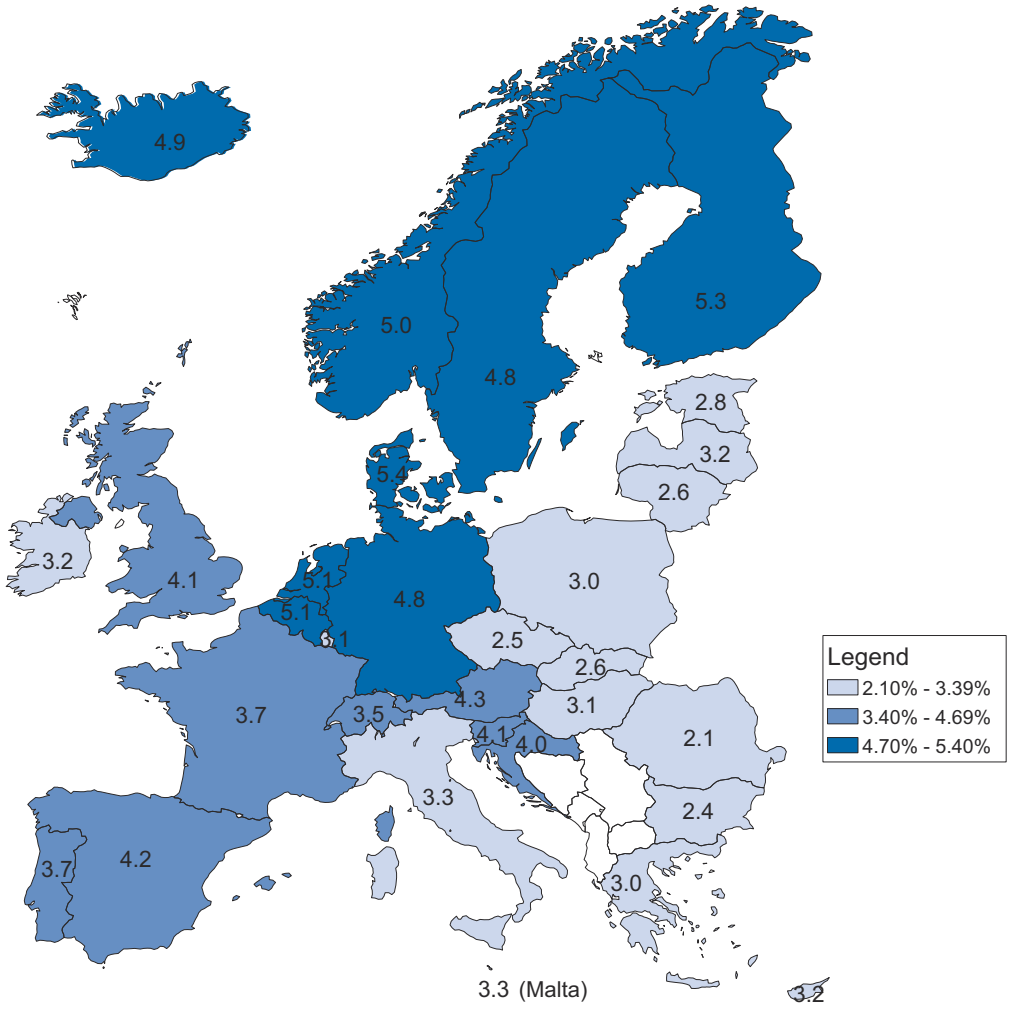
The total costs of mental health problems on EU economies are huge, highlighting the need for greater efforts to prevent mental ill-health and to provide timely and effective treatments when it occurs. Besides the costs on health care systems, mental health problems also result in substantial costs in terms of social security benefits as well as negative labour market impacts in terms of reduced employment and productivity. This section provides estimates of the direct and indirect costs related to mental illnesses across EU countries, using different data sources and based on a set of explicit assumptions where necessary (see Box 1.2).

In 2015, the overall costs related to mental ill-health are estimated to have exceeded 4% of GDP across the 28 EU countries. This equates to more than EUR 600 billion. This total breaks down approximately into the equivalent of 1.3% of GDP (or EUR 190 billion) in direct spending on health systems, 1.2% of GDP (or EUR 170 billion) on social security programmes, and a further 1.6% of GDP (or EUR 240 billion) in indirect costs related to labour market impacts (lower employment and lower productivity). Despite these costs being considerable, they are still a significant under-estimate, as several additional costs have not been taken into account. These include, in particular, social spending related to mental health problems, such as higher social assistance benefits and higher work-injury benefits, and the higher cost of treating a physical illness if the patient also has a mental illness. In addition, some of the indirect impacts of mental health problems on labour market participation such as reduced employment rates or working hours for informal caregivers taking care of people with mental health problems or the impact on co-workers, have not been taken into account.

By country, the estimated costs related to mental health problems range from 2% to 2.5% of GDP in Romania, Bulgaria and the Czech Republic, to over 5% of GDP in Denmark, Finland, the Netherlands and Belgium (Figure 1.6). These variations are mainly driven by the share of people reporting mental health problems (which may be under-estimated in countries where there is a strong stigma associated with mental health problems) as well as differences in the social security benefits provided to people with mental health problems (in terms of paid sick leave benefits, disability benefits and unemployment insurance benefits), and different levels of spending on mental health care services.

Figure 1.6. **Estimated direct and indirect costs related to mental health problems across EU countries**

As a % of GDP, 2015



Source: OECD estimates (see Box 1.2 and Table 1.1 for further information).

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Table 1.1. **Estimates of total costs (direct and indirect) of mental health problems in EU countries, in million EUR and as a share of GDP, 2015**

	Total costs		Direct costs				Indirect costs	
			On health systems		On social benefits		On the labour market	
	in million EUR	% of GDP	in million EUR	% of GDP	in million EUR	% of GDP	in million EUR	% of GDP
EU28	**607 074**	**4.10**	**194 139**	**1.31**	**169 939**	**1.15**	**242 995**	**1.64**
Austria	14 930	4.33	4 686	1.36	3 902	1.13	6 342	1.84
Belgium	20 740	5.05	5 447	1.33	5 845	1.42	9 448	2.30
Bulgaria	1 067	2.36	448	0.99	299	0.66	320	0.71
Croatia	1 785	4.01	525	1.18	537	1.21	724	1.63
Cyprus	569	3.21	203	1.14	144	0.81	223	1.25
Czech Republic	4 132	2.45	1 727	1.02	1 046	0.62	1 360	0.81
Denmark	14 627	5.38	3 431	1.26	5 563	2.05	5 633	2.07
Estonia	572	2.81	210	1.03	167	0.82	196	0.96
Finland	11 140	5.32	2 576	1.23	3 884	1.85	4 681	2.23
France	81 345	3.71	29 337	1.34	26 437	1.20	25 570	1.17
Germany	146 536	4.81	43 421	1.43	40 939	1.35	62 177	2.04
Greece	5 311	3.01	2 241	1.27	1 440	0.82	1 630	0.92
Hungary	3 454	3.12	1 417	1.28	703	0.64	1 333	1.20
Ireland	8 299	3.17	2 232	0.85	1 891	0.72	4 176	1.59
Italy	54 487	3.30	20 221	1.22	15 787	0.96	18 478	1.12
Latvia	789	3.24	270	1.11	169	0.70	350	1.44
Lithuania	990	2.64	372	0.99	266	0.71	352	0.94
Luxembourg	1 634	3.14	413	0.79	701	1.35	520	1.00
Malta	314	3.29	132	1.38	40	0.42	142	1.50
Netherlands	34 969	5.12	8 534	1.25	11 069	1.62	15 367	2.25
Poland	12 952	3.01	5 113	1.19	3 235	0.75	4 604	1.07
Portugal	6 580	3.66	2 048	1.14	1 652	0.92	2 880	1.60
Romania	3 400	2.12	1 510	0.94	737	0.46	1 153	0.72
Slovak Republic	2 061	2.61	655	0.83	599	0.76	807	1.02
Slovenia	1 602	4.13	507	1.31	308	0.79	786	2.02
Spain	45 058	4.17	14 415	1.33	12 318	1.14	18 325	1.70
Sweden	21 677	4.83	5 696	1.27	7 558	1.68	8 423	1.88
United Kingdom	106 024	4.07	36 353	1.40	22 704	0.87	46 967	1.80
Iceland	753	4.93	201	1.31	265	1.73	288	1.88
Norway	17 299	4.97	4 965	1.43	6 384	1.83	5 950	1.71
Switzerland	21 679	3.54	5 769	0.94	7 023	1.15	8 888	1.45

Source: OECD estimates based on Eurostat Database and other data sources (see Box 1.2 on sources and methodology on direct and indirect costs).

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Box 1.2. **Methodology and data sources used to estimate the costs of mental health problems**

Table 1.2 below summarises the different categories of direct and indirect costs that have been considered in the analysis in this chapter, along with the main data sources used. The direct costs include both those borne by health care systems to provide treatments to mental health problems and additional social security spending, including paid sick leave benefits, disability benefits and unemployment insurance benefits. The indirect costs relate to the labour market impact of mental health problems, and include both lower employment rates for people with mental health problems and lower productivity due to higher absenteeism and lower productivity when at work ("presenteeism").

Box 1.2. **Methodology and data sources used to estimate the costs of mental health problems** *(cont.)*

Table 1.2. **Summary of direct and indirect costs related to mental health problems and main data sources**

Broad categories	Specific cost categories	Sources
Impact on health spending	Higher direct health care costs (physician visits, pharmaceutical costs and hospitalisations, etc.)	Cost of disorders of the brain in Europe 2010 Eurostat Health Expenditures by Diseases and Conditions 2016
Impact on social spending	Higher paid sick leave benefits	Eurostat Database and national administrative data (for some countries)
	Higher disability benefits	Eurostat Database and national administrative data (for some countries)
	Higher unemployment insurance benefits	Eurostat Database and national survey data for some countries
Impact on labour market (employment and productivity)	Lost income due to mortality from mental illnesses among working-age population	Eurostat Database (Causes of mortality)
	Lost income due to lower employment rate among working-age population with mental health problems	Eurostat Database (European Health Interview Survey 2014)
	Lost income due to greater absenteeism (fewer hours worked and more sick leaves) among people with mental health problems	European Working Conditions Survey (2015) and Eurostat Database
	Lost income due to lower productivity for people with mental health problems at work (presenteeism)	European Working Conditions Survey (2015) and Eurostat Database

Estimates of direct health care costs are based on a selection of mental health conditions contained in a previous study on the cost of disorders of the brain in Europe (Gustavsson et al., 2011). The original cost estimates have been extrapolated to 2015 using recent health spending data and updated macroeconomic data. Overall estimates have also been corroborated with country-specific health expenditure by disease studies such as the Eurostat Health Expenditures by Diseases and Conditions study in 2016. The assumption has been made that the share of mental health spending remained constant between 2010 and 2015.

The main data sources for the estimates on social security benefits are the Eurostat Database, the European Working Conditions Survey, and national data sources. The following assumptions have been made to fill data gaps on the share of social security spending related to mental health problems for countries that did not have the required data readily available: 1) 20% of paid sick leave benefits are related to mental health problems, based on the available evidence from Sweden (OECD, 2012); 2) 37% of disability benefits are related to mental health problems, based on the available evidence from six countries (Austria, Belgium, Denmark, Netherlands, Sweden, United Kingdom) (OECD, 2015) and 3) 15% of unemployment insurance benefits are related to mental health problems, based on the evidence from the same group of six countries that about 30% of people on average who are receiving unemployment insurance benefits also report some mental health problems, but assuming that mental health problems are the leading cause for unemployment for half of these people only.

The labour market impact of mental health problems draws also on the Eurostat Database and the European Working Conditions Survey. The approach used to measure the negative employment effect of mental health problems is to assume that people with mental health problems would have had the same employment rate as the rest of the population, and earn the same salary, using the median wage in the economy. The productivity effect is measured by looking at both absenteeism and "presenteeism". The latter is based on a study that has found that both blue-collar and white-collar workers experiencing mental ill-health are about 6% less productive than those without such problems (Hilton et al., 2008). The assumption is made that this lower productivity at work is reflected in lower wages.

The costs throughout the analysis are expressed in euros without any adjustment for variations in the cost of living (no adjustment for purchasing power parity).

Direct costs of mental health problems on health systems and social security benefits

A sizeable share of health spending goes towards mental health problems

Spending on the provision of mental health services is estimated to have accounted for about 13% of health spending across EU countries in 2015. This is less than spending on circulatory diseases – the number one cause of mortality in the EU – but similar to spending on cancer care in many countries.

This equals 1.3% of GDP or around EUR 194 billion of direct health care spending on a broad range of mental health conditions across the EU. This covers spending on the health services and goods related to the prevention, diagnosis and treatment of mental health disorders (including physician visits, hospitalisations and pharmaceuticals).

This spending reaches an estimated 1.4% of GDP in Germany and the United Kingdom. At the lower end, in addition to Luxembourg at 0.8% and Ireland at 0.9%, Lithuania, Bulgaria, Romania and the Slovak Republic are all estimated to have spent less than 1% of GDP on direct health care services for mental health.

Mental health problems result in much higher sickness benefits, disability benefits and unemployment insurance benefits

The direct costs of mental ill-health extend well beyond the health system; mental illness leads to substantial additional spending in many social security programmes, including paid sick leave benefits, disability benefits and unemployment insurance benefits.

Expenditure on disability benefits accounts for the bulk of mental health-related social spending. It is estimated that mental health problems accounted for EUR 112 billion in disability benefits across the EU as a whole in 2015 (or 0.76% of GDP). Paid sick leave benefits related to mental health problems accounted for another EUR 28 billion (or 0.19% of GDP) in 2015, whereas unemployment insurance benefits were estimated to add another EUR 29 billion (or 0.20% of GDP).

As already noted, these estimated costs of mental health problems on social spending are an under-estimation as they do not include the cost of other social programmes, such as social assistance benefits or lone-parent benefits.

Indirect costs of mental health problems on employment and productivity

Beyond the direct costs to health systems and social security benefits, mental ill-health also contributes to substantial indirect costs, primarily related to reduced labour market participation and productivity. These indirect costs include not only lower employment rates for people with mental health problems, but also reduced productivity due to higher absenteeism and lower productivity at work (often referred as “presenteeism”). These costs add up to over EUR 240 billion or 1.6% of GDP across EU countries in 2015.

Lost income and employment due to mortality from mental health problems and suicide is estimated at EUR 22 billion per year across EU countries

Over 50 000 premature deaths among the working-age population (people aged 25-64) were due to mental health problems and suicide across EU countries in 2015. Assuming that all those people who died prematurely would have been employed until age 65 at the same employment rate as the rest of the population, the associated potential loss for the economy is estimated to be about 640 300 potentially productive life years across EU countries. Assuming that these people would have earned the median income in each

country, this amounts to EUR 22 billion in potential income loss each year, or 0.15% of GDP across the EU as a whole.

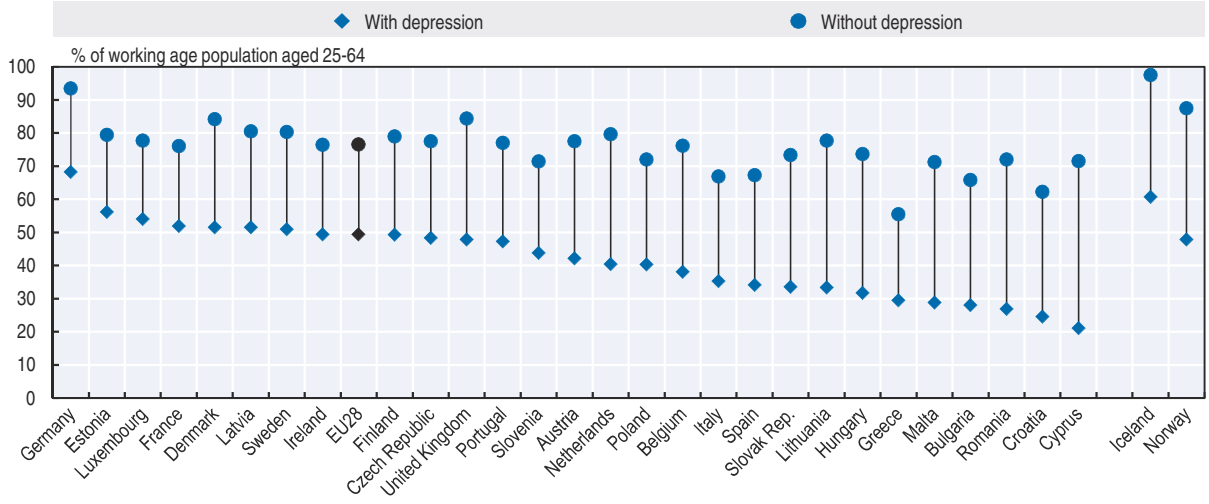
This loss in income as a share of GDP was particularly large in Slovenia, Belgium, Latvia and Lithuania, mainly because of higher suicide rates.

Lost income due to lower employment rate of people with depression is estimated at EUR 176 billion per year across EU countries

Living with mental health problems has an impact on people's daily lives, including their ability to work. Mental health problems often impede an individual's ability to participate in the labour market which can lead to a "vicious" circle whereby the longer people are out of work, the more damaging the consequences are for their mental health (OECD, 2014).

The analysis here only focuses on the labour market impact of depression, as it is the only mental health problem considered in the last wave of the European Health Interview Survey in 2014. Figure 1.7 shows that people reporting chronic depression have much lower employment rates than the rest of the population. Only about half of the population aged 25-64 reporting chronic depression were in employment, compared with over three-quarter (77%) among those who do not report chronic depression on average across EU countries. This employment gap is particularly large in Cyprus, Croatia, Malta, Romania and Bulgaria, although this may partly be due to small sample sizes in EHIS. The cost of this lower employment rate related to chronic depression is estimated at about EUR 176 billion in 2015, representing an amount equivalent to 1.2% of GDP across EU countries as a whole.

Figure 1.7. **People reporting chronic depression are much less likely to work in all EU countries**



Note: Weighted EU28 average. People with depression are identified through the question "During the past 12 months, have you had any of the following diseases?" with depression being one of these diseases. Due to missing data, the assumption has been made that the situation in Ireland is the same as the EU average.
Source: Eurostat Database, based on the European Health Interview Survey (2014).

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Higher absenteeism and lower productivity at work amongst people with mental health problems is estimated to cost about EUR 42 billion in EU countries

Even when people with mental health problems are working, the cost of mental health problems for employees and employers in terms of greater absenteeism and lower

productivity at work is high. Reduced working hours and more days of absence from work are estimated to cost about EUR 19 billion or an amount equivalent to 0.13% of GDP across EU countries in 2015.

Even when at work, people with mental health problems do not always function to their full or usual abilities and may be less productive – what is often referred as "presenteeism". Based on the finding that workers experiencing mental ill-health are about 6% less productive than those without such problems (Hilton et al., 2008), and assuming that lower productivity is reflected in lower wages, the cost of this loss of productivity is estimated at almost EUR 23 billion in 2015.

The high direct and indirect costs of mental illness should not be seen as a foregone conclusion. Greater and more effective investment in mental health promotion and treatment could help substantially reduce many of these costs and help more people realise their full potential.

Actions to promote mental health and prevent mental illness in Europe

The substantial costs of mental health problems make a clear case for increasing efforts to promote good mental health and prevent mental illness, as well as to identify the signs and symptoms of mental illness early, and improve the management and treatment of mental health problems when they occur. More and more European countries are ensuring they have comprehensive policies in place. Several countries (e.g. Belgium, the Czech Republic, Finland, France, Hungary, Ireland, Italy, the Netherlands, Slovenia, Spain, Portugal and the United Kingdom) have a specific plan or policy document addressing mental health promotion and prevention.

Mental health promotion or prevention policies are designed to promote mental health in schools and workplaces, to prevent suicide, to improve the mental well-being of older people, or detect mental distress early on. As awareness of mental illness improves, and stigma around mental illness falls, more people may also seek help when they experience mental illness.

Several international strategies have also supported a greater focus on addressing mental health issues. The 2015 Recommendation of the *OECD Council on Integrated Mental Health, Skills and Work Policy* (2015) (see Box 1.3) aims to foster mental well-being and improve awareness of mental health conditions by encouraging activities that promote good mental health as well as help-seeking behaviour when mental illness occurs. The European Framework for Action on Mental Health and Wellbeing (European Commission, 2016), too, focused on the effective implementation of policies and interventions contributing to promotion of mental health and the prevention and treatment of mental disorders, including through integration of mental health in all policies and multi-sectoral cooperation. The importance of including mental health promotion is echoed in the activities of the EU-Compass for Action on Mental Health and Wellbeing (see Box 1.4). The WHO Comprehensive Mental Health Action Plan 2013-2020 (WHO, 2013) emphasises integrated and coordinated prevention, promotion, care and support including via the implementation of a multi-sectoral strategy that combines universal and targeted interventions for promoting mental health and preventing mental disorders.

There are more than 100 prevention and promotion actions in place across the 28 European countries and 3 EFTA countries (with counting capped at one per life course category in each country). Actions were identified across different points across the life

Box 1.3. **OECD Recommendation of the Council on Integrated Mental Health, Skills and Work Policy**

Recognising that mental ill-health demands interventions that are cross-sectoral in scope and complementary in nature, in 2015 the OECD Council published the OECD Recommendation of the Council on Integrated Mental Health, Skills and Work Policy (OECD, 2015). This recommendation is a sign that governments in OECD countries understand that good policies can make a significant difference when it comes to preventing mental illness at all ages, including in youth and adolescence, in supporting those experiencing mental illness to stay in the workplace and supporting those who have left employment to return to the labour market.

The OECD Recommendation gives a series of guidelines to address the impact of mental ill-health on employment, education, health and social outcomes. These guidelines, which all OECD signatories are expected to follow, encourage countries to seek to "promote mental well-being, prevent mental health conditions, and provide appropriate and timely services which recognise the benefits of meaningful work for people living with mental health conditions".

Box 1.4. **The EU-Compass for Action on Mental Health and Wellbeing**

The EU-Compass for Action on Mental Health and Wellbeing drove the collection, exchange and analysis of information on policy and stakeholder activities in mental health in European countries between 2015 and 2018. The Compass was a means of communicating information on the European Framework for Action on Mental Health and Wellbeing, as well as monitoring the mental health and well-being policies and activities of EU countries and non-governmental stakeholders. Main activities under the Compass included the identification and dissemination of good practices in mental health, collection of information on activities in mental health, and holding mental health workshops in each EU country and in Iceland and Norway.

The EU Compass generated a series of published good practice, annual reports, and consensus paper, especially around seven priority areas:

- Preventing depression and promoting resilience (priority for 2016)
- Better access to mental health services (priority for 2016)
- Mental health at work (priority for 2017)
- Mental health in schools (priority for 2017)
- Preventing suicide (priority for 2017)
- Providing community-based mental health services (priority for 2018)
- Developing integrated governance approaches (priority for 2018)

Alongside governments, the Compass also engaged with businesses, educational institutions and civil society organisations on their role in implementing positive mental health initiatives. Engaged stakeholders, and policies collected from these stakeholders, are also available on the EU Compass web platform.

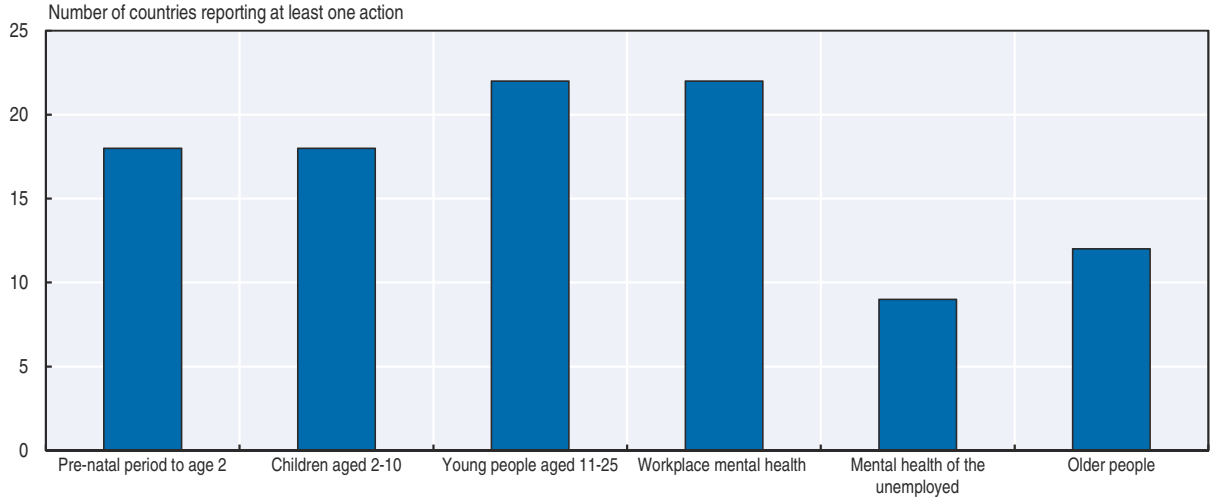
course including: prenatal, perinatal and infancy; children aged 2-10 years and their parents; children and young people aged 11-25 years; workplace mental health; unemployed populations; and older people. Actions were identified from an OECD survey

of mental health promotion and prevention programmes, the WHO Mental Health Atlas 2017, and actions reported to the EU Compass 2016-2018, and supplemented with a literature review.

Figure 1.8 identifies countries reporting at least one action in a particular life course area. At least one prevention or promotion action was found in every European country. Targeted prevention or promotion programmes were found in all but four countries (Bulgaria, the Czech Republic, Malta and Romania). Generalised prevention and promotion programmes were also reported, for instance the Czech Republic was unable to divide programmes into target groups as programs supported by the Ministry of Health of the Czech Republic are mostly designed for all persons with mental illness.

Figure 1.8. **Countries reporting at least one promotion or prevention action for mental health in areas across the life course**

Number of countries reporting at least one promotion or prevention action, out of the 31 EU and EFTA countries



Source: McDaid, Hewlett and Park (2017); EU Compass for Action on Mental Health and Wellbeing (2017); WHO (2018); EU Compass for Action on Mental Health and Wellbeing, 2018 (2018).

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It is clear from Figure 1.8 that the distribution of actions to promote mental well-being and prevent mental ill-health is uneven throughout the life course. 22 of 31 countries had actions in place targeting young people aged 11-25 and the actions targeting the workplace, while 18 countries had actions targeting the prenatal to 2 years period, with the same number for children aged 2-10 years. However, actions to target the mental health of unemployed persons were reported or identified in the literature for only 9 countries, and actions targeting the mental health of older populations were reported or found in only 12 countries.

Preventing deaths by suicide

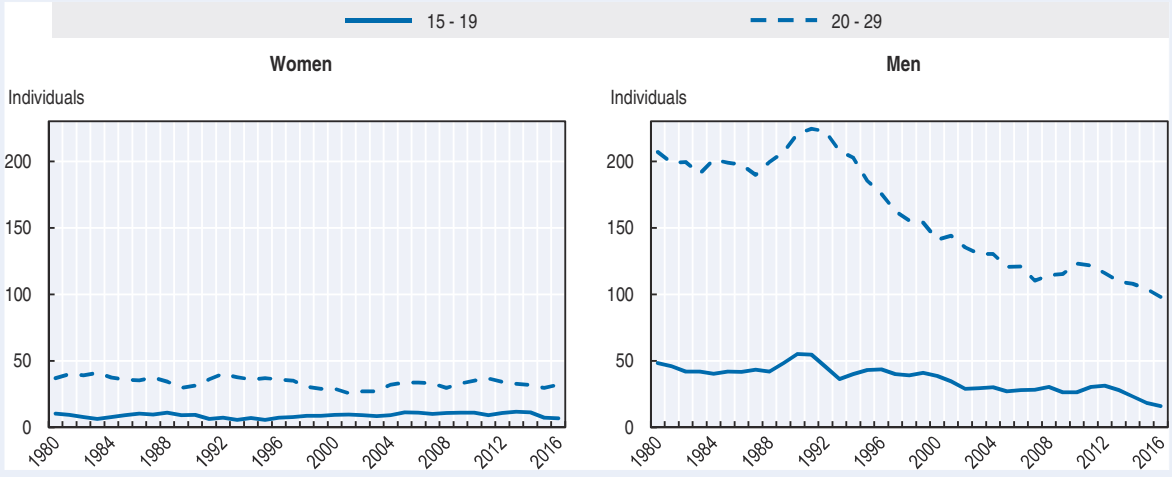
Though suicide remains a major cause of death, and still contributes significantly to mortality from mental illness (as discussed earlier in the chapter), longstanding national commitments to reducing suicide in European countries have helped to reduce the rate of suicide in most countries. On average, the number of deaths by suicide per 100 000 population fell from 12.5 in 2005 to 10.9 in 2015 (Eurostat, 2017). In some countries the falls were even more significant, albeit often from a higher starting rate. Between 2005 and 2015, deaths by suicide fell by more than 20% in almost half of all EU28 countries.

A range of measures are recognised as effective in reducing suicide, including restricting access to lethal means, raising awareness of suicide and suicide risk, improving access to mental health treatment, signposting to sources of help and protective measures in suicide "hotspots", and tailored efforts to reduce suicide following hospitalisation, for example psychosocial assessment and good follow-up care (Hawton et al., 2016; Zalsman et al., 2016). Such approaches have helped some countries achieve significant falls in suicide rates (for instance Finland, see Box 1.5), even as all countries still continue to seek to prevent suicide more effectively.

Box 1.5. **A renewed strategy to prevent suicide in Finland**

In Finland, the rate of suicide has fallen by over 50% over the past 30 years. A significant driver of the reduction in suicide has been the fall amongst young men aged 20-29 (Figure 1.9). Nonetheless, death by suicide amongst young Finnish males remains high in comparison with other Nordic countries (Denmark, Norway, Sweden). Mental illness and alcohol dependence or abuse are significant causal factors (Titelman et al., 2013; Wahlbeck et al., 2011), but socioeconomic conditions have also had an impact.

Figure 1.9. **Suicide amongst young Finns (15-29), 1980-2016**



Source: Statistics Finland.

StatLink http://dx.doi.org/10.1787/888933834091

Suicide prevention campaigns in Finland began in the 1980s, and led to a series of national suicide prevention programmes that ran during the 1990s. Finland's strategy identified depression, access to mental health care, substance and alcohol abuse, and access to lethal means as central features. The strategy also led to the establishment of crisis phone lines for persons experiencing suicidal thoughts, and guidance to the media, for instance not reporting suicide methods (Patana, 2014; Korkeila, 2013). Recognition that suicide was particularly high amongst young men led to the development of the "Time Out! Back on the track" (*Aikalisä! Elämä raitelleen*) initiative in 2004, which promoted social inclusion amongst vulnerable men. Two-thirds of participants reported that the participation in the programme was worthwhile, while about 60% considered it had improved their life situation (Appelqvist-Schmidlechner et al., 2012).

At the end of 2017, the Finnish Parliament allocated EUR 300 000 in 2018 to develop a new national strategy to prevent suicide, which will be included in Finland's new broader National Mental Health Strategy. This work will establish a network for coordinating suicide prevention, and improve the planning, implementation, monitoring and evaluation of suicide prevention measures (Finnish Government, 2017).

Some countries have also developed dedicated national suicide strategies, or included suicide prevention in their broader mental health strategy. A comparative study also found that nationwide suicide prevention programmes had a positive effect in helping to reduce suicide, especially those focused on reducing suicide amongst elderly and young populations (Matsubayashi and Ueda, 2011). For example, Austria began "Suicide Prevention Austria" (Suizidprävention Austria [SUPRA]) in January 2017, focused on national and regional coordination of suicide prevention strategies, developing media support for suicide prevention, research, and integration of suicide prevention into other health promotion activities (EU Compass Consortium, 2017).

Early life interventions to promote mental well-being

Efforts to ensure good mental health in the first few years of life are cost effective in terms of mental, physical, and social outcomes. Effective actions can start even before a child is born: poor maternal mental health – conditions such as anxiety, depression, post-traumatic stress and psychosis affecting some 10-20% of women in the perinatal period (Gavin et al., 2005) – have been associated with poorer physical and cognitive development (Ibanez et al., 2015), higher risk of pre-term birth, and lower birth weight (Jarde et al., 2016).

Many countries have programmes that focus on maternal health, infant health, promoting mental well-being in pre-schools, or parenting support. In England, clinical guidelines by NICE suggest that primary care providers discuss mental health and well-being with women upon first contact during the early postnatal period (National Institute for Health and Care Excellence, 2018). In 2017 the Baby-Mother-Father Perinatal Mental Disorders Service in Hungary developed a new official guideline in intersectoral cooperation, providing support for treatment of perinatal and postnatal depression, which has started as a pilot programme in one hospital (EU Compass for Action on Mental Health and Wellbeing, 2018).

Programmes which promote parenting skills and seek to improve parent-child relationships, often targeting vulnerable or at-risk children, can have a positive impact on the mental health of parents and children. In Germany, the "Early Help" initiative gives support to parents of children aged 0 to 3, delivered by family midwives and other professionals, and is available to all families with more intensive services available for cases requiring more support (McDaid, Hewlett and Park, 2017).

Promotion of good mental health in schools

Schools are an ideal setting for interventions to promote mental well-being as almost all children and young people in Europe spend a good part of their day in school settings. School-based interventions can benefit mental health, develop mental health literacy, as well as improve social and educational outcomes; long-term benefits include improved academic performance, better resilience, and better cognitive skills (Weare and Nind, 2011; Durlak et al., 2011). Investing in good mental health for school-aged children can reduce the risk of children dropping out of school or having a difficult school-to-work transition (OECD, 2015).

School-based programmes often take a universal approach, covering either the full school population or a specific age group (e.g. primary school children or secondary school children). A few countries have introduced programmes that target vulnerable or at-risk children or young people – for instance Finland, Norway or the United Kingdom (McDaid, Hewlett and Park, 2017). Interventions delivered in schools can include actions targeting

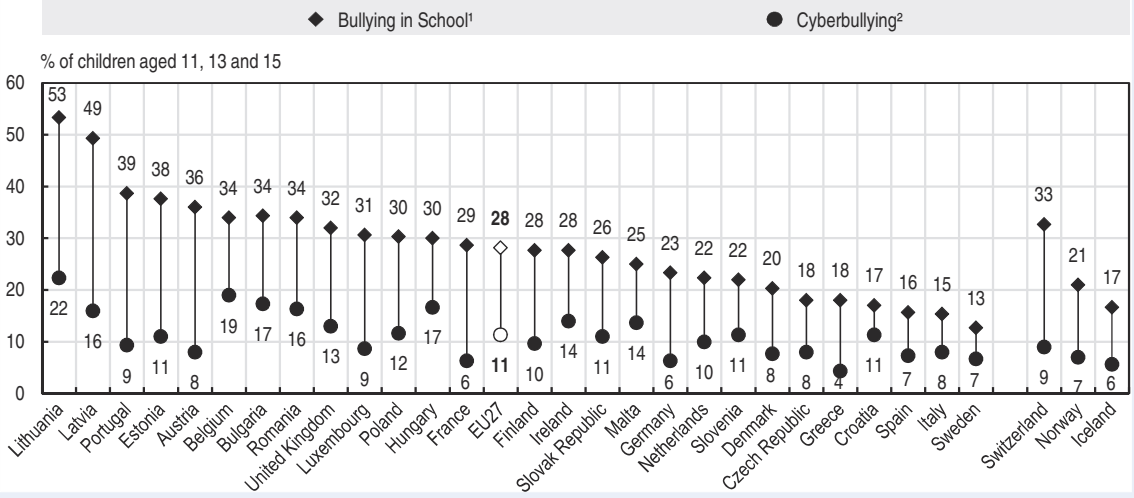
teaching skills, promotion of positive mental health or well-being, programmes to improve mental health "literacy" and understanding of mental disorders, reduce stigma, or actions to prevent bullying and cyberbullying (see Box 1.6). General mental health promotion programmes are common, for example in Slovenia, the Slovenian Network of Health Promoting Schools which covers 324 schools (around 55%), adopted the theme of mental health promotion in 2015-16, developing a manual for teachers to promote mental health. Zippy's Friends is a universal school-based programme adopted in 27 countries, including Denmark, Ireland and Lithuania, which helps young children to develop coping and social skills. An evaluation in Norway found that the programme had helped improve the classroom atmosphere, reduce bullying, and improve academic scores (Holen et al., 2013; Clarke, Bunting and Barry, 2014).

Box 1.6. **Understanding and preventing cyberbullying**

With the increasing ubiquity of the internet, social media and online platforms, the way people, and particularly young people, interact has dramatically changed. While technological developments offer children and young people new opportunities for personal development and growth, they also present challenges to health and well-being. Concern has been rising in particular about cyberbullying. Cyberbullying can include sending offensive messages or comments online, spreading rumours, excluding victims from online groups and other forms of harassment (OECD, 2017). Like bullying, exposure to cyberbullying has been related to a wide range of negative outcomes, including stress and suicidal thoughts (Kowalski et al., 2014), depression and anxiety (Fahy et al., 2016).

The Health Behaviour in School-Aged Children (HBSC) survey of 42 countries asked children about their experiences of bullying on the internet, and found that on average 11% of children aged 11, 13 and 15 reported having been cyberbullied at least once by message. Just over 3% of children reported having been cyberbullied by message at least 2-3 times a month. In all countries the rate of bullying in school was found to be significantly higher than the rate of cyberbullying.

Figure 1.10. **Bullying and cyberbullying experienced by children aged 11, 13 and 15, 2013/14**



1. Proportions who reported being bullied at least twice at school in the past couple of months.
2. Proportions who had experienced cyberbullying by message (instant messages, wall-postings, emails and text messages) at least once.

Source: Health Behaviour in School-aged Children (HBSC) Survey, 2013/14.

StatLink http://dx.doi.org/10.1787/888933834110

Box 1.6. **Understanding and preventing cyberbullying** *(cont.)*

Some interventions have been found as effective ways to counter cyberbullying, including school-based anti-bullying programmes, programmes including parent meetings, parent and child education, and teaching empathy and coping skills (Hutson, Kelly and Militello, 2018; Farrington and Ttofi, 2009) although the long-term effectiveness of these programmes is not clearly evidenced (Cantone et al., 2015).

Protecting and improving the mental health of the working-age population

Actions around mental health in the workplace – which 20 countries report having in place – include efforts to improve mental well-being, actions to support workers experiencing mental ill-health stay in work, and actions to facilitate return-to-work after a period of sickness absence. Such interventions can contribute to reducing some of the high economic costs related to mental illness noted earlier in the chapter and contribute to maximising productivity, opportunities and fulfilment for employees. The most economically effective interventions were found to be those targeting individuals rather than organisations (McDaid and Park, 2014; Hamberg-van Reenen, Proper and van den Berg, 2012).

Many European countries are using health and safety legislation and labour laws to safeguard and promote mental well-being at work. Austria, Belgium, Finland, France, Norway, and the Netherlands are using labour legislation to tackle psychosocial workplace risks. Finland and Lithuania require employers to assess and respond to mental stress and strain at work (McDaid, Hewlett and Park, 2017).

Workplace programmes can focus on the individual, or on an organisation-wide approach, for instance promoting mental health awareness amongst managers, changes to the physical working environment, and improving social relations at work. In Belgium prevention advisers give guidance to workplaces on psychological well-being, and support the preparation of risk assessment plans to minimise stress and violence at work (Samele, Frew Stuart and Urquia Norman, 2013). In the Netherlands the "SP@W: Stress Prevention at Work" aims to identify and deal with stress in the workplace through a learning network, a digital Occupational Stress platform, and roadmaps tailored to each individual company (EU Compass for Action on Mental Health and Wellbeing, 2017).

Few initiatives, though, were found to focus on improving the mental health of the unemployed, with actions reported or identified in the literature for only nine countries. This is despite strong evidence that unemployment is a strong risk factor for mental illness. As noted before, lost income due to lower employment rate of people with depression alone is estimated to amount to EUR 176 billion per year across EU countries, and these estimated costs would be even higher if other mental health disorders were included. Where they exist, many programmes focus on helping to reintegrate individuals who already had mental health problems, rather than supporting the mental well-being of unemployed persons (McDaid, Hewlett and Park, 2017). A few exceptions can be found. In a suburb of Athens, a centre for psychological support of the long-term unemployed was established in 2013, supported by the European Social Fund and Ministry of Health (Center of Psychosocial Support of Long-term Unemployed, 2016).

Given that unemployment is a strong risk factor for mental ill-health, it is important that policies to promote good mental health reach these more vulnerable populations.

Promoting good mental health among older people

As the European population ages – more than 18% of the European population is now over 65, and about 5% is over 80 – promoting healthy ageing is a growing policy priority (OECD, 2017). Mental well-being should be a key part of healthy ageing alongside physical health. There are key mental health risks linked to ageing, for instance around the sometimes-difficult transition from work to retirement, or related to physical illness and frailty. Social isolation, loneliness, and lower levels of contact with friends and family can also contribute to lower levels of mental well-being. Equally, older people commonly fall outside of social structures such as schools and workplaces where mental health promotion and illness prevention interventions are more common, as Figure 1.8 shows.

To promote mental well-being amongst older populations, interventions have focused on tackling some of the risk factors for mental illness, for example loneliness, and promoting activities that foster mental well-being, for instance through promoting social participation. Although evidence on the cost-effectiveness of interventions for the older population is limited, a systematic literature review including more than 10 countries found that participation in social activities, psychosocial educational interventions, intergenerational activities and volunteering, and some educational activities could help protect the mental well-being of older people (McDaid, 2015).

Though far fewer actions to promote the well-being of older people are found than for other parts of the life course, a number of countries are nonetheless intervening with actions primarily to reduce loneliness and isolation. In England, efforts to tackle loneliness amongst older people entailed identifying, signposting, and in some cases funding, of local activities such as lunch clubs, dance afternoons, befriending services, and sports groups (McDaid, Hewlett and Park, 2017). In Norway, government grants are awarded to local areas to create social activities with a social participation component, while in Iceland volunteers from the Icelandic Red Cross make weekly visits to older, ill, or isolated individuals.

Conclusions

Mental health problems represent a huge burden in terms of morbidity and mortality, and can have devastating consequences on the lives of people experiencing mental ill-health, their friends, relatives and caregivers. More than one in six people across EU countries had a mental health problem in 2016, with an estimated 25 million people suffering from anxiety disorders, 21 million from depressive disorders, 11 million people living with drug and alcohol use disorders, almost 5 million people suffering from bipolar disorder, and schizophrenic disorders affecting an estimated 1.5 million people. For each of these individuals, mental illness will affect their daily lives, their relationships, their jobs, their physical health, their economic status and opportunities.

In some cases, mental ill-health leads not just to lives lived less fully, but also to lives lost prematurely: over 84 000 people died of mental health problems and suicides across EU countries in 2015. While mortality rates – driven primarily by deaths from suicide – vary considerably by gender and by country and have been falling over time in almost all countries, each of these deaths must be seen as a tragedy, and no European country can rest easy. The experience of European countries where deaths from suicide have been reduced so substantially are heartening, and offer policy lessons for other countries to follow.

The burden of mental illness, and the impact of lives lost from suicide and other causes related to mental ill-health, contribute to significant economic costs in Europe. This

chapter estimates total costs related to mental ill-health to be equivalent to more than 4% of GDP. While around one-third of these costs are direct spending on health services, most of these costs relate to social security benefits and the indirect costs of mental ill-health in the labour market, driven by lower employment rates and reduced productivity due to mental illness.

Many European countries are taking action to prevent mental illness and to promote mental well-being. More than one hundred interventions to promote good mental health and protect populations from the negative impacts of mental illness were found across the EU, targeting all age groups. Measures are being adopted to promote well-being in schools and nurseries, with new parents, or in workplaces. Reducing stigma and increasing understanding of mental well-being are policy priorities. Furthermore, with improved population-level awareness and understanding of mental health, the stigma around seeking mental health care and talking about mental illness falls. Overcoming stigma and improving diagnosis rates can be expected, in turn, to contribute to more robust data on the true prevalence of mental ill-health.

As this chapter shows, mental ill-health is not distributed evenly across the population, and there are important age, gender and socio-economic differences in the burden of disease. Some groups are also less likely to be the target of promotion or prevention interventions. Supporting vulnerable groups, such as older people or unemployed people, is important to build more inclusive and active societies, but at present far fewer policies reach these groups. The dialectic relationship between distance from social structures and deteriorated mental well-being should also not be underestimated. Just as mental ill-health reduces the likelihood of being in employment, unemployment increases the risk of having poor mental health. Programmes that foster good mental health – reducing loneliness, encouraging social participation, building support structures – and interventions that can identify and respond to signs of mental distress, should be priorities for European countries.

The growing evidence base along with the significant burden of mental illness make clear that there is a societal case for introducing many such promotion and prevention programmes, but there is also a clear economic case for further investment in this area. Actions to prevent mental illness and promote good mental health can bring lifelong benefits to children and their families, workplace interventions can reduce absenteeism and presenteeism, and suicide prevention strategies can prevent tragic losses of life and potential.

The costs of mental illness are extremely high, the potential gains from strengthening mental well-being are significant, and the opportunities for promotion and prevention are far from exhausted. This chapter lays the grounds for a clear case: much more can and must still be done to promote mental well-being and prevent mental ill-health.

Note

1. These IHME estimates are lower than those previously reported by Wittchen et al. (Wittchen et al., 2011), partly because they do not include the prevalence of dementia.

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State of Health in the EU Cycle
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PART I

Chapter 2

Strategies to reduce wasteful spending: Turning the lens to hospitals and pharmaceuticals

Evidence suggests that as much as one-fifth of health spending is wasteful, and could be reduced or eliminated without undermining health system performance. With as much as 9.6% of European GDP directed to health care, reducing such spending is thus important not only for improving access to needed care, but also for ensuring health system resilience.

This chapter points the lens at two particular areas of waste: hospitals and pharmaceuticals. Hospitals represent an integral and essential component of any functioning health system, but are often the most expensive part. In many instances, the resources consumed in hospitals can be put to more efficient use. Improved community care for chronic diseases could reduce millions of avoidable admissions and bed days across EU countries. Reducing unnecessary investigations and procedures would not compromise quality. Greater use of day surgery and reducing delays in discharging patients no longer requiring inpatient care could also free-up resources for patients with greater needs.

Minimising waste and optimising the value derived from expenditure on pharmaceuticals are also critical to efficient and sustainable health systems. This chapter discusses a mix of supply and demand side policy levers that include ensuring value for money in selection and coverage, procurement and pricing of medicines; exploiting the potential of savings from generics and biosimilars; encouraging rational prescribing and use; and improving adherence to treatment.

Ultimately, progress in reducing wasteful spending may be seen not only as a barometer of quality improvement, but also an ethical and financial imperative in the pursuit of more resilient and equitable health care systems.

Introduction

Reducing wasteful spending in health is an important objective in both good and bad economic times. In an economic downturn, properly targeting wasteful spending in health care can help ensure that cost-containment efforts do not compromise quality and outcomes, thus contributing to the health system's resilience. In better times, reducing wasteful spending in health is increasingly seen as a sound quality improvement strategy. It can also release resources that can be better targeted to improving the system's accessibility. In other words, reducing waste can contribute to improving health system performance along several dimensions.

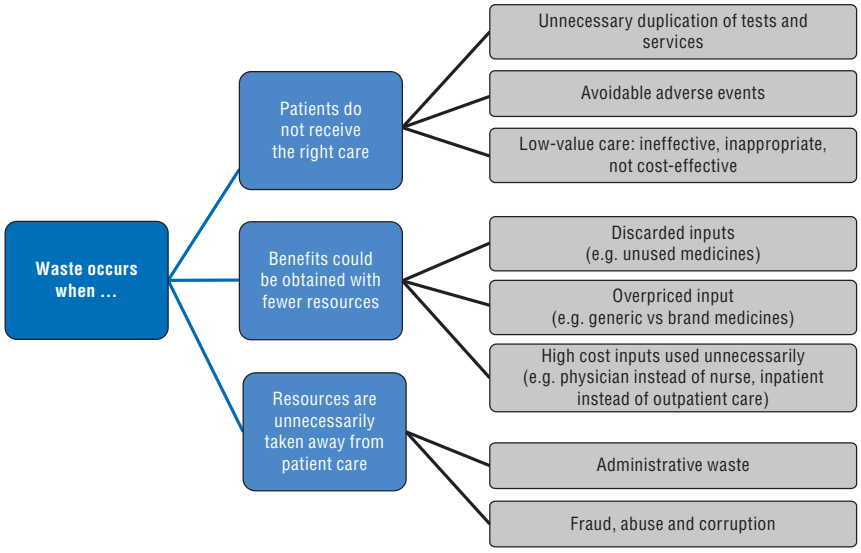
Evidence suggests that as much as one-fifth of health spending is wasteful and could be eliminated without undermining health system performance (OECD, 2017). This alarming estimate – seldom challenged by experts – is well supported by available research. For example, in 2012, a sample of physicians polled in France reported that on average they viewed 28% of interventions as not fully justified (Vanlerenberghe, 2017). A study in the Netherlands estimated that 20% of expenditure on acute care could be saved by reducing overuse, increasing the integration of care, and involving patients in care decisions (Visser et al., 2012). In Italy, a country that spends less on health than many other Western European countries, the proportion of inefficient or wasteful public spending was estimated to be around 19% in 2017 (Fondazione GIMBE, 2018).

Wasteful spending can take many forms (as illustrated in Figure 2.1) and has a range of effects:

- Patients are unnecessarily harmed, or receive unnecessary or low-value care that makes little or no difference to their health outcomes.
- The same outcomes can be achieved with fewer resources. For example, some health systems have low utilisation of generic medicines; others provide care in resource-intensive places such as hospitals, when it could be provided in the community.
- A number of administrative processes add no value, and funds are lost to fraud and corruption.

With up to 9.6% of Europe's GDP devoted to health care in 2017, waste serves only to undermine the financial sustainability of health systems. Pursuing efficiency in health spending and maintaining access to services are persistent, but at times conflicting policy challenges in most European countries. Tackling wasteful spending can only work to improve value for money and support both. In this chapter, the lens is pointed squarely at two particular areas of waste: hospitals and medicines.

Figure 2.1. **A pragmatic approach to identifying and categorising wasteful spending on health**

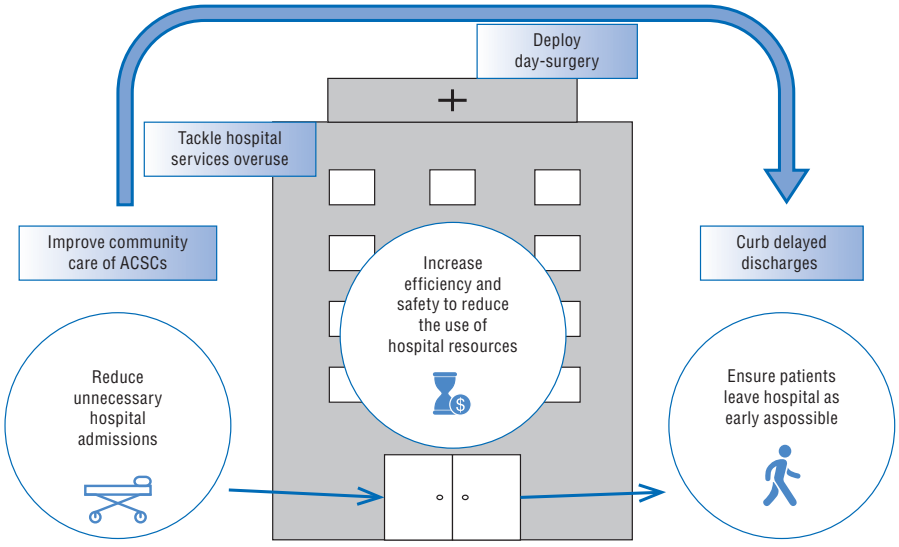


Source: Adapted from OECD (2017), *Tackling Wasteful Spending on Health*, *http://dx.doi.org/10.1787/9789264266414-en*.

Addressing wasteful spending in hospitals

Hospitals represent an integral and essential part of any functioning health system. Yet, as illustrated in Figure 2.2, resources consumed in hospitals could be put to more efficient use. For example, improved community care for ambulatory care-sensitive conditions could reduce avoidable admissions. Tackling the overuse of hospital services could reduce the resources used during a necessary admission without compromising quality. Other opportunities to deploy available hospital resources more efficiently include more extensive use of day surgery in place of inpatient care. This, together with other strategies directed to reducing discharge delays, can help ensure that patients leave the hospital as early as possible. These examples are discussed in turn below.

Figure 2.2. **Pressure points on wasteful hospital spending**



Reducing potentially avoidable admissions

Potentially avoidable hospital admissions for some chronic conditions consume over 37 million bed days each year

A large number of hospital admissions could be averted through better prevention and management of both acute and chronic conditions outside the hospital. Among more than 30 conditions for which hospitalisation could be reduced with better primary care (also referred as ambulatory care-sensitive conditions) (Purdy et al., 2009), five stand out as particularly relevant in European countries: 1) diabetes, 2) hypertension, 3) heart failure, 4) chronic obstructive pulmonary disease (COPD) and bronchiectasis and 5) asthma.

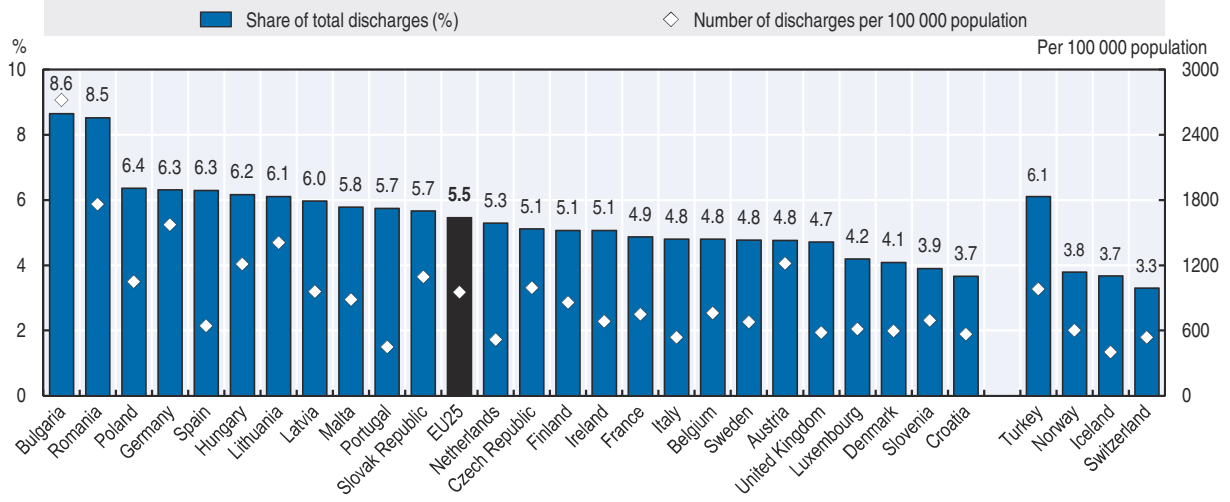
Across the EU, over 4.6 million admissions were made for these five conditions in 2015 – amounting to 5.6% of all admissions which might have been avoided[1] (Table 2.1). The average length of stay (ALOS) for these five conditions was 8.1 days, which exceeded

Table 2.1. **Hospital admissions for five chronic conditions, EU countries, 2015**

	Diabetes	Hypertension	Heart failure	COPD and Bronchiectasis	Asthma	**Total (five conditions)**
Admissions/discharges	800 303	665 396	1 749 384	1 109 865	328 976	**4 653 924**
% of all admissions	1.0%	0.8%	2.1%	1.3%	0.4%	**5.6%**
Average LOS (days)	8.5	6.9	9.5	8.9	6.6	**8.1** (avg.)
Total bed days	6 794 572	4 597 886	16 619 148	9 855 601	2 177 821	**37 603 706**
Proportion of all bed days	1.1%	0.7%	2.7%	1.6%	0.4%	**6.5%**

Note: The data on hospital admissions refer to discharges (including deaths in hospital). They include patients in all age groups, but exclude outpatient and day cases (patients who do not stay overnight in hospital). The number of bed days was calculated by multiplying the number of admissions (discharges) by ALOS. The total number of admissions (discharges) excludes healthy neonates.
Source: OECD Health Statistics, *https://doi.org/10.1787/health-data-en* and Eurostat database.

Figure 2.3. **Share of potentially avoidable hospital admissions due to five chronic conditions, EU countries, 2015**



Note: The data on hospital admissions refer to discharges related to five chronic conditions: diabetes, hypertension, heart failure, COPD and bronchiectasis and asthma. They include patients in all age groups, but exclude outpatient and day cases (patients not staying overnight in hospital). These potentially avoidable hospital admissions do not control for any variation in the prevalence of these five chronic conditions. Estonia and Greece are not shown due to missing data for several of these causes of hospitalisation. Data for Cyprus are not shown as they only include discharges from public hospitals, resulting in substantial under-estimation as most hospitals are private.
Source: OECD Health Statistics, *https://doi.org/10.1787/health-data-en* and Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834129

the ALOS for all causes of hospitalisation (7.4 days). In total, admissions for these 5 conditions represented over 37 million bed days in 2015. Cross-country comparisons of potentially avoidable hospital admissions should be interpreted with caution, as many other factors, beyond better access to primary care, can influence the statistics, including data comparability and the prevalence of these chronic conditions. Nevertheless, admission rates for these five chronic conditions were particularly high in Bulgaria, Romania, Germany, Lithuania, Austria and Hungary, while as a proportion of all hospital admissions, rates were highest in Bulgaria and Romania, followed by Poland, Germany, Spain and Hungary (Figure 2.3).

Reducing admissions requires meeting people's needs outside of the hospital

Recognising the need to improve access to care outside hospitals, many EU countries have taken steps to increase the availability of primary and community care, and to introduce new models of intermediate care that can serve as alternatives to hospitals.

Many people present to hospitals simply because their primary care providers are unavailable. To address this, a number of countries have increased access to after-hours primary care. For example:

- In the Netherlands, after-hours care is organised at the municipal level in GP "posts". These posts are generally situated near or within hospitals in order to provide urgent primary care overnight, and work closely with emergency departments. Nearly all GPs work for a GP post. Specially trained assistants respond to phone calls and perform triage, with GPs then determining referrals to hospital. GPs are paid at hourly rates for after-hours work and must provide at least 50 hours of after-hours care per year to maintain their GP registration. As GP care in the Netherlands is free at the point of service, and a mandatory deductible applies for (emergency) hospital care, patients have a financial incentive to choose GP posts over the Emergency Department (Wammes et al., 2017).
- In Denmark, after-hours care is organised by the regions. The first line of contact is a regional telephone service, most often answered by a physician or sometimes a nurse in Zealand and the Copenhagen region who decides whether to refer the patient for a home visit or to an after-hours clinic, usually co-located with a hospital emergency department. GPs can choose to take on more or less work within this programme and receive a higher rate of payment for after-hours work (Vrangbaek, 2017).
- In 2017, Portugal established a call centre that operates around the clock and, among other services, provides guidance to patients based on their needs. Among 800 000 callers in 2017, 26% were advised on self-care, 42% referred to physicians and 24% directed to emergency services.

Some countries have also started to develop intermediate in-home care services as an alternative to hospital-based ones. For example:

- In the United Kingdom, since 2005 "virtual wards" have been set up in some parts of the country to provide care at home for people recently discharged or at high risk of hospital (re-)admission. Care is provided through multi-disciplinary care teams. Evidence suggests that these "virtual wards" have reduced unplanned hospital (re)-admissions and the length of stay in hospitals for the most at risk groups (Sonola et al., 2013).

- In France, the "hospital at home" model, organised and funded through hospitals, is designed to offer patients the option of receiving hospital care at home for certain conditions. In 2016, more than 100 000 patients in France were treated in a "hospital at home" programme, equivalent to 175 000 admissions, an increase of 8% over 2015 (FNEHAD, 2017).

Most countries recognise that in order to respond effectively to the needs of ageing populations and the growing burden of chronic disease, further efforts are needed both to strengthen access to primary care and to provide more continuous and coordinated care outside hospitals.

Measuring and addressing overuse in hospitals

Unfortunately, not all care received by hospitalised patients is necessary, and in some cases, may not only be futile but even cause harm. Many services that are delivered offer only very modest benefit to patients, or are of benefit only to some, and in some cases the evidence of benefit is weak or lacking altogether (Brownlee et al., 2017).

In a recent effort to identify services overused in hospitals, researchers reviewed more than 800 recommendations targeting low-value services issued in the United States, Canada, Australia and the United Kingdom, and found that two-thirds of them pertained to services delivered in hospitals (Chalmers et al., 2018), including investigations and surgical procedures. Another recent study in the United Kingdom identified 71 low-value interventions performed in general surgery alone (Malik et al., 2018).

One in four European countries has now systematically documented unwarranted variation in the use of hospital services using Atlases

Detecting and measuring wasteful spending on low-value care has mobilised considerable effort over the years, with two main approaches currently in use. The first consists broadly of comparing utilisation rates for specific low-value services across geographic areas, adjusting for population need (for lack of better indicators, generally using age and gender as proxies). These analyses invariably display very large and unwarranted variations in utilisation that cannot be explained by differences in disease burden, standards of care, or patient preference, especially within countries. For example, in 2011 caesarean-section (C-section) rates in Italy varied by a ratio of 1 to 6 across local health units (OECD, 2014). In 2015 they varied to a similar degree across areas in Spain (on-line Spanish Atlas, see below) and by a ratio of 1 to 2 across French *Départements* in 2014 (Le Bail and Or, 2016).

This approach, a hallmark of the US Dartmouth Atlas of Health Care, has been used in at least five European countries to generate "Atlases of variation in health care" (Table 2.2). Additionally, in 2014, in the context of the EU-funded ECHO project, Slovenia, Denmark and Portugal produced atlases of low value care. These atlases cover a similar set of services, in particular elective surgery. They help raise public awareness about the problem of overuse and may catalyse behaviour change, but their operability is limited as they do not typically identify when, for whom, and which specific providers' services may have been over or under-provided. Nevertheless, this comparative approach can help identify areas where overuse is systemic, as overuse of various services is often correlated in a given area (Miller et al., 2018).

Table 2.2. **Atlases of variations in health care in Europe**

Country Time period Document	Authors	Stated objective	Approach and scope	Examples of hospital interventions
Belgium *2006* Analysis of variations in elective surgery in Belgium *Under preparation* Thematic Atlases for over 100 procedures	KCE (public research centre in health) INAMI (National Institute for Health and Disability Insurance)	Highlight unexplained variations in elective surgery. Promote appropriate care by documenting unwarranted variation in practice.	Analysis of geographic variations in elective surgical procedures. Selection criteria included high and increasing volume, evidence of relevance from international literature. Interventions are prioritised based on importance (spending), convenience (data available) and relevance (literature, policy debate). A standard methodology is used across procedures selected to represent all specialties.	8 surgeries: Hip replacement, knee replacement, knee arthroscopy, carpal tunnel surgery, cataract surgery, carotid artery surgery, hysterectomy, C-section. Bariatric surgery, myringotomy, phlebotomy, medical imaging (MR,CT), appendectomy, tonsillectomy, knee and hip replacement.
Spain *Since 2006* Atlas VPM (Variations in Medical Practice): A platform of regularly updated thematic atlases	Consortium of around 50 researchers coordinated by research units in Valencia and Aragon	Identify systematic and unwarranted variations in population use of specific hospital services within and across 17 decentralised regions to inform policy debate.	Variations in standardised utilisation rates are analysed for 3 categories of services: i) proven to be effective, e.g. hip fracture repair ii) services whose effectiveness is uncertain beyond appropriately selected groups of patients, e.g. C-section, iii) generally considered lower-value care, e.g. spinal fusion. The latest atlases are presented in an interactive online platform where different indicators can be explored across zones.	11 atlases relate to hospital procedures including orthopaedic surgery (hip fracture, knee and hip replacement), general surgery, paediatric hospitalisations, cardiovascular procedures (including stroke management), diabetes care, cancer care, hospitalisations for mental health problems, avoidable hospitalisations for frail patients or chronic conditions and procedures considered lower-value care.
England *2016* The NHS Atlas of Variation in Healthcare (Compendium) Previous editions: 2010 and 2011. *Since 2012* Thematic Atlases: Liver disease (2017) Diagnostic tests (2017)	NHS and Public Health England (Department of Health agency), in consultation with relevant specialists	Identify unwarranted variations in outcomes and activity. The goal is to ensure provision of same quality evidence-based NHS services to all patients.	The "compendium" atlases highlight unwarranted geographic variations for the main categories of diseases covered by NHS budget programmes (cancer, mental health disorders). For each programme, geographic variations for an ad-hoc set of indicators are presented which may include morbidity, risk factor, volumes of specific services provided, or quality indicators assessing process (% of people who receive recommended service) or outcome (mortality, survival).	Around 100 indicators are mapped in the 2016 compendium Atlas (up from 34 in the first edition). The last edition emphasises quality indicators and differences in the coverage of appropriate interventions but relatively few interventions known to be of variable value. Exceptions for hospital care include tonsillectomy and hip replacement.
France *2016* Atlas of medical practice variation	IRDES (research centre), in collaboration with Ministry of Health and with contribution from medical societies	Reduce unwarranted variations in inappropriate care, thereby improving quality and reducing cost.	Analysis of geographic variations in "priority" surgical procedures. Selection criteria for procedures included: high (>20 000) and increasing volume, large variations, initiatives in place addressing these services or interest by various authorities, evidence of relevance from international literature suggesting a proportion of procedure is low-value.	11 surgeries Tonsillectomy, appendectomy, C-section, bariatric surgery, prostate surgery, carpal tunnel surgery, cholecystectomy, hysterectomy, knee replacement, thyroidectomy. Hip fracture surgery, considered generally effective and thus less subject to unwarranted variation was used as a benchmark.
Germany *2015* Healthcare Fact Check: The development of regional variations Previous edition: 2011 *Since 2012* Thematic fact-checks also prepared on specific interventions (e.g. C-sections, back surgery)	Bertelsmann Foundation (independent think tank), in collaboration with a research centre and experts.	Measure variations to highlight "efficiency shortcomings and quality deficits", spark public debate and encourage the development of measures to improve value in the system.	The 2015 atlas analyses geographic variations for a set of elective surgical procedures. Selection criteria included relevance to the general public (prevalence) and per international literature. Stakeholders in the health care system as well as citizens can propose topics for review.	The 2015 atlas examines 9 surgical procedures: C-section, tonsillectomy and appendectomy in children and adolescents, cholecystectomy, hysterectomy, prostatectomy, knee replacement, coronary bypass, implantation of a defibrillator.

Source: Author's analysis based on Atlases.

The other strategy to measure the extent of overuse is more direct, and consists of identifying, by using patient-level data, those services likely to have been delivered inappropriately. Analyses of service delivery records are undertaken to identify the characteristics of those patients who should not have received a particular service. This analysis can produce estimates of the amount of resources "wasted", but is limited to those services for which the criteria for appropriateness are sufficiently specific and can be mapped to available data. By aggregating analyses across services it is possible to build bottom-up estimates of wasteful spending. In the United Kingdom, a recent study of services in general surgery using a similar approach identified a potential EUR 153 million which could be saved annually by NHS England (Malik et al., 2018).

Rates of C-sections are still growing in a third of EU countries

C-sections are a prime example of a surgical procedure which can save lives when clinically indicated, but for which the benefits are disputed. At population level, C-section rates above 15% of deliveries are not associated with reductions in maternal, neonatal or infant mortality (Stordeur et al., 2016). Yet, in 2016, on average 28% of babies were born by C-section in Europe, a rate that varies more than threefold between the Netherlands (16%) and Cyprus (55%). C-section rates began increasing rapidly in the 1980s and continued to rise on average by more than 6% per annum between 2000 and 2005. The growth rate slowed to 2.6% per annum between 2005 and 2010 and further decreased to 1.2% over the following 5 years (Figure 2.4).[2]

In many countries, elective C-section among low-risk women is among the first procedures for which interventions aimed at reducing overuse have been introduced.

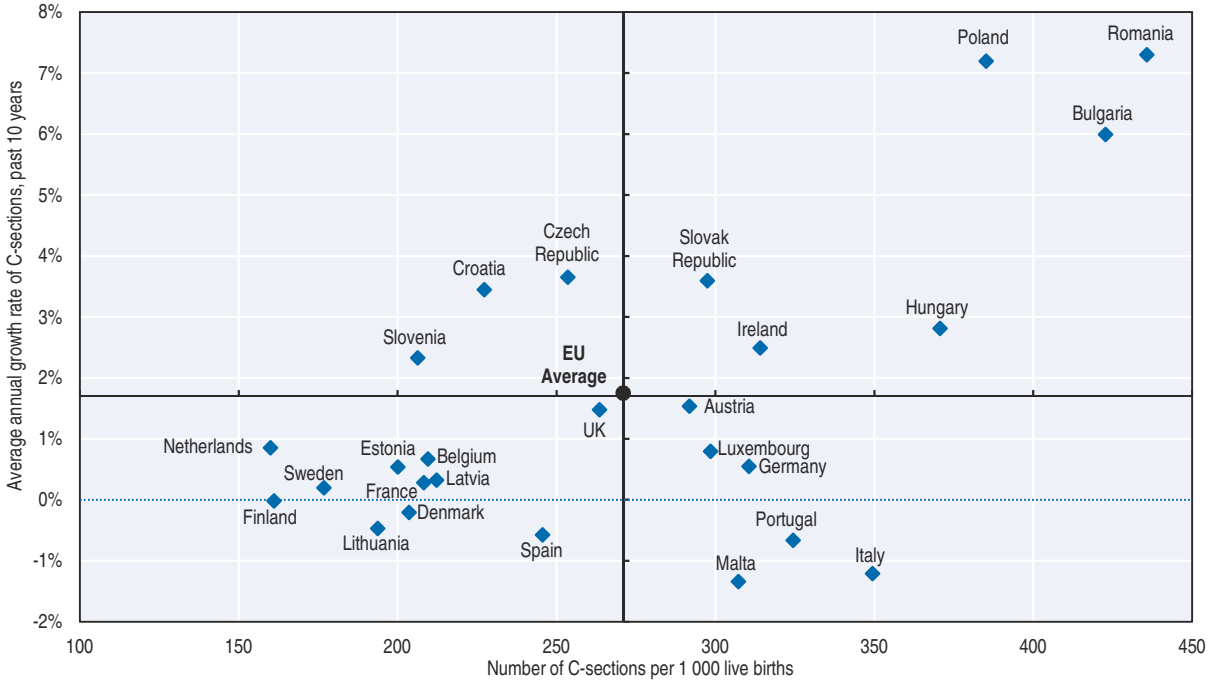
Figure 2.4 compares European country levels and trends in C-section rates over the last 10 years, with the centre of the graph representing the European average for both metrics. In many countries in Central and Eastern Europe, C-section rates have risen very rapidly over the past decade, and are very high (most notably in Poland, Romania and Bulgaria), suggesting overuse may have yet to receive much attention. In contrast, many countries of Northern Europe have considerably lower C-section rates, and these have remained fairly stable over the last 10 years. Nordic countries have traditionally had low C-section rates, while a number of other countries in which rates have increased slowly or even declined have put in place specific policies to target this.

Tackling overuse is likely to require multi-pronged strategies that engage patients and clinicians in particular

Policies targeting patients and providers to address overuse revolve around three types of levers:

- Producing and publishing information on overuse. This can i) raise awareness; ii) enable better informed conversations between providers and patients (as illustrated by the Choosing Wisely® campaign[3]); or iii) serve to benchmark providers against their peers. For example, all maternity units in Belgium receive confidential annual reports detailing their obstetric indicators and comparing them with other maternity units, encouraging poor performers to question their practices.
- Supporting behaviour change through, for example, clinical decision-making support tools or feedback and audits. In 2013, France offered methodological support to maternity units that volunteered to undertake practice analyses and develop change strategies.

Figure 2.4. **C-section rates in 2016 and their annual growth rate between 2006 and 2016**



Note: Cyprus is not represented due to a break in the data series, but the 2016 C-section rate is by far the highest in the EU (554 per 1 000 live births). The annual growth rate for Luxembourg only covers the period 2011 to 2016 due to a break in the series in 2011. Data are not available for Greece.

Source: Eurostat, except Netherlands: Perinatal registry (*www.perined.nl/*).

StatLink http://dx.doi.org/10.1787/888933834148

- Financial levers, such as payment systems limiting incentives for providers to deliver low-value services, or limiting service coverage to circumstances where comparative effectiveness is documented. Financial incentives are used in France, Portugal, and Italy, targeting procedure prices, hospital budgets and regional budget allocations respectively.

Table 2.3 summarises the strategies used by a handful of countries to reduce C-section rates and provides additional concrete examples.

Although impact evaluations are lacking, the interventions presented above are believed to have contributed to slowing the growth or reducing C-section rates in countries that have implemented them.

However, to date achieving significant and sustained impact in reducing the overuse of various investigations and surgical procedures has proven elusive. Addressing overuse is complex and requires systemic effort and multi-pronged strategies; evidence of impact is often incomplete and system-dependent (OECD, 2017; Mafi and Parchman, 2018; Ellen et al., 2018; Elshaug et al., 2017). Nevertheless, reducing unwarranted use is a quality-enhancing strategy which offers the potential to free-up significant resources in the health system.

Table 2.3. **Examples of strategies to reduce C-section rates in Europe**

Levers	Leverage information and raise awareness	Provide direct behaviour change support	Financial incentives	Observed change
France Started in 2010 (Haute Autorité de Santé, 2016)	New best practice guidelines (2012). User-friendly flyers for expectant mothers detailing the indications for C-sections. C-section justification must be documented in patient's medical file.	Campaign providing methodological support to volunteer maternities in their efforts to analyse and improve practice (2013).	Between 2009-12, France reduced the gap between DRG prices for vaginal delivery and C-section from 40% to 16% (13% in 2018) in public hospitals (17% for private hospitals in 2018).	Reduction in programmed C-section and increase in the proportion programmed after 39 weeks, with a more marked improvement in maternities which joined the programme supporting behaviour change.
Portugal Started in 2010 (Ayres-De-Campos et al., 2015)	Creation of a national commission to control C-section rates. Debates in policy and scientific circles.	Information sessions in maternities with a C-section rate above 35% and discussions of options to reduce C-sections (in the region with highest rates). Training of health professionals (in the region with highest rates). New practice guidelines (2015).	Funding of public hospitals indexed to C-section rates.	C-section rates are 10% lower in 2016 than in 2010.
Belgium (Stordeur et al., 2016)	All maternity units receive a yearly confidential report detailing obstetric indicators and comparting them with other maternity units.			
Italy	Patients can look-up the C-section rate in any given hospital in a website run by the National Outcomes Programme of the Ministry of Health (MoH).		Since 2012, C-section rates are one of 35 indicators for which regional targets are set and monitored by the MoH. Good performance across these indicators and progress is rewarded by a 3% increase in the health budget to regions.	

Exploiting the potential of day surgery

Greater use of day surgery can also reduce the utilisation of hospital resources, with the added benefit that most patients prefer day surgery as it allows them to return home the same day. The use of day surgery has increased in all EU countries over the past few decades, thanks to progress in surgical techniques and anaesthesia, but the pace of diffusion has varied, with some countries leading the way in adopting day surgery earlier and faster, and others still lagging behind.[4]

The diffusion of day surgery varies widely across EU countries

The trends in the adoption of day surgery presented here focus on four high-volume surgical procedures: cataract surgery, tonsillectomy, inguinal hernia repair, and laparoscopic cholecystectomy.[5] The diffusion of day surgery varies greatly both across these four surgical procedures and across countries. While almost all cataract surgery is now performed as day surgery in most EU countries, the average rate of day surgery in 2015 was 40% for inguinal hernia repairs, 32% for tonsillectomies and 13% for laparoscopic cholecystectomies.

The 22 EU countries included in the analysis can be classified into three groups in terms of adoption of day surgery: advanced adopters, moderate adopters, and low adopters (Figure 2.5).

The Nordic countries and the United Kingdom have led the way in adopting day surgery for a growing number of interventions, and the Netherlands has also expanded day surgery more rapidly than most other EU countries. Nearly all cataract operations in Denmark,

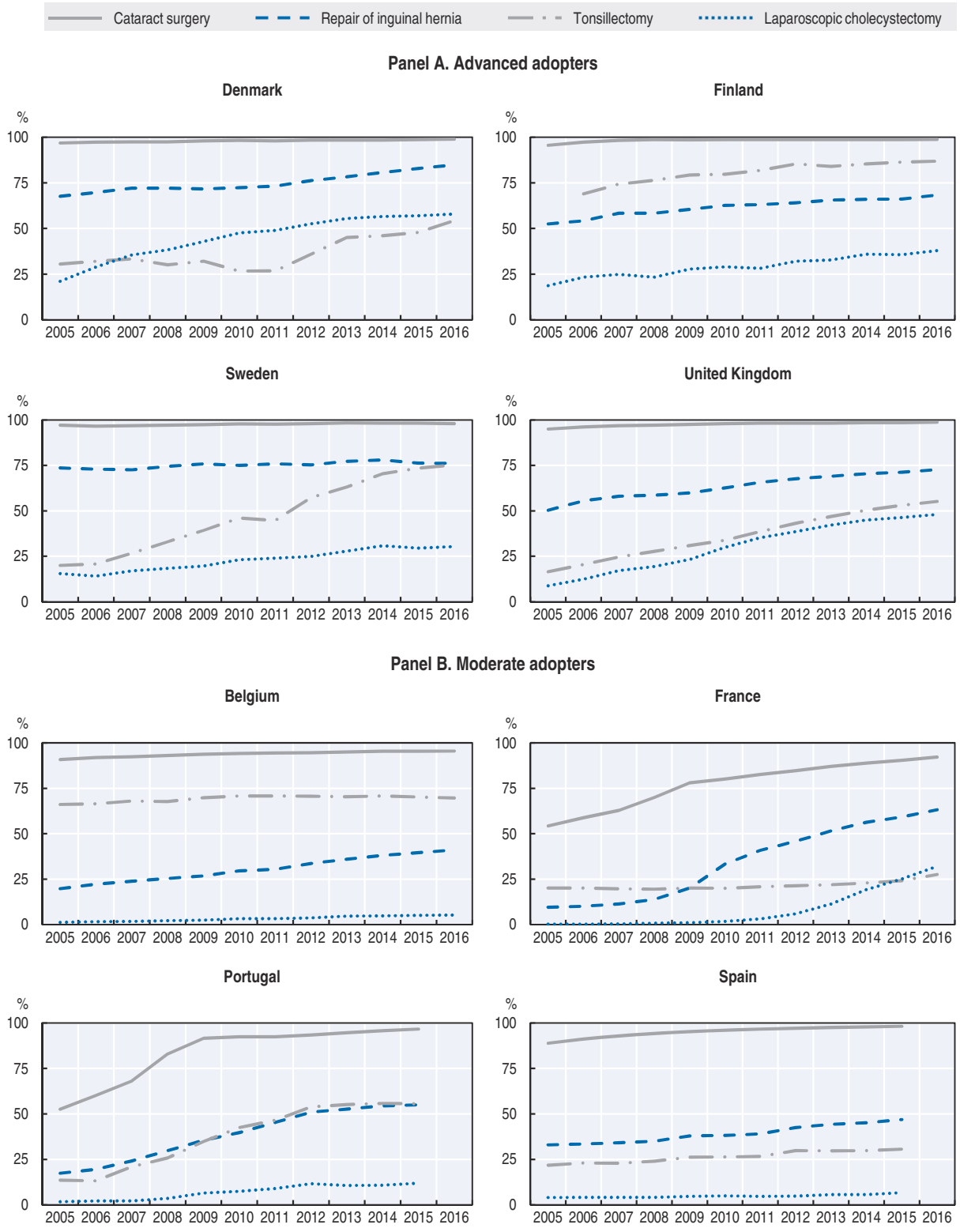
Figure 2.5. **Nordic countries have led the way in adopting day surgery, whereas countries in Central and Eastern Europe have generally lagged behind**

Note: The grouping of countries is based on an analysis of the distance of the country to the EU average for each of the four selected surgical procedures in 2015. Data are not available for Bulgaria, Czech Republic, Greece, Latvia, Slovak Republic and Switzerland. Data for Cyprus are not shown as they only include discharges from public hospitals, resulting in a large bias given that most hospitals are private.
Source: OECD Health Statistics, *https://doi.org/10.1787/health-data-en* and Eurostat Database.

Finland, Sweden and the United Kingdom have been performed as day surgery for well over a decade (Figure 2.6, Panel A). Day surgery rates for inguinal hernia repair and tonsillectomy are also much higher in these countries (over 70% and over 50% respectively) than in other EU countries, and laparoscopic cholecystectomy is also increasingly performed as day surgery, and rates now reaching at least 30% in Sweden and over 50% in Denmark.

Several countries in Western Europe (Belgium, France and Ireland) and in Southern Europe (Portugal, Spain, Italy and Malta) have been moderately fast adopters of day surgery. In many of these countries, day surgery has grown fairly rapidly over the past decade for some interventions, for example cataract surgery in France and Portugal (Figure 2.6, Panel B) but remains much more limited for other interventions such as inguinal hernia repair and laparoscopic cholecystectomy. However, national averages often mask large variations within countries. For example, in Belgium day surgery rates for laparoscopic cholecystectomy range from nil in many hospitals yet to adopt this practice, to 50% or 60% in those hospitals that have been leading the way (Leroy et al., 2017). This indicates that a lot of scope remains in this group of countries to expand day surgery further.

Figure 2.6. **Diffusion of day surgery between 2005 and 2016 in selected EU countries**



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en* and Eurostat Database.

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In Austria, Germany and several countries in Central and Eastern Europe (e.g. Hungary, Poland and Romania), the diffusion of day surgery for most interventions has generally been much slower. While progress has been made on cataract procedures, the use of day surgery for most other interventions remains much more limited. The indicator on "Day surgery" in Chapter 8 shows low day surgery rates in these countries for inguinal hernia repair and tonsillectomy.

Further progress in day surgery could help achieve substantial savings in hospital expenditure. For example, a recent report in France estimated that an increase of 3 percentage points in day surgery could result in savings of EUR 200 million per year (CNAMTS, 2018).

Enabling greater diffusion of day surgery

A number of barriers and enabling factors can influence the uptake of day surgery not only across countries, but also across different hospitals within each country. The same broad types of policy levers that can be used to reduce the overuse of diagnostic tests and treatments can also be used to reduce the unnecessary hospitalisation of patients who could instead be managed with day surgery:

- Publicly reporting the use of day surgery at different levels (national, regional and hospital levels) can play an important role in monitoring progress. One good example of such regular monitoring is the release of the British Association of Day Surgery's Directory of Procedures, which is accompanied by a national dataset identifying the best performers in the use of day surgery for up to 200 interventions (BADS, 2016). The Belgian Health Care Knowledge Centre also released a comprehensive report in 2017 reporting variations in day surgery rates between Belgium and other neighbouring countries, as well as between the three Belgian regions, and across hospitals (Leroy et al., 2017).
- Providing required support for behavioural and clinical change is also important, so that lagging hospitals or hospital units can learn from and catch up with the most innovative and best performers. Experience in many countries shows that the development of day surgery is often led by "local champions" who drive change in clinical practice.
- Providing proper financial incentives to ensure that health care providers (hospitals and surgical teams) do not lose revenue by moving towards a greater use of day surgery, and may even be financially better-off, is also key. The Best Practice Tariffs in England provide a good example of an explicit policy to incentivise moves toward day surgery (see below).

These interventions are likely to be more effective if they are part of a comprehensive strategy to promote day surgery and are led by clinicians.

In Sweden, one of the main factors that has contributed to the expansion of day surgery over the past few decades has been clinical leadership in the adoption of evidence-based guidelines to streamline pre- and post-operative surgical procedures, and promote safe and effective use of day surgery. Nationwide collaboration and support from national authorities have helped to set up and disseminate new standards, while leaving sufficient autonomy to enable adaptation to local circumstances. The expansion of day surgery has helped achieved substantial savings, but further progress is still possible. A 2016 review by the National Board of Health and Welfare showed that the costs of the 11 most common types of procedures would have been 14% higher if the share of day surgery had not increased between 2005 and 2013. However, the review also pointed out that the full cost saving potential has not yet been reached, as the share of day surgery still varied widely across the 21 regional health administrations. For

example, the rate of day surgery for tonsillectomy varied between 4% and 94% in 2013 (Tiainen and Lindelius, 2016).

In the United Kingdom, the British Association of Day Surgery (BADS) has played an instrumental role in the development of day surgery in England by gradually expanding the list of procedures deemed suitable and safe for day surgery from 20 in 1990 to more than 200 procedures in 2016 (BADS, 2016). A national dataset also accompanies this Directory of Procedures, providing the latest data on the percentage of procedures successfully performed as day cases and for each procedure also indicating the performance of the top 5%, 25% and 50% of hospitals. Since 2009, the BADS has also worked with the Department of Health to develop Best Practice Tariffs to provide financial incentives to support the further development of day surgery. By initially paying a relatively higher price for day surgery, the Best Practice Tariffs incentivise providers to treat patients as day cases, and the incentives are gradually reduced as day surgery becomes the norm, as is the case now for cataract surgery (Table 2.4). These financial incentives have contributed to a steady increase in the share of day surgery for interventions such as inguinal hernia repair, tonsillectomy and laparoscopic cholecystectomy in England since 2009 (see Figure 2.6).

Table 2.4. **Best Practice Tariffs for day surgery in England, selected interventions, 2017**

Surgical procedure	Inpatient reimbursement (EUR)	Day surgery reimbursement (EUR)
Cataract surgery	902	902
Repair of inguinal hernia	1 424	1 581
Tonsillectomy (children)	1 146	1 269
Tonsillectomy (adults)	1 157	1 257
Laparoscopic cholecystectomy	2 002	2 214

Note: A Best Practice Tariff is no longer provided for cataract surgery as nearly all are now day cases. The conversion into euros is based on an exchange rate of GBP 1 = EUR 1.16.
Source: National datasets for Payment by Results.

France has combined financial incentives and administrative measures, over time aligning inpatient and ambulatory surgery tariffs closer to the costs of the latter. Since 2008, hospitals with relatively low ambulatory surgery rates can be required by the health insurance fund to request prior authorisation for each instance of planned inpatient admission for those surgeries (which can be justified, for example if a patient cannot be accompanied by a responsible adult upon discharge). The initial list of surgical procedures included cataract surgery; laparoscopic cholecystectomy and hernia repair were added later, but tonsillectomy has not yet been added, which in part explains the trends observed in Figure 2.6.

Reducing delayed discharge from hospital

Delayed discharges unnecessarily increase health care costs[6]

In many cases, savings can be gained through better management of length of stay in hospital, which can be reduced through better co-ordination and planning within hospitals, and between hospitals and post-discharge care settings. Unnecessarily delayed discharges can be costly to health systems for several reasons. Patients who are clinically ready to be discharged can occupy beds that could otherwise be used to care for patients with greater needs. A recent cross-country review estimated that the cost of delayed discharge ranges from EUR 230-650 per patient per day (Rojas-García et al., 2018). In the

United Kingdom (England), the National Audit Office has estimated the cost of delayed transfers of care for people aged 65 and over to be GBP 820 million per year (~EUR 726 million) (National Audit Office, 2016).

Delayed discharges from hospital also contribute to high-cost care through their effects on the health of patients. A longer stay in hospital increases the risk of health care-associated infections, and can accelerate functional decline, particularly among elderly patients (Covinsky et al., 2003; Zisberg et al., 2015).

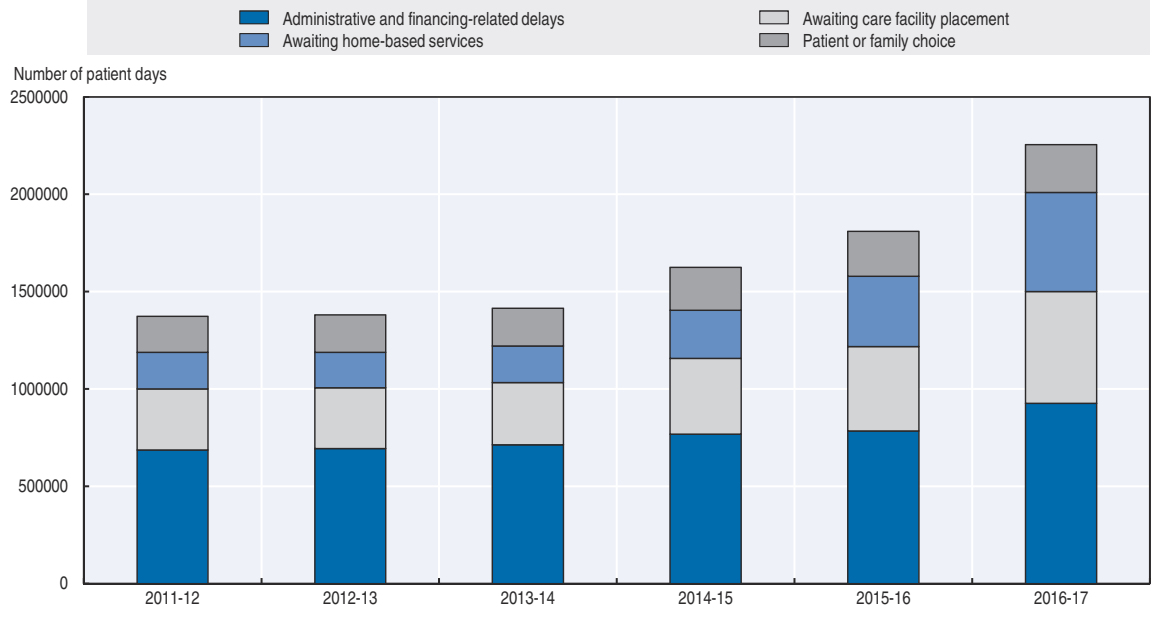
Table 2.5. **Bed days attributable to delayed transfers of care, 2016**

	Number of bed days	Bed days/1 000 population
Denmark	30 844	5
Ireland	201 977	43
Norway	82 411	16
Sweden	393 124	40
United Kingdom (England)	2 254 821	34

Note: Data for the United Kingdom (England) refer to April 2016-March 2017. Bed days per 1 000 population for Denmark was country-reported. Bed days per 1 000 population for all other countries are based on dividing the total number of bed days lost by the 2016 population (UN Population Prospects 2017, medium variant).
Source: Suzuki (forthcoming), "Reducing delays in hospital discharge", OECD Health Working Papers.

The extent of delayed discharges differs markedly, from 5 bed days per 1 000 population in Denmark to 43 bed days per 1 000 population in Ireland, also the country with the highest bed occupancy rate (94%). The proportion of bed days occupied by patients with delayed discharge is driven by two related components: the number of patients who experience a delayed discharge, and the length of the additional stay. In the United Kingdom (England), for example, the number of patients who experienced a delay in discharge from hospital increased by 60% between 2011 and 2016, with the total number of excess bed days over 2.25 million in 2016 (NHS England, 2018).

Figure 2.7. **Bed days associated with delayed transfers of care, England (United Kingdom)**



Source: NHS England (2018).

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Similarly, the number of patients with a recorded delay in discharge doubled in Norway between 2012 and 2016 (Helsedirektoratet, 2018). It is estimated that patients over 65 make up 85% of those with delayed discharge in England (Department of Health, 2016). With population ageing, the challenge of patients experiencing a delay in discharge in European countries is of growing concern.

Approaches to reducing delayed discharge from hospital

The reasons behind rising rates of delayed discharge in many European countries are multifactorial, with elements from health and social care systems. Many of the key drivers are factors outside the hospital itself, including capacity shortages in intermediate, home and long-term care, as well as poor transition planning and care co-ordination.

Several countries have taken steps to increase the capacity of intermediate care facilities and home care to accommodate people who no longer require acute care. Increasing the availability of intermediate care is used as a strategy to improve hospital transitions in the Netherlands, Norway, Scotland, and Sweden. Strengthening home-based care services, including hospital-at-home and outreach services following discharge, has been found to both reduce length of stay and the risk of hospital readmission (O'Connor et al., 2015).

Poor management of hospital transitions and lack of co-ordination between hospitals and community-based services also contribute substantially to delays in discharge (Barker et al., 1985; Shepperd et al., 2013). Hospital discharge planning processes often begin too late in the patient's hospital stay to ensure effective post-discharge care in time. Policies to improve co-ordination, including better integration of primary care into care co-ordination processes, and incentivising better co-ordination through pay-for-performance and pay-for-co-ordination schemes, can help to ensure patient care is better managed following discharge.

Better monitoring of delayed hospital discharges enables countries to develop more finely tailored approaches to reducing them. At least eight European countries currently monitor delayed discharges in some form, of which five have developed financial incentives for reducing them. In Denmark, Norway, Sweden, and the United Kingdom (England), where municipalities play a strong role in delivering social care in the community, financial penalties have been introduced for every additional day a patient spends in hospital after they are clinically ready for discharge. In Denmark, a sharp increase in the daily penalty in January 2017 – from DKK 1976 (~EUR 265) to DKK 3952 (~EUR 530) per day, rising to DKK 5928 (~EUR 795) for the third and all subsequent days of delay – was associated with a decline in the number of delayed discharges reported by hospitals.

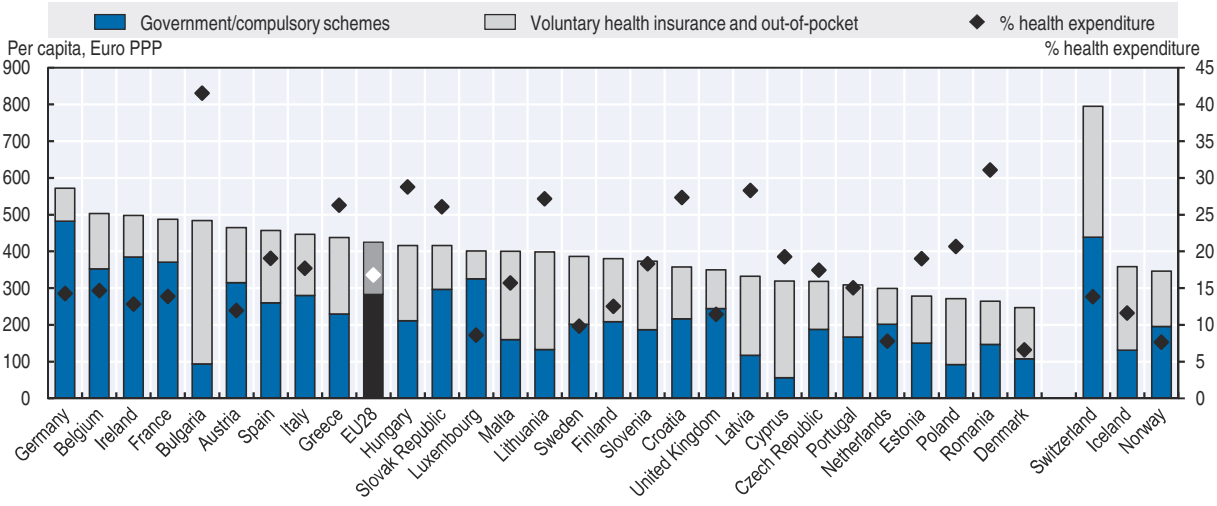
After hospital discharge was identified through patient surveys as the least satisfying aspect of a hospital stay, Norway began re-organising the discharge process, including starting the discharge planning process at admission, communicating important information to municipalities during the admission, facilitating a discharge discussion with patients and families, and creating a discharge checklist. In addition, hospitals are required to contact municipalities within 24 hours of an admission if they believe the patient will require follow-up from health or social care services once discharged.

Addressing wasteful spending on pharmaceuticals

After inpatient and outpatient care, pharmaceuticals represent the third largest component of health spending (see Chapter 5). In 2016, on average medicines accounted

for 17% of total health expenditure in EU countries (excluding medicines used in hospitals), but more than 40% in Bulgaria, over 30% in Romania, and in excess of 25% in Latvia, Lithuania, Greece, Hungary, Croatia and the Slovak Republic (Figure 2.8). Trends in pharmaceutical expenditure are thus an important influence on overall health expenditure patterns. While a high level of spending does not in itself indicate waste, optimising the value derived from medicines expenditure and identifying and eliminating waste where it occurs are both critical to achieving efficient and sustainable health care systems.

Figure 2.8. **Pharmaceutical expenditure (retail) per capita and as a share of health expenditure, 2016**



Note: Pharmaceuticals used in hospitals could add another 30% of spending on top of retail spending.
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en* and Eurostat Database.

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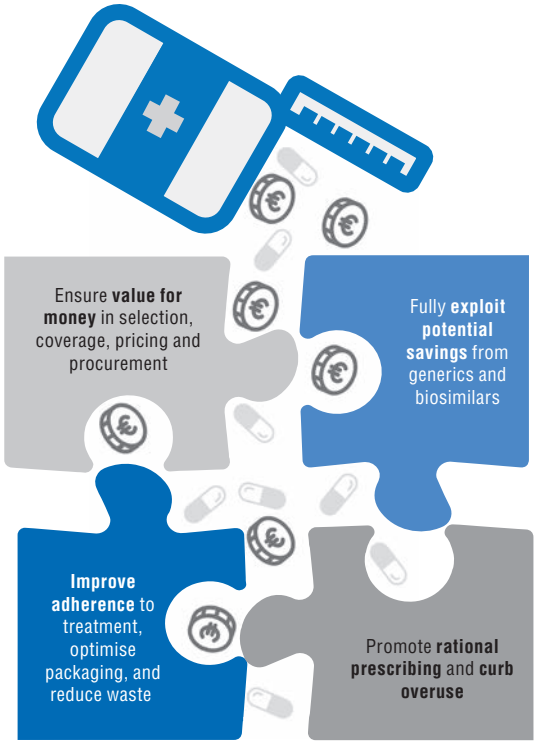
To achieve these objectives – without reducing benefits for patients or undermining the quality of care – a mix of supply and demand side levers can be considered to: i) ensure value for money in selection and coverage, procurement and pricing; ii) promote off-patent competition and exploit the potential of generics and biosimilars; iii) encourage rational use; and iv) improve adherence (Figure 2.9). These are discussed in turn in the remainder of this section.

Ensuring value for money in selection and coverage, procurement and pricing

Using health technology assessment (HTA) to inform the selection of covered medicines

One approach to avoiding wasteful spending is to ensure that those medicines selected for procurement or reimbursement reflect good value for money. Health technology assessment (HTA) is a comparative, multi-disciplinary process used to evaluate the added benefit or impact of health technologies, and which can be used to inform decision makers' assessment of the opportunity cost of replacing an existing standard of care with a new therapy. In this way, selection and coverage decisions can avoid displacing high value products with ones of lesser value to the health system. HTA can also be used to review the value for money offered by existing therapies, and to adjust prices to reflect a desired level of cost-effectiveness or willingness to pay.

Figure 2.9. **Possible approaches to reducing wasteful spending on pharmaceuticals**



Many European countries have established, and several more are in the process of institutionalising forms of HTA to inform the selection of medicines for their public programmes. Twenty-three EU Member States have HTA mechanisms that assess medicines; 20 have HTA systems that also assess medical devices, and 17 countries include the assessment of other technologies. While cooperation between EU countries on HTA has been increasing over time, as part of its 2017 work programme, the European Commission (EC) announced an initiative to take this a step further. In January 2018, the EC issued a proposed Regulation on HTA covering new medicines and certain new medical devices, providing a basis for increased cooperation at EU level. Under the regulation, Member States would develop common HTA tools, methodologies and procedures for: 1) joint *clinical* assessment; 2) joint scientific consultations for developers seeking advice from HTA bodies; 3) identification of emerging health technologies. Member States are currently debating the substance of the proposed regulation, particularly whether (and the extent to which) the cooperation on clinical assessment should be mandatory (European Commission, 2018).

Increasing bargaining power

Intra- and international cooperation among buyers can increase bargaining power, and can improve both the information and resources available to buyers. Belgium, the Netherlands and Luxembourg established a cooperative initiative in 2015, and were joined by Austria in 2016 and Ireland in 2018. The initiative involves cooperation in informing and developing pricing and reimbursement decisions, including joint HTA, horizon scanning and exchange of information from national disease registries, as well as joint price negotiations

with industry (BeNeLuxA, 2017; Department of Health, Ireland, 2018). To date, the focus has been on high-cost and orphan drugs considered priorities in each of the countries, and for which assessment methods are deemed sufficiently similar to allow for such cooperation. Similar cooperation has been announced, but not yet implemented by Bulgaria and Romania in the procurement of high-cost drugs (Novinite.com, 2016); by Poland, Hungary, the Slovak Republic and Lithuania (Visegrad Group, 2017); and by ten Southern European countries that are signatories to the Valletta Declaration (Infarmed, 2018).

Promoting off-patent competition and exploiting the potential of generics and biosimilars[7]

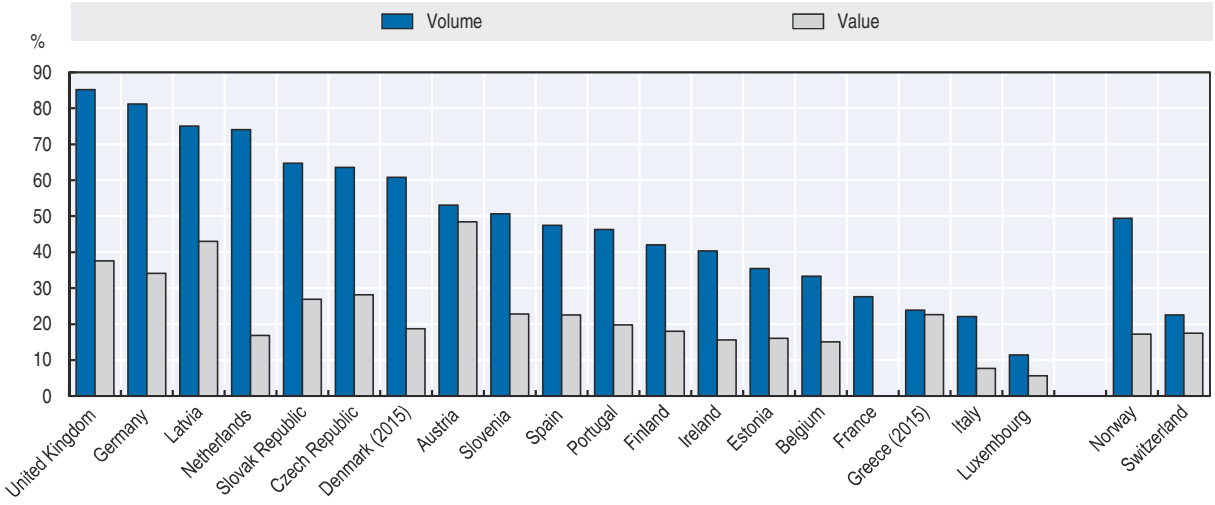
It is widely recognised that the development of competitive generics markets are an important mechanism for reducing expenditure without compromising benefits to patients (Seeley. E, 2008). The use of a cheaper generic equivalent (or in some cases, a cheaper, therapeutically interchangeable drug from the same therapeutic class) in lieu of an originator medicine can generate significant cost savings. Moreover, the market entry of generics can also enhance patient access, particularly in lower-income countries (Elek et al., 2017).

Some countries set single reimbursement amounts for groups of therapeutically equivalent drugs, known as "reference prices", and these can substantially reduce government or other third-party payer outlays. However, they can also discourage competition and lead to higher prices for off-patent medicines than might be expected through competitive procurement mechanisms such as tendering. Rather than offer discounts to government or other third-party payers, to gain market share manufacturers may set their list prices at the reference price level, but offer discounts or other inducements to wholesalers and/or pharmacies. Where third-party payers then reimburse the full reference price, significant profits accrue to wholesalers and pharmacies without any benefits flowing to consumers or third-party payers (Seiter, 2010). In response, some countries have imposed ceilings on wholesaler and pharmacy margins or introduced profit-sharing arrangements (European Commission, 2012). Evidence also suggests that direct regulation of generics prices, for example, by imposing fixed discounts relative to originator products (or using reference prices) is less effective in reducing prices than where prices are established through competitive mechanisms such as tendering or negotiation (OECD, 2017) However, competition-inducing policy measures should be tailored to respective care settings (outpatient vs inpatient) and take into account issues of long-term supply certainty.

Across Europe, prices, market shares and timing of market entry of generic medicines vary widely (Rémuzat et al., 2017; Kanavos, 2014). In 2016, generics accounted for more than 75% of the volume of medicines covered by basic health coverage in Germany and the United Kingdom, but made up less than 30% in Switzerland and Italy, and less than 15% in Luxembourg. A recent study also reported that prices of generics in Switzerland were more than six times higher than in the United Kingdom (Wouters, Kanavos and McKee, 2017). Yet, generic market entry intensity or price decline cannot be entirely explained by the size of a geographical market (Kanavos, 2014). Although some of the observed differences in uptake across countries may reflect differences in the timing of patent expiries, generic uptake depends very much on policies implemented at national level (Belloni, Morgan and Paris, 2016; EvaluatePharma®, 2018). In addition to promoting competitive procurement and pricing, these include encouraging rapid market entry of follow-on products on loss of

market exclusivity of originator medicines; promoting or mandating prescribing by international non-proprietary name (INN)[8]; encouraging and incentivising pharmacists to substitute at the point of dispensing; and incentivising and educating patients.

Figure 2.10. **Generic market share by volume and value, 2016 (or latest year)**



Note: Data reflect the total market when available (if not, data reflect the reimbursed market or the community pharmacy market).
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en* and Eurostat Database.

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Several European countries employ a range of approaches to promoting generic uptake, while others are yet to establish policy frameworks that fully exploit their potential. Over the past decade, Belgium and France have introduced financial incentives to encourage patients to choose a generic rather than an originator product. Belgium also has prescription quotas for doctors, mandatory substitution for some categories of drugs, education and information campaigns for patients, and fixed fees for pharmacies to avoid any unintended incentives to dispense either originator or generic products. However, even though the generic market share by volume doubled from 17% to 35% between 2005 and 2015 in Belgium, generic use is still low relative to many other EU countries such as the United Kingdom, Germany and the Netherlands (OECD/European Observatory on Health Systems and Policies, 2017).

France (in 2009) and Hungary (in 2010) have also introduced incentives for GPs to prescribe generics through pay-for-performance (P4P) schemes. Between 2011 and 2016, the generic market share by volume in France increased from 18% to 28%, but similar to Belgium, it remains well below the EU average, in part because France restricts the categories of drugs for which generic substitution and competition are permitted. In 2015, France implemented mandatory INN prescribing, and the 2017 National Action Plan for the promotion of generics aims to increase the generic market share by a further 5 percentage points by 2018 (CNAMTS, 2018). In Italy, prescribers may indicate either the INN or the brand of a medicine, but unless a reason is provided to preclude substitution (or the patient objects) the pharmacist must dispense the cheapest version of the product. Greece has issued prescribing guidelines; set maximum prices for generics; implemented a compulsory, country-wide electronic prescription system to monitor prescribing and

dispensing; and mandated prescribing by INN, generic substitution in pharmacies, and the use of generics in public hospitals (OECD/European Observatory on Health Systems and Policies, 2017).

Countries that have achieved strong or rapid improvement in penetration of generics include the Netherlands, Denmark, and Spain. In the Netherlands, competition between generics is encouraged by "preference policy", whereby insurers only reimburse the cheapest generic (Zuidberg, 2010). Denmark introduced price controls and promotion of generics, and increased generic market share by volume from less than 40% in 2007 to over 60% in 2015 (OECD/European Observatory on Health Systems and Policies, 2017). Spain adopted a series of measures that include accelerating market entry of generics and mandatory pharmacy substitution with the cheapest generic (since 2006); the generic market share by volume increased from 14% in 2005 to 47.5% of the total reimbursed market in 2016 (OECD/European Observatory on Health Systems and Policies, 2017).

Biologics represent one of the most rapidly growing segments of the pharmaceutical market, predicted to increase from 25% of global sales (by value) in 2017 to 31% in 2024 (EvaluatePharma®, 2018). Just as generic versions of small-molecule medicines generate opportunities to obtain comparable health benefits at lower prices, so do "follow-on biologics" – known as *biosimilars*. However, expanding biosimilar uptake presents some additional challenges; the inherent complexity of biological products means that biosimilars can be more challenging to develop and manufacture than small molecule generics, and as they are not identical to their reference products, they may not be suitable for substitution at the point of dispensing – a key driver of generic uptake.

Biosimilars have been available in Europe for over a decade, and as of 31 March 2018, more than 40 biosimilar products in 15 different biologic classes were approved for marketing in the EU, with 19 new biosimilars authorised between January 2017 and March 2018 (Aideed, 2018). However, despite Europe accounting for nearly 90% of global biosimilar sales (Brennan, 2018), the overall market penetration of biosimilars remains low. With many major patent expiries anticipated between 2018 and 2024, opportunities for further savings are substantial (IMS Institute for Healthcare Informatics, 2016).

Across Europe, significant differences exist in policy approaches to biosimilar pricing and reimbursement, stakeholder incentives for biosimilar use, and levels of education and awareness, with consequent variations in uptake and the extent of savings (Roediger, Freischem and Reiland, 2017; Rémuzat et al., 2017). A recent study of biosimilar policies in 24 countries (20 EU Member States, plus Iceland, Norway, Russia and Serbia) showed that many biosimilars were not uniformly accessible across Europe, with Germany the only country in which all approved biosimilars were available and funded (Moorkens et al., 2017).

In most countries, biosimilar pricing in ambulatory care involves a mix of mechanisms (see Table 2.6), while in the hospital setting, tendering is used in all countries, either at national level or by individual hospitals. In the majority of countries, the reference product and biosimilar may be subject to internal reference pricing to set a common reimbursement level (Moorkens et al., 2017). Demand side measures include incentives for physicians to prescribe biosimilars. For example, France encourages physicians to prescribe at least 20% insulin glargine biosimilars in ambulatory care, while in Belgium biosimilars form part of physicians' quotas for prescribing low-cost medicines, and they are encouraged to prescribe at least 20% biosimilars for treatment-naïve patients.

Table 2.6. **Biosimilar policies across Europe**

Country	Biosimilar pricing in ambulatory care	Internal reference pricing	Incentives to prescribe	Substitution
Austria	1st/2nd/3rd biosimilar prices -38%/-15%/-10% discount from Reference Product (RP). RP must reduce price by 30% three months after 1st biosimilar reimbursement. After 3rd biosimilar, RP must match price of the cheapest available biosimilar.	Yes	Yes	No
Belgium	Prices of biosimilars negotiated on a case by case basis, maximum reimbursed price cannot be > RP. RP must reduce price on market entry of biosimilar.	No	Yes	No
Bulgaria	Ex-factory price of biosimilar cannot exceed lowest price in a set of countries (Bulgaria, Romania, France, Latvia, Greece, Slovak Republic, Lithuania, Portugal, Italy, Slovenia, Spain, Belgium, Czech Republic, Poland, Hungary, Denmark, Finland, or Estonia), referred to as external reference pricing (ERP). Ceiling retail price is determined using 3-levels of regressive margins.	Yes	No	No
Croatia	Biosimilar price determined via ERP (Italy, Slovenia, Czech Republic, Spain, France). 1st biosimilar: -15% on RP/subsequent biosimilars: -10%.	Yes	No	No
Czech Republic	The price and reimbursement of 1st biosimilar -30% of the RP. List price of RP remains the same, but reimbursement level is lowered to the price of the biosimilar. The maximum price of the biosimilar is determined via ERP of all EU countries except Bulgaria, Czech Republic, Estonia, Luxembourg, Germany, Austria, Romania, Cyprus and Malta.	Yes	No	No
England	Free pricing, with volume based pricing scheme (rebates when expenditure exceeds agreed total). However biosimilars predominantly sold to hospitals, which procure them via a nationally coordinated tendering process.	No	Yes	No
Estonia	The price is negotiated; in ambulatory care the price must be at least 15% < RP.	Yes	Yes	Yes
Finland	The price of the biosimilar must be < the price of the RP. The wholesale price of the 1st reimbursable biosimilar must be at least 30% < wholesale price of RP.	No	Yes	No
France	Prices determined by negotiation, but typically 10-20% below the price of RP, taking into account a range of factors including the price in the rest of Europe.	Yes	Yes	Yes
Germany	Free pricing.	Yes	Yes	Yes/No
Iceland	The price of the biosimilar must not be higher than the lowest wholesale price in Denmark, Norway, Sweden and Finland. Once a biosimilar is on the market, the price of the RP is reduced to 80% of the original ex-factory price.	No	Yes	No
Ireland	The price of the biosimilar is negotiated, typically 10-20% below RP.	No	No	No
Italy	In general, biosimilars are priced approximately 20% < RP.	No	Regional	No
Latvia	1st biosimilar at least -30% on RP; 2nd and 3rd biosimilars at least -10% on 1st/2nd biosimilars; subsequent biosimilars: -5% further decrease. Price may not be > 1/3 lowest price in Czech Republic, Romania, Slovakia, Hungary and Denmark, and no higher than in Estonia and Lithuania.	Yes	No	Yes
Malta	Maximum price is set for national procurement through ERP. Procurement by centralised tendering (by INN, thus promoting competition).	No	No	No
Netherlands	The price of a biosimilar is officially the same as the price of the RP.	Yes	In hospitals	No
Norway	The price of the biosimilar cannot be higher than the price of the RP.	No	Yes	No
Poland	1st biosimilar: -25% on RP; 2nd biosimilar must be < 1st, "limit groups" exist where the cheapest is the limit for the whole group.	Yes	No	Yes
Portugal	ERP, with annual changes in reference countries (2017: Spain, France and Italy), to establish maximum price. For reimbursement biosimilar must be < 80% of RP or < 70% of RP when biosimilar market share is ≥ 5% for the INN.	No	In hospitals	Yes/No
Serbia	1st biosimilar: -30% on RP, sets the reimbursement rate. 2nd biosimilar: -10% on 1st biosimilar. 3rd biosimilar: -10% on 2nd biosimilar, with maximum 90% of average price in Slovenia, Croatia, and Italy. National tendering by brand name can occur.	Yes	No	No
Slovenia	Biosimilar price is either 92% of the lowest price in Austria, Germany and France, or 92% of median price in other EU/EEA countries. If the biosimilar is not in any of the reference countries or EU/EEA countries, price is 68% of RP.	Yes	No	No
Spain	The price of the biosimilar is negotiated, typically 20-30% below the price of the RP. A maximum price is set for national procurement.	Yes	In some regions	No
Sweden	The price of the biosimilar must be same or lower than that of RP.	No	Regionally	No

ERP: External Reference Pricing, EU: European Union, EEA: European Economic Area, RP: Reference Product.

* In Italy, biosimilars are considered interchangeable with their RPs, but substitution is only at the discretion of the prescriber. See *www.agenziafarmaco.gov.it/sites/default/files/2_Position-Paper-AIFA-Farmaci-Biosimilari.pdf*.

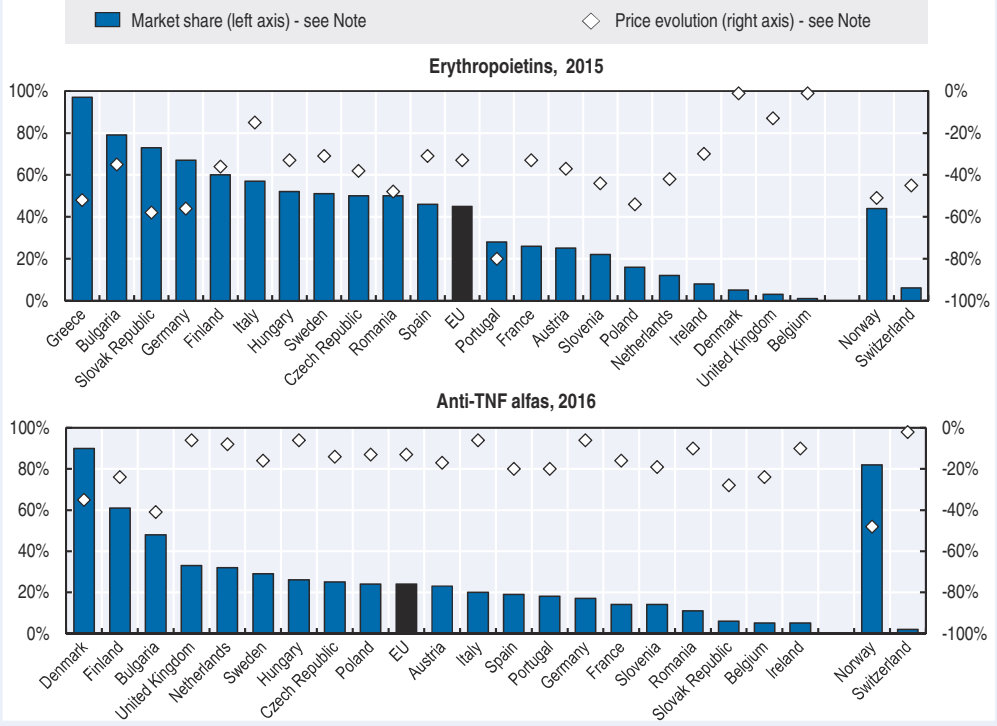
** In Portugal, substitution is encouraged for infliximab, rituximab and etanercept if the biosimilar is cheaper and the patient stable, but is not mandatory.

Source: Adapted from Moorkens et al. (2017).

Box 2.1. **Current and potential future savings from the use of biosimilars**

In 2016, it was estimated that biosimilars could generate savings up to EUR 100 billion by 2020 in the five most populous countries in the European Union (Germany, France, Italy, Spain and the United Kingdom) plus the United States. Although thus far price reductions offered by biosimilars have not been nearly as large as those seen with small molecule generics, discounts of over 60% have been reported for selected products (see graphs). Uptake of biosimilars also varies substantially across Europe. That said, the correlation between biosimilar market shares and price reductions is weak, suggesting the existence of barriers to effective competition. Promoting biosimilar uptake is important for driving savings and ensuring the continued participation of players in the market, but it is the market entry of biosimilars that promotes price competition. The two graphs below show a) the *market penetration of biosimilars as a proportion of all products within the same drug class eligible for biosimilar competition* (vertical bars, left axis) and b) the *price evolution across all products within the class eligible for biosimilar competition* (diamonds, right axis). The first graph shows the results for the class of drugs known as erythropoietins, used in the acute care setting to stimulate red blood cell production in a number of conditions, including chronic renal failure. Erythropoietins were among the first biosimilar products to be approved in Europe. The second graph shows similar metrics for anti-TNF alfas, a class of drugs used for a range of chronic conditions such as rheumatoid arthritis and Crohn's disease, and for which biosimilars have entered the market more recently.

Figure 2.11. **Market share of biosimilars and price evolution**



Note: Graphs show market share of biosimilars for year shown: a) biosimilar treatment days (TD) as a proportion of TD of all products in the drug class eligible for biosimilar competition (*vertical bars, left axis*) and b) price evolution (change in price per TD for year shown across all products in the drug class eligible for biosimilar competition, relative to price per TD in the year prior to biosimilar market entry [*right axis*]).
Source: IMS Institute for Healthcare Informatics (2016); Quintiles IMS (2017).

StatLink http://dx.doi.org/10.1787/888933834243

Portugal has recently implemented financial incentives for pharmacies to encourage dispensing of lower price medicines, and defined target market shares for biosimilar versions of infliximab, etanercept and rituximab. In the Netherlands, limitations on the prescribing of reference products are often part of agreements reached between insurance companies and hospitals, though budget constraints within hospitals already provide incentives for the use of biosimilars. Substitution rules are also important in influencing biosimilar uptake. With the exception of Estonia, France, Latvia, and Poland, most countries do not permit unrestricted substitution of biologicals at the point of dispensing. In France, draft legislation permitting substitution of biosimilars was introduced in 2017 but is limited to initiating treatment in treatment-naïve patients, or to ensuring continuity for patients previously dispensed a biosimilar (ibid.).

Encouraging rational use

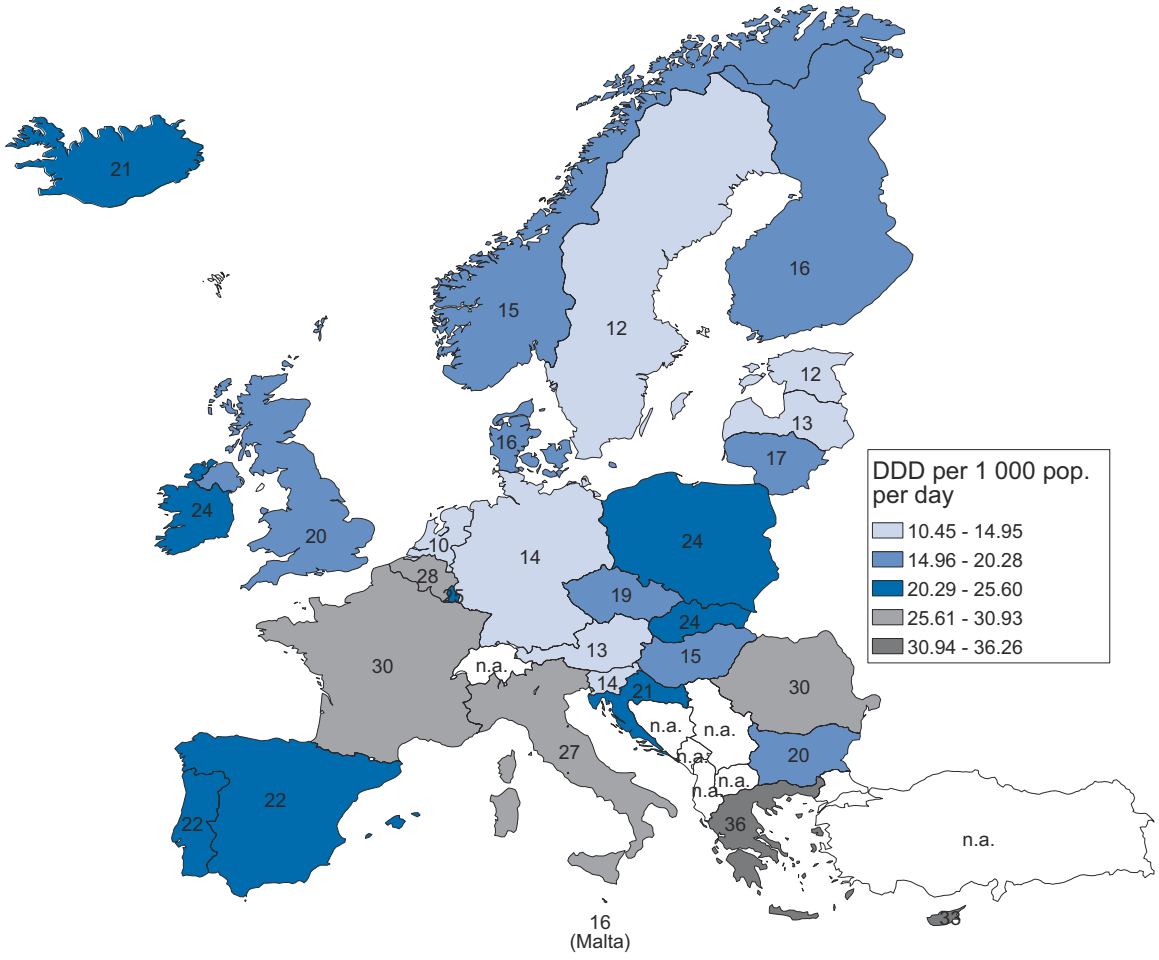
Efforts to minimise waste in expenditure on medicines can be undermined significantly by over-prescribing and inappropriate use. Over-prescribing not only wastes resources, it increases the risks of therapeutic failure, adverse events, and the development of antimicrobial resistance (AMR). This section focuses on two specific groups of medicines that are frequently subject to over-prescription, and have particular implications for public health: antibiotics and hypnotics/anxiolytics (mainly benzodiazepines).

Antimicrobial resistance represents an increasingly serious social and economic burden globally, projected to be responsible for as many as 33 000 deaths per year in the EU alone between 2015 and 2050, if no effective action is put in place (OECD, 2018). In addition, overprescribing of antibiotics incurs a number of other direct and indirect costs, by medicalising conditions for which antibiotics are not useful, and by putting patients at risk of adverse effects (and the costs of treating them).

Primary care accounts for 80-90% of all antibiotic prescriptions in Europe, with most prescribed for respiratory tract infections (van der Velden et al., 2013). However, rates of antibiotic prescribing differ significantly across Europe, despite little evidence of differences in the prevalence of infectious diseases (Llor and Bjerrum, 2014). In 2016 the population-weighted average consumption of antibiotics for systemic use in the community was 22 defined daily doses (DDD)[9] per 1 000 population per day, and ranged from 10 DDD (the Netherlands) to 36 DDD per 1 000 population per day (Greece), a 3.5-fold difference (Figure 2.12).

Prescribing influences have been shown to be multifactorial and include cultural and socioeconomic elements, diagnostic uncertainty, the way health care is funded or reimbursed, the percentage of generic drugs in the market, economic incentives and pharmaceutical industry influences, attitudes and beliefs about the therapeutic value of antibiotics among patients, as well as differences in prescriber and patient expectations of consultations for respiratory tract infections (Llor and Bjerrum, 2014). A 2014 survey of over 1 000 GPs in the United Kingdom reported that 55% felt under pressure, mainly from patients, to prescribe antibiotics, and 44% admitted to prescribing antibiotics to get a patient to leave the surgery (Cole, 2014). There is a clear need to improve health literacy, in particular to raise awareness about antibiotic use and resistance among European populations, while the increasing prevalence of antibiotic-resistant bacteria could be addressed, at least in part, by promoting more limited and appropriate antibiotic use in primary care and in the community (European Centre for Disease Prevention and Control,

Figure 2.12. **Consumption of antibiotics in the community, EU/EEA countries, 2016 (DDDs per 1 000 population per day)**



Note: These data are mainly drawn from sales of antibiotics in the country, or a combination of sales and reimbursement data. Cyprus and Romania provide data on overall consumption (including the hospital sector). Spain provides data only on reimbursed antibiotics (i.e. not including consumption without prescription or not reimbursed).
Source: European Centre for Disease Prevention and Control (ECDC) (2017).

2014). Findings from a recent OECD publication investigating the effectiveness and cost effectiveness of public health policies to promote prudent use of antimicrobials support an upscaling of national actions in this direction (OECD, 2018).

In addition to differences in antimicrobial use, patterns of resistance, and the extent to which effective national policies to deal with AMR have been implemented vary within the EU. In June 2017, the European Commission adopted the *EU One Health Action Plan against AMR* to i) make the EU a best practice region; ii) boost research, development and innovation; and iii) shape the global agenda on AMR (European Commission, 2017). The European Commission has also published guidelines for the prudent use of antimicrobials in human health (European Commission, 2017).

Levels of prescribing of hypnotics and anxiolytics, especially among the elderly, are another important public health issue. Benzodiazepines (BZDs) and related drugs are frequently prescribed for older adults for anxiety and sleep disorders, despite

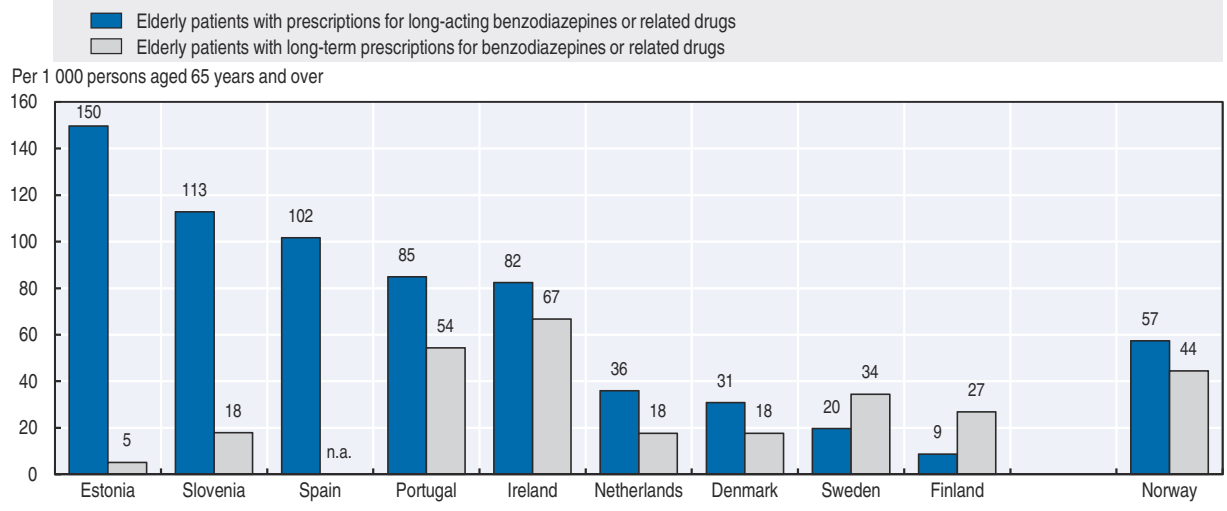
Box 2.2. **Approaches to reducing AMR in Belgium**

AMR has been recognised as an important public health issue in Belgium for several years. The Belgian Antibiotic Policy Coordination Committee, established in 1999, is responsible for fostering more appropriate use of antibiotics in humans and animals and for promoting infection control and hospital hygiene, with the overall aim of reducing AMR. Recent measures to reduce antibiotic consumption have targeted patients (e.g. through public awareness campaigns and increased co-payments for some antibiotics) and prescribers (e.g. through organised feedback), and have contributed to a reduction in hospital-acquired antibiotic-resistant staphylococcus infections. Although Belgium performs relatively well in terms of levels of resistance, it now faces challenges in preventing and controlling infections by carbapenem resistant isolates (CREs).

Source: OECD/European Observatory on Health Systems and Policies (2017), European Centre for Disease Prevention and Control (2018).

well-documented risks of adverse effects including fatigue, dizziness and confusion. Long-term use of BZDs can also lead to falls, accidents and overdose, as well as tolerance, dose escalation and dependence, long-term cognitive impairment and pseudo-dementia (Ford and Law, 2014). Apart from the associated mortality and morbidity, these impose substantial additional and potentially avoidable costs on health systems. In addition to issues arising from prolonged use, there is also concern about the types of BZDs being prescribed in the older age groups, with long-acting products not recommended in older adults (OECD, 2017). While data are available for only a few countries (Figure 2.13), wide variations in prescribing rates are apparent, with the rate of *long-term*[10] BZD prescribing in the over 65s highest in Ireland, and nearly 13 times that of Estonia. Conversely, prescribing of *long-acting* BZDs in the over 65s was highest in Estonia, with a rate more than 17 times that of Finland.

Figure 2.13. **Elderly patients with prescriptions for benzodiazepines or related drugs, number per 1 000 patients aged 65 and over, 2015 or nearest year**



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933834262

Improving adherence and other avenues for reducing waste

Apart from contributing to an estimated 200 000 premature deaths, poor adherence to prescribed medication is thought to cost as much as EUR 125 billion in Europe each year in avoidable hospitalisations, emergency care, and adult outpatient visits (OECD, 2017). Three prevalent chronic conditions – diabetes, hypertension, and hyperlipidaemia – appear to give rise to the highest avoidable costs. Among patients with these three conditions, it has been estimated that between 4 and 31% do not fill their first prescription; of those who fill their first prescription only 50 to 70% take their medications regularly (i.e. at least 80% of the time); and more than half discontinue taking them within two years (Khan and Socha-Dietrich, 2018).

Modelled over a 10-year period in five European countries (Italy, Germany, France, Spain, and England), the potential savings from increasing adherence to antihypertensive treatment to 70% have been estimated at EUR 332 million (Mennini et al., 2015). Research undertaken in the United Kingdom also identified potential savings of over GBP 100 million (EUR 111 million) annually if 80% of patients with hypertension were adherent to treatment (Trueman et al., 2010). The same report estimated the annual cost of medicine wastage in primary care to be as high as GBP 300 million (EUR 333 million), of which GBP 100-150 million (EUR 111-166 million) was identified as avoidable. However the authors also found that while patient non-adherence contributes to wastage, a range of other factors are also implicated, some of which are unavoidable, such as treatment changes due to lack of efficacy or the emergence of adverse effects. Those that can be addressed included inappropriate repeat prescribing and dispensing processes, which, independently of any patient action, may cause excessive volumes of medicines to be supplied (Trueman et al., 2010). A study examining waste samples in Vienna in 2015-16 found significant quantities of prescription medicines discarded in household garbage. By extrapolation the authors estimated the value of the discarded medicines to correspond to approximately 6% of public pharmaceutical expenditure nationally in the year of survey, or at least EUR 21 per person to Austrian social health insurance (Vogler and de Rooij, 2018).

Box 2.3. **Reducing waste in the United Kingdom**

The National Health Service's *MedicineWaste* campaign provides information about common reasons for discarding medicines, describes simple steps for patients to follow to enhance adherence, and proposes a short checklist for clinicians to evaluate repeat prescriptions (NHS Business Services Authority, 2015). In addition, across the UK, pharmacists work alongside GPs to improve outcomes by undertaking patient-facing clinical medication reviews, and improving the management of long-term conditions (Mann et al., 2018). In September 2017, the Department of Health & Social Care established a Short Life Working Group (SLWG) to provide advice on a programme of work to improve medication safety. Recommendations of the SLWG included the rollout of primary care interventions such as PINCER (pharmacist-led information technology intervention) which have been shown to be effective in reducing a range of medication errors in general practices with computerised clinical records. Other efficiency initiatives introduced in the United Kingdom in recent years include the *Hospitals Pharmacy & Medicines Optimisation* (HoPMOp) project, which helps NHS acute hospital trusts to implement the recommendations of the review of NHS productivity and efficiency by Lord Carter of Coles, and the *Getting It Right First Time* (GIRFT) project, which aims to reduce unwarranted variation in clinical practice across the NHS.

In hospitals, medicines may be discarded because of inappropriate pack sizes, often the case with drugs requiring weight-based dosing (common in oncology), or that are supplied in single-dose units that must either be administered or discarded once opened (OECD, 2017). The latter issue requires an audit of the extent to which regulation – or a lack of it – contributes to unnecessary waste. For instance, regulatory agencies could require manufacturers to provide drugs in a variety of pack sizes to ensure that an amount of drug more closely corresponding to a patient's body weight or size can be drawn up without waste, and could develop or revise existing guidelines on vial sharing. Alternatively, payers could determine reimbursement amounts that correspond to the actual dose administered (i.e. no reimbursement for leftover drug) (ibid.).

Policies aimed at tackling poor adherence and unnecessary waste of medicines by patients are aimed at encouraging improved communication between clinicians and patients and enhancing patient understanding of the importance of completing prescribed courses of treatment. Clinical trials conducted in the United Kingdom and Sweden suggest that wastage could be reduced by up to 30% if patients starting new courses of treatment were offered additional opportunities to discuss medication-related issues over and above the initial instructions given at the time of prescribing (OECD, 2017). Targeted medication reviews can be used to monitor patients' consumption of medication and establish the need for (or lack of) prescription renewal (Trueman et al., 2010) (Box 2.3).

Conclusions

Progress in reducing wasteful spending in health is not only a barometer of quality improvement; it is both an ethical and financial imperative in the pursuit of resilient and equitable health care systems. While the estimate that as much as one-fifth of health spending could be eliminated is sobering, the many avenues for saving money and streamlining services, without undermining access or quality of care, are cause for optimism. Pointing the lens at two major areas of expenditure – hospitals and medicines – reveals a range of options for improving efficiency and reducing waste, but significant variation across Europe in the extent to which these options are being deployed.

For hospitals, reducing or eliminating unnecessary investigations and procedures, many of which expose patients to unnecessary risks without the prospect of clinical benefit, is an obvious target for direct intervention. Expanding the use of day surgery can also be instigated at hospital level. However minimising avoidable admissions, particularly for ambulatory care-sensitive conditions, reducing unnecessary length of stay, and improving discharge processes require broader perspectives. Enhanced primary care services, expanded post-acute care facilities, post-discharge care coordination, and in-home care services all require health system reforms that cannot be initiated by hospitals alone.

For pharmaceuticals, creating and supporting competitive markets and promoting the uptake of generics and biosimilars can generate substantial savings. That said, reducing waste does not necessarily mean spending less; it may equally be achieved by gaining better value for money from existing expenditure. Both supply and demand side levers offer scope for better value. Using health technology assessment to inform selection, pricing and procurement of new medicines facilitates an understanding of the true opportunity costs of therapies and helps avoid the displacement of high value interventions with ones of lesser value.

In all approaches to reducing waste, stakeholder engagement and effective communication are critical. Prescribers and patients need to understand the value offered by generics and biosimilars, and be adequately reassured as to their equivalence and safety. Both need to appreciate the risks of overprescribing antibiotics and the circumstances in which they are of low or no benefit. In hospitals, patients and providers need to recognise that not only will certain investigations and procedures provide no benefit, they may even be harmful. Financial incentives for patients and providers must also be calibrated to reinforce appropriate behaviours. Above all, the development and promulgation of guidelines and protocols that provide both a basis for discussion and engagement and support for rational clinical decision-making, are critical to the waste-reducing armamentarium.

Notes

1. This analysis captures only five of thirty conditions for which hospitalisations may be avoidable through better primary care, and is therefore conservative. That said, not all hospitalisations related to these five conditions would be avoidable. Some analysts argue that only admissions involving a short stay in hospital – as a proxy for severity – should be counted (Swerissen, Duckett and Wright, 2016).
2. Analyses which group women according to obstetric criteria (for instance number of foetuses, presentation of foetus, previous C-section) provide finer analyses of the drivers behind these trends and differences in C-sections rates (Betrán et al., 2014).
3. A campaign, established in 2012 by the American Board of Internal Medicine and since emulated in a growing number of countries, has sought to promote a dialogue around appropriate care. One of its core strategies has been to encourage medical societies to draw up shortlists of services known to be used inappropriately, and issue "do-not-do" recommendations to guide providers and patients in reducing their utilisation.
4. Day surgery is defined as the release of a patient who was admitted to a hospital for a planned surgical procedure and discharged the same day. The analysis covers 22 EU countries only due to data gaps in the other six: Greece and Latvia do not report data on day surgery; Cyprus only reports data for public hospitals (which account for less than half of hospital activities); and Bulgaria, the Czech Republic and the Slovak Republic only report data for one or two of the procedures considered here. The main limitation in data comparability is that many countries do not include outpatient surgery, defined as situations where patients are not formally admitted to or discharged from hospitals (see the indicator "Day Surgery" in Chapter 8 for more information).
5. Tonsillectomy is mainly performed in children. Inguinal hernia repair is a procedure to repair a defect in the abdominal wall that allows abdominal contents to slip into a narrow tube called the inguinal canal and is commonly performed laparoscopically (using minimally invasive keyhole surgery, allowing patients to return home more quickly). Cholecystectomy is the removal of the gallbladder, also commonly performed laparoscopically.
6. Delayed discharges from hospital are defined here as cases in which a hospital patient remains in hospital, despite being clinically ready to be discharged.
7. A generic medicine is defined as a pharmaceutical product with the same qualitative and quantitative composition in active substances, and the same pharmaceutical form as the reference product, and to which bioequivalence has been demonstrated. A biosimilar is a biological medicinal product that contains a "follow-on" version of an already-authorised biological reference product and has no clinically meaningful differences in terms of safety and effectiveness from the reference product. However, although biosimilars are conceptually similar to generic versions of chemically derived small molecule medicines, because of the complexity and inherent heterogeneity of biotechnological products, and of the manufacturing processes used to produce them, a follow-on biologic is referred to as "biosimilar" rather than "biogeneric".
8. International Non-proprietary Names (INN) are unique and globally recognised names used to identify pharmaceutical substances. All pharmaceutical products are assigned an INN; most will also carry a brand or trade name which, unlike the INN, may differ between countries.
9. The DDD is the assumed average maintenance dose per day for a drug used for its main indication in adults. The DDD is a unit of measurement and does not necessarily reflect the recommended or prescribed daily dose.

10. "*Long-term*" refers to prolonged duration of use; "*long-acting*" refers to a drug that has slow absorption and maintains its effects over an extended period.

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PART II

Overview of health indicators

PART II

Chapter 3

Health status

This chapter describes the health status of EU citizens, including recent trends in life expectancy, the main causes of death, health inequalities by gender and socioeconomic status, and the occurrence of communicable and chronic diseases.

Life expectancy now reaches 81 years on average across EU countries, but the gains have slowed down markedly in several Western European countries in recent years, with even some reductions in certain years. This appears to have been driven by a slowdown in the rate of reduction of deaths from circulatory diseases and periodical increases in mortality rates among elderly people due partly to bad flu seasons in some years.

The main causes of deaths across EU countries remain circulatory diseases (over 1 900 000 deaths in 2015) and cancers (1 320 000 deaths), which together account for over 60% of all deaths.

Large inequalities in life expectancy persist not only by gender (women still live nearly 5½ years more than men on average), but also by socioeconomic status. On average across EU countries, 30-year-old men with a low education level can expect to live about 8 years less than those with a university degree or the equivalent. The "education gap" among women is smaller, at about 4 years. Large inequalities also exist in how people rate their health: nearly 80% of adults in the highest income group report to be in good health across EU countries, compared with about 60% of people in the lowest income group.

Communicable diseases, such as measles, hepatitis B and many others, pose major threats to the health of European citizens, although vaccination can efficiently prevent these diseases. 13 475 cases of measles were reported across the 30 EU/EEA countries from May 2017 to May 2018, up by nearly 60% over the preceding 12-month period. But in most countries where vaccination coverage is high, very few cases of measles were reported.

TRENDS IN LIFE EXPECTANCY

Life expectancy has increased in EU countries over the past decades, but this rise has slowed down since 2010 in many countries, particularly in Western Europe.

Life expectancy at birth reached 81 years across the 28 EU member states in 2016. Spain and Italy have the highest life expectancy among EU countries, with life expectancy reaching over 83 years in 2016. Life expectancy at birth now exceeds 80 years in two-thirds of EU countries, but still remains at only around 75 years in Bulgaria, Latvia, Lithuania and Romania (Figure 3.1).

As is the case around the world, women live longer than men in EU countries – on average nearly 5½ longer – although this gap has narrowed by one year since 2000 as life expectancy among men increased more rapidly in most countries. The current gender gap is particularly large in Latvia and Lithuania where women live more than 10 years longer than men, and is also quite large in Bulgaria and Romania. These gender gaps are partly due to greater exposure to risk factors among men, particularly greater tobacco consumption, excessive alcohol consumption and less healthy diet, resulting in higher death rates from heart diseases, various types of cancer and other diseases.

Until recently, life expectancy was rising fairly rapidly and steadily across EU countries, by about 2½ years per decade on average. However, since 2011, the gains in life expectancy have slowed down markedly, particularly in some Western European countries, with less than half a year gained between 2011 and 2016 in countries like France, Germany, the Netherlands and the United Kingdom. Life expectancy actually decreased in 8 EU countries in 2012 and in 19 countries in 2015, including in France, Germany, Italy and the United Kingdom, particularly among people aged over 75, before recovering in 2016 (Figure 3.2).

The marked reduction in 2015 was due at least partly to excess mortality in the winter months, especially among older people, related to a bad flu season and increased mortality from cardiovascular diseases. Excess mortality among older people has also been observed during the winter 2017-18 (EuroMOMO, 2018), which may impact negatively on life expectancy in some countries. Another important factor that has contributed to the recent slowdown in life expectancy gains in many EU countries is the slowdown in the reduction in death rates from circulatory diseases, which was previously the main factor driving life expectancy gains.

In the United Kingdom, the recent stalling in life expectancy gains has prompted comments about the causes, including the possible effects of austerity measures on health and other public spending (Hiam et al., 2018). In Europe, some countries that have implemented more severe austerity measures, such as Greece and Spain, have continued to experience rising life expectancy since 2011, with the notable exception of 2015 when life expectancy also came down in these two countries. Further research is needed to understand better the recent slowdown in life expectancy gains in many European countries (Raleigh, 2018).

Definition and comparability

Life expectancy at birth measures the average number of years that a person can expect to live based on current mortality rates (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, actual life spans will on average be higher than life expectancy calculated with current death rates.

References

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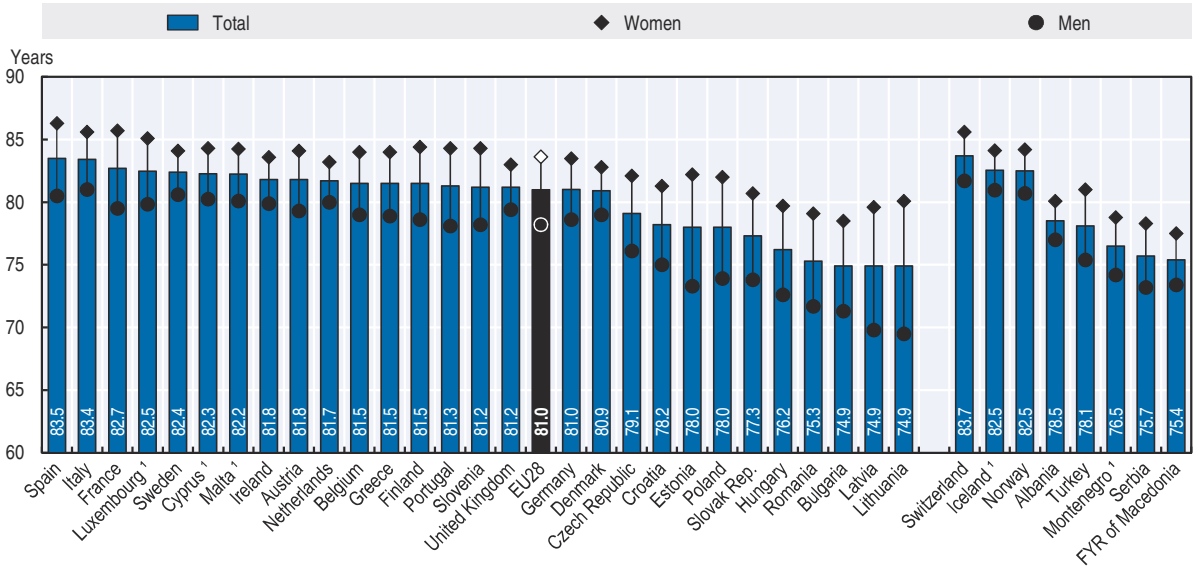
Raleigh, V. (2018), Stalling life expectancy in the UK, *British Medical Journal*, 362, 27 September 2018.

3.1. Life expectancy at birth, by gender, 2016

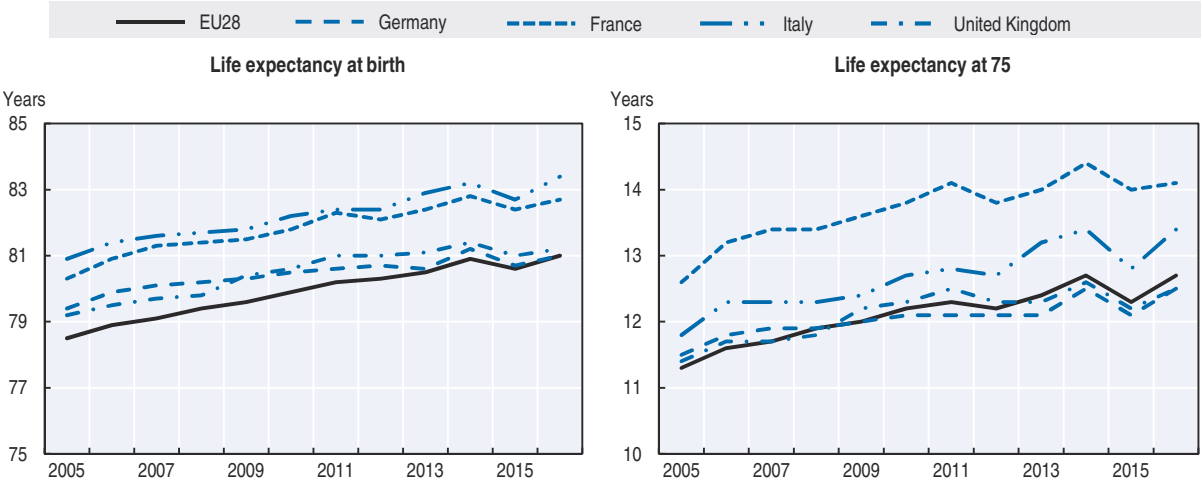


1. Three-year average (2014-16).

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834281

3.2. Trends in life expectancy, 2005-16



Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834300

INEQUALITIES IN LIFE EXPECTANCY

Large inequalities in life expectancy exist not only by gender, but also by socioeconomic status, no matter how it is measured – by education level, income or occupational group. This section focuses mainly on inequalities by education level since this is the socioeconomic indicator with the most widely available data.

Inequalities in life expectancy by education level are generally larger among men than among women, and are particularly large in Central and Eastern Europe (Figure 3.3). On average across EU countries, 30-year-old men with less than upper secondary education can expect to live about 8 years less than those with a tertiary education (a university degree or the equivalent). The education gap among women is smaller, at about 4 years. In the Slovak Republic, Hungary, Poland, the Czech Republic and Latvia, 30-year-old men with a low level of education can expect to live more than 10 years less than those with a high level of education.

This education gap in life expectancy is due to higher mortality rates among the least educated at different ages. Figure 3.4 shows the difference in the (age-standardised) mortality rate for some of the main causes of death between low-educated and high-educated men and women for two age groups (25-64 and 65-89 years) across 10 European countries. The education gap is particularly large among men in both age groups. While the mortality rate among prime-age men (25-64 years) is much lower than among older men (65-89 years), the gap in mortality rate between low-educated and high-educated prime-age men is wider – an almost four-fold difference. This gap is due to much higher mortality rates from all the main causes of death among low-educated prime-age men. Half of the gap in mortality rate among men in that age group is due to higher death rates from circulatory diseases and cancer, and another 20% is due to external causes of death (e.g. accidents and suicides). An important gap in mortality rates by education level also exists among older men and women, driven mainly by higher death rates from circulatory diseases and cancer (Murtin et al., 2017).

Smoking remains a very important risk factor for both circulatory diseases and different types of cancer (notably lung cancer). A substantial part of the education gap in mortality is due to higher smoking rates among people with a lower level of education (see indicator "Smoking among adults" in Chapter 4). A greater prevalence of other risk factors such as excessive alcohol consumption, particularly among low-educated men, also contribute to higher mortality rates from circulatory diseases, different types of cancer and external (violent) causes of death.

Gaps in life expectancy at age 30 have remained relatively stable over the past decade, as life expectancy increased at about the same rate for lower-educated and higher-educated people in the group of countries with time series.

Looking beyond the gap by education level, some countries regularly monitor inequalities in life expectancy by income or deprivation level. In France, the results for the period 2012-16 show a gap of 8 years in life expectancy at age 35 between men in the top income quartile and those in the bottom income quartile. This gap is slightly smaller (5 years) among women (INSEE, 2018).

Reducing inequalities in life expectancy across socioeconomic groups requires coordinated actions involving not only health ministries but also other ministries responsible for education, labour, social protection and housing (James et al., 2017).

Definition and comparability

Life expectancy measures the average number of remaining years of life for people at a specific age based on current mortality conditions. Education level is based on the ISCED 2011 classification. The lowest education level refers to people who have not completed their secondary education (ISCED 0-2). The highest education level refers to people who have completed a tertiary education (ISCED 6-8). Data on life expectancy by education level have been extracted from the Eurostat database for most countries, with the exception of Austria, Belgium, France, Latvia, the Netherlands and the United Kingdom which have provided data directly to the OECD.

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 level are only available for a subset of the population for the Czech Republic and Norway. In these two 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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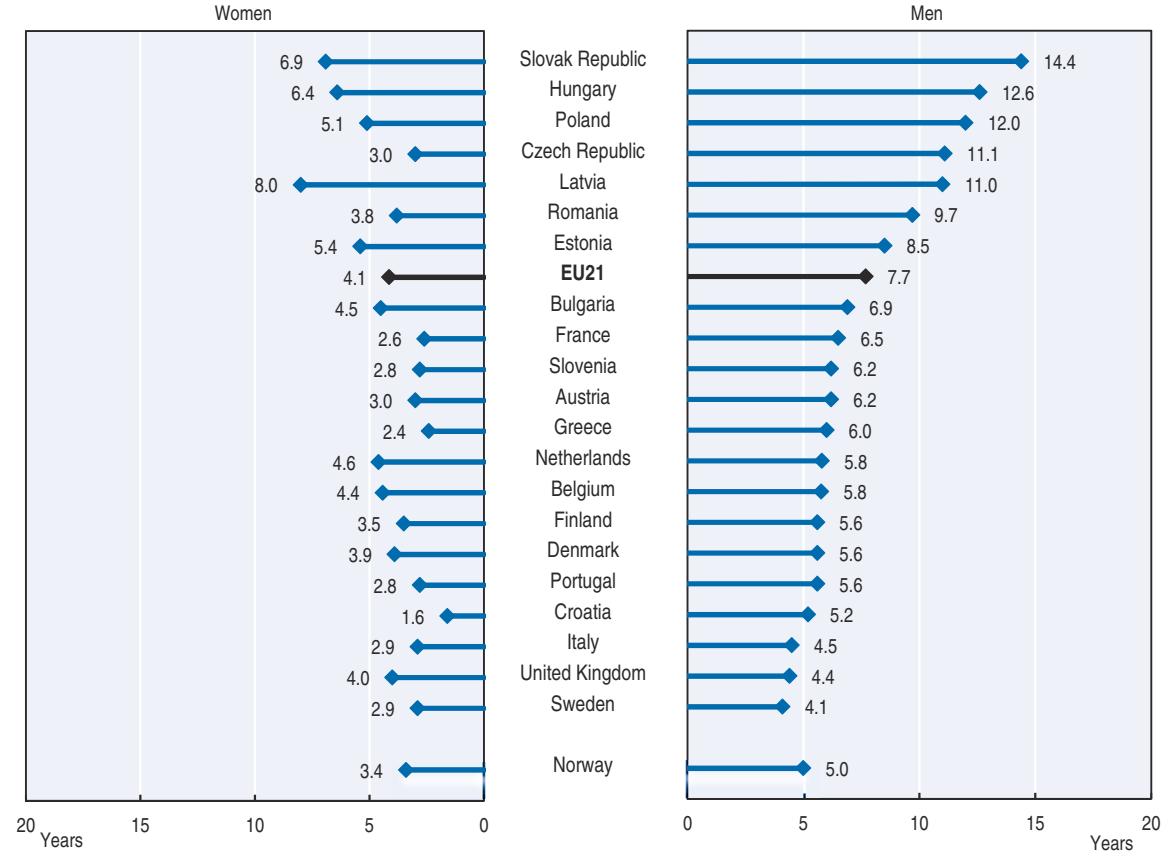
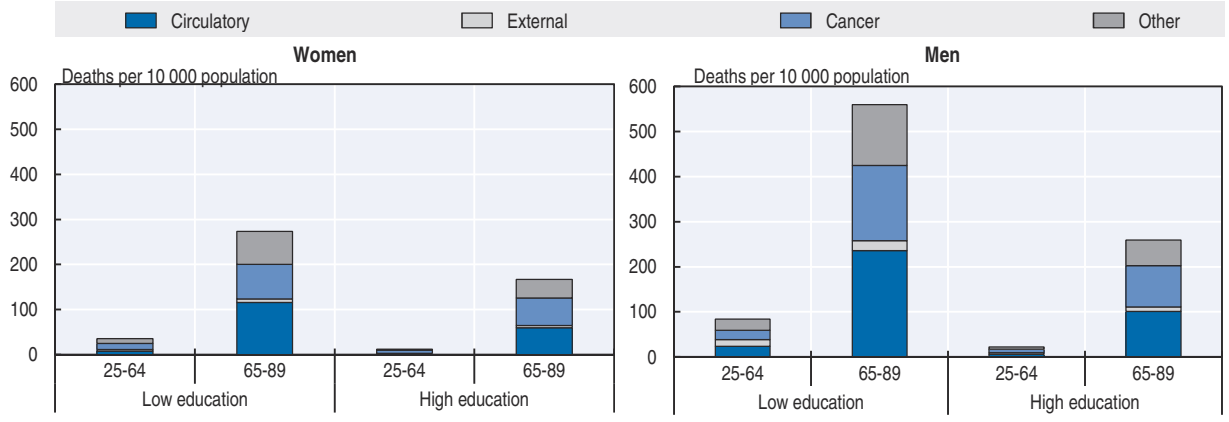
3.3. Gap in life expectancy at age 30 between people with the lowest and highest level of education, 2016 (or nearest year)



Note: Data refer to 2012 for France and Austria and to 2011 for Latvia, Belgium and the United Kingdom (England). EU average is unweighted.
Source: Eurostat Database; national sources or OECD calculations using national data for Austria, Belgium, France, Latvia, the Netherlands and the United Kingdom (England).

StatLink http://dx.doi.org/10.1787/888933834319

3.4. Mortality rates by education level and causes, 10 European countries, 2011 (or nearest year)



Note: Countries covered are Belgium, the Czech Republic, Denmark, Finland, Hungary, Latvia, Norway, Poland, Slovenia and the United Kingdom (England).
Source: Murtin, F. et al. (2017).

StatLink http://dx.doi.org/10.1787/888933834338

HEALTHY LIFE EXPECTANCY AT BIRTH AND AT AGE 65

Healthy life expectancy is an important indicator of population health. It indicates whether any gains in life expectancy are lived in good health or with some health problems and disabilities. A greater number of healthy life years generally means a healthier workforce, fewer early retirements due to health problems, and reduced long-term care needs.

The main indicator of healthy life years used in the European Union is the number of years lived free of activity limitations due to health problems (in other words, disability-free life expectancy). On average across EU countries, people can expect to live about 80% of their lives free of disability (Figure 3.5). This proportion of healthy life years is lower among women than men (77% vs 81%) because women generally report more activity limitations due to health problems at any given age and also because women live longer. Whereas the gender gap in life expectancy at birth is about 5.5 years on average across EU countries, there is virtually no gap in healthy life expectancy (64.2 years for women compared with 63.5 years for men). Women in EU countries can expect to live over 19 years of their lives with some disabilities compared with less than 15 years for men.

In 2016, Malta and Sweden were the two countries with the highest healthy life expectancy among both women and men. In these two countries, women can expect to live more than 85% of their life expectancy free of disability, and this share reaches around 90% for men. Latvia, Estonia and the Slovak Republic had among the lowest healthy life expectancy, reflecting both relatively low life expectancy and a substantial share of life lived with some disability.

As people get older, the share of the remaining years of life that they can expect to live free of disability falls. At age 65, people can only expect to live about 50% of their remaining years of live free of disability across EU countries (Figure 3.6). Again, this proportion is substantially smaller among women (47% only) than men (54%), because women report more disability at any specific age and because they live longer. Women can expect to live another 21.6 years when they reach age 65 across the EU, but only about 10 of these years can be expected to be free of activity limitation, with the other 11.5 years lived with some disabilities. For men, the remaining life expectancy at age 65 is more than three years shorter (18.2 years), but they can expect to live also about 10 years free of disability on average. The number of healthy life years for men at age 65 is greater than for women in about half of EU countries.

Inequalities in healthy life years by socioeconomic status are even greater than inequalities in life expectancy, because women and men with lower education or income are much more likely to report some activity limitations throughout their lives than those with higher level of education or income (see indicator "Self-reported health and disability").

A wide range of policies is required to increase healthy life expectancy and reduce inequalities. These include greater efforts to prevent health problems starting early in life, promote equal access to care for the whole population, and better manage chronic health problems when they occur to reduce their disabling effects (OECD, 2017).

Definition and comparability

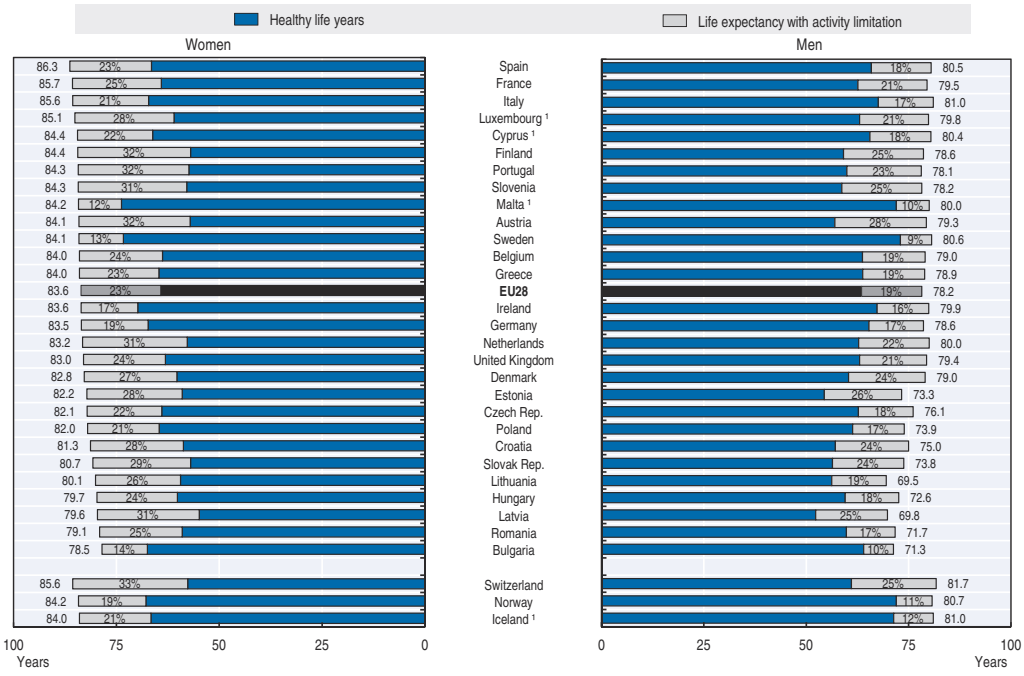
Healthy life years (HLY) are defined as the number of years spent free of long-term activity limitation (this is equivalent to disability-free life expectancy). Healthy life years are calculated annually by Eurostat based on life table data and age-specific prevalence data on long-term activity limitations. The disability measure is the Global Activity Limitation Indicator (GALI), which measures limitation in usual activities, coming from the EU-SILC survey.

The comparability of the data on healthy life years is limited by the fact that the indicator is derived from self-reported data which can be affected by people's subjective assessment of their activity limitation (disability) and by social and cultural factors. There are also differences across countries in the formulation of the question on disability in national languages in EU-SILC, limiting data comparability (Eurostat, 2017).

Reference

OECD (2017), *Preventing Ageing Unequally*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264279087-en*.

3.5. Life expectancy and healthy life years at birth, by gender, 2016 (or nearest year)



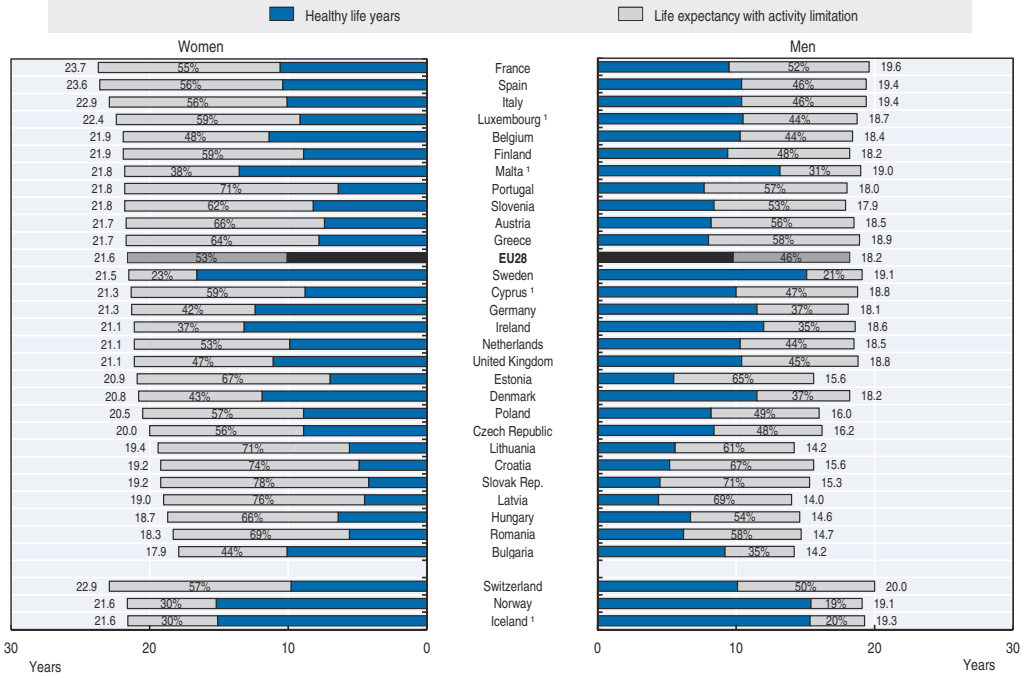
1. Three-year average (2014-16 except for Iceland: 2013-15).

Note: Data comparability is limited because of cultural factors and different formulations of question in EU-SILC.

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834357

3.6. Life expectancy and healthy life years at 65, by gender, 2016 (or nearest year)



1. Three-year average (2014-16 except for Iceland: 2013-15).

Note: Data comparability is limited because of cultural factors and different formulations of question in EU-SILC.

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834376

MAIN CAUSES OF MORTALITY

Over 5 200 000 people died in EU countries in 2015 (Figure 3.7). An unusual large increase in the number of deaths in 2015 explains the reduction in life expectancy in many countries compared with 2014 (see indicator "Trends in life expectancy"). The higher number of deaths in 2015 across EU countries was concentrated mainly among people aged 75 and over, and was attributed mainly to higher mortality from influenza and pneumonia triggering cardiorespiratory events, Alzheimer's disease and other dementias, and heart diseases.

Slightly more women than men died across EU countries in 2015, as there are more women in the population, particularly in older age groups. Once the population structure is adjusted by age, the age-standardised mortality rate was about 50% higher among men across the EU as a whole (1 287 per 100 000 men compared with 849 per 100 000 women).

The main causes of death in EU countries are circulatory diseases and various types of cancer, followed by respiratory diseases and external causes of death.

Circulatory diseases continue to be the leading cause of death across the EU, accounting for over 1 900 000 deaths in 2015. Ischaemic heart diseases, which include heart attack and other diseases, and stroke are the most common causes of death from circulatory diseases (see indicator "Mortality from circulatory diseases"). The age-standardised mortality rate from circulatory diseases is much higher among men than women (about 40% higher), but nonetheless diseases of the circulatory system account for a greater share of deaths among women than men across EU countries.

Some 1 320 000 people died of cancer in 2015, accounting for 22% of all deaths among women and 29% of all deaths among men. Breast cancer and lung cancer are the leading causes of cancer death among women, whereas lung cancer and colorectal cancer are the two main causes of cancer death for men (see indicator "Mortality from cancer").

After circulatory diseases and cancer, respiratory diseases are the third leading cause of death in EU countries, causing some 440 000 deaths in 2015, with the vast majority of these deaths occurring among people aged over 65. This group of diseases accounted for 8% of all death among women and 9% among men. Chronic obstructive pulmonary disease (COPD) is the most common cause of mortality among respiratory diseases, followed by pneumonia (see indicator "Mortality from respiratory diseases").

External causes of death, which include accidents, suicides, homicides and other violent causes of death, were responsible for 3% of all deaths among women and 6% of deaths among men in EU countries in 2015. The most important causes of violent deaths are road traffic accidents and other accidental deaths, and suicides. Road traffic accidents are a particularly important cause of death among young people (aged 18-25), whereas suicide rates generally increase with age.

More than 80% of all deaths in EU countries occur after the age of 65. While the main cause of death among people aged over 65 is circulatory diseases, the main cause for people under 65 is cancer, particularly among women (Eurostat, 2018).

Overall mortality rates vary widely across countries. France, Spain and Italy have the lowest death rates, with age-standardised rates between 850 and 900 deaths per 100 000 population in 2015 (Figure 3.8). This was mainly due to relatively low mortality rates from circulatory diseases. Mortality rates are highest in Bulgaria, Romania and Hungary, with age-standardised rates at least 50% higher than the EU average in 2015. The main reason for this much higher mortality rate in Bulgaria and Romania is higher mortality rates from circulatory diseases. In Hungary, higher mortality rates from cancer explain a large part of the difference with the EU average.

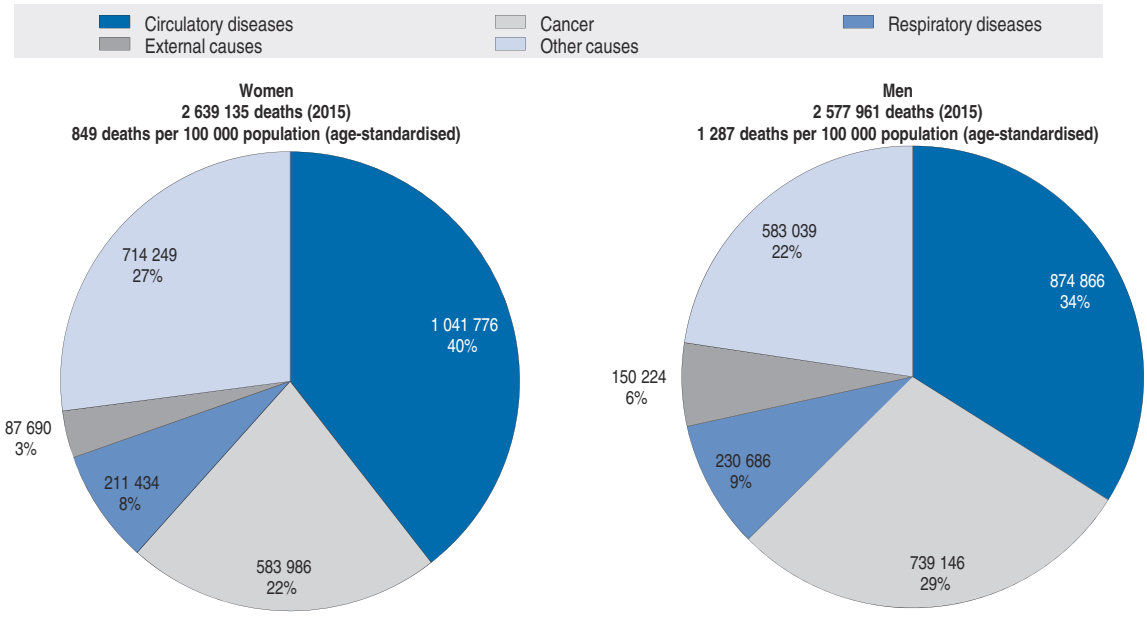
Definition and comparability

Deaths from all causes are classified to ICD-10 codes A00-Y89, excluding S00-T98. Mortality rates are based on the number of deaths registered in a country in a year divided by the population. The rates have been age-standardised to the revised European standard population adopted by Eurostat in 2012 to remove variations arising from differences in age structures across countries and over time.

Reference

Eurostat (2018), "Causes of Death Statistics – People Over 65", *Statistics Explained*, European Commission, April.

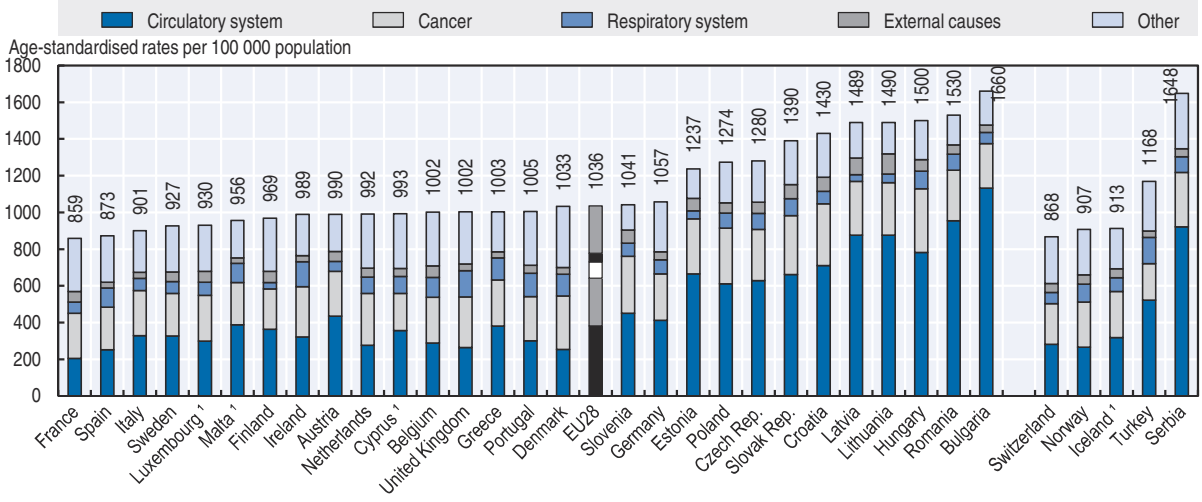
3.7. Main causes of mortality among women and men in EU countries, 2015



Note: External causes of death include accidents, suicides, homicides and other causes.
Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834395

3.8. Main causes of mortality by country, 2015



1. Three-year average (2013-15).
Note: External causes of death include accidents, suicides, homicides and other causes.
Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834414

MORTALITY FROM CIRCULATORY DISEASES

Circulatory diseases remain the main cause of mortality in nearly all EU member states, accounting for some 1 910 000 deaths and 37% of all deaths across EU countries in 2015. Circulatory diseases comprise a range of illnesses related to the circulatory system, including ischaemic heart diseases (notably heart attacks) and cerebrovascular diseases (such as strokes). Ischaemic heart diseases and strokes alone account for over 55% of all deaths from circulatory diseases, and caused more than one-fifth of all deaths in EU member states in 2015.

Ischaemic heart diseases (IHD) are caused by the accumulation of fatty deposits lining the inner wall of a coronary artery, restricting blood flow to the heart. Death rates for IHD are over 80% higher for men than for women across EU countries, because of a greater prevalence of risk factors among men, such as smoking, hypertension and high cholesterol.

Mortality rates from IHD are highest in Lithuania, Latvia, the Slovak Republic and Hungary, with age-standardised rates more than three times greater than the EU average. The countries with the lowest IHD mortality rates are France, the Netherlands, Portugal and Spain, with death rates about two times lower than the EU average (Figure 3.9).

Since 2000, age-standardised mortality rates from IHD have declined in all countries, with an overall reduction of over 40% on average across the EU, although the reduction has slowed down in recent years (Figure 3.11). The decrease since 2000 has been quite modest in some countries like Lithuania (only a 4% reduction), whereas it has been more rapid in Finland (a 44% reduction). Reductions in risk factors such as tobacco consumption have contributed to reducing the incidence of IHD and consequently mortality rates (see indicator "Smoking among adults" in Chapter 4). Improvements in medical care have also played an important role (see indicator "Mortality following acute myocardial infarction" in Chapter 6).

Strokes (or cerebrovascular diseases) were responsible for some 430 000 deaths across the EU in 2015, accounting for about 8% of all deaths. Strokes are caused by the disruption of the blood supply to the brain. In addition to being an important cause of mortality, the disability burden from stroke is substantial. The gender gap in (age-standardised) mortality rates from stroke is not as large as for IHD (less than 20%).

As with IHD, there are wide variations in stroke mortality rates across countries. The rates are three times higher than the EU average in Bulgaria, Latvia and Romania. They are the lowest in France, Luxembourg and Spain (Figure 3.10).

Since 2000, stroke mortality rates have decreased by nearly 50% across the EU, although the gains have slowed down over the past five years. The reduction since 2000 has been much slower in some countries like Bulgaria and Lithuania (only a 10% to 15% reduction) compared with a reduction of between 40% to 50% in Finland, France and Germany (Figure 3.12). As with IHD, the reduction in stroke mortality can be attributed at least partly to both a reduction in risk factors and improvements in medical treatments (see indicator "Mortality following stroke" in Chapter 6).

Looking ahead, further progress in reducing mortality rates from IHD, strokes and other circulatory diseases may be hampered by a rise in certain risk factors such as obesity and diabetes (OECD, 2015).

Definition and comparability

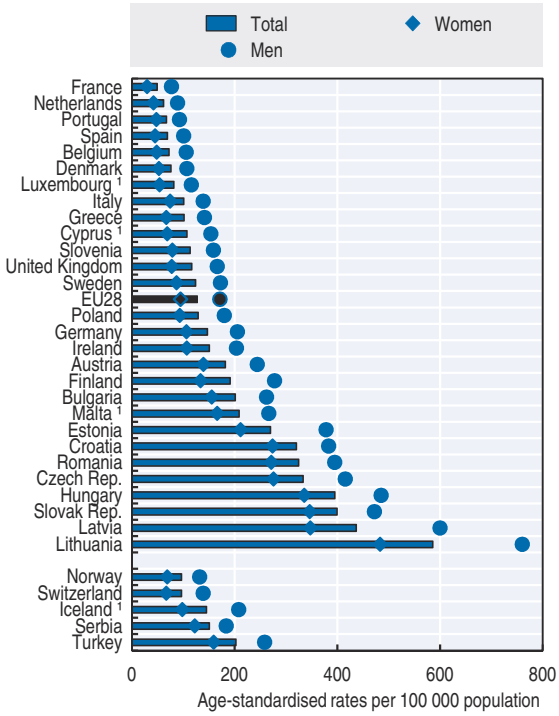
Mortality rates are based on the number of deaths registered in a country in a year divided by the population. The rates have been age-standardised to the revised European standard population adopted by Eurostat in 2012 to remove variations arising from differences in age structures across countries and over time.

Deaths from ischaemic heart diseases relate to ICD-10 codes I20-I25, and stroke (or cerebrovascular diseases) to I60-I69.

Reference

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

3.9. Ischaemic heart disease mortality, 2015

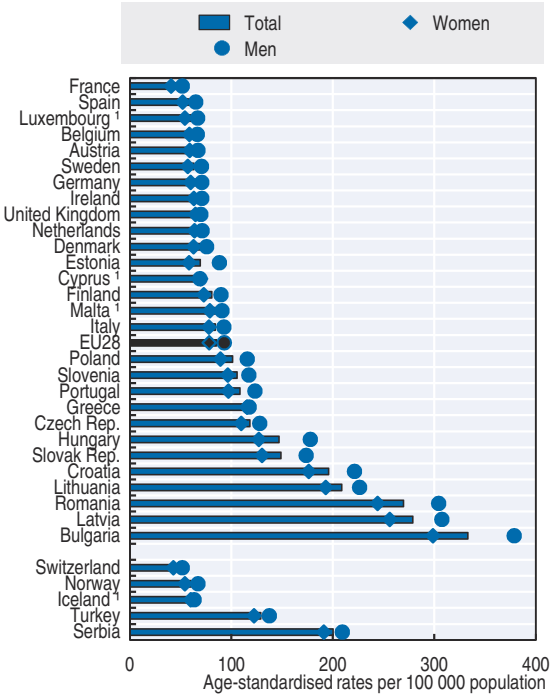


1. Three-year average (2013-15).

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834433

3.10. Stroke mortality, 2015

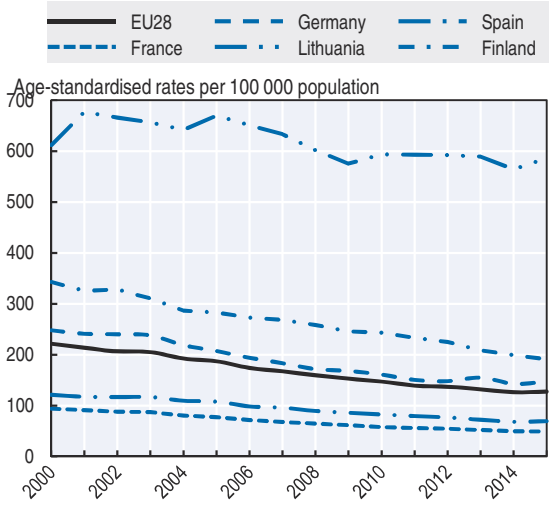


1. Three-year average (2013-15).

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834452

3.11. Trends in ischaemic heart disease mortality, selected EU countries, 2000-15

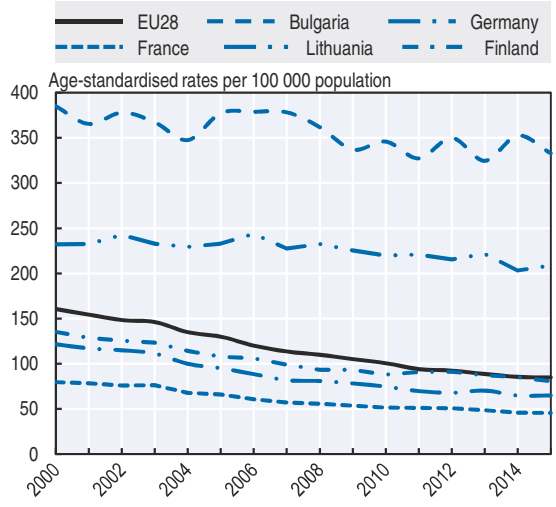


Note: OECD estimates of EU28 average for 2000 and 2001.

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834471

3.12. Trends in stroke mortality, selected EU countries, 2000-15



Note: OECD estimates of EU28 average for 2000 and 2001.

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834490

MORTALITY FROM CANCER

Cancer caused some 1 320 000 deaths in the European Union in 2015 (Figure 3.13). It is the second leading cause of mortality after cardiovascular diseases, accounting for 25% of all deaths in 2015.

Mortality rates from cancer are lowest in Cyprus, Finland, Malta, Spain and Sweden, with rates at least 10% lower than the EU average. They are highest in Hungary, Croatia, the Slovak Republic, Slovenia and Poland, with rates more than 15% higher than the EU average (Figure 3.14).

In all countries, mortality rates from cancer are greater among men than women. Overall, some 584 000 women and 739 000 men died from various types of cancer in EU countries in 2015. The aged-standardised mortality rates from cancer was 70% higher among men than women on average in the EU (346 deaths per 100 000 men, compared with 201 deaths per 100 000 women). This gender gap is particularly wide in Latvia, Lithuania, Estonia, Spain and Portugal, with mortality rates more than two times greater among men than among women. It can be explained by the greater prevalence of risk factors among men (e.g. smoking and alcohol consumption), as well as the more limited availability or use of screening programmes for cancers affecting men, leading to lower survival rates after diagnosis.

Lung cancer remains by far the most common cause of death from cancer among men (25% of all cancer deaths across the EU) and the second most common among women (after breast cancer). Some 184 000 men and 89 000 women died from lung cancer in EU countries in 2015. Smoking is the main risk factor for lung cancer. Over the past 10 years, the mortality rate from lung cancer increased by almost 20% across EU countries, driven mainly by a large increase in deaths among women in many countries. This reflects the fact that many women started to smoke several decades later than men (Torre et al., 2014).

Colorectal cancer is the second most common cause of cancer death, killing some 154 200 men and women in EU countries in 2015. The mortality rate from colorectal cancer is about 75% higher among men than among women across EU countries. There are several risk factors for colorectal cancer besides genetic factors and age, including a diet high in fat and low in fibre, alcohol consumption, smoking and obesity. The mortality rate has declined over the past decade in most countries, due to a large extent to earlier detection and higher survival after diagnosis (see indicator "Survival and mortality from colorectal cancer" in Chapter 6).

Breast cancer is the leading cause of cancer death among women, causing 94 300 deaths in 2015 and accounting for 16% of all female cancer deaths. While incidence rates of breast cancer have increased over the past decade, death rates have declined or stabilised, indicating increases in survival rates due to earlier diagnosis and better treatment (see indicator "Screening, survival and mortality for breast cancer" in Chapter 6).

Prostate cancer is the third most common cause of cancer deaths among men across EU countries (particularly among men aged over 65), resulting in 75 300 deaths in 2015 and accounting for 10% of all male cancer deaths.

Death rates from all types of cancer combined among men and women have declined at least slightly in most EU member states since 2000, although the decline has been more modest than for circulatory diseases, explaining why cancer now accounts for a larger share of all deaths.

Definition and comparability

Mortality rates are based on the number of deaths registered in a country in a year divided by the population. The rates have been age-standardised to the revised European standard population adopted by Eurostat in 2012 to remove variations arising from differences in age structures across countries and over time.

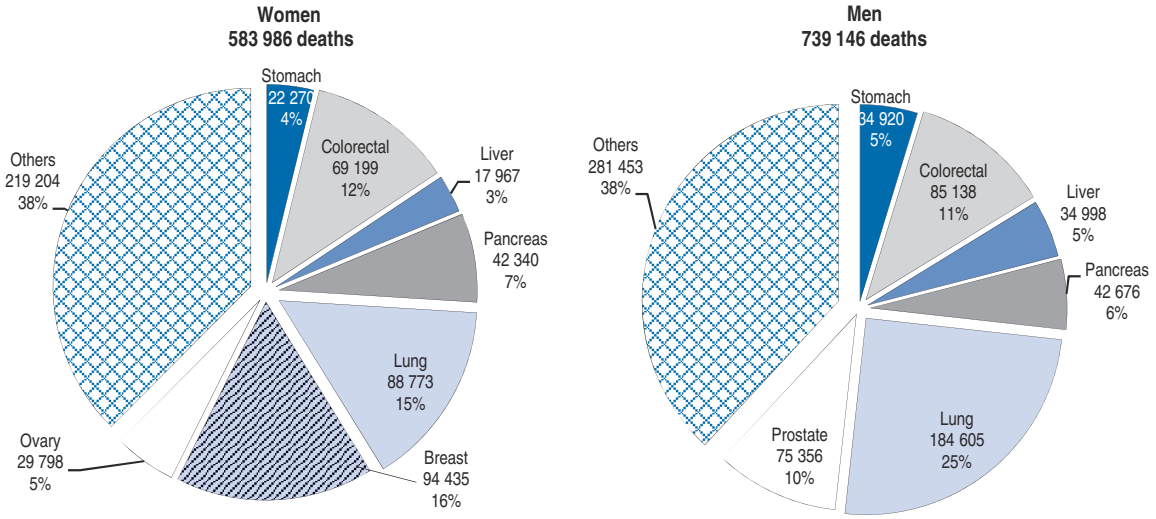
Deaths from all cancers relate to ICD-10 codes C00-C97, lung cancer to C33-C34. The international comparability of cancer mortality data can be affected by differences in medical training and practices as well as in death certification procedures across countries.

References

Torre et al. (2014), International variation in lung cancer mortality rates and trends among women, *Cancer Epidemiology Biomarkers Prev*, Vol. 23, No. 6, pp. 1025-36.

OECD (2013), *Cancer Care: Assuring Quality to Improve Survival*, OECD Health Policy Studies, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264181052-en*.

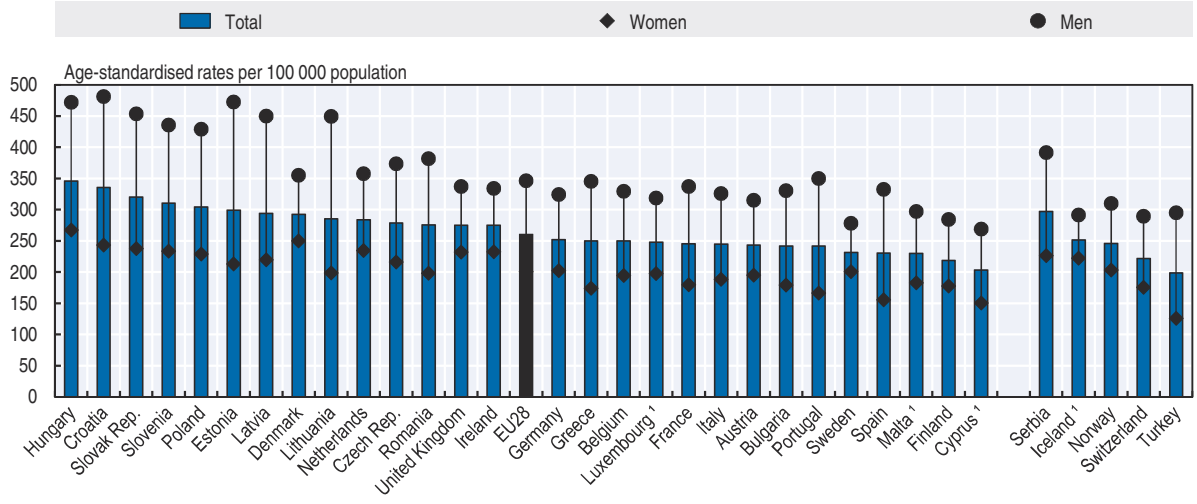
3.13. Main causes of cancer mortality among men and women in EU countries, 2015



Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834509

3.14. Cancer mortality, 2015



1. Three-year average (2013-15).

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834528

MORTALITY FROM RESPIRATORY DISEASES

Mortality from respiratory diseases is the third main cause of death in EU countries, accounting for 8% of all deaths in 2015. More than 440 000 people died from respiratory diseases in 2015, an increase of 15% over the previous year. Most of these deaths (90%) were among people aged 65 and over. The main causes of death from respiratory diseases are chronic obstructive pulmonary disease, pneumonia, asthma and influenza.

In 2015, the United Kingdom and Ireland had the highest age-standardised death rates from respiratory diseases among EU countries (Figure 3.15). Finland, Latvia, Estonia and Lithuania had the lowest rates, with rates only about half the EU average.

Death rates from respiratory diseases are on average 85% higher among men than among women in all EU countries. This is partly due to higher smoking rates among men. Smoking is an important risk factor for chronic obstructive pulmonary disease and other respiratory diseases.

Chronic obstructive pulmonary disease (COPD) (or chronic lower respiratory diseases), which includes chronic bronchitis and emphysema, caused over 180 000 deaths in EU countries in 2015 and accounted for over 40% of all respiratory disease mortality. Mortality from COPD varies widely across countries. Hungary, Denmark and the United Kingdom have the highest rate of mortality from COPD, with age-standardised rates at least two-thirds higher than the EU average (Figure 3.16). The main risk factor for COPD is tobacco smoking (both active and passive smoking), but other risk factors include occupational exposure to dusts, fumes and chemicals, and air pollution more generally. A large number of people with COPD are only diagnosed at a late stage, contributing to higher mortality. People with COPD are also more susceptible to influenza and pneumonia.

Pneumonia was responsible for nearly 140 000 deaths in EU countries in 2015, accounting for over 30% of all respiratory disease mortality. As with COPD, there are large variations in mortality rates across EU countries: Portugal, the Slovak Republic and the United Kingdom have the highest rates of pneumonia mortality, whereas Finland, Greece and Austria have the lowest rates (Figure 3.17). The main risk factors for pneumonia are age, smoking and alcohol abuse, and having COPD or HIV infection (Torres et al., 2013).

More than 7 000 people died from asthma in EU countries in 2015. Mortality rates from asthma are highest in Estonia, Ireland and the United Kingdom, but remain much lower than for COPD and pneumonia.

Nearly 6 000 deaths were directly attributed to influenza, with most of these deaths concentrated among people aged over 65. But influenza also contributed to many more deaths among frail elderly people with chronic diseases. The European Monitoring of Excess Mortality network estimated that up to 217 000 deaths were related to influenza among elderly people across EU countries during the winter 2015 (EuroMoMo, 2016).

The prevalence and mortality from respiratory diseases are likely to increase in the coming years as the population ages and presently unreported cases of COPD begin to manifest, whether alone or in co-morbidity with other chronic diseases.

Many deaths from respiratory diseases could be prevented by tackling some of the main risk factors, notably smoking, and by increasing vaccination coverage for influenza and pneumonia, particularly among elderly people and other vulnerable groups. Better management of both asthma and COPD in primary care could also help reduce health complications.

Definition and comparability

Mortality rates are based on the number of deaths registered in a country in a year divided by the population. The rates have been age-standardised to the revised European standard population adopted by Eurostat in 2012 to remove variations arising from differences in age structures across countries and over time.

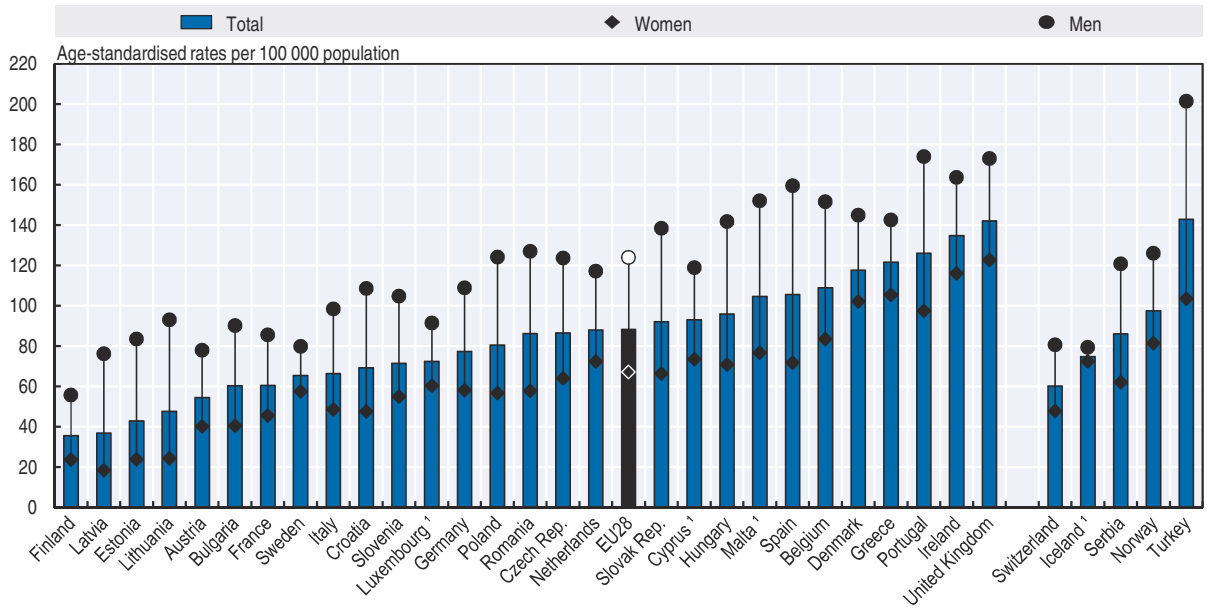
Deaths from respiratory diseases relate to ICD-10 codes J00-J99, with pneumonia relating to J12-J18, chronic obstructive pulmonary disease (or chronic lower respiratory diseases) relating to J40-J47 and asthma to J45-J46. The international comparability of data on mortality from respiratory diseases can be affected by differences in medical training and coding practices for causes of death. Finland revised some coding practices in 2005-06, leading especially to a decrease of recorded deaths caused by pneumonia.

References

Torres, A. et al. (2013), "Risk Factors for Community-acquired Pneumonia in Adults in Europe: A Literature Review", *Thorax*, Vol. 68, pp. 1057-1065.

EuroMoMo (2016), "Excess mortality in Europe in the winter season 2014/15, in particular amongst the elderly", Winter season summary 2015.

3.15. Respiratory diseases mortality, 2015

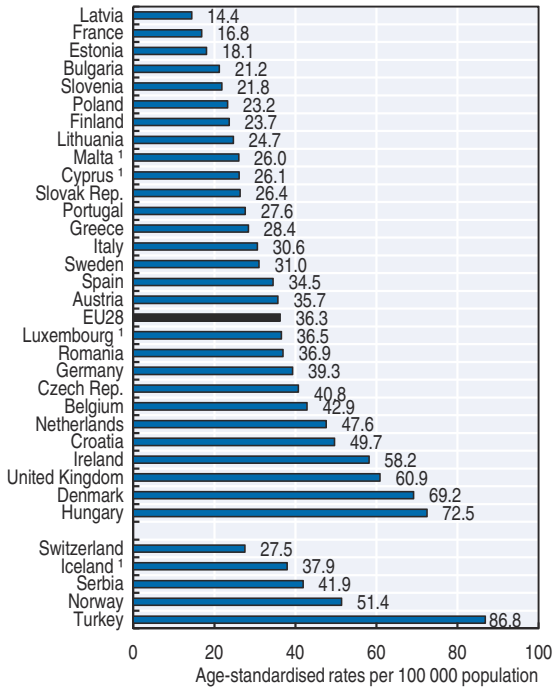


1. Three-year average (2013-15).

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834547

3.16. COPD mortality, 2015

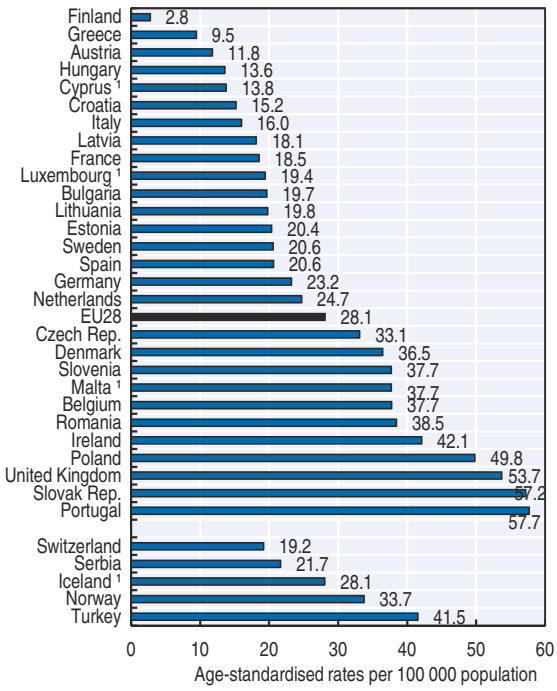


1. Three-year average (2013-15).

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834566

3.17. Pneumonia mortality, 2015



1. Three-year average (2013-15).

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834585

INFANT HEALTH

Infant mortality reflects the effect of socioeconomic conditions on the health of mothers and newborns, as well as the effectiveness of health systems, particularly in addressing any life-threatening problem during the neonatal period (i.e. during the first four weeks).

Infant mortality rates are low in most EU countries, with an average of less than 4 deaths per 1 000 live births across EU countries in 2016 (Figure 3.18). However, a small group of countries – Romania, Bulgaria, Malta and the Slovak Republic – still have infant mortality rates above 5 deaths per 1 000 live births. These rates, though, have declined steadily over the past 25 years. In Malta, infant mortality rates may be higher because induced abortions following the detection of congenital anomalies are illegal, whereas this is possible in other countries in cases of severe and/or lethal anomalies.

Around two-thirds of the deaths during the first year of life occur during the first month (i.e. neonatal mortality). The main causes of death during the first month are congenital anomalies, prematurity and other conditions arising during pregnancy. For deaths beyond one month (post neonatal mortality), there tends to be a greater range of causes – the most common being Sudden Infant Death Syndrome (SIDS), birth defects, infections and accidents.

All European countries have achieved notable progress in reducing infant mortality rates over the past few decades. The EU average went down from over 10 deaths per 1 000 live births in 1990 to 3.6 deaths in 2016. Reductions in infant mortality rates have been particularly rapid in Bulgaria, Poland and Romania, converging towards the EU average (Figure 3.19). However, the downward trend in infant mortality has halted in recent years in a number of Western European countries, at least partly because of increasing numbers of low birth weight infants.

Across EU countries, 1 in 14 babies (7.0%) weighed less than 2 500 grams at birth in 2016 (Figure 3.20). This is up slightly from 1 in 15 babies (6.7%) in 2000. Low birth weight can occur as a result of restricted foetal growth or from pre-term birth. Low birth weight infants have a greater risk of poor health or death, require a longer period of hospitalisation after birth, and are more likely to have health problems and disabilities later in life. Some of the main risk factors for low birth weight include maternal smoking, alcohol consumption and poor nutrition during pregnancy, low body mass index, lower socio-economic status, having had in-vitro fertilisation treatment and multiple births, and a higher maternal age. The increased use of delivery management techniques such as induction of labour and caesarean delivery, which have increased the survival rates of low birth weight babies, also partly explain the small rise in low birth weight infants.

The Baltic countries (Estonia, Latvia and Lithuania) and the Nordic countries (Finland, Sweden and Denmark) have the lowest proportion of low birth weight babies, whereas some countries in Southern Europe (Cyprus, Greece, Bulgaria and Portugal) have the highest proportion. While this proportion has decreased slightly over the past decade in Cyprus, it has increased slightly in Greece. Some suggest that the peak of 10% of low birth weight infants in 2010 in Greece, a sharp increase compared with 2008, may be due to the impact of the economic crisis on household's access to health care (Kentikelenis, 2014). In Portugal, the proportion of low birth weight babies also increased over the past decade, from 7.6% of all live births in 2006 to 8.7% in 2013, with the rate broadly stable since then.

Definition and comparability

Infant mortality rate is the number of deaths of children under one year of age per 1 000 live births. Some of the international variation in infant and neonatal mortality rates may be due to variations among countries in registering practices of premature infants. While some countries have no gestational age or weight limits for mortality registration, several countries apply a minimum gestational age of 22 weeks (or a birth weight threshold of 500 grams) for babies to be registered as live births (Euro-Peristat, 2013).

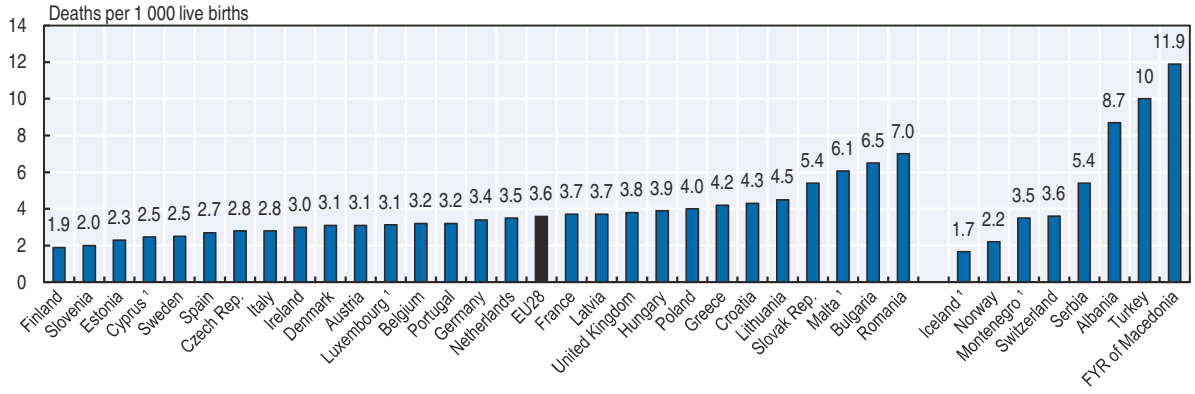
Low birth weight is defined by the World Health Organization as the weight of an infant at birth of less than 2 500 grams (5.5 pounds) irrespective of the gestational age of the infant. This threshold is based on epidemiological observations regarding the increased risk of death of the infant. Despite the widespread use of this 2 500 grams limit, physiological variations in size occur across different countries and population groups, and these need to be taken into account when interpreting differences (Euro-Peristat, 2013). The number of low weight births is expressed as a percentage of total live births.

References

Euro-Peristat (2013), "European Perinatal Health Report: The Health and Care of Pregnant Women and their Babies in 2010", Luxembourg.

Kentikelenis, A. (2014), "Greece's health crisis: From austerity to denialism", *The Lancet*, Vol. 383, Issue 9918, pp. 748-753.

3.18. Infant mortality, 2016

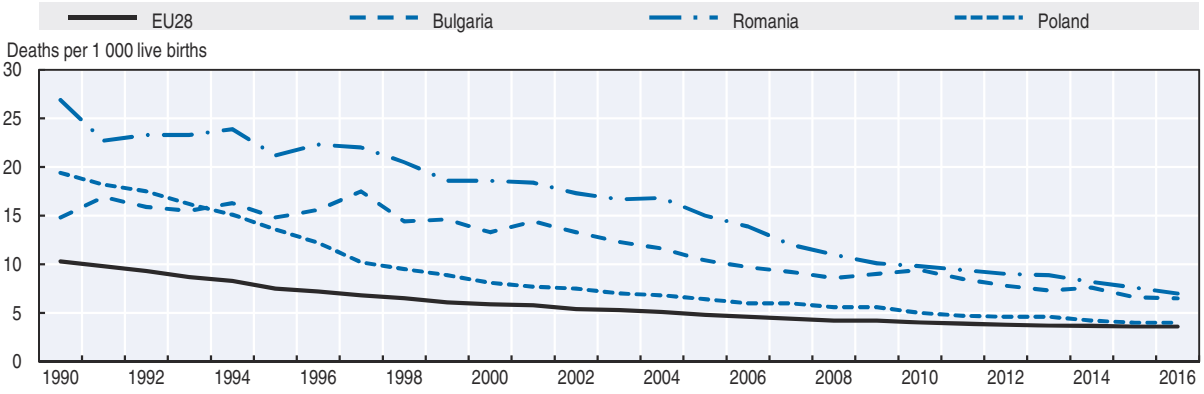


1. Three-year average (2014-16).

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834604

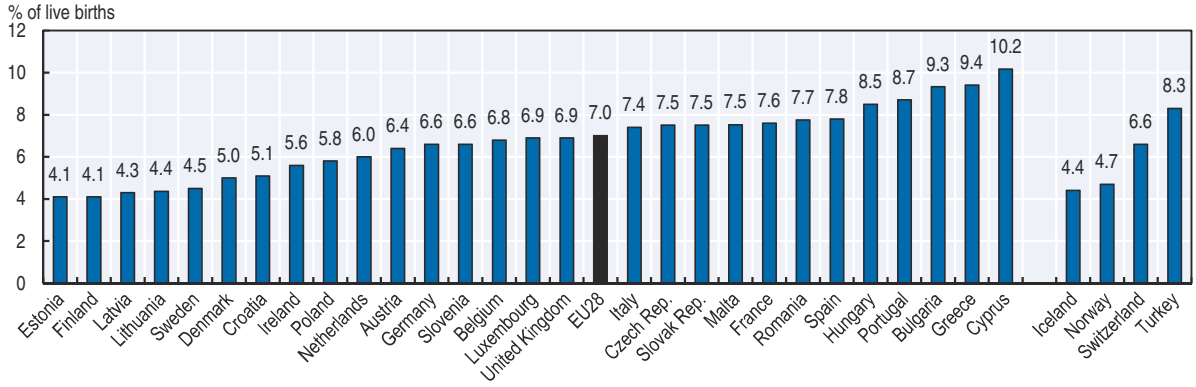
3.19. Trends in infant mortality, 1990-2016



Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933834623

3.20. Low birthweight, 2016 (or nearest year)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*, Eurostat Database and national source for Cyprus.

StatLink http://dx.doi.org/10.1787/888933834642

SELF-REPORTED HEALTH AND DISABILITY

The health module in the EU Statistics on Income and Living Conditions survey (EU-SILC) allows respondents to report on their health status, whether they are generally in good health, have a chronic disease and are limited in their usual activities because of a health problem (a common definition of disability).

Cross-country differences in perceived health status can be difficult to interpret because social and cultural factors may affect responses. Further, since older people generally report poorer health and more chronic diseases than younger people, countries with a larger proportion of elderly people may have a lower proportion of people reporting to be in good health and without any chronic disease or disability.

With these limitations in mind, most adults in the European Union rate their health quite positively: two-thirds of people aged 16 and over report to be in good health in 2016 (Figure 3.21). Ireland, Cyprus, the Netherlands and Sweden have the highest share of adults rating their health to be good, with at least three-quarters doing so. In contrast, less than half of adults in Lithuania, Latvia and Portugal report to be in good health.

Men are more likely than women to rate their health as good. There are also disparities in self-reported health across different socio-economic groups. On average across EU countries, nearly 80% of people in the highest income quintile report to be in good health, compared with about 60% for people in the lowest income quintile. These disparities are particularly large in Baltic countries (Estonia, Latvia and Lithuania). In these three countries, at least two-thirds of people in the highest income group report to be in good health (which is equal to the EU average for all the population), but this proportion goes down to about one-third only for people in the lowest income group. These disparities can be explained by differences in living and working conditions, as well as differences in lifestyles (e.g. smoking, harmful alcohol drinking, physical inactivity, and obesity).

One-third of adults in EU member states reports having a chronic disease or health problem (Figure 3.22). Adults in Finland and Estonia are more likely to report having some chronic illnesses or health problems, while such chronic conditions are less commonly reported in Italy, Romania and Bulgaria. Women report some long-standing illnesses or health problems more often than men (35% versus 31% across EU member states). There are also some disparities in reporting chronic illnesses by income group: on average, less than 30% of people in the highest income group report some chronic diseases or health problems, compared with less than 40% for people in the lowest income group. These disparities are particularly large again in the Baltic countries (Estonia, Latvia and Lithuania).

Almost one-quarter of adults on average across EU member states reports that they are limited in their usual daily activities because of a health problem (Figure 3.23). This proportion is highest in Latvia, Austria, Portugal and Finland (with one-third or more of respondents reporting such limitations). Women report more often to be limited in their daily activities than men (26% versus 22% on average across EU member states). As expected, such activity limitations increase greatly with age: about 60% of people aged 75 years and over report to be limited in their daily activities. As with other indicators of health, there are also disparities in this indicator of disability by income group: on average across EU countries, about 16% of people in the highest income group report such activity limitations compared with 30% for people in the lowest income group.

It is likely that there is also a reverse causal link between health and income inequalities, with poor health status leading to lower employment and lower income.

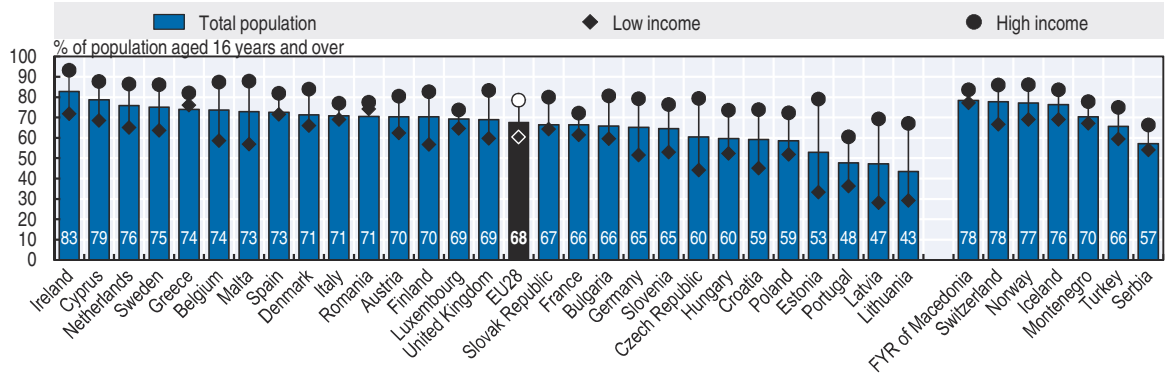
Definition and comparability

The questions used in the EU-SILC survey to measure health status generally and the prevalence of any chronic disease and disability are: i) "How is your health in general? Is it very good, good, fair, bad, very bad?", ii) "Do you have any long-standing illness or health problem which has lasted or is expected to last for 6 months or more"; and iii) "For at least the past 6 months, to what extent have you been limited because of a health problem in activities people usually do? Would you say you have been severely limited, limited but not severely, or not limited at all?" (Data reported here include both people who say that they are limited severely or not severely). People living in institutions are not surveyed.

The income level is reported for the lowest income quintile (people in the bottom 20% of the income distribution) and the highest income quintile (the top 20%). The income may relate either to the individual or the household (in which case the income is equivalised to take into account the number of persons in the household).

Caution is required in making cross-country comparisons of perceived health status, since people's assessment of their health is subjective and can be affected by social and cultural factors. There are also differences in the formulation of the question on disability across countries, limiting the comparability of the data.

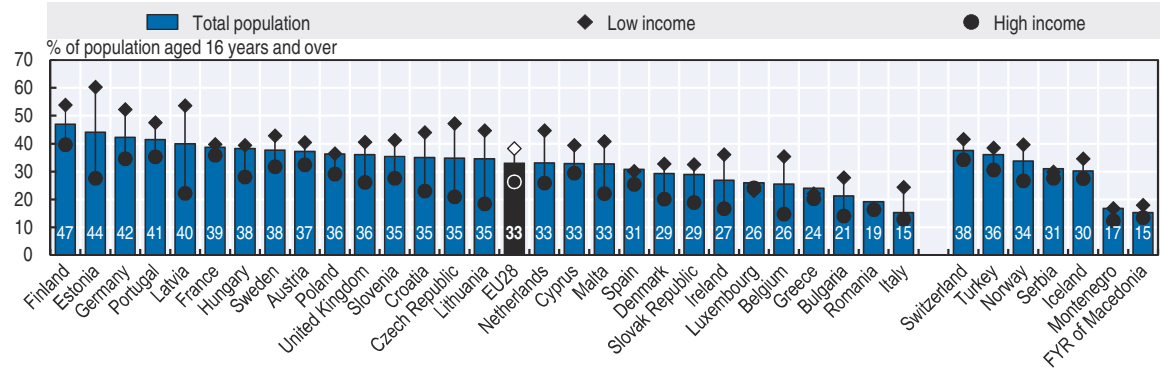
3.21. Health status perceived as good or very good, by income quintile, 2016 (or nearest year)



Source: Eurostat Database, based on EU-SILC.

StatLink http://dx.doi.org/10.1787/888933834661

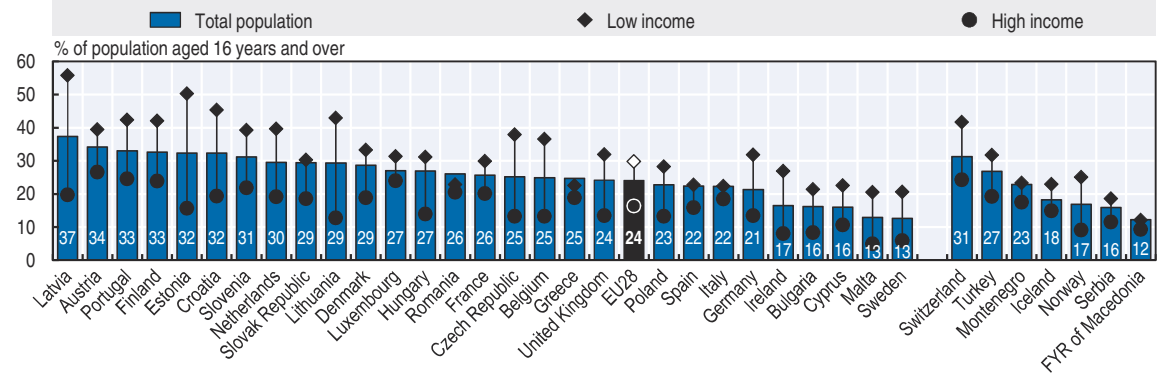
3.22. Self-reported chronic condition, by income quintile, 2016 (or nearest year)



Source: Eurostat Database, based on EU-SILC.

StatLink http://dx.doi.org/10.1787/888933834680

3.23. Self-reported disability, by income quintile, 2016 (or nearest year)



Source: Eurostat Database, based on EU-SILC.

StatLink http://dx.doi.org/10.1787/888933834699

NOTIFIED CASES OF VACCINE-PREVENTABLE DISEASES

Communicable diseases, such as measles, hepatitis B and many others, pose major threats to the health of European citizens, although vaccination could efficiently prevent these diseases (EC, 2018). Measles, a highly infectious disease of the respiratory system, is caused by a virus. Symptoms include fever, cough, runny nose, red eyes and skin rash. It can lead to severe health complications, including pneumonia, encephalitis, diarrhoea and blindness.

13 475 cases of measles were reported to the European Surveillance System by the 30 EU/EEA countries from May 2017 to May 2018, up from 8 523 cases for the preceding 12-month period. The average rate in the EU in 2017 was 2.2 cases per 100 000 population, but with wide variations across countries (Figure 3.24). Romania reported the highest number of new cases and highest rate (28.4 cases per 100 000 population). Greece and Italy followed with rates higher than 8 per 100 000 population. An outbreak of measles started in 2016 in Romania and smaller outbreaks, amplified by low vaccination coverage, stemmed partly from it in a few other countries. In most countries where vaccination coverage is high, very few cases of measles were reported in 2017 (see indicator on vaccination in Chapter 6).

Vaccination against measles is very effective: the vast majority of newly diagnosed people were not vaccinated. Although 45% of measles cases occurred among people aged 15 and older, most cases are among infants under one year old, as they are often still too young to have received the first dose of vaccine. Unvaccinated infants are generally protected against measles when at least 95% of population have received the second dose of vaccine (ECDC, 2018a).

Hepatitis B is a liver infection caused by a virus transmitted by contact with blood or body fluids of an infected person. People who are infected can go on to develop a chronic infection, especially those who are infected at younger ages. People with chronic hepatitis B are more likely to suffer from liver cirrhosis and liver cancer.

More than 29 300 hepatitis B cases were reported in EU/EEA countries in 2016 (ECDC, 2018b). This equals a rate of 6 cases of hepatitis B per 100 000 population across EU countries in 2016. Sweden, the United Kingdom and Latvia had the highest notification rates, with more than 18 cases per 100 000 population (Figure 3.25). The rates are also high in Austria, Ireland, Iceland and Norway. The higher number of reported cases in these countries is due at least partly to a more comprehensive surveillance and reporting system that includes both acute and chronic cases. The vast majority of cases reported in these countries are chronic cases. Many countries with low rates such as France, Greece and Lithuania do not report such chronic cases.

Reported cases of hepatitis B are higher in men than in women. About one-third of all reported hepatitis B cases occurs among people aged 25-34. For acute infections, heterosexual transmission is the most common route of transmission, followed by nosocomial transmission, transmission among men who have sex with men, injuries and drug injection. Mother-to-child transmission is the most common route for chronic cases (ECDC, 2018b). The most effective prevention is vaccination (see indicators on childhood vaccination in Chapter 6).

Definition and comparability

Mandatory notification systems for communicable diseases, including measles and hepatitis B, exist in most European countries, although case definitions, laboratory confirmation requirements and reporting systems may differ. Measles and hepatitis B notification is mandatory in all EU member states. Caution is required in interpreting the data because of the diversity in surveillance systems, case definitions and reporting practices (for example, several countries only collect data on acute cases, not chronic cases). Variation between countries also likely reflects differences in testing as well as differences in immunisation and screening programmes.

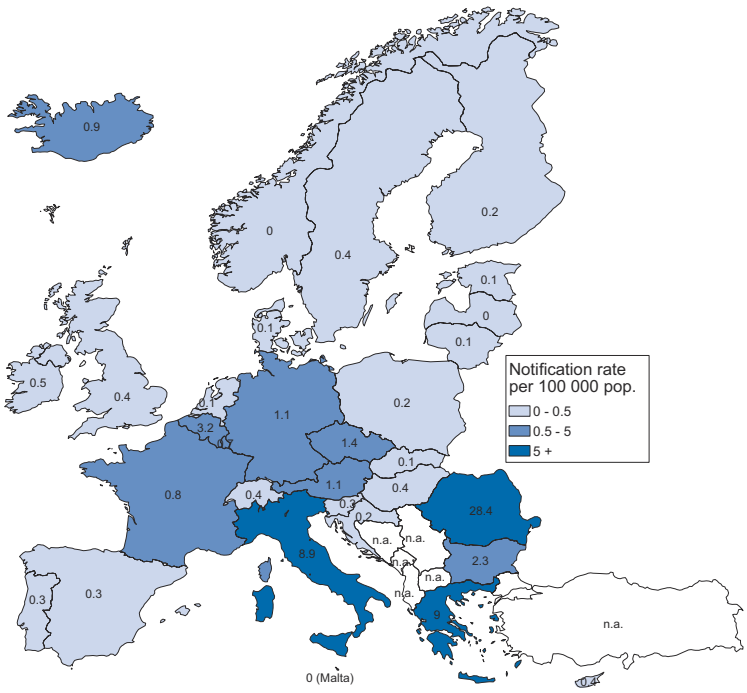
References

EC (2018), Proposal for a council recommendation on strengthened cooperation against vaccine preventable diseases, European Commission, Brussels.

ECDC (2018a), Measles outbreaks still ongoing in 2018 and fatalities reported from four countries, accessed 27 June 2018.

ECDC (2018b), *Annual epidemiological report for 2016 Hepatitis B*, Stockholm.

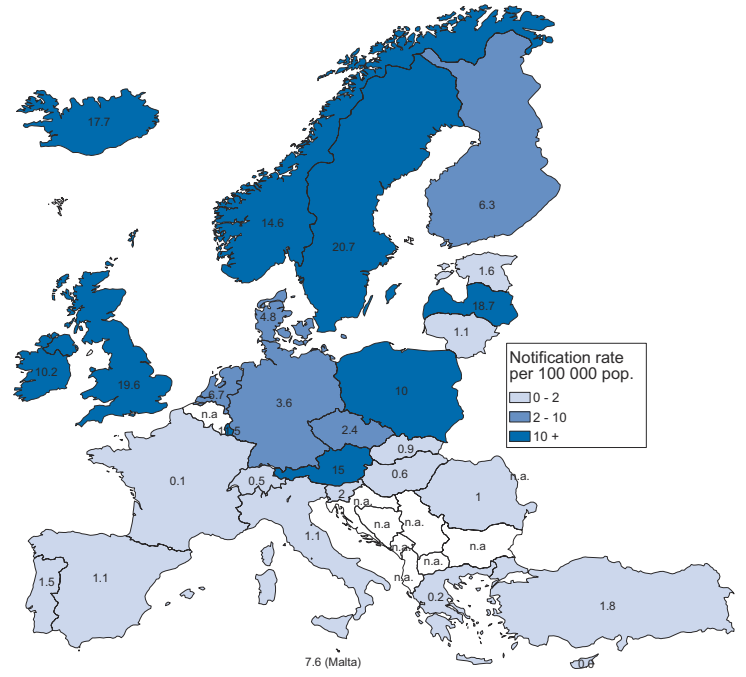
3.24. Notification rate of measles, 2017 (or nearest year)



Note: Data refer to 2015 for Switzerland.
Source: ECDC Surveillance Atlas of Infectious Diseases.

StatLink http://dx.doi.org/10.1787/888933834718

3.25. Notification rate of hepatitis B, 2016



Note: The comparability of data is limited due to differences in surveillance and reporting system (many countries with low rates only report acute cases, not chronic cases).
Source: ECDC Surveillance Atlas of Infectious Diseases.

StatLink http://dx.doi.org/10.1787/888933834737

NEW REPORTED CASES OF HIV AND TUBERCULOSIS

HIV remains a major public health issue in Europe, with more than 610 000 diagnosed people living with HIV infection in EU countries in 2016 (ECDC/WHO Regional Office for Europe, 2017). In addition, another estimated 200 000 people are undiagnosed and unaware that they are living with HIV infection (Pharris et al., 2016). Nearly 30 000 people across EU countries were newly diagnosed with HIV in 2016. This equals about six new cases of HIV infection per 100 000 population on average. Latvia had the highest rate of new cases (18.5 per 100 000 population), followed by Estonia and Malta. The lowest rates were in the Slovak Republic and Hungary, with rates lower than 2.5 new cases per 100 000 population (Figure 3.26).

The number and rate of newly diagnosed HIV cases have declined slightly overall over the past decade. However, the trend has evolved differently across countries. In Estonia and Portugal, infection rates have decreased rapidly, although the infection rates remain above the EU average. In Latvia and Malta, infection rates have increased at least slightly since 2007 (ECDC/WHO Regional Office for Europe, 2017).

Men are about three times more likely to be diagnosed with HIV than women. About 40% of new HIV transmission is through men having sex with men and 32% by heterosexual contact, while 4% of new cases are through drug injection. Nearly 30% of new cases in 2016 were diagnosed at an advanced stage of HIV and almost 50% had already been infected for several years. People who were diagnosed several years after being infected were more likely to be older, infected by heterosexual sex or by drug injection, and to be women.

Sustained efforts are needed to reduce new HIV infections through effective prevention campaigns, and more frequent HIV testing and education campaigns targeting high risk groups (EC, 2018).

Tuberculosis is still an important public health issue in several EU countries, despite notable progress in most countries in reducing the number of cases over the past few years. Nearly 59 000 new cases of tuberculosis were reported across EU countries in 2016, down from about 70 000 cases in 2012. Romania had the highest rate of reported cases of tuberculosis in 2016, with 68.9 per 100 000 population, followed by Lithuania and Latvia, with rates above 30 per 100 000 population (Figure 3.27). Greece, Finland and the Czech Republic had the lowest rates, with rates below 5 per 100 000 population in 2016. Men are much more likely to be infected by tuberculosis than women in all EU countries.

Although the number and rate of tuberculosis cases have decreased in nearly all countries since 2012, the pace of decline has varied by country. In Romania, the rate has decreased by more than 20% since 2012. The rates also declined sharply in Lithuania and Latvia. However, the rates have increased in Germany (from 5.2 to 7.2 per 100 000 population) and Sweden (6.6 to 7.4 per 100 000 population) between 2012 and 2016.

Among people with tuberculosis for whom information was available on HIV, about 4.5% were co-infected by HIV.

Antimicrobial resistance to tuberculosis threatens effective treatment and control. On average, about 4% of cases of tuberculosis with drug susceptibility testing were multi-drug resistant. These rates were much higher in Lithuania, Estonia and Latvia than in other countries (ECDC/WHO Regional Office for Europe, 2018).

Despite progress, further efforts are needed to eliminate tuberculosis in EU countries in the coming years. Countries can take a series of actions to reduce tuberculosis infections, including by addressing the needs of vulnerable groups such as migrants, and by optimising the prevention and care of drug-resistant tuberculosis (EC, 2018).

Definition and comparability

The rates of reported HIV are the number of new cases per 100 000 population at year of diagnosis. Under-reporting and under-diagnosis affect the reported rates, and may represent as much as 40% of cases in some countries (ECDC/WHO Regional Office for Europe, 2017).

A new reported case of tuberculosis is defined as a patient in whom tuberculosis has been confirmed by bacteriology or diagnosed by a clinician. The rates are expressed per 100 000 population (ECDC/WHO Regional Office for Europe, 2018).

References

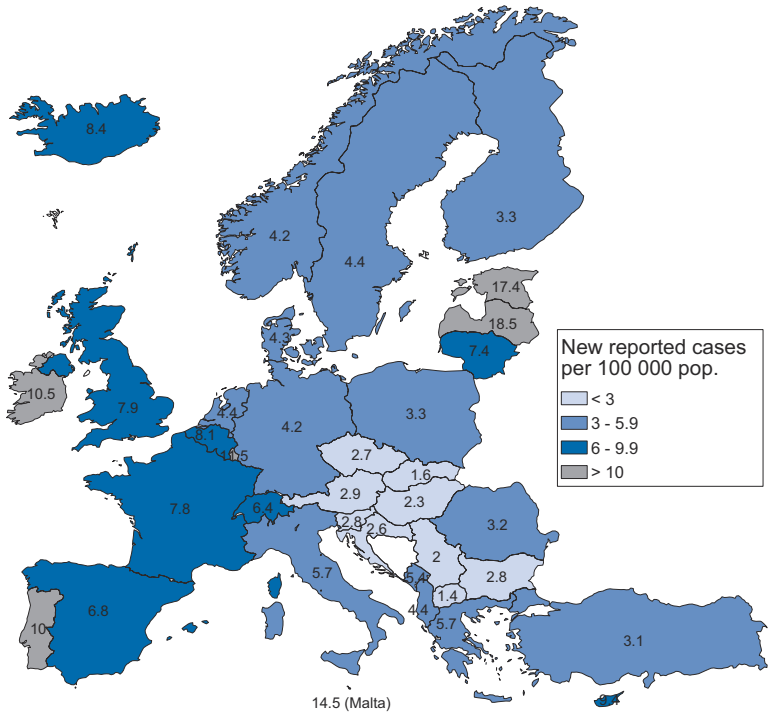
EC (2018), Commission Staff Working Document on Combatting HIV/AIDS, Viral Hepatitis and Tuberculosis in the European Union and Neighbouring Countries – State of play, policy instruments and good practices, European Commission, Brussels.

ECDC/WHO Regional Office for Europe (2018), Tuberculosis Surveillance and Monitoring in Europe 2018 – 2016 data, Stockholm.

ECDC/WHO Regional Office for Europe (2017), HIV/AIDS Surveillance in Europe 2017 – 2016 data, Stockholm.

Pharris et al. (2016), "Estimating HIV incidence and number of undiagnosed individuals living with HIV in the European Union/European Economic Area, 2015", *Euro Surveillance Journal*, Vol. 21, No. 48.

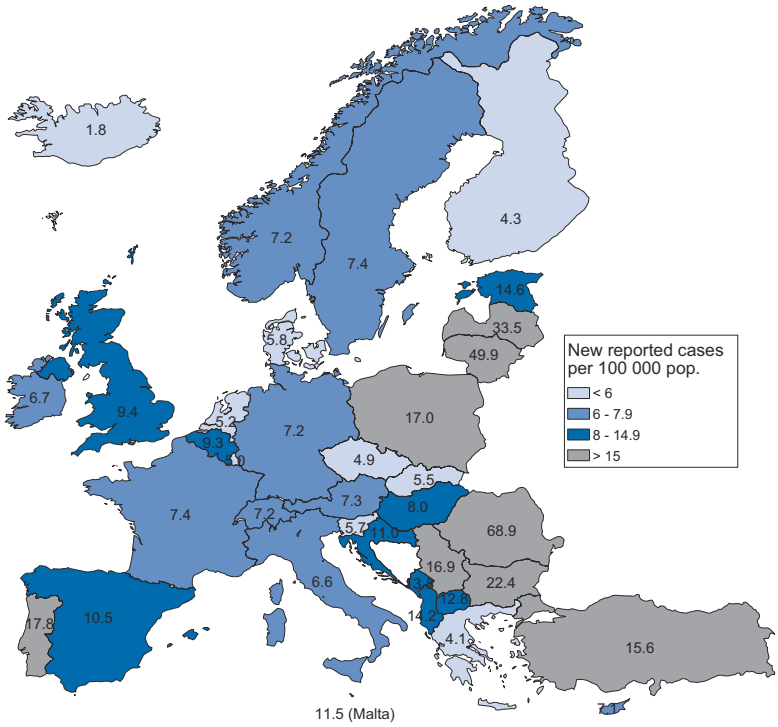
3.26. New reported cases of HIV, 2016



Source: ECDC/WHO Regional Office for Europe (2017), HIV/AIDS Surveillance in Europe 2017.

StatLink http://dx.doi.org/10.1787/888933834756

3.27. New reported cases of tuberculosis, 2016



Source: ECDC/WHO Regional Office for Europe (2018), Tuberculosis Surveillance and Monitoring in Europe 2018.

StatLink http://dx.doi.org/10.1787/888933834775

CANCER INCIDENCE

In 2018, 3 million new cases of cancer are expected to be diagnosed in the 28 EU member states (Joint Research Centre, 2018). Slightly more than half of these cancers (53% or around 1.6 million) are expected to be diagnosed in men.

The most common cancer sites are breast cancer (with more than 400 000 women expected to be diagnosed in 2018, accounting for 13.5% of all new cancer cases), followed by prostate cancer (376 000 men or 12.5% of new cancer cases), colon and rectum cancers (368 000 men and women for these two cancer sites combined or 12.3% of new cancer cases) and lung cancer (365 000 men and women or 12.2% of new cases). These five cancers represent half of all the cancers that are expected to be diagnosed in EU countries in 2018. Following these five cancers, the most common cancer sites are bladder cancer, skin melanoma cancer, uterus cancer (corpus uteri and cervical), pancreas cancer and kidney cancer. These five other cancers are expected to account for another 20% of all new cancer cases in the European Union in 2018 (Figure 3.28).

Large variations exist in cancer incidence across EU countries. Hungary, Ireland, Denmark, Belgium and France are expected to have the highest age-standardised incidence rates in 2018 (all cancers combined), with rates more than 10% higher than the EU average (Figure 3.29). The incidence of lung cancer and colon and rectal cancer is particularly high in Hungary (more than 50% higher than the EU average), contributing largely to the overall high incidence rate. The high incidence of lung cancer is related to high smoking rates (see the indicator "Smoking among adults" in Chapter 4).

These variations in incidence rates reflect not only variations in the real number of new cancers occurring each year, but also differences in national policies regarding cancer screening to detect different types of cancer as early as possible (see indicators "Screening, survival and mortality from breast cancer and cervical cancer" in Chapter 6), as well as differences in the quality of cancer surveillance and reporting.

Among women, breast cancer accounts for 29% of all new cancers across EU countries. Colon and rectal cancers (12% of cancer cases), lung cancer (10%) and uterus and cervical cancer (8%) are the next more common cancers diagnosed in women. The variation in breast cancer incidence across EU member states can be partly attributed to variation in the extent and type of screening activities. Mortality rates from breast cancer have declined in most EU countries since the 1990s due to earlier detection and improvements in treatments, but still breast cancer continues to be one of the leading causes of cancer death among women (see indicator "Mortality from cancer" in this chapter and the indicator on "Screening, survival and mortality from breast cancer" in Chapter 6).

Among men, prostate cancer is expected to account for almost one quarter (23%) of all new cancers diagnosed in 2018. The incidence of prostate cancer has increased in most European countries since the late 1990s, partly because the greater use of prostate specific antigen (PSA) tests is leading to greater detection. Lung cancer (14% of new cancer cases), and colon and rectum cancers (13%) also account for a large number of new cancers detected in men.

Definition and comparability

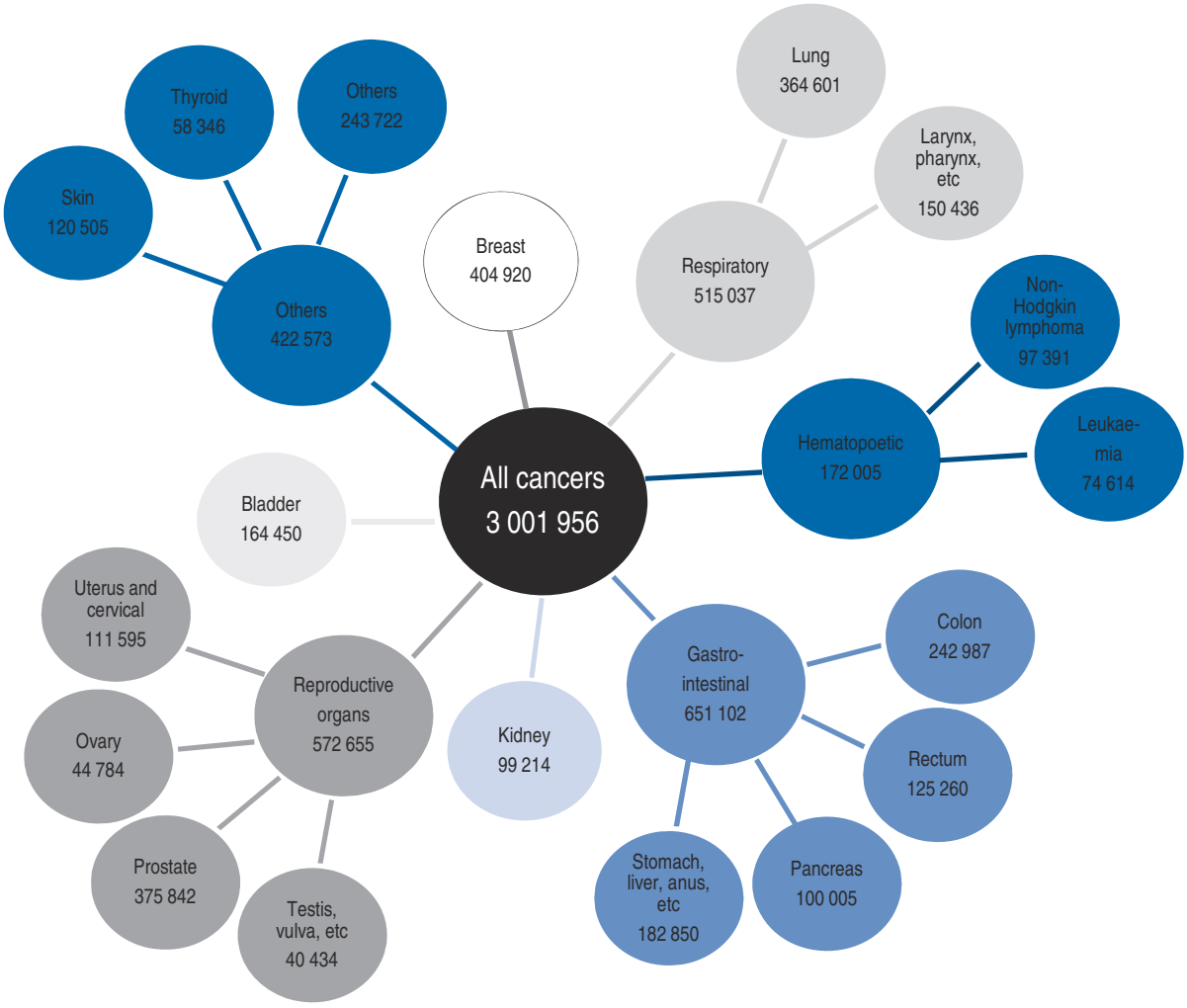
Cancer incidence rates are based on numbers of new cases of cancer registered in a country in a year divided by the population. Differences in the quality of cancer surveillance and reporting across countries may affect the comparability of the data. Rates have been age-standardised based on the new European Standard Population to remove variations arising from differences in age structures across countries and over time. The data come from the European Cancer Information System (ECIS). The estimates for 2018 may differ from national estimates due to differences in methods.

The incidence of all cancers is classified to ICD-10 codes C00-C97 (excluding non-melanoma skin cancer C44).

Reference

Joint Research Centre (2018), Dataset Collection: European Cancer Information System, *https://ec.europa.eu/jrc/en/publication/dataset-collection-european-cancer-information-system*.

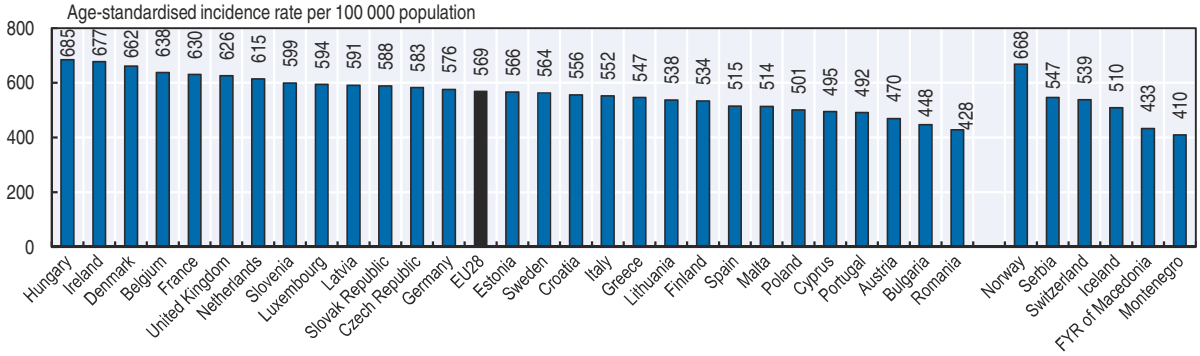
3.28. Estimated number of new cancer cases, all EU countries, 2018



Note: Non-melanoma skin cancer is excluded.
Source: JRC (European Cancer Information System).

StatLink http://dx.doi.org/10.1787/888933834794

3.29. Estimated incidence rate for all cancers, by country, 2018



Note: All cancers are included except non-melanoma skin cancer. Numbers are age-standardised based on the European Standard Population.
Source: JRC (European Cancer Information System).

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DIABETES PREVALENCE

Diabetes is a chronic disease characterised by high levels of glucose in the blood. It occurs either because the pancreas stops producing the insulin hormone (Type 1 diabetes), or because the cells of the body do not respond properly to the insulin produced (Type 2 diabetes). People with diabetes are at greater risk of developing cardiovascular diseases such as heart attack and stroke if the disease is left undiagnosed or poorly controlled. They also have higher risks of sight loss, foot and leg amputation, and renal failure.

About 32.7 million adults were diabetics in the European Union in 2017, up from an estimated 18.2 million adults in 2000. In addition, some 12.8 million people were estimated to have undiagnosed diabetes in 2017. The number of men with diagnosed diabetes has increased particularly rapidly since 2000, more than doubling from around 8 million in 2000 to 17.1 million in 2017. But the number of women with diabetes has also gone up substantially, rising from 10.3 million in 2000 to 15.6 million in 2017, an increase of over 50% (Figure 3.30).

Diabetes is more common among older people: 19.3 million people aged 60-79 have diabetes across EU countries, compared with 11.7 million people aged 40-59 and only 1.8 million aged 20-39 (Figure 3.31). While more men than women have diabetes in middle-age (between 40 and 59 years old), a greater number of women have diabetes after age 70 mainly because they live longer.

The age-standardised prevalence rate of diabetes among adults was 6% on average in EU countries in 2017. The rates varied from 9% or more in Portugal, Romania and Malta to 4% or less in Ireland, Lithuania and Estonia (Figure 3.32).

Age-standardised rates of diabetes prevalence have stabilised in many European countries in recent years, especially in Nordic countries, but they have gone up slightly in Southern Europe countries and in Central and Eastern Europe countries. These upward trends are partly due to the rise in obesity and physical inactivity, and their interactions with population ageing (NCD Risk Factor Collaboration, 2016).

Based on self-reported data on the prevalence of diabetes from the second wave of the European Health Interview Survey conducted in 2014, adults with the lowest level of education are more than twice as likely to report having diabetes than those with the highest level of education, on average across EU countries. This may partly be due to a higher proportion of low-educated people in older population groups and to the risk of diabetes increasing with age. But the prevalence of important risk factors for diabetes including obesity is much higher among people with a lower level of education (see the indicator "Obesity among adults" in Chapter 4).

The economic burden of diabetes is substantial. The health expenditure allocated to treat diabetes and prevent complications are estimated at about EUR 150 billion in 2017 in the European Union, with the average expenditure per diabetic adult estimated at about EUR 4 600 per year (IDF, 2017).

Type 2 diabetes is largely preventable. A number of risk factors, such as overweight and obesity, nutrition and physical inactivity, are modifiable. However, the prevalence of overweight and obesity is increasing in most countries (see the indicator "Overweight and obesity among adults" in Chapter 4). These reinforce the need for effective preventive strategies.

Definition and comparability

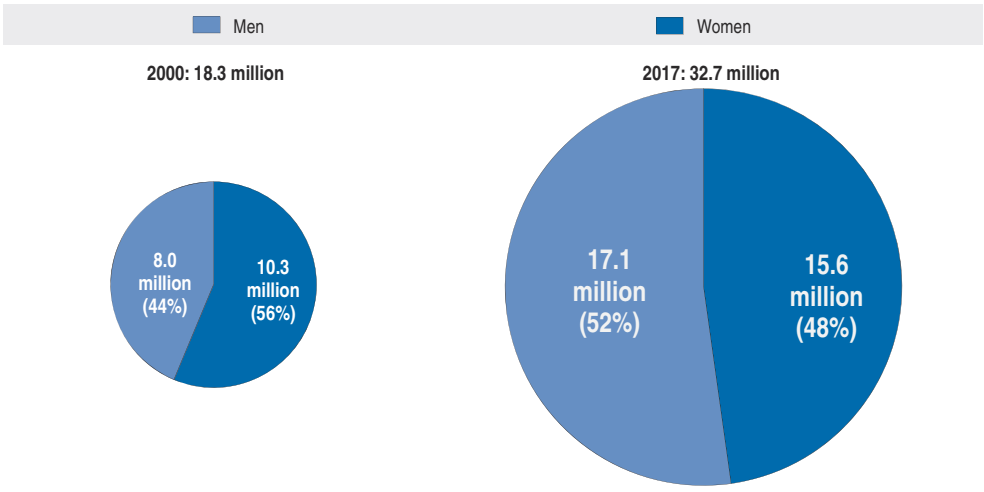
The sources and methods used by the International Diabetes Federation are outlined in the Diabetes Atlas, 8th edition (IDF, 2017). The IDF produced estimations based on a variety of sources of which the majority was peer-reviewed articles and national health surveys. In addition, sources were only included if they met several criteria for reliability. Age-standardised rates were calculated using the world population based on the distribution provided by the World Health Organization. Adult population covers those aged between 18 and 99 years old with Type 1 or Type 2 diagnosed diabetes.

References

IDF (2017), *Diabetes Atlas, 8th edition*, International Diabetes Federation, Brussels.

NCD Risk Factor Collaboration (2016), "Worldwide Trends in Diabetes Since 1980: A Pooled Analysis of 751 Population-based Studies with 4.4 Million Participants", *The Lancet*, Vol. 387, pp. 1513-1530, *http://dx.doi.org/10.1016/S0140-6736(16)00618-8*.

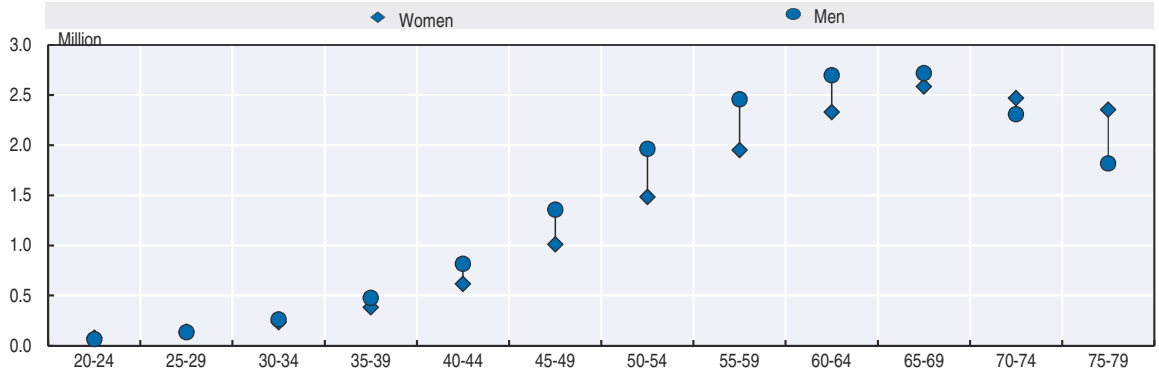
3.30. Number of people with diabetes in EU28, 2000 and 2017



Note: Data include people aged 20-79 with Type 1 or Type 2 diagnosed diabetes. The number of people with diabetes in 2000 has been estimated for some countries due to data gaps.
Source: IDF Atlas, 8th Edition, 2017 and OECD estimates.

StatLink http://dx.doi.org/10.1787/888933834832

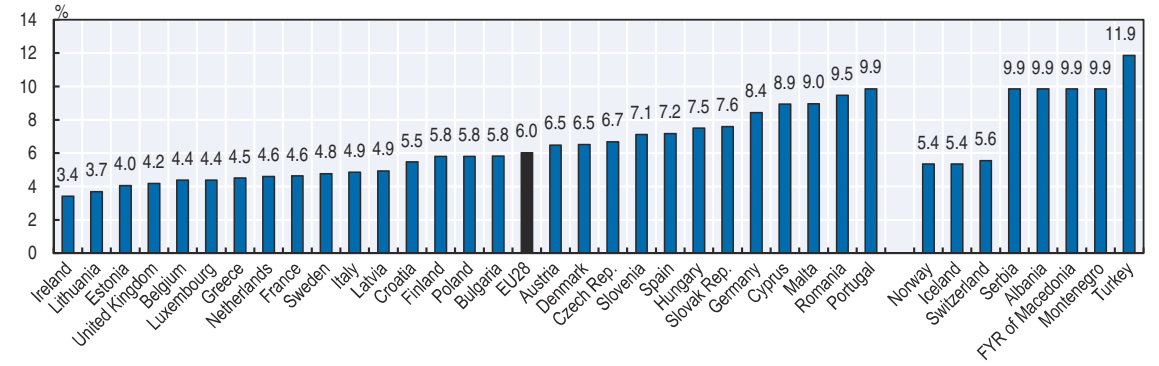
3.31. People with diabetes in EU28, by gender and age group, 2017



Note: Population with Type 1 or Type 2 diagnosed diabetes. Data are only available up to 79 years old.
Source: IDF Atlas, 8th Edition, 2017.

StatLink http://dx.doi.org/10.1787/888933834851

3.32. Share of adults with diabetes, 2017



Note: Age-standardised prevalence of population aged 18-99 with Type 1 or Type 2 diagnosed diabetes.
Source: IDF Atlas, 8th Edition, 2017.

StatLink http://dx.doi.org/10.1787/888933834870

DEMENTIA PREVALENCE

Dementia describes a variety of brain disorders which progressively lead to brain damage and cause a gradual deterioration of the individual's functional capacity and social relations. Alzheimer's disease is the most common form of dementia, representing about 60% to 80% of cases. There is currently no cure or disease-modifying treatment, but better policies can improve the lives of people with dementia by helping them and their families adjust to living with the condition and ensuring that they have access to high quality health and social care.

In 2018, an estimated 9.1 million people aged over 60 are living with dementia in EU member states, up from 5.9 million in 2000. If the age-specific prevalence of dementia remains the same, ageing populations mean that this number will continue to grow substantially in the future. The overall number of people living with dementia in EU countries is expected to rise by about 60% over the next two decades to reach 14.3 million in 2040, with the oldest people (those aged over 90) accounting for a growing share (Figure 3.33).

The prevalence of dementia increases rapidly with age. While only around 1% of people aged 60-64 have dementia, this proportion goes up to nearly 40% among those aged over 90 across EU countries. More women than men also live with dementia at any age group, with the gap increasing at older ages (Figure 3.34).

Overall, around 7% of the population aged over 60 in EU countries have dementia in 2018. This proportion is expected to grow to over 8% by 2040 because of population ageing. Countries that have high shares of very elderly people now generally have a greater proportion of people with dementia. Italy, France, Greece and Spain have around 8% of their population aged over 60 living with dementia now, while this proportion is only around 4% or less in Croatia, the Slovak Republic, Bulgaria, Romania, Poland, the Czech Republic and Hungary. Over the next two decades, the prevalence of dementia will rise particularly quickly in those countries where the share of people aged over 80 and 90 years will grow more rapidly (Figure 3.35).

However, there is some evidence that the age-specific prevalence of dementia may be falling in some countries (Matthews et al., 2013) and it may be possible to reduce the risk of dementia through healthier lifestyles and preventive interventions. A recent randomised-controlled trial of a multi-domain intervention, including diet, physical exercise, and cognitive training, found such lifestyle interventions to have a positive effect on cognition (Ngandu et al., 2015). If such efforts are successful, the rise in prevalence may be less dramatic than these numbers suggest.

Nonetheless, dementia will undoubtedly pose a growing challenge to all EU countries. There has been a renewed international focus on supporting countries to improve the lives of people living with dementia, their families and carers. This includes an increased focus on ensuring patients have access to a timely and accurate diagnosis and adequate post-diagnostic support. The growth of dementia-friendly initiatives across many EU countries – including training social services, businesses, and volunteers to recognise signs of dementia and respond appropriately – may help reduce the stigma around the disease, particularly for those living at home. Nevertheless, further efforts are also needed to improve care coordination to help patients and their families navigate complex health and social systems, to develop residential care models adapted to the needs of people with dementia, and to improve the quality of care for people with dementia in hospitals and at the end of life (OECD, 2018).

Definition and comparability

Estimates are taken from the World Alzheimer Report 2015, which includes a systematic review of studies of dementia prevalence around the world over the past few decades, assuming that age-specific prevalence has been constant over time. The prevalence by country has been estimated by applying the age-specific prevalence rates for each region of the world to the population structure estimates from the United Nations (World Population Prospects: 2017 Revision).

References

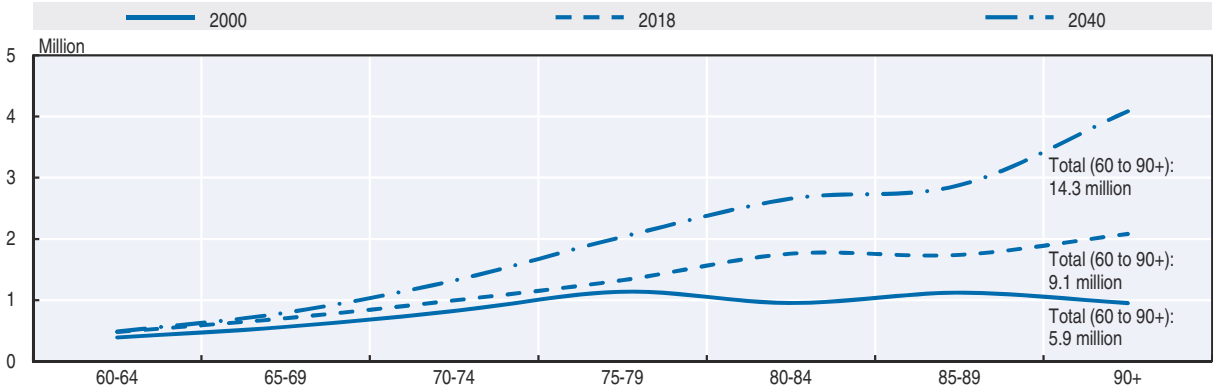
Matthews, F.E. et al. (2013), "A two-decade comparison of prevalence of dementia in individuals aged 65 years and older from three geographical areas of England: Results of the cognitive function and ageing Study I and II", *The Lancet*, Vol. 382, No. 9902.

Ngandu, T. et al. (2015), "A 2 year multidomain intervention of diet, exercise, cognitive training, and vascular risk monitoring versus control to prevent cognitive decline in at-risk elderly people (FINGER): A randomised controlled trial", *The Lancet*, *http://dx.doi.org/10.1016/S0140-6736(15)60461-5*.

OECD (2018), *Care Needed: Improving the Lives of People with Dementia*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/9789264085107-en*.

Prince, M. et al. (2015), *World Alzheimer Report 2015: The Global Impact of Dementia*, Alzheimer's Disease International.

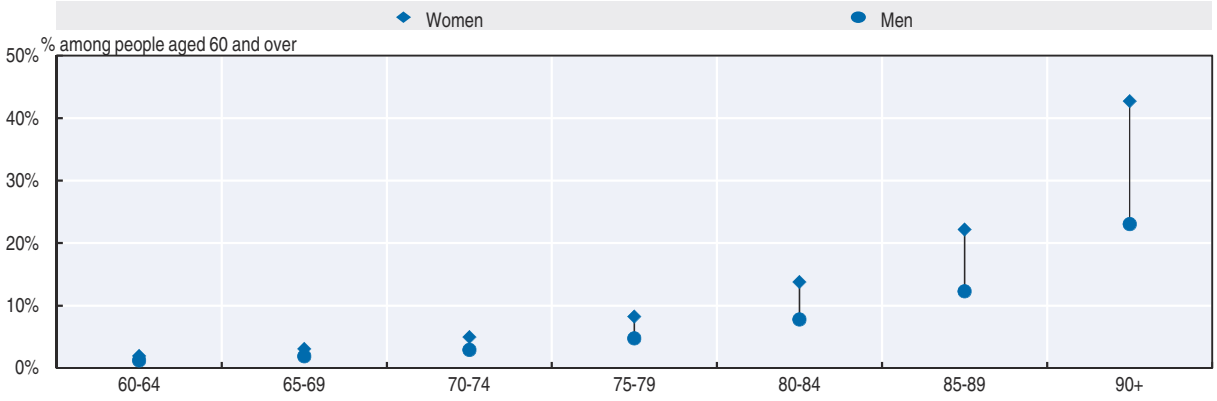
3.33. Estimated number of people with dementia in EU countries, by age group, 2000, 2018 and 2040



Source: OECD analysis of data covering 28 EU countries from the World Alzheimer Report 2015 and the United Nations.

StatLink http://dx.doi.org/10.1787/888933834889

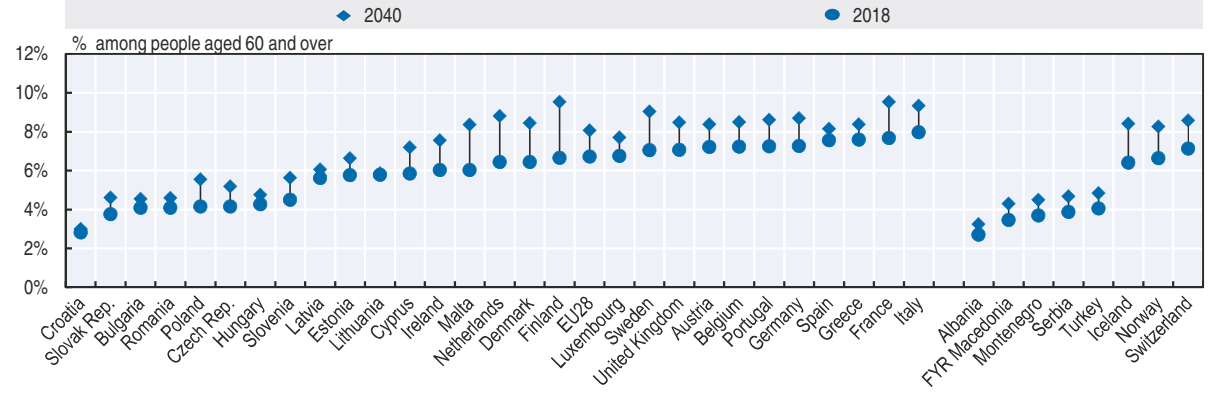
3.34. Estimated prevalence of dementia among people aged 60 and over, by gender and age group, 2018



Source: OECD analysis of data covering 28 EU countries from the World Alzheimer Report 2015 and the United Nations.

StatLink http://dx.doi.org/10.1787/888933834908

3.35. Estimated prevalence of dementia among people aged 60 and over, 2018 and 2040



Source: OECD analysis of data from the World Alzheimer Report 2015 and the United Nations.

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PART II

Chapter 4

Risk factors

This chapter focuses mainly on modifiable risk factors to health among children and adults, including smoking, alcohol consumption and obesity. It ends with a new indicator of mortality related to environmental factors such as air pollution and extreme weather conditions.

Recent estimates indicate that some 790 000 people in EU countries died prematurely in 2016 because of tobacco smoking, alcohol consumption, unhealthy diets and lack of physical activity. Smoking among both children and adults has decreased in most EU countries, yet about one-fifth of adults still smoke every day, and the proportion still exceeds one in four adults in some countries that are lagging behind. Alcohol control policies have achieved progress in reducing overall alcohol consumption in several countries, with overall consumption dropping by over 10% over the past decade, but heavy alcohol consumption remains an issue among adolescents and adults. Nearly two out of five adolescent boys and girls report at least one "binge drinking" event in the past month, and more than two out of five young men aged 20-29 also report heavy episodic drinking across EU countries. The use of illicit drugs remains an important public health issue in Europe. While the use of some drugs has declined, cannabis remains frequently used among young people and the use of cocaine is on the rise in several countries.

Obesity continues to spread among adults in most EU countries, while there are some signs of plateauing among children. Inequality in obesity remains marked: 12% of people with higher education level are obese compared to 20% of those with lower education level.

Exposure to serious air pollutants is estimated to have caused the death of nearly 240 000 people across EU countries in 2016. Extreme weather conditions such as heat waves or cold waves are also becoming more frequent, and some episodes in the past have led to the deaths of many thousands of people, particularly among frail elderly people.

These findings suggest that a much stronger focus on health promotion and disease prevention could help reduce the burden of many diseases and avoid a large number of premature deaths.

SMOKING AMONG CHILDREN

Smoking in childhood and adolescence has both immediate and long-term health consequences. The immediate adverse health consequences of smoking include addiction, reduced physical fitness and endurance, and asthma, while early onset of smoking habits increase children's long-term risk of cardiovascular diseases, respiratory illnesses and cancer. Children who smoke are also more likely to experiment with alcohol and illicit drugs.

On average in EU countries, 25% of 15-16 year olds reported smoking in the past month in 2015 (Figure 4.1). More than 30% of them smoked in the past month in Bulgaria, Croatia, Germany, Italy and the Slovak Republic, whereas less than 15% did so in Belgium (Flanders), Ireland, Malta and Sweden. Smoking rates among 15-16 year olds have decreased since 2007 in most EU countries, except in Poland and Romania where they have increased. The largest decreases have occurred in Austria, Denmark, Ireland, Latvia, Malta, and Sweden.

The gap in smoking between 15-16 year old boys and girls is fairly small in most countries. On average, a slightly greater proportion of 15-16 year old girls reported smoking in 2015 (26% compared with 24% for boys). Smoking rates among 15-16 year olds have decreased since 1999, slightly more rapidly among boys than girls (Figure 4.2).

A mix of policies including excise taxes to increase prices, clean indoor-air laws, restrictions on youth access to tobacco, and greater education about the effects of tobacco on health has contributed to reducing smoking rates among children and adolescents. In May 2016, the new Tobacco Products Directive became effective in all EU Member States. This directive particularly targets adolescents and young adults, as 25% of 15-24 year olds in the European Union are smokers (Pötschke-Langer, 2016). It bans flavoured cigarettes, makes larger health warnings (image and text) on packages mandatory, and introduces safety, quality and packaging regulations pertaining to e-cigarettes.

Specific measures to reduce smoking among adolescents implemented in some countries include: plain packaging of tobacco products, price hike, advertising restrictions, smoke-free environments legislation, ban on the sale of e-cigarettes to children, or the prohibition of proxy purchasing by adults on behalf of children.

In addition to direct smoking, many children are also exposed to second-hand smoking at home, at school or in cars. Second-hand smoking also increases greatly the risk of many respiratory diseases or other illnesses (WHO Europe, 2018). In response, many countries have taken measures to protect children from such second-hand smoking in public places but also in some cases by banning smoking in cars when children are present.

Definition and comparability

The data refer to the proportion of children aged 15-16 year olds who report smoking in the past 30 days. The data come from the European School Survey Project on Alcohol and Other Drugs (ESPAD). The ESPAD survey has been collecting comparable data on smoking and other substance use among 15-16 year old students in European countries every four years since 1995.

Data for Spain (a non-ESPAD country) come from the Spanish national school survey (2014-15). Data from Latvia need to be interpreted with caution due to small sample size.

For more information, please see *http://espad.org/report/home/*.

References

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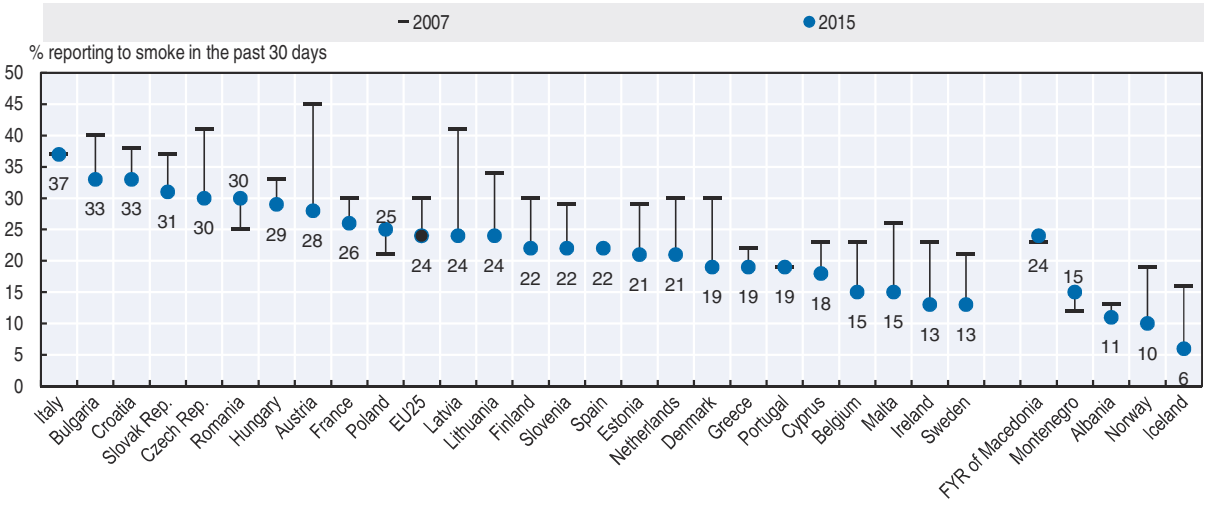
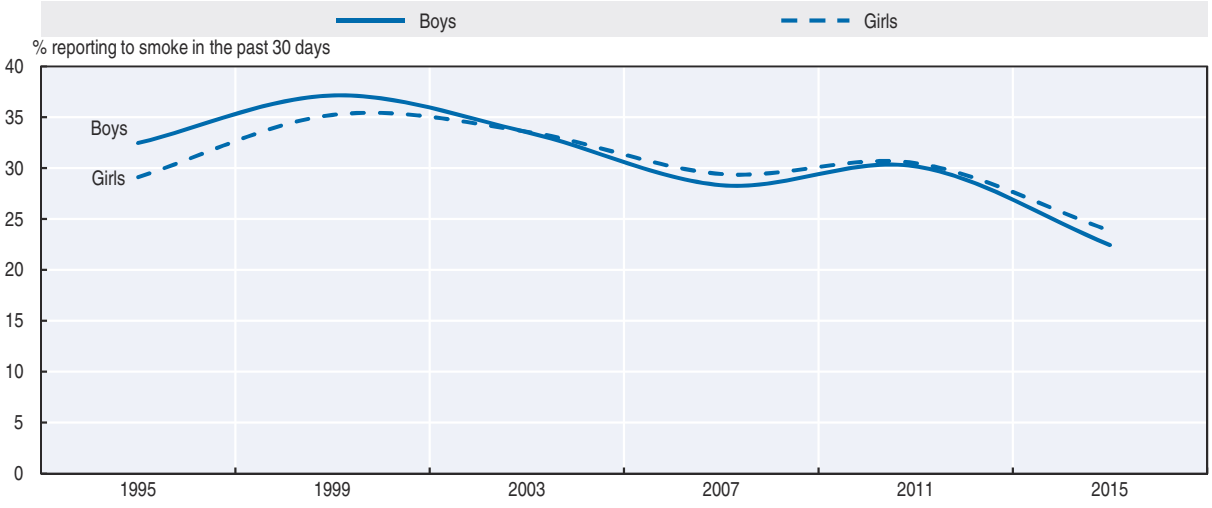
4.1. Changes in smoking rates among 15-16 year olds, 2007 to 2015



Note: The EU average is not weighted by country population size. The data for Belgium refers to the Flanders region only.
Source: ESPAD, 2007 and 2015.

StatLink http://dx.doi.org/10.1787/888933834946

4.2. Gender gap in smoking rates among 15-16 year olds, average across EU countries and Norway, 1995 to 2015



Source: ESPAD.

StatLink http://dx.doi.org/10.1787/888933834965

SMOKING AMONG ADULTS

Tobacco consumption is the largest avoidable health risk in the European Union and the most significant cause of premature death, with over 300 000 deaths per year according to IHME estimates (IHME, 2018). Around half of smokers die prematurely, dying 14 years earlier on average. It is a major risk factor for at least two of the leading causes of mortality, circulatory diseases and cancer, and an important risk factor for many serious respiratory diseases.

The proportion of adults who smoke daily varies more than two-fold across EU countries (Figure 4.3). It is the lowest in Nordic countries (Sweden, Finland, as well as Iceland and Norway) and the highest in Bulgaria, Greece, Hungary and Cyprus. On average, the proportion of adults smoking daily has decreased from 24% in 2006 to 20% in 2016, with large reductions in Nordic countries, the Netherlands, Latvia and Greece.

Men smoke more than women in all European countries, except in Sweden and Iceland where the rate is virtually equal (Figure 4.4). One in four men and one in six women smoke daily on average in EU countries. The gender gap is particularly large in Cyprus, Latvia, Lithuania and Romania.

The Eurobarometer survey reports higher smoking rates among both men and women as it includes people smoking daily or occasionally. The results from the latest Eurobarometer survey conducted in 2017 indicate that 30% of men and 22% of women are daily or occasional smokers on average across EU countries (TNS Opinion & Social, 2017).

According to a tobacco control scale from the Association of European Cancer Leagues, the United Kingdom, Ireland, Iceland, France and Norway are the top five European countries with the most comprehensive tobacco control policies in 2016 (Joossens and Raw, 2017). Countries that have stricter tobacco control policies generally have higher reductions in smoking rates and higher quit ratios (Feliu et al., 2018), although there are exceptions.

The EU Tobacco Products Directive (2014/40/EU), adopted in February 2014, requires that health warnings appear on packages of tobacco and related products, bans all promotional and misleading elements on tobacco products, and sets out safety and quality requirements for electronic cigarettes (European Commission, 2014). One important step forward in health warnings is plain packaging for tobacco products aiming to restrict branding. Following the lead from Australia, plain packaging has been adopted by an increasing number of European countries (e.g. France, Hungary, Ireland, the United Kingdom, Norway, and will be implemented in Slovenia in 2020).

Among tobacco control measures, rising taxes on tobacco is the most effective way to reduce tobacco use and to encourage users to quit (WHO, 2017). The EU Directive on excise duty on tobacco (2011/64/EU), which requires Member States to levy a minimum rate of excise duties on cigarettes (European Commission, 2011), has contributed a lot to the success of tax measures in EU members. In 2012, the large majority of EU countries (22 countries) were complying with the tax share minimum level recommended by WHO (tax share representing more than 75% of the retail price of the most popular brand of cigarettes) (WHO, 2014).

Definition and comparability

The proportion of daily smokers is defined as the percentage of the population aged 15 years and over who report tobacco smoking every day. Other forms of smokeless tobacco products, such as snuff in Sweden, are not taken into account. The comparability of data is limited to some extent due to the lack of standardisation in the measurement of smoking habits in health interview surveys across EU Member States. Variations remain in the age groups surveyed, wording of questions, response categories and survey methodologies.

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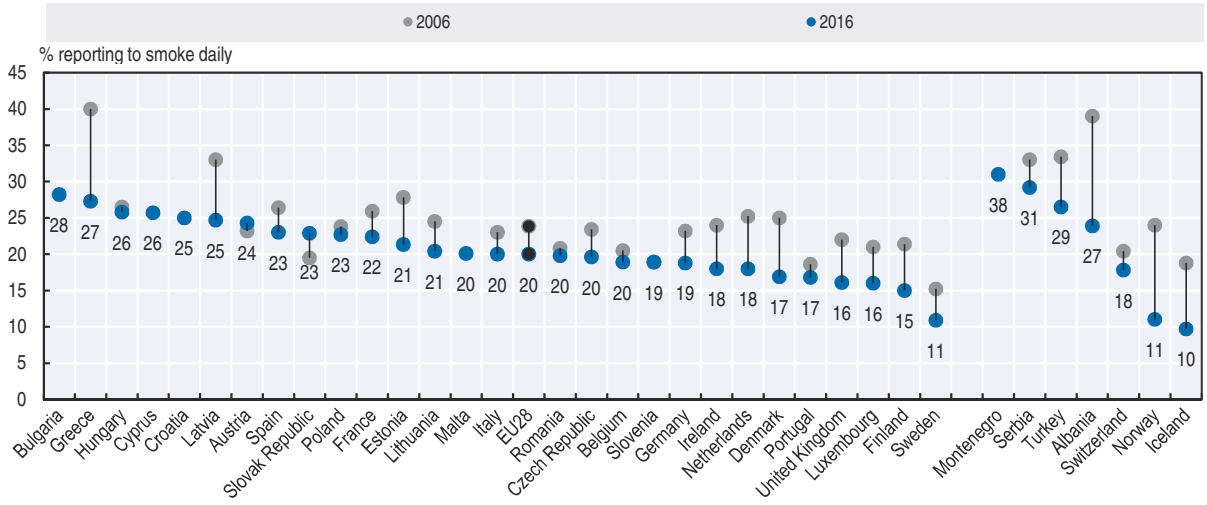
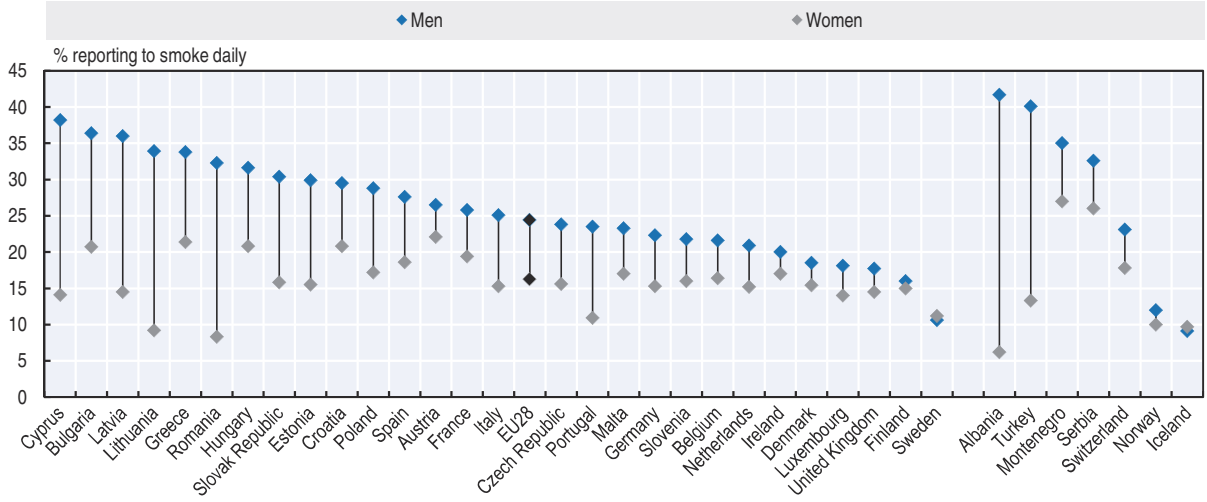
4.3. Changes in daily smoking rates among adults, 2006 and 2016 (or latest year)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en* (based on national health interview surveys), complemented with Eurostat (EHIS 2014) for Bulgaria, Croatia, Cyprus, Malta, and Romania, and with WHO Europe Health for All database for Albania, Serbia and Montenegro.

StatLink http://dx.doi.org/10.1787/888933834984

4.4. Gender gap in daily smoking rates among adults, 2016 (or latest year)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en* (based on national health interview surveys) complemented with Eurostat (EHIS 2014) for Bulgaria, Croatia, Cyprus, Malta, and Romania, and with WHO Europe Health for All database for Albania, Serbia and Montenegro.

StatLink http://dx.doi.org/10.1787/888933835003

ALCOHOL CONSUMPTION AMONG CHILDREN

Alcohol use in adolescence continues to be very common in Europe, with beer being by far the most popular alcoholic beverage, even though the percentage of 15-16 year olds reporting heavy episodic drinking has come down at least slightly in recent years in several countries (ESPAD, 2016).

Two adolescent drinking patterns are specifically linked to negative health, education and social outcomes – early initiation of alcohol consumption and binge drinking. About half of European adolescents started drinking alcohol at the age of 13 or even younger, and almost 10% have been drunk at least once by the age of 13 (ESPAD, 2016). Children who report early initiation to alcohol and having been drunk on several occasions are more likely to develop alcohol dependence later in life (Spear, 2015).

By age 15-16, over 80% of adolescents report having tried alcohol at least once in their life, and half say that they have consumed alcohol in the past month (ESPAD, 2016). More than two-thirds of 15-16 year olds in Denmark, Austria, Cyprus, the Czech Republic and Greece report having consumed alcohol over the past month, compared with less than one-third in Sweden and Finland. Frequent alcohol use is linked to how easy it is for adolescents to purchase alcohol. More than 90% of adolescents in countries where they report drinking regularly say that it is easy to obtain alcohol.

Heavy episodic drinking (also known as "binge drinking") is a frequent behaviour among many European adolescents – 38% of 15-16 year old boys and girls reported at least one binge drinking session in the past month on average. Binge drinking is particularly popular among adolescents in Denmark and Cyprus, with half of 15-16 year olds reporting heavy drinking in the past month. This proportion was much lower in Portugal, Norway and Iceland (Figure 4.5)

On the positive side, the proportion of adolescents who report regular binge drinking has decreased significantly from 2011 to 2015 in most countries, while it has remained stable in several other countries. This proportion has increased significantly in only two countries (Cyprus and Montenegro).

In most countries, binge drinking is slightly more frequent among boys than girls, although the gap has narrowed recently (Figure 4.6). In 2015, 39% of 15-16 year old boys reported heavy alcohol drinking in the past month compared with 35% of girls. This gender gap remains particularly large in Romania, Cyprus, the Czech Republic and Greece.

Approximately a third of European adolescents report negative experiences while under the influence of alcohol. These include accidents or injuries (9% of boys and girls) and unprotected sex (8% of boys and 5% of girls).

A number of policies have proven to be effective to reduce alcohol drinking among adolescents, such as limiting accessibility (e.g. through restrictions on location and hours of sales, and raising the minimum age to drink alcohol), increase prices, and advertising regulations. In January 2018, Lithuania, which has one of the highest level of alcohol consumption among adolescents based on another children and adolescent survey (Inchley et al., 2016), introduced a new legislation on alcohol control particularly targeting young people. This legislation raised the legal drinking age from 18 to 20, restricted opening hours for sales in retail stores, and banned all advertising for beers, wines and spirits.

Definition and comparability

Heavy episodic drinking is defined as drinking five or more drinks in a single occasion in the past 30 days. National examples are given so that a "drink" is understood to contain roughly the equal amount of pure alcohol as a glass of wine.

The data source is the European School Survey Project on Alcohol and Other Drugs (ESPAD). The ESPAD survey has been collecting comparable data on alcohol use and other substance use among 15-16 year old students in European countries every four years since 1995.

For more information, please see *http://espad.org/report/home/*.

References

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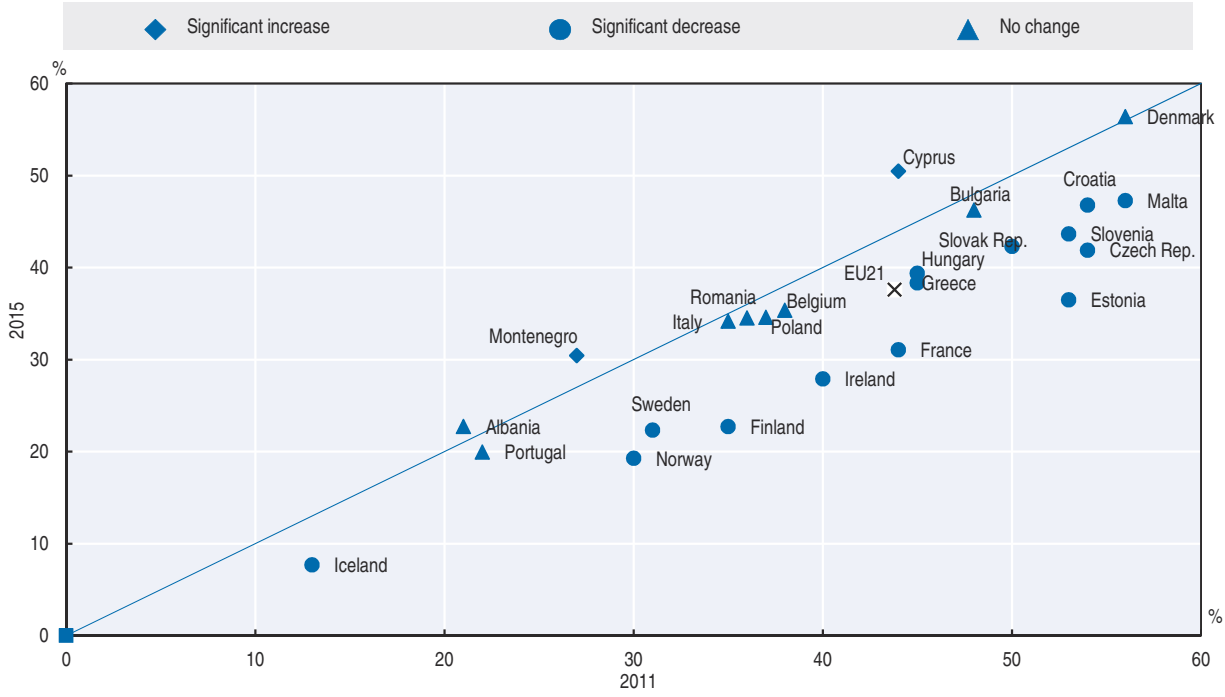
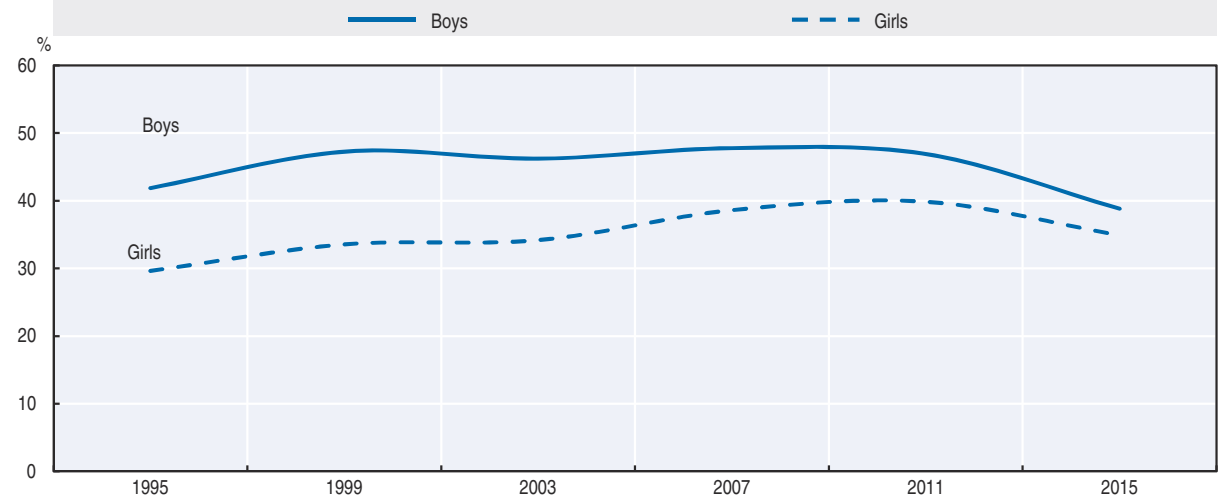
4.5. Changes in the proportion of heavy episodic drinking in the past 30 days among 15-16 year olds, 2011 to 2015



Note: The grey line represents "no change" between 2011 and 2015. Decreases of 3 or more percentage points between successive surveys are indicated with a square, increases of 3 or more percentage points with a triangle, and unchanged situations with a losange (less than ± 3 percentage points).
Source: ESPAD 2011 and 2015. The data for Belgium refers to the Flanders region only.

StatLink http://dx.doi.org/10.1787/888933835022

4.6. Changes in heavy episodic drinking in the past 30 days among 15-16 year old boys and girls, average across EU countries and Norway, 1995 to 2015



Note: The average is not weighted by country population size.
Source: ESPAD.

StatLink http://dx.doi.org/10.1787/888933835041

ALCOHOL CONSUMPTION AMONG ADULTS

Alcohol-related harm is a major public health concern in the European Union, both in terms of morbidity and mortality. Alcohol was the third leading risk factor for disease and mortality after tobacco and high blood pressure in Europe in 2012, and accounted for an estimated 7.6% of all men's deaths and 4.0% of all women's deaths (WHO, 2014). High alcohol intake is associated with increased risk of heart diseases and stroke, as well as liver cirrhosis and certain cancers, but even moderate alcohol consumption increases the long-term risk of developing such diseases. Foetal exposure to alcohol increases the risk of birth defects and intellectual impairments. Alcohol also contributes to death and disability through accidents and injuries, assault, violence, homicide, and suicide, particularly among young people.

Measured through sales data, overall alcohol consumption stood at 9.8 litres of pure alcohol per adult on average across EU Member States in 2016, down from 11 litres in 2006 (Figure 4.7). Lithuania reported the highest consumption of alcohol, with 13.2 litres per adult, followed by France, the Czech Republic, Bulgaria, Austria, Luxembourg, Ireland, and Latvia with more than 11 litres per adult. At the other end of the scale, Greece, Italy and Sweden have relatively low levels of consumption, below 8 litres of pure alcohol per adult.

Although overall alcohol consumption per capita is a useful measure to assess long-term trends, it does not identify sub-populations at risk from harmful drinking patterns. Heavy episodic drinking, also known as "binge drinking", is more common among men, and particularly young men aged 20-29. More than 40% of men aged 20-29 report heavy episodic drinking on average across the EU. Nonetheless, a sizeable proportion of both men and women at older ages also report regular heavy drinking (Figure 4.8).

A number of countries have taken initiatives to limit harmful use of alcohol in recent years. Some interventions target heavy drinkers only, other target young drinkers (e.g. sales restrictions to young people below a certain age, tighter alcohol consumption limit for young drivers), while others are more broadly based. In 2018, Scotland introduced minimum pricing per unit of alcohol at 50 pence, which set a minimum price of GBP 1 for a 500 ml can of beer and GBP 4.69 for a bottle of wine. Wales also plans to introduce such a minimum price for alcohol with the Public Health (Minimum Price for Alcohol) (Wales) Act. Minimum pricing is likely to reduce the consumption of cheap alcohol, in particular in harmful patterns such as binge drinking and alcohol-dependent use.

Regulations on advertising alcoholic products have taken different forms on different media (e.g. printed newspapers, billboards, the internet). For example, Estonia recently passed a law restricting alcohol sales and alcohol marketing practices. This new law specifically aims to restrict the visibility of alcohol in public places (e.g. by requiring stores to reduce the public display of alcoholic products) and to change advertising practices so as to avoid linking alcohol consumption with good times such as holidays. In addition, alcohol advertisement by alcohol operators will be prohibited from social media, except on their own websites.

All EU countries have set maximum levels of blood alcohol concentration for drivers in their legislation, but these regulations are not always enforced rigorously. Less stringent policies include health promotion messages, school-based and worksite interventions, and greater counselling by family doctors or other primary care providers. Comprehensive policy packages including fiscal measures, regulations and less stringent policies are shown to be the most effective to reduce harmful use of alcohol (OECD, 2015).

Definition and comparability

Overall alcohol consumption is defined as annual sales of pure alcohol in litres per person aged 15 years and over. The methodology to convert alcohol drinks to pure alcohol may differ across countries. Official statistics do not include unrecorded alcohol consumption, such as home production. In some countries (e.g. Luxembourg), national sales do not accurately reflect actual consumption by residents, since purchases by non-residents may create a significant gap between national sales and consumption. Alcohol consumption in Luxembourg is thus estimated as the average alcohol consumption in France and Germany.

Regular heavy episodic drinking (or binge drinking) is derived from self-reported information as part of the European Health Interview Survey in 2014. Regular binge drinking is defined as having 60 grams of pure alcohol per single occasion at least once a month over the past 12 months. The figures represent the proportion of adults who reported binge drinking at least once a month over the past 12 months as a percentage of adults who drank alcohol in the past 12 months.

References

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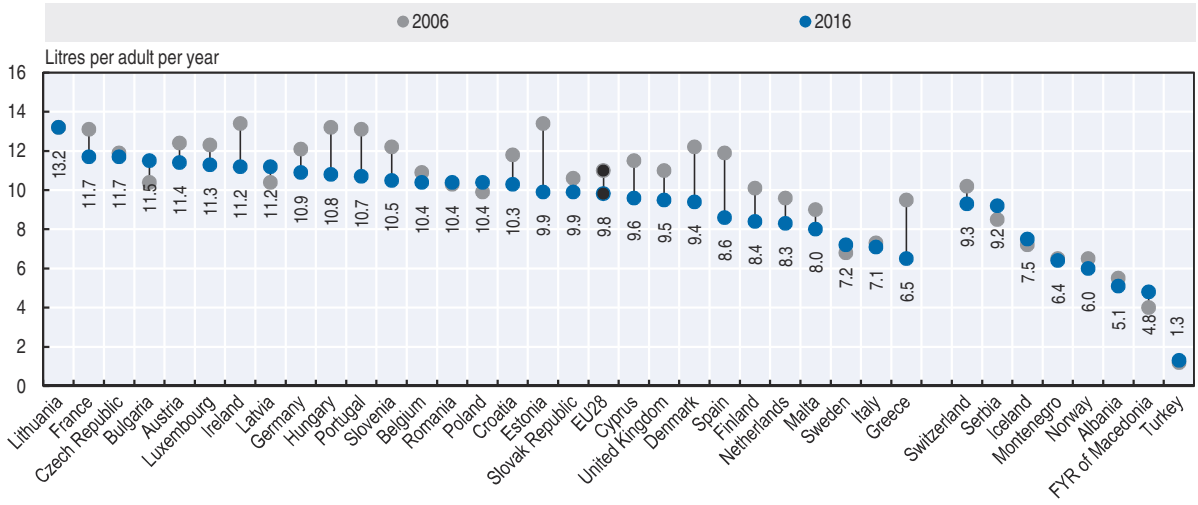
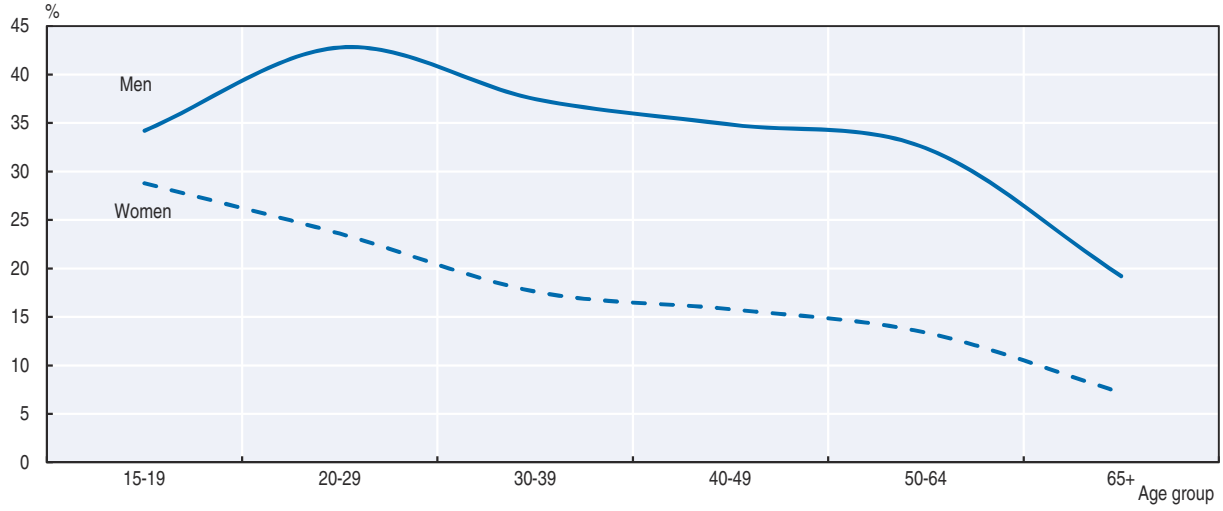
4.7. Overall alcohol consumption among adults, 2006 and 2016 (or nearest years)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Global Information System on Alcohol and Health for non-OECD countries and Austria, Belgium, Germany, Greece, Italy, Latvia, Luxembourg, Portugal, and Spain.

StatLink http://dx.doi.org/10.1787/888933835060

4.8. Gender gap in regular heavy episodic drinking by age, EU average, 2014



Note: The EU average is not weighted by country population size.
Source: Eurostat, EHIS 2014.

StatLink http://dx.doi.org/10.1787/888933835079

ILLICIT DRUG CONSUMPTION AMONG CHILDREN

Adolescence is a period of experimentation sometimes linked to engagement in risky behaviour, including the use of illicit substances such as cannabis being by far the most "popular" drug. Frequent and heavy cannabis use during adolescence is linked to an increased risk of dependence and neurobiological problems (WHO, 2016).

Close to one in five 15-16 year olds (16%) in EU countries report having consumed cannabis at least once during their lifetime, and 7% say that they have consumed cannabis in the past month. The proportion of 15-16 year olds reporting to have consumed cannabis the past month is highest in France (17%) and Italy (15%), and the lowest in Finland and Sweden (2% only) (Figure 4.9). In all countries, boys are more likely than girls to report having consumed cannabis in the past month, although the gap is almost nil in some countries (e.g. Malta, Portugal and the Slovak Republic). About 1% of 15-16 year olds consume cannabis almost every day.

The lifetime use of at least one illicit drug other than cannabis at age 15-16 is 6% on average across EU countries (Figure 4.10). The highest rates are observed in Bulgaria and Poland, while the lowest rates are in Denmark, Finland and Sweden. Boys are more likely than girls to report having consumed illicit drug other than cannabis in a majority of countries. At least once in a lifetime consumption of ecstasy, amphetamines, cocaine, LSD and other hallucinogens are reported on average by 2% of 15-16 year olds. Crack and heroin use is less common, with only about 1% of 15-16 year olds reporting use at least once during their life.

The use of new psychoactive substances is an important concern in many European countries and has been identified as a priority for monitoring under Early Warning Systems. About 4% of adolescents aged 15-16 years old report to have used such new psychoactive substances at least once during their lifetime across EU countries, with the proportion being the highest in Poland and Estonia (10%).

The use of illegal drugs together with alcohol and other substances increases the risks of accidents and injuries for adolescents and mental health problems later in life (Connor et al., 2014). The vast majority of 15-16 year olds in EU countries (more than 90%) who ever smoked cannabis have also consumed alcohol and tobacco.

The overall trend in illicit drug use among 15-16 year olds seems fairly stable over the past decade in the case of cannabis or even showing a slight decrease in the case of other illicit drugs, following a large increase in the 1990s (Figure 4.11 and Figure 4.12). In recent years, the gender gap in the use of different types of illicit drugs between boys and girls has narrowed slightly.

Definition and comparability

The use of illicit drugs other than cannabis includes use of amphetamines, cocaine, crack, ecstasy, LSD or other hallucinogens, heroin and GHB.

The data source is the European School Survey Project on Alcohol and Other Drugs (ESPAD). The ESPAD survey repeatedly collects comparable data on the use of illicit drugs and other substance among 15-16 year olds students in European countries. The ESPAD survey data have been collected every four years since 1995.

Data for Spain (a non-ESPAD country) come from the Spanish national school survey (2014-15), only including some indicators where comparability is high. Data from Latvia need to be interpreted with caution due to low sample size.

For more information, please see *http://espad.org/report/home/*.

References

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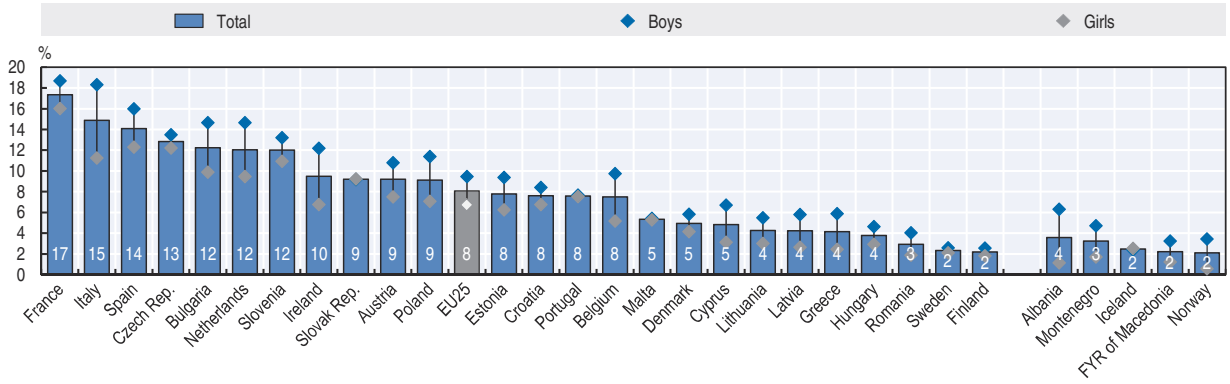
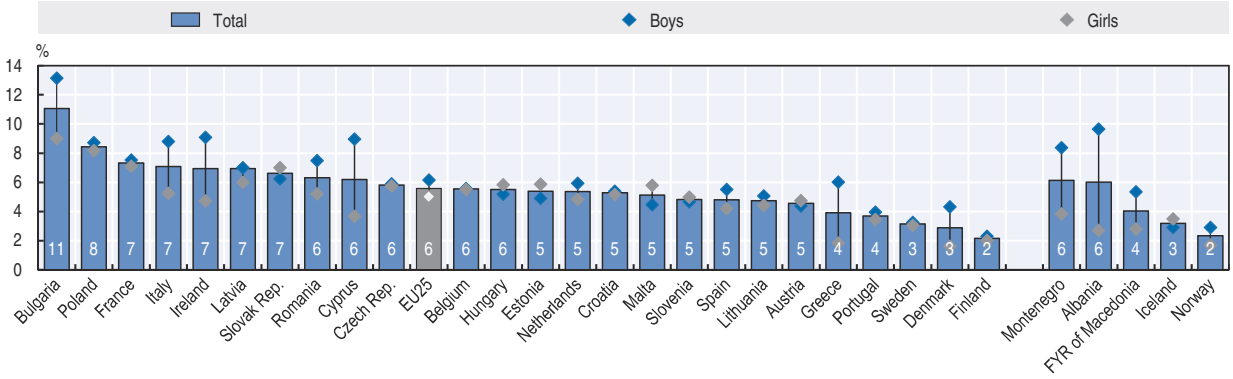
4.9. Prevalence of cannabis use in the last 30 days among 15-16 year olds, 2015



Note: The EU average is not weighted by country population size. The data for Belgium refers to the Flanders region only.
Source: ESPAD, 2015. Spanish national school survey 2014-15 for Spain.

StatLink http://dx.doi.org/10.1787/888933835098

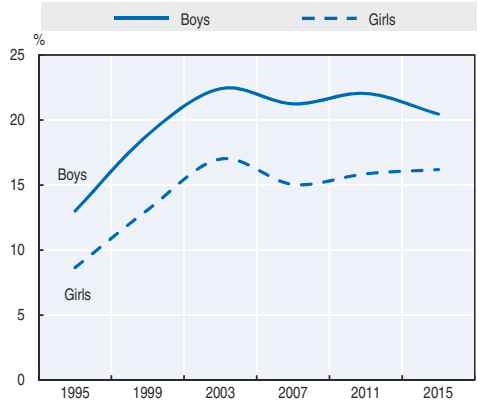
4.10. At least once in a lifetime use of illicit drugs other than cannabis among 15-16 year olds, 2015



Note: The EU average is not weighted by country population size. The data for Belgium refers to the Flanders region only.
Source: ESPAD, 2015. Spanish national school survey 2014-15 for Spain.

StatLink http://dx.doi.org/10.1787/888933835117

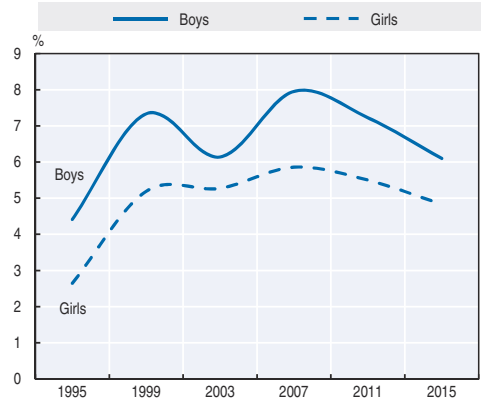
4.11. Lifetime use of cannabis among 15-16 year olds, average across EU countries and Norway, 1995 to 2015



Note: The average is not weighted by country population size.
Source: ESPAD.

StatLink http://dx.doi.org/10.1787/888933835136

4.12. Lifetime use of illicit drugs other than cannabis among 15-16 year olds, average across EU countries and Norway, 1995 to 2015



Note: The average is not weighted by country population size.
Source: ESPAD.

StatLink http://dx.doi.org/10.1787/888933835155

ILLICIT DRUG CONSUMPTION AMONG ADULTS

The use of illicit drugs remains an important public health issue in Europe. Over a quarter of adults in the European Union aged 15-64, or over 92 million people, have used illicit drugs at some point in their lives. In most cases, they have used cannabis, but some have also used cocaine, amphetamines, ecstasy and other drugs (EMCDDA, 2018). The use of illicit drugs, particularly among people who use them regularly, is associated with higher risks of cardiovascular diseases, mental health problems, accidents, as well as infectious diseases such as HIV. Illicit drug use is a major cause of mortality among young adults in Europe, both directly through overdose and indirectly through drug-related diseases, accidents, violence and suicide.

Cannabis is the illicit drug most used among young adults in Europe. Over 14% of people aged 15 to 34 in EU countries report having used cannabis in the last year (Figure 4.13). This proportion is the highest in France and Italy (20% or more). Cannabis use has increased over the past decade in some Nordic countries which initially had low levels (Denmark and Finland), and are now converging towards the European average. Among those countries with above-average use of cannabis, the decreasing trends previously observed in Spain have now stabilised, while France reported a marked increase in recent years.

Cocaine is the most commonly used illicit stimulant in Europe: around 2% of young adults reported having used cocaine in the last year (Figure 4.14). This percentage is highest in Denmark, the Netherlands, Spain and the United Kingdom (3% or more). After years of reported decreases in cocaine use, there are now signs of stabilisation and possible increase in some countries.

The use of amphetamines and ecstasy (or MDMA) is slightly lower than the use of cocaine, with about 1% of young adults in EU countries reporting to have used amphetamines and 1.8% ecstasy (or MDMA) in the last year. The use of amphetamines tends to be higher in some Nordic and Baltic countries (Estonia and Finland) and in Croatia, Germany and the Netherlands. The use of ecstasy is highest in Bulgaria, the Czech Republic, Ireland and the Netherlands (EMCDDA, 2018). Over the last decade, the use of amphetamines has remained relatively stable in most European countries. In many countries, the use of ecstasy declined after reaching a peak in the early and mid-2000s, but recent surveys point to increased use in some countries.

The prevalence of use of new psychoactive substances among young people in the last year ranges from 0.2% in Italy and Norway to 1.7% in Romania. While consumption levels of new psychoactive substances are low overall in Europe, over two-thirds of countries report their use by high-risk drug users. In particular, the use of synthetic cathinones by opioid and stimulant injectors has been linked to serious health and social problems (EMCDDA, 2017).

The consumption of opioids (i.e. heroin and other drugs) is responsible for the majority of drug overdose deaths (reported in about 80% of fatal overdoses). The main opioid used in Europe is heroin, but there are concerns in several countries about the increasing use of other synthetic opioids (such as buprenorphine, methadone, fentanyl and tramadol). The prevalence of high-risk opioid use among adults aged 15-64 is estimated at 0.4% of the EU population; this was equivalent to 1.3 million high-risk opioid users in 2016.

Definition and comparability

Data on drug use prevalence come from national population surveys, as gathered by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). The data presented in this section focus on the percentage of young adults aged 15 to 34 years old reporting to have used different types of illicit drugs in the last year. Such estimates of recent drug use produce lower figures than "lifetime experience", but better reflect the current situation. The information is based on the latest survey available for each country. The study years range from 2008 to 2017. To obtain estimates of the overall number of users in Europe, the EU average is applied to those countries with missing data.

For more information, please see: *www.emcdda.europa.eu/data/stats2018_en*.

References

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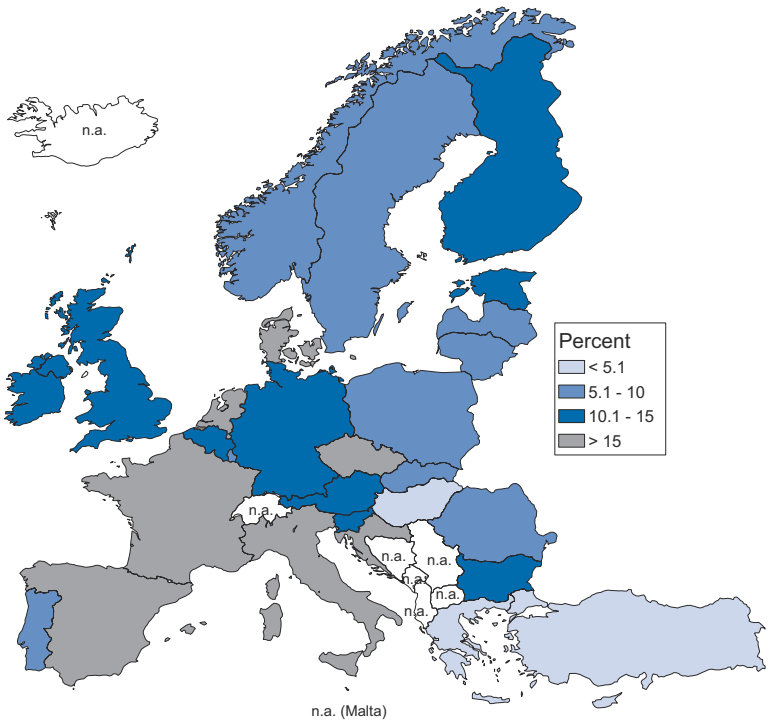
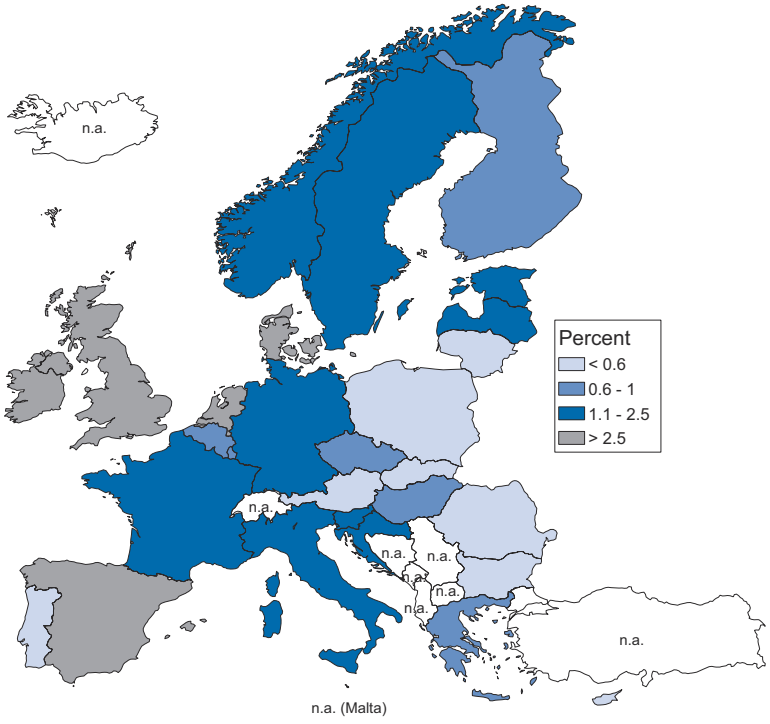
4.13. Cannabis use over the last 12 months among people aged 15 to 34, 2017 (or nearest year)



Source: EMCDDA, 2018.

StatLink http://dx.doi.org/10.1787/888933835174

4.14. Cocaine use over the last 12 months among people aged 15 to 34, 2017 (or nearest year)



Source: EMCDDA, 2018.

StatLink http://dx.doi.org/10.1787/888933835193

OBESITY AMONG CHILDREN

Children who are overweight or obese are at a greater risk of poor health in adolescence as well as in adulthood. Obesity among children is also often related to psychosocial problems such as poor self-esteem, bullying at school, underachievement at school, eating disorders, and depression, leading to health and economic problems in adulthood.

Nearly one in eight children aged 7-8 is obese on average in EU countries (Figure 4.15) (WHO Europe, 2018). Cyprus, Italy, Greece, Malta and Spain show the highest obesity rates in 7-8 year olds. The lowest child obesity rates are in the Czech Republic, Denmark, France, Ireland and Latvia. The obesity rate among children aged 7-8 has in fact shown signs of decrease in several EU countries between 2007-08 and 2015-17. This decrease has been particularly strong in Greece, Italy, Portugal and Slovenia, although child obesity rates in Greece and Italy still remain relatively high.

On average across 23 EU countries, 14% of boys and 10% of girls aged 7-8 year olds are obese, according to the COSI study (Figure 4.16). Boys tend to carry excess weight more often than girls, with the largest gender differences observed in Austria, Italy, Greece and Romania (about 6-7 percentage points). In particular, more than one in five boys is obese in Cyprus, Greece, and Italy.

The WHO European Food and Nutrition Action Plan 2016-2020 was adopted by the WHO Regional Committee for Europe in 2014. Specific policy options in this action plan include stronger restrictions on the marketing of foods high in saturated fat, sugars and salt to children, the promotion of better labelling on the front of food packages, and strict standards for the foods available in schools. Using a life-course approach, the actions range from the protection and promotion of exclusive breastfeeding, to the improvement of the baby food market landscape, to the increase of intake of fruit and vegetable (WHO Europe, 2017).

The EU Action Plan on Childhood Obesity 2014-20 aims to halt the rise in overweight and obesity in children and young people by 2020. It is based on several key areas for action, including the support of a healthy start in life and promoting healthier environments, especially in schools and pre-schools (e.g. limiting exposure to less healthy food options and ensuring access to free drinking water) (European Commission, 2014). A mid-term evaluation report on its implementation will be delivered in the second half of 2018.

The Joint Action on Nutrition and Physical Activity (JANPA), run from 2015 to 2017, was a direct contributor to this action plan, notably by using the economic evaluation of the cost of obesity to encourage public actions, and by identifying multilevel, multi-sectorial and life-course approaches for preventing obesity, sedentary lifestyle and unhealthy nutrition (JANPA, 2017).

Another focus of action is through improving the availability of healthy food in schools through better public procurement based on nutritional food quality standards (European Commission, 2017).

In the area of food marketing, the revised Audiovisual Media Services Directive allows the Commission and the Member States to continue working together with stakeholders to develop voluntary codes of conduct to reduce the exposure of children to aggressive marketing of foods high in fat, sugar or salt (European Commission, 2018). In 2018, a project started to measure children's exposure to food marketing especially in the digital sphere.

Definition and comparability

Estimates of obesity are based on body mass index (BMI) calculations using measured height and weight. Obese children are defined as those with a BMI above the WHO age- and sex-specific cut-off points (de Onis et al, 2017).

Measured data on height and weight are collected by the WHO Childhood Obesity Surveillance Initiative (COSI), which has monitored trends in overweight and obesity among primary-school-aged children for over 10 years (WHO, 2018).

Data refer to children aged 7 years old in most countries, except in Albania, Austria, Croatia, France, Italy, Norway, Poland, Romania and Sweden, where children are aged 8.

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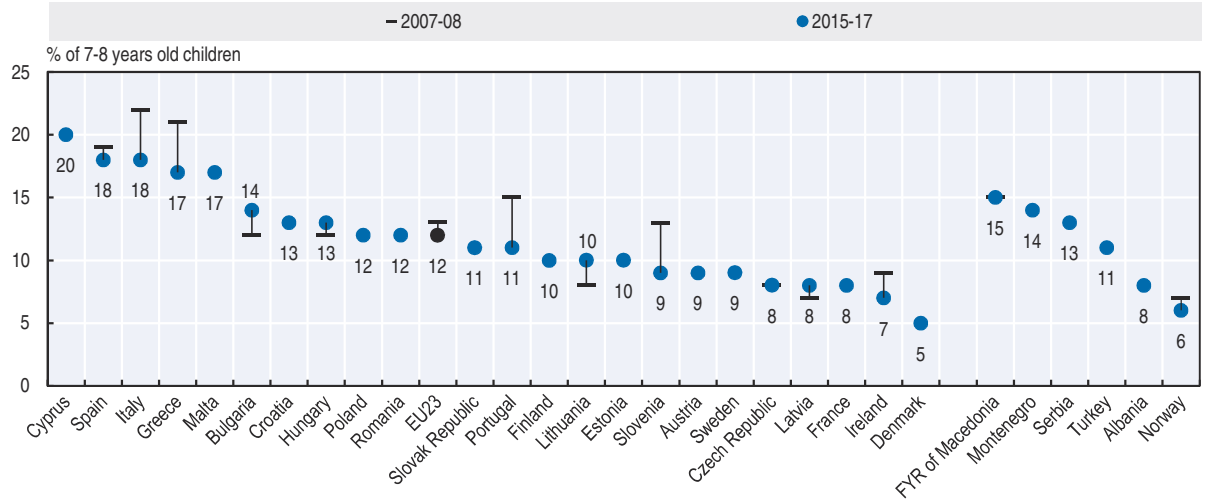
WHO Europe (2017), European Food and Nutrition Action Plan 2015-2020, WHO Regional Office for Europe, Copenhagen, *www.euro.who.int/__data/assets/pdf_file/0008/253727/64wd14e_FoodNutAP_140426.pdf*.

4.15. Changes in obesity rates among children aged 7-8 years old, 2007-08 (or nearest year) and 2015-17



Note: The EU average is not weighted by country population size.
Source: WHO-Europe (Children Obesity Surveillance Initiative).

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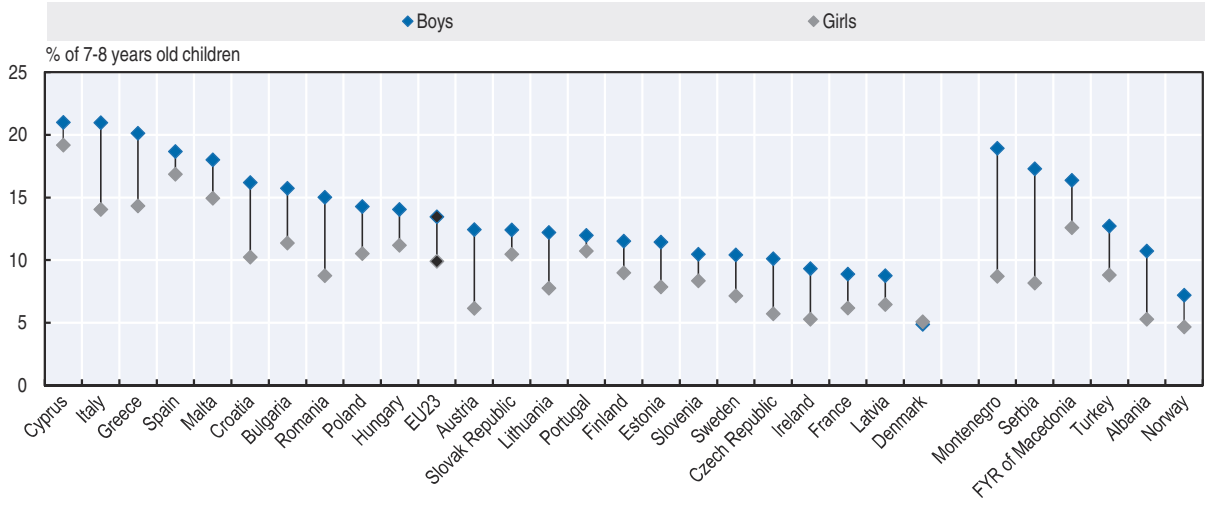
4.16. Obesity among children aged 7-8 years old, by gender, 2015-17



Note: The EU average is not weighted by country population size.
Source: WHO-Europe (Children Obesity Surveillance Initiative).

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OBESITY AMONG ADULTS

Obesity is a known risk factor for numerous health problems, including hypertension, high cholesterol, diabetes, cardiovascular diseases, and some forms of cancer. As obesity is associated with higher risks of chronic illnesses, it is linked to significant additional health care costs as well as substantial indirect costs due to lower employment and loss of work productivity (OECD/EU, 2016).

On average across EU countries, 16% of adults were obese in 2014, according to data self-reported by people. Obesity rates among adults vary greatly across EU countries, from 9% in Romania to 26% in Malta (Figure 4.17). Obesity has increased in almost all European countries since 2000. It has notably increased in Finland, France, Ireland, the Netherlands, and Sweden where obesity rates used to be much lower. On the other hand, obesity rates among adults seem to have remained relatively stable between 2008 and 2014 in Belgium, the Czech Republic, Greece, Italy, Latvia and Poland.

Obesity rates based on the actual measurement of height and weight are much higher than those based on self-reported data (as many people either overestimate their height or underestimate their weight), but these more reliable data are only available in a limited number of countries. These data show that obesity rates have increased over the past decade in Finland, Hungary, Luxembourg and the United Kingdom, while they have plateaued in France and Ireland (Figure 4.18).

The prevalence of obesity is generally greater among people with primary education (20% based on self-reported data) than those with tertiary education (12%) on average (Figure 4.19). The gap in obesity by education level is particularly large in Luxembourg, Portugal, Slovenia and Spain, while it is smaller in Latvia and Romania.

A number of behavioural and environmental factors have contributed to the long-term rise in obesity rates across EU countries, including the widespread availability of energy-dense foods and an increasingly sedentary lifestyle. These factors have created obesogenic environments, putting people, and especially those in socially disadvantaged groups, more at risk.

A growing number of countries have adopted policies to prevent and reverse obesity from spreading further. One approach has been to improve the information available to citizens to make more healthy choices (e.g. through food and menu labelling, public awareness campaigns, mobile apps, restrictions or bans on food product advertising targeting children). For instance, easy-to-understand interpretative labels put on the front of prepacked food have been used on a voluntary basis in England (traffic-light system), France (Nutri-Score), Denmark, Norway, Sweden and Lithuania (Keyhole logo) (OECD, 2017). Policies and programmes to promote regular physical activity, such as subsidies to encourage cycling and worksite wellness programmes, have also become increasingly popular (OECD, 2017).

The taxation of foods high in fat, sugar or salt and/or sugary drinks is also used by an increasing number of countries to tackle overweight and obesity. At least nine countries in Europe (Belgium, Estonia, Finland, France, Hungary, Ireland, Norway, Portugal and the United Kingdom) have taxes in place on sugar-sweetened beverages in 2018.

At EU level, the 2007 Strategy for Europe on Nutrition, Overweight and Obesity-related Health Issues promotes a balanced diet and active lifestyle. It also encourages action by Member States and civil society (notably through the EU Platform for action on Diet, Physical Activity and Health) on food reformulation, marketing and advertising, physical activity, consumer information, and advocacy and information exchange (European Commission, 2016). A project on food reformulation will start at the end of 2018 to provide a baseline to help Member States monitor the removal of excess sugars, salt and fat from products that are bought every day in European supermarkets.

Definition and comparability

Obesity is defined as excessive weight presenting health risks because of the high proportion of body fat. The most frequently used measure is based on the body mass index (BMI), which is a single number that evaluates an individual's weight in relation to height (weight/height^2, with weight in kilograms and height in metres). Based on the WHO classification, adults over age 18 with a BMI greater than or equal to 30 are defined as obese.

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

References

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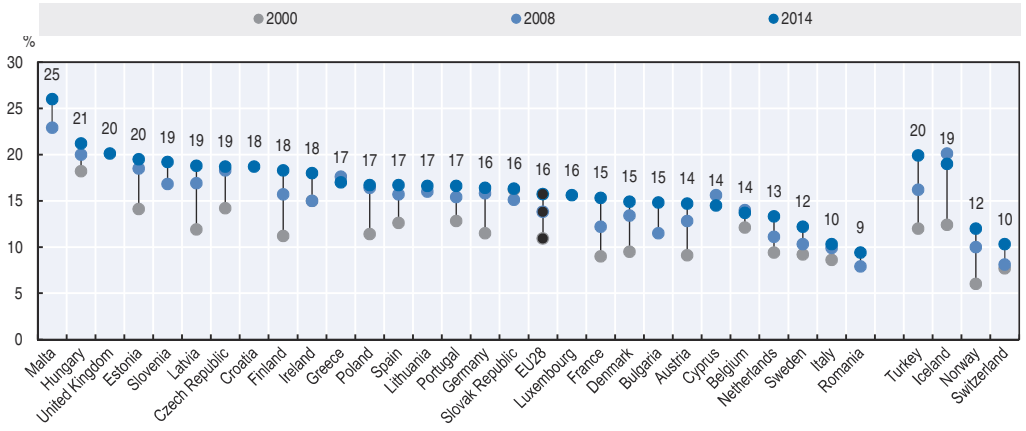
OECD (2017), "Obesity Update", available at *www.oecd.org/els/health-systems/Obesity-Update-2017.pdf*.

4.17. Changes in self-reported obesity rates among adults, 2000 to 2014 (or nearest year)



Source: Eurostat (EHIS 2008 and 2014) complemented with OECD Health Statistics 2018 for 2000 data and data for non-EU countries, *https://doi.org/10.1787/health-data-en*.

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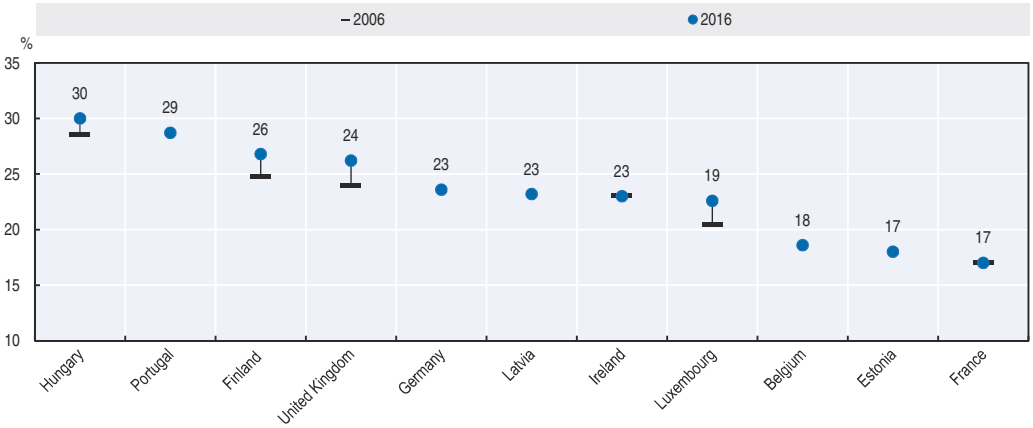
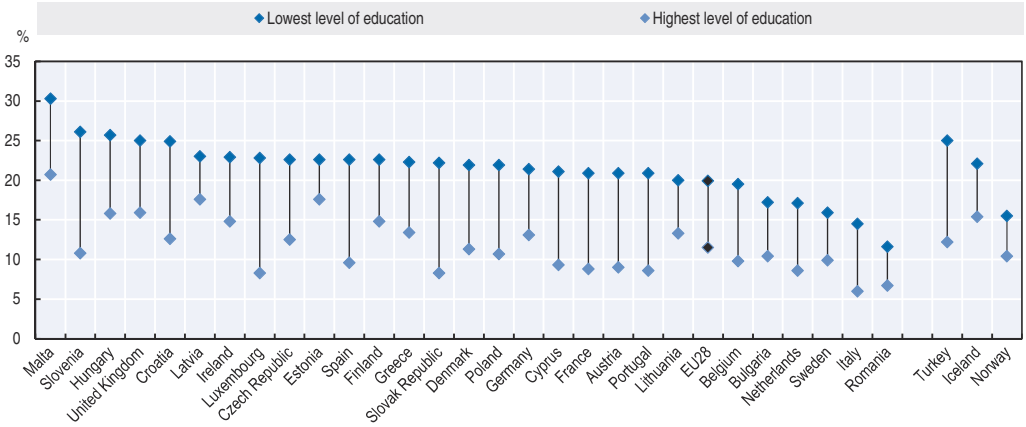
4.18. Changes in measured obesity rates among adults, 2006 to 2016 (or nearest year)



Source: OECD Health statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933835269

4.19. Self-reported obesity rates by education level, 2014



Note: The lowest level of education refers to people with less than a high-school diploma, while the highest level refers to people with a university or other tertiary diploma.
Source: Eurostat, EHIS 2014.

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MORTALITY DUE TO AIR POLLUTION AND EXTREME WEATHER CONDITIONS

Environmental degradations, in particular air pollution and extreme weather conditions due at least partly to climate change, expose people to health risk and excess mortality.

Air pollution increases the risk of various health problems (including respiratory diseases, lung cancer and cardiovascular diseases), with children and older people being particularly vulnerable. Some projections have estimated that outdoor air pollution may cause 6 to 9 million premature deaths a year worldwide by 2060 and cost 1% of global GDP as a result of sick days, medical bills and reduced agricultural output (OECD, 2016).

In Europe, exposure to some serious air pollutants such as fine particulate matter 2.5 ($PM_{2.5}$) and ozone is estimated to have caused the death of 238 400 people in 2016. Mortality rates due to air pollution are highest in Central and Eastern Europe (e.g. Bulgaria and Hungary) while they are lowest in Nordic countries (Figure 4.20).

Climate change-related events – such as extreme temperatures, floods, and drought – also have serious consequences on health and premature death. Heat waves can cause health problems such as fatigue, dehydration and stress, and can lead to respiratory and cardiovascular diseases, and aggravated allergies (European Environment Agency, 2017; OECD, 2017). Some population groups, such as the elderly and people with chronic diseases, are more vulnerable to heat waves, but also to cold waves in some countries, particularly the Northern and Eastern part of Europe.

Figure 4.21 shows the death rate related to extreme temperature events in Europe, cumulated over the 2000-2016 period. Heat waves had a much bigger impact than cold waves, particularly in Southern and Western Europe. Several Southern European countries were mostly impacted by the heat wave in 2003 when more than 55 000 persons died in France, Italy, and Spain, and more recently in 2015 when 3 700 people died in France and Belgium. Cold waves have had an impact on mortality mainly in Eastern Europe and Nordic countries, with the latest largest event causing 350 deaths in Poland and Romania in 2012.

Cross-sectoral policy actions to limit greenhouse gas emissions and control the rise in temperature are essential to limit the detrimental impacts on human health and the environment. While there have been improvements in reducing the emission of a number of air pollutants in the past decade, further efforts are needed to reduce air pollution, notably by reducing emissions from motor vehicles, but also from power stations, which produce more pollution than any other industry. Health care systems also have a role to play in reducing environmental risk factors, for instance by supporting the implementation of nutritional guidelines for healthier food consumption that can put less stress on the environmental resources used in food production (OECD, 2017).

Definition and comparability

The first indicator presented here refers to mortality due to air pollution (specifically $PM_{2.5}$ and ozone) and is based on estimates from the Global Burden of Disease study (IHME, 2016).

Fine particulate matter (PM) is a mixture of very small particles and liquid droplets released into the air. $PM_{2.5}$ refers to suspended particulates less than 2.5 microns in diameter that are capable of penetrating deep into the respiratory tract and causing significant health damage. They are potentially more toxic than PM_{10} as they may include heavy metals and toxic organic substances. Most fine particulate matters come from fuel combustion, including from vehicles, power plants, factories and households.

Ozone is a secondary pollutant (meaning that it is not emitted directly by any emission source), formed in the lower part of the atmosphere from complex chemical reactions following emissions of precursor gases such as nitrogen dioxides (which are emitted during fuel combustion). Ozone exposure is generally highest in emission-dense countries with warm and sunny summers.

Data on fatalities due to extreme temperature events come from the Emergency Events Database (EM-DAT). EM-DAT includes all disasters worldwide since 1900, conforming to at least one of the following criteria: a) 10 or more people dead; b) 100 or more people affected; c) the declaration of a state of emergency; d) a call for international assistance. Empty fields in the EM-DAT database usually indicate missing values or non-reported information. Missing information in EM-DAT was complemented with data from national registry on deaths by cause collected in the WHO Mortality Database. Deaths due to exposure to excessive natural heat (ICD code X30) and exposure to excessive natural cold (X31) were selected.

References

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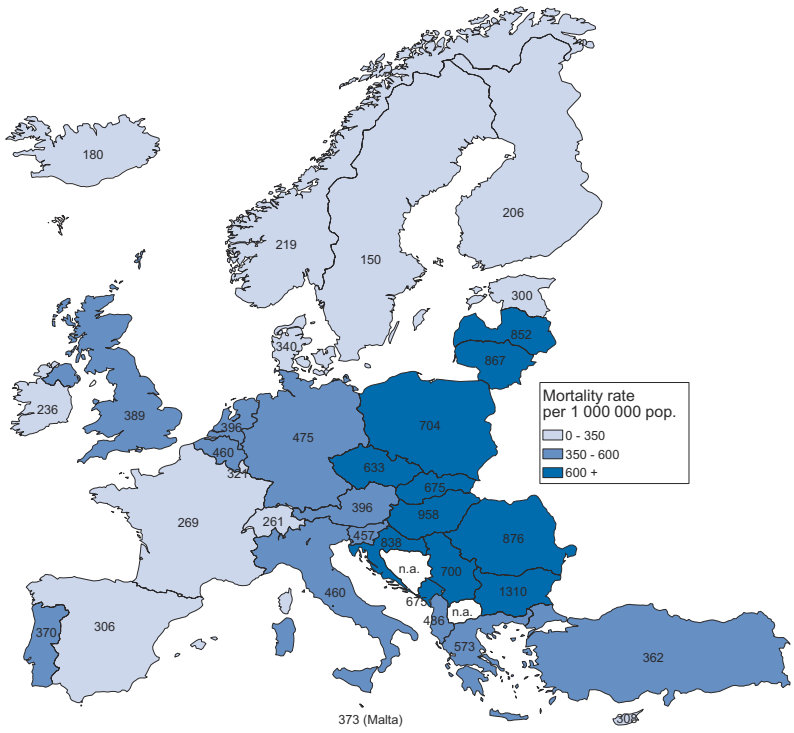
IHME (2016), "Global Burden of Disease Study 2016 Results", Seattle, United States, *http://ghdx.healthdata.org/gbd-results-tool*.

4.20. Deaths due to exposure to outdoor $PM_{2.5}$ and ozone, 2016



Source: IHME (Global Burden of Disease, 2016).

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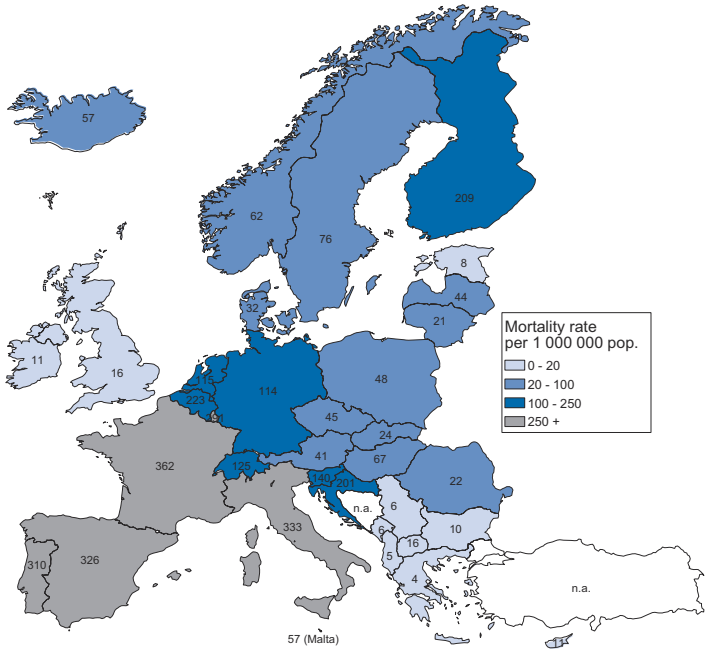
4.21. Deaths due to extreme weather conditions (heat waves and cold waves), cumulative from 2000 to 2016



Note: In France, Italy and Spain, most of the deaths are related to the heat wave in 2003.
Source: Emergency Events Database (EM-DAT), complemented with WHO Mortality Database for Denmark, Finland, Ireland, Malta, Sweden, Iceland and Norway.

StatLink http://dx.doi.org/10.1787/888933835326

PART II

Chapter 5

Health expenditure and financing

This chapter looks at recent trends in health spending, both at an overall level but also disaggregated according to the type of health care service or medical good, and by health care provider. A particular focus is given to analysing spending in the hospital sector and on pharmaceuticals. The chapter ends by analysing how health care is financed in Europe, both in terms of the type of financing arrangements in place and the revenues that ultimately fund health care spending. Data presented in this chapter are jointly collected by OECD, Eurostat and WHO, and comply with internationally standardised definitions of health spending provided under the System of Health Accounts (SHA 2011) framework.

In 2017, spending on health care in the European Union stood at 9.6% of gross domestic product, ranging from over 11% in France and Germany to less than 6% in Romania. This share remained largely unchanged from the previous two years as health spending grew in line with the economy in Europe. In most countries, payments for curative and rehabilitative care services made up the bulk of health spending, while spending on pharmaceuticals also accounted for a large share of health expenditure in some countries. Regarding the financing of health care, compulsory schemes, either government financed or through compulsory public or private health insurance, were the dominant method of financing accounting for more than three-quarters of overall health spending. However, out-of-pocket expenditure also played an important role in health financing for several Southern as well as Central and Eastern European economies.

HEALTH EXPENDITURE PER CAPITA

The amount a country spends on health and the rate at which it can grow over time is influenced by a wide array of social and economic determinants, as well as the financing arrangements and organisational structure of the health system itself. In particular, there is a strong relationship between the overall income level of a country and how much the population of that country spends on health care.

Given these factors, there are large variations to be observed in the level and growth of health spending across Europe. High-income countries such as Luxembourg, Norway and Switzerland are the European countries that spent the most on health in 2017 (Figure 5.1). With spending at EUR 4 713 per person – adjusted for differences in countries' purchasing powers – Luxembourg was the biggest spender in the European Union. Among EU member states, Germany (EUR 4 160), Sweden (EUR 4 019) and Austria (EUR 3 945) were also big spenders. At the other end of the scale, Romania (EUR 983) and Bulgaria (EUR 1 234) were the lowest spending EU countries. Taking the European Union as a whole, per capita health spending reached EUR 2 773 in 2017. Among some of the other European states, Switzerland (EUR 5 799) and Norway (EUR 4 653) rank among the high spenders overall while health spending per capita in Turkey, Montenegro, the Former Yugoslav Republic of Macedonia and Albania were all below that of Romania.

After a number of years of slow or even negative health spending growth across Europe following the economic crisis in 2008, growth rates picked up again in nearly all countries in recent years. Across the European Union as a whole, health spending per capita increased by around 1.9% each year in real terms (adjusted for inflation) between 2013 and 2017, compared with an annual growth rate of only 0.6% between 2009 and 2013. During the crisis, ten EU countries saw expenditure on health retract in real terms with only Bulgaria and Romania among the member countries continuing to see growth above 5% per year. During the subsequent four-year period, there has been a large-scale turnaround with all but two EU countries seeing some growth in health spending, albeit growth has remained slow in some countries (Figure 5.2).

On an individual country basis, Greece experienced one of the biggest falls in health spending growth following the crisis. During the period 2009 to 2013, per capita health spending in Greece averaged an 8.7% annual drop. It is notable, however, that during the period 2003-2009, Greece experienced a much steeper increase in real per capita health spending than the average for EU countries. Portugal, Croatia, Cyprus and Spain also experienced negative growth between 2009 and 2013. On the other hand, Malta, Bulgaria and Romania saw health spending continue to grow strongly. While nearly all EU countries have seen positive growth between 2013 and 2017, per capita health spending in countries such as Greece and Portugal continued to be at a lower level in 2017 than in 2009. Outside of the EU, Iceland also experienced negative growth between 2009 and 2013 while Turkey also saw a significant slowdown. Switzerland on the other hand appeared to be little affected with constant annual growth of 2-2.5% throughout.

Definition and comparability

Expenditure on health measures the final consumption of health goods and services, as defined in the System of Health Accounts (OECD, Eurostat and WHO, 2017). This refers to current spending on medical services and goods, public health and prevention programmes, and administration irrespective of the type of financing arrangement.

Under Commission Regulation 2015/359, all EU countries are now obliged to produce health expenditure data according to the boundaries and definitions of the System of Health Accounts 2011 (SHA, 2011). Data on health expenditure for 2017 are considered preliminary, either estimated by national authorities or projected by the OECD Secretariat, and are therefore subject to revision.

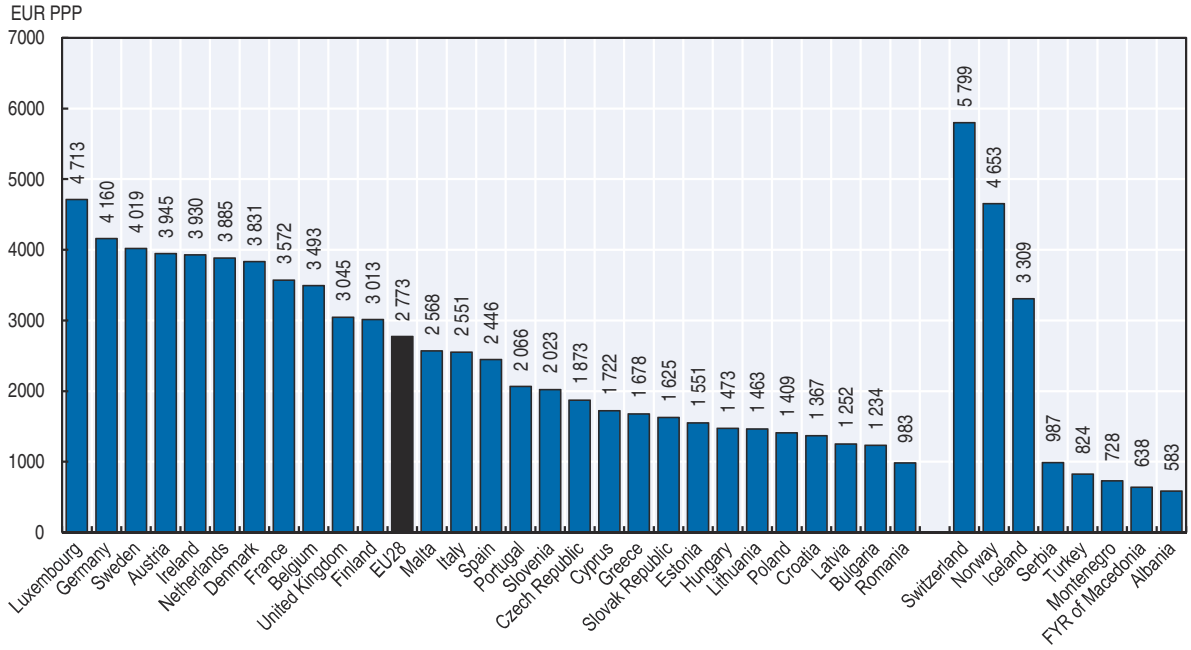
Countries' health expenditures are converted to a common currency (Euro) and are adjusted to take account of the different purchasing power of the national currencies, in order to compare spending levels. Economy-wide gross domestic product (GDP) PPPs are used to compare relative expenditure on health in relation to the rest of the economy.

For the calculation of growth rates in real terms, economy-wide GDP deflators are used. Although some countries (e.g. France and Norway) produce their own health-specific deflators, based on national methodologies, these are not currently used due to the limited availability and comparability for all countries.

Reference

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

5.1. Health expenditure per capita, 2017 (or nearest year)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database; WHO Global Health Expenditure Database.

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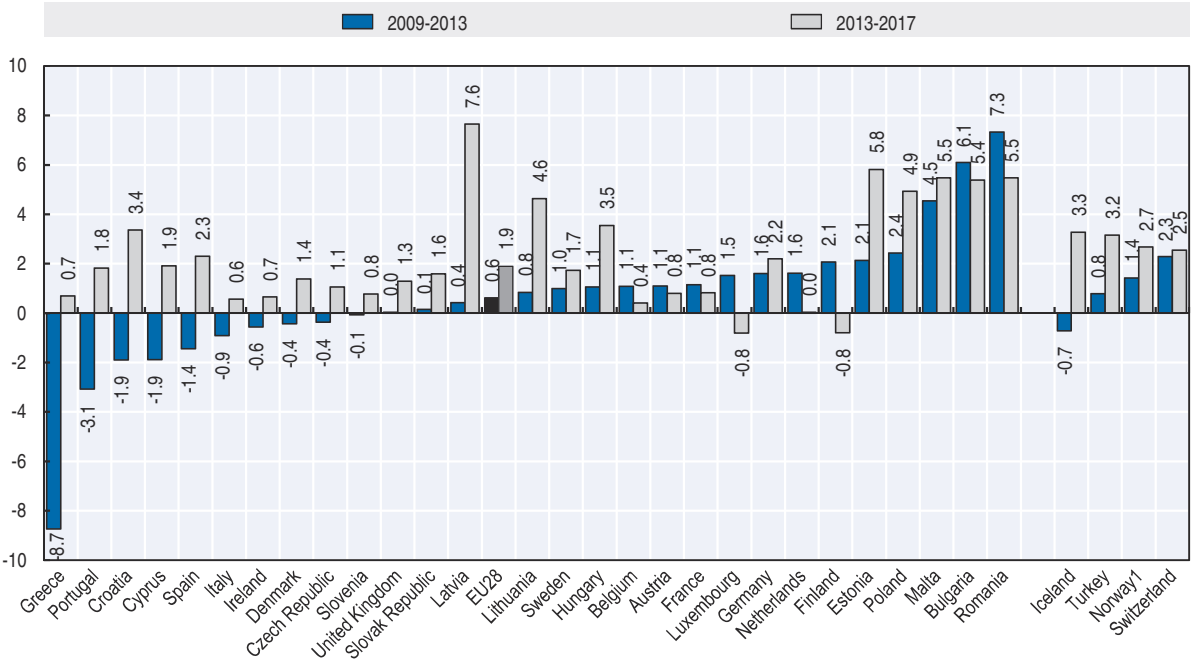
5.2. Annual average growth rate (real terms) in per capita health spending, 2009 to 2017 (or nearest year)



1. Mainland Norway GDP price index used as deflator.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835364

HEALTH EXPENDITURE IN RELATION TO GDP

How much a country spends on health care in relation to all other goods and services in the economy and how that changes over time depends not only on the level of health spending but on the size of the economy as a whole.

In 2017, the EU as a whole devoted 9.6% of its GDP to health care (Figure 5.3). This figure stayed largely unchanged from the levels in both 2015 and 2016 as growth in health spending remained broadly in line with overall economic growth. Among the EU member states, seven had spending on health at 10% or more of GDP, with France (11.5%) and Germany (11.3%) having the highest shares of GDP spent on health. Nevertheless, these shares remain well below that of the United States, where health expenditure accounted for 17.2% of GDP in 2017. At the other end of the scale, the share of health spending in GDP was lowest in Romania (5.2%), Luxembourg (6.1%), Latvia and Lithuania (both at 6.3%). Across all of Europe, Switzerland allocated the biggest share, spending 12.3% of its GDP on health, while Turkey at 4.2% of GDP had the lowest share.

For a better understanding of the different dynamics, the health spending to GDP ratio should be considered together with health spending per capita. While higher income countries tend to devote more of their income to health care, some countries with relatively high health expenditure per capita can have relatively low health spending to GDP ratios, and vice versa. For example, while Slovenia and Bulgaria spent roughly the same share of their GDP on health in 2017, per capita health spending (adjusted to EUR PPP) was 64% higher in Slovenia (see Figure 5.1). Luxembourg, despite having the highest per capita spending in the EU, has one of the lowest shares of health spending relative to GDP. This reflects its high level of economic wealth.

Over time, changes in health spending often reflect changes in GDP, though there is often a lag before changes in economic conditions are reflected in health spending. When overall economic conditions rapidly deteriorated in many European countries from 2008 onwards, overall health spending was initially maintained or even continued to grow (see Figure 5.4). As a result, the health spending to GDP ratio in the European Union jumped sharply to reach 9.6% – up from 8.8% in 2008. After a slight decline – as countries introduced a range of measures in attempts to rein in government health spending and reduce burgeoning budgetary deficits (Morgan and Astolfi, 2014) – the pattern of health expenditure growth per capita has become more aligned to economic growth in many European countries. Consequently, the ratio of health spending to GDP has been relatively stable.

Changes in the ratio of health spending to GDP are the result of the combined effect of growth in both GDP and health expenditure. Even taking into account the economic crisis, the long-term growth in health expenditure per capita (in real terms) in the European Union between 2005 and 2017 has been greater than the growth rate in GDP per capita. With the exception of a handful of countries – Greece, Hungary, Ireland, Luxembourg and Romania – the share of GDP allocated to health has increased in all EU countries.

Looking at some of the larger EU economies, both France and Germany saw their health spending to GDP ratio jump in 2009, stabilise, and then show a gradually increasing trend in subsequent years (Figure 5.5). While Italy and Spain also experienced a similar increase in 2009, growth in health spending has been much more closely aligned with economic growth since then, resulting in the health-to-GDP ratio remaining stable over the last five years or so.

Definition and comparability

Gross domestic product (GDP) is the sum of final consumption, gross capital formation and net exports. Final consumption includes all the goods and services used by households or the community to satisfy their individual needs. It includes final consumption expenditure of households, general government and non-profit institutions serving households.

Data on health expenditure for 2017 are considered preliminary, either estimated by national authorities or projected by the OECD Secretariat, and are therefore subject to revision.

The GDP figures used to calculate the indicator health expenditure to GDP are based on official GDP data available as of mid-June 2017. Any subsequent revisions to GDP data are not reflected in the indicator.

In countries, such as Ireland and Luxembourg, where a significant proportion of GDP refers to profits exported and not available for national consumption, gross national income (GNI) may be a more meaningful measure than GDP, but for international comparability, GDP is used throughout.

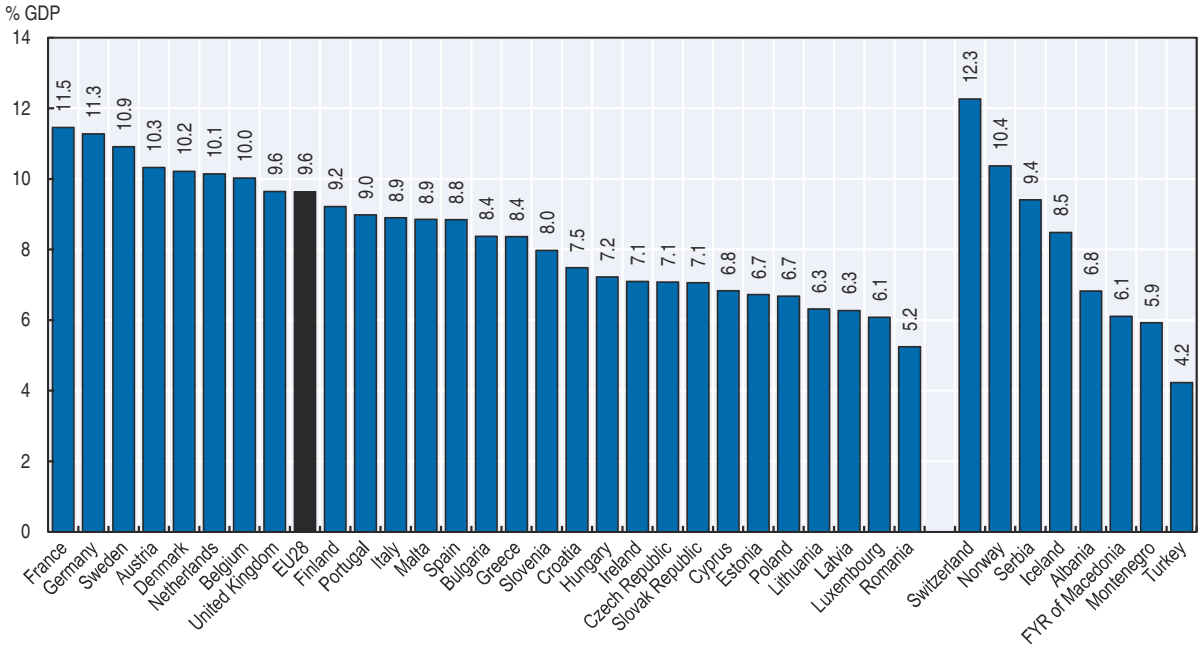
Both GDP and GNI increased significantly in Ireland in 2015 primarily due to the relocation of a limited number of big economic operators to Ireland leading to a substantial drop in the health expenditure to GDP/GNI indicators in that year.

References

Morgan, D. and R. Astolfi (2014), "Health Spending Continues to Stagnate in Many OECD Countries", *OECD Health Working Papers*, No. 68, OECD Publishing, Paris, *http://dx.doi.org/10.1787/5jz5sq5qnwf5-en*.

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

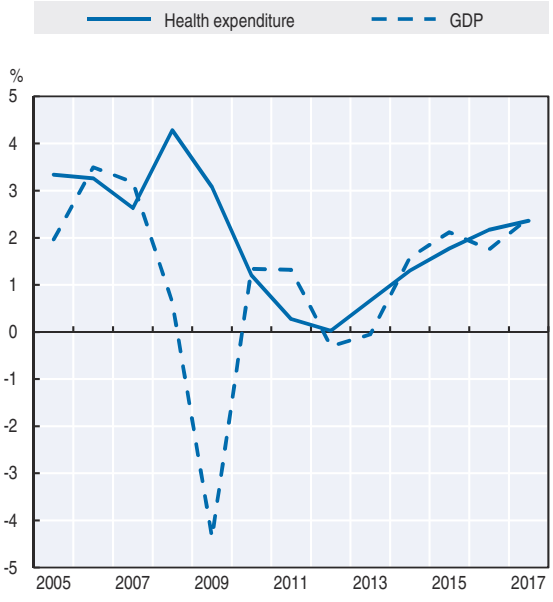
5.3. Health expenditure as a share of GDP, 2017 (or nearest year)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database; WHO Global Health Expenditure Database.

StatLink http://dx.doi.org/10.1787/888933835383

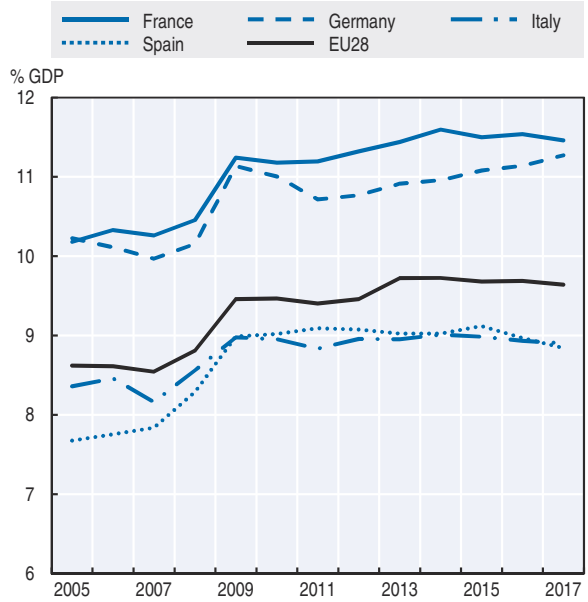
5.4. Annual average growth (real terms) in per capita health expenditure and GDP, EU28, 2005 to 2017



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835402

5.5. Health expenditure as a share of GDP, EU28 and selected countries, 2005 to 2017



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835421

HEALTH EXPENDITURE BY TYPE OF GOOD AND SERVICE

A variety of factors, from disease burden and system priorities to organisational aspects and costs, help determine the share of spending on the various types of health care goods and services. In 2016, EU member states spent three-fifths of their health expenditure on curative and rehabilitative care services, 20% went on medical goods (mainly pharmaceuticals), while 13% was on health-related long-term care. The remaining 7% was spent on collective services, such as prevention and public health as well as the governance and administration of health care systems.

In 2016, the share of current health expenditure going to curative and rehabilitative care ranged from around half of total health spending in Bulgaria to three-quarters in Portugal. Greece had the highest proportion of spending on inpatient care (including day care in hospitals), accounting for 42% of health spending. Inpatient care also accounted for more than one-third of all expenditure in Romania, Poland, Bulgaria and Austria. However, for most EU countries, spending on outpatient care (including home-based curative and rehabilitative care and ancillary services) exceeded that on inpatient care, notably in Portugal where outpatient care accounted for just under half of all health spending (49%).

The other major category of health spending is medical goods consumed in outpatient settings. A range of factors can influence spending, including differences in distribution channels, the prevalence of generic drugs, as well as relative prices in different countries. The share of medical goods spending tended to be highest in Southern and Central European countries and represented the largest component of health spending in Bulgaria and the Slovak Republic. In contrast, the shares in Western European and Scandinavian countries tended to be smaller: medical goods accounted for less than 15% of overall health spending in Denmark, the Netherlands, the United Kingdom, Luxembourg, Ireland and Sweden in 2016.

There are also differences in countries' spending on health-related long-term care. Countries such as Sweden and the Netherlands, with established formal arrangements for the elderly and the dependent population, allocated more than a quarter of all health spending to long-term care in 2016. In many Southern and Central European countries, with more informal arrangements, the expenditure on formal long-term care services accounts for a much smaller share of total spending.

Figure 5.7 presents the growth in key health goods and services for three time periods: before the financial crisis (2004-2008), during and immediately after the financial crisis (2008-12) and in the most recent period (2012-16). The financial crisis hampered growth in most parts of the health sector. Growth rates did recover, but not to match pre-crisis levels.

Following an average annual per capita increase of 1.8% over the years leading up to the financial crisis, EU retail pharmaceutical expenditure fell by an annual average rate of 0.7% between 2008 and 2012. Spending then recovered between 2012 and 2016, rising by an average of 0.8% per year. The same trend was seen for preventive care spending, which increased between 2004 and 2008 across the EU, but then contracted by 1.4% on average through the crisis years, despite countries' intentions to protect public health budgets.

While the growth in spending on inpatient and outpatient care was reduced during the years of the economic crisis, it remained positive, at 1.2% and 1.0% respectively. During the crisis, some governments decided to protect expenditure for primary care and front-line services while looking for cuts elsewhere in the health system. Long-term care was the only major health care service to experience an increase in spending growth over this period compared to the pre-crisis years (2004-08), rising from 3.0% to 4.3%.

Definition and comparability

The System of Health Accounts (OECD, Eurostat and WHO, 2017) defines the boundaries of the health care system. The functional dimension defines the type of health care consumed. Current health expenditure comprises personal health care (curative and rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration). Curative, rehabilitative and long-term care can also be classified by mode of provision (inpatient, day care, outpatient and home care). Concerning long-term care, only care that relates to the management of the deterioration in a person's health is reported as health expenditure, although it is difficult in certain countries to clearly separate out the health and social aspects of long-term care.

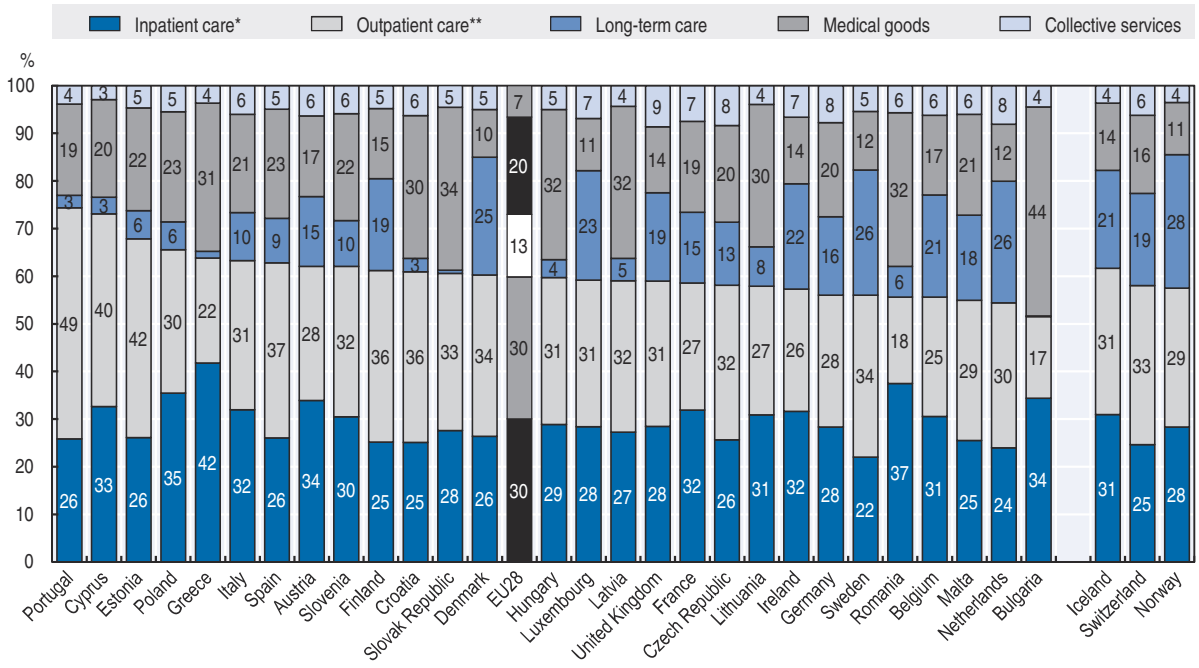
Some countries can have difficulties separating spending on pharmaceuticals used as an integral part of hospital care from those intended for use outside of the hospital, potentially leading to an underestimate of pharmaceutical spending and an overestimate of inpatient and/or outpatient care.

The variation between countries in price levels of medical goods (tradable) is generally smaller than that for health services (non-tradable). Hence, spending on medical goods will tend to make up a larger share of health spending in low-income countries.

Reference

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

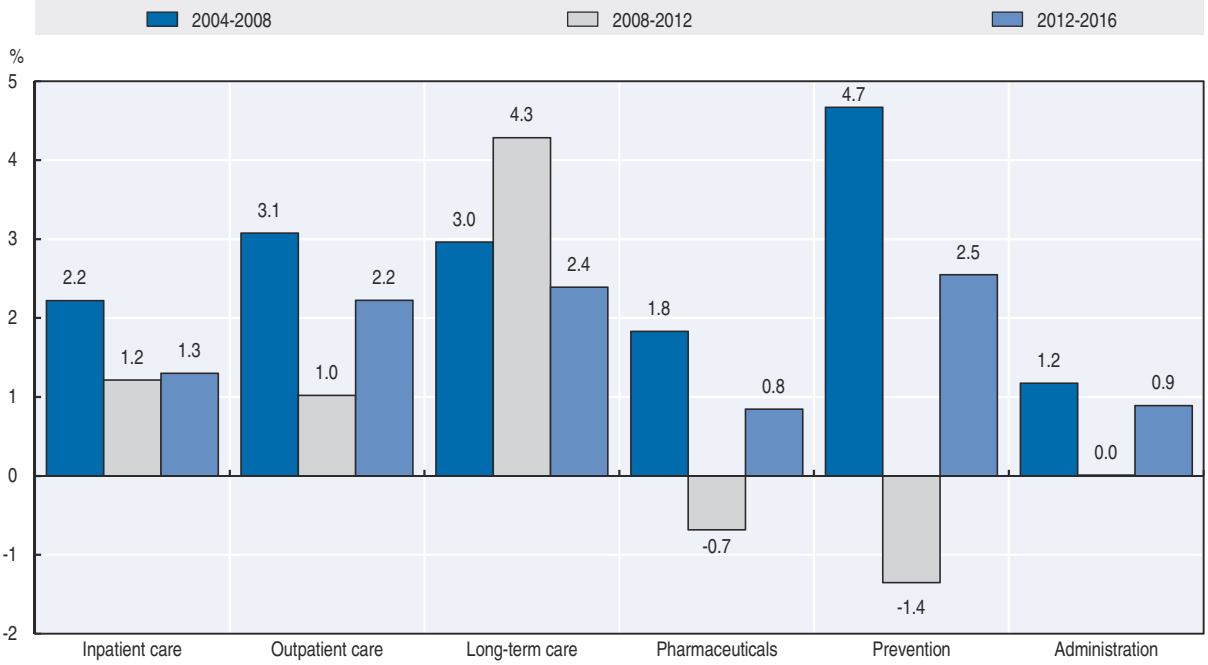
5.6. Health expenditure by function, 2016 (or nearest year)



* Refers to curative-rehabilitative care in inpatient and day care settings.
** Includes home care and ancillary services.
Note: Countries are ranked by the sum of inpatient and outpatient care as a share of current health expenditure.
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835440

5.7. Growth rates of health expenditure per capita for selected functions, EU average, 2004-2016



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835459

HEALTH EXPENDITURE IN HOSPITALS

Breaking down health spending by provider offers an organisational perspective, by identifying the setting in which different health services are delivered. Care can be provided in a variety of institutions, ranging from hospitals and medical practices, to pharmacies, care homes and even private households caring for family members.

Hospitals have traditionally been the key health care provider, in terms of their share of health spending. In 2016, health services in hospitals accounted for nearly two-fifths of all EU health expenditure and represented the largest spending category for most EU countries. In Estonia, Cyprus and Italy almost half of health care expenditure related to hospital services. In contrast, in Germany a greater proportion of health services are provided in ambulatory settings and, by consequence, hospital services in Germany accounted for less than 30% of health spending, the lowest share in the EU. Part of the variation in the share of hospital spending can also be attributed to the provision of outpatient pharmaceuticals, with hospital pharmacies playing a larger role in some countries than in others.

While expenditure on hospital services varies considerably between EU member states, it tends to be in line with overall health care expenditure, with high-income countries spending the most. Overall, EU countries spent EUR 1 059 per person on hospitals in 2016. Spending was highest in Denmark at EUR 1 653 per person, and was more than EUR 1 500 per capita in Luxembourg and Sweden (Figure 5.8). By comparison, spending on hospitals in Romania accounted for less than EUR 350 per person and was at a similar level for Latvia, Bulgaria and Poland.

While the types of care delivered in hospital settings differ across EU countries (Figure 5.9), inpatient and outpatient care remain the most common services provided. In 2016, spending on inpatient curative and rehabilitative care accounted for at least half of all hospital expenditure for the majority of EU countries and more than 90% in Poland, Germany and Greece. This high share is due, to a large extent, to the use of alternative settings for care delivery; for example, specialised outpatient services delivered in ambulatory centres or private practices in Germany (Busse and Blümel, 2014). The share of hospital inpatient care is lowest in Portugal, Estonia, the Netherlands, Croatia and Finland, where hospital outpatient services play a much greater role.

The share of hospital spending on day care services has generally been increasing in most EU countries. This often reflects an explicit policy to generate efficiency gains and reduce hospital waiting times (OECD, 2017). Moreover, for some interventions, guidelines advise that day care procedures are the most appropriate treatment method. For all EU countries, inpatient and day care services together account for at least half of hospital spending.

Hospitals can also be important providers of outpatient care, for example through accident and emergency departments, hospital-based specialist outpatient units, or laboratory and imaging services provided to outpatients. Outpatient care accounted for 45% of hospital spending in Portugal, and more than 40% in Sweden, Estonia, Finland and Denmark. On the other hand, in Poland, Bulgaria, Romania, Belgium, Germany and Greece, less than 10% of hospital expenditure goes on outpatient care.

Definition and comparability

The classification of health care providers is defined in the System of Health Accounts (OECD, Eurostat and WHO, 2017) and encompasses primary providers, i.e. organisations and actors that deliver health care goods and services as their primary activity, as well as secondary providers, for which health care provision is only one among a number of activities.

The main categories of primary providers are hospitals, residential long-term care facilities, ambulatory providers (e.g. offices of general and specialised physicians, dental practices, ambulatory health care centres), providers of ancillary services (e.g. ambulance services), retailers (e.g. pharmacies), and providers of preventive care (e.g. public health institutes).

Secondary providers include, for example, supermarkets that sell over-the-counter medicines, or facilities that provide health care services to a restricted group of the population such as prisons or police health services. Secondary providers also include providers of health care system administration and financing (e.g. government agencies, health insurance agencies) and households as providers of home health care.

Differences can exist in the administering and dispensing of pharmaceuticals to outpatients in hospitals. Some countries have a larger range of pharmaceuticals dispensed in hospital outpatient settings, which should be considered when comparing overall hospital spending. In addition, some of these costs may erroneously be accounted under curative care rather than under pharmaceuticals.

References

Busse, R. and M. Blümel (2014), "Germany: Health system review", Health Systems in Transition, Vol. 16/2, *www.euro.who.int/__data/assets/pdf_file/0008/255932/HiT-Germany.pdf?ua=1*.

OECD (2017), *Tackling Wasteful Spending on Health*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264266414-en*.

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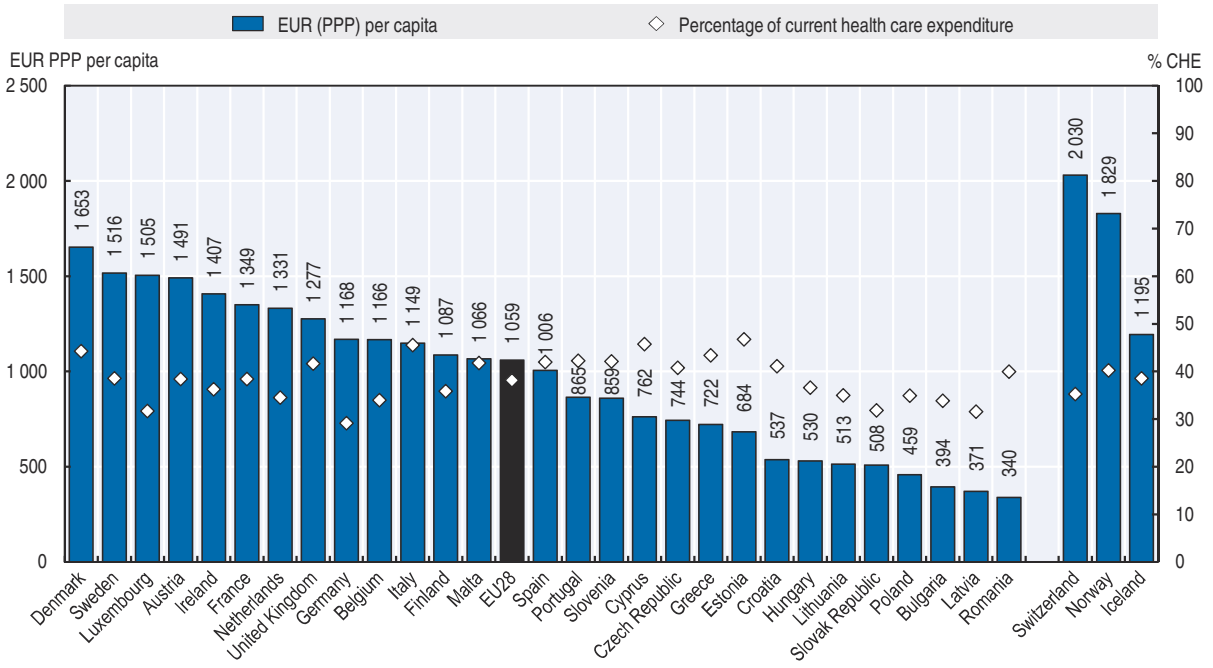
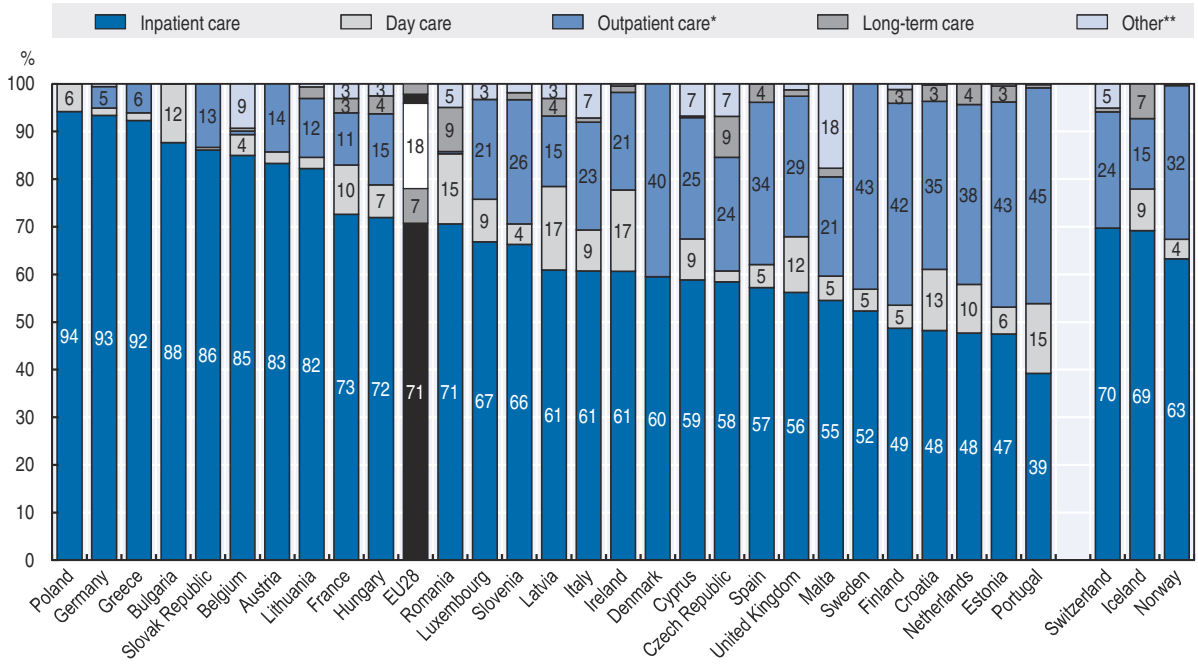
5.8. Hospital spending in per capita terms and as a share of health spending, 2016



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835478

5.9. Hospital expenditure by type of service, 2016 (or nearest year)



* Refers to curative-rehabilitative care in outpatient and home-based settings and ancillary services.

** Includes medical goods and collective health services.

Note: Countries are ranked by inpatient care as a share of hospital expenditure.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835497

PHARMACEUTICAL EXPENDITURE

Pharmaceuticals play a vital role in the health system. After inpatient and outpatient care, pharmaceuticals (excluding those used in hospitals) represent the third largest item of health care spending, accounting for a sixth of health expenditure in the EU in 2016. The challenge for policymakers, acknowledging that health care budgets are limited, is to balance access for new medicines while providing the right incentives to industry.

The total retail pharmaceutical bill across the European Union was more than EUR 210 billion (adjusted for purchasing power parities) in 2016 and an increase of around 5% (in nominal terms) since 2010. The variations in per capita pharmaceutical spending across countries can reflect differences in pharmaceutical prices, consumption and dispensing practices, as well as the market penetration of generics (Figure 5.10). Among EU Member States, Germany spent the most on pharmaceuticals on a per capita basis (EUR 572), around 40% above the EU average. Ireland (EUR 498) and Belgium (EUR 491) spent nearly 20% more on medicines per capita than the EU average. At the other end of the scale, Denmark (EUR 203), Romania (EUR 255), Estonia (EUR 262) and Poland (EUR 267) had relatively low spending levels. Outside the EU, Switzerland (EUR 742) spent significantly more on medicines per capita than any other country in Europe.

Around four out of every five euros spent on retail pharmaceuticals goes on prescription medicines, with the rest on over-the-counter medicines (OTC). OTC medicines are pharmaceuticals that are generally bought without prescription with their costs, in most cases, fully borne by patients. However, it should be noted that pharmaceuticals classed as prescriptions in one country might be classed as an OTC medicine in another. The share of OTC medicines is particularly high in Poland, accounting for half of pharmaceutical spending, and stands at 30% or more in Spain (36%), Latvia (31%) and Cyprus (30%).

The cost of pharmaceuticals is predominantly covered by government or compulsory insurance schemes in Europe (Figure 5.11). In the EU, these schemes cover around 64% of all retail pharmaceutical spending, with out-of-pocket payments (34%) and voluntary private insurance (1%) financing the remaining part. Coverage is most generous in Germany and Luxembourg where government and compulsory insurance schemes pay for 80% or more of all pharmaceutical costs. By contrast, in around a quarter of EU Member States, public or mandatory schemes cover less than half the amount spent on medicines and coverage is particularly low in Bulgaria (19%) and Cyprus (18%).

During the financial crisis, average annual spending growth on retail pharmaceuticals in the EU was much lower compared to other health services (see indicator "Health expenditure by type of good and service") and was negative in some years. Several countries took measures to reduce pharmaceutical spending during the crisis – such as cutting manufacturer prices and margins for pharmacists and wholesalers, introducing compulsory rebates, de-listing some pharmaceuticals and incentivising the use of generics (Belloni, Morgan and Paris, 2016). Patent expiries for a number of blockbuster drugs also contributed to the fall in spending over this period. However, new high cost treatments such as for Hepatitis C and some oncological drugs help explain a return to positive growth rates in more recent years for some countries.

The retail pharmaceutical sector only tells part of the story, since spending on pharmaceuticals used during hospital care can typically add another 20% to a country's pharmaceutical bill (Belloni et al., 2016). Available data in a number of European countries suggest that pharmaceutical spending growth in the hospital setting has outpaced that of retail pharmaceuticals (Figure 5.12). Average annual growth of pharmaceuticals consumed in hospitals was significantly higher in Iceland and Denmark than retail pharmaceutical spending between 2009 and 2016. Although on a smaller scale, the same is true for Germany, Finland, Estonia and Spain.

Definition and comparability

Pharmaceutical expenditure covers spending on prescription medicines and self-medication, often referred to as over-the-counter products. Final expenditure on pharmaceuticals includes wholesale and retail margins and value-added tax. Total pharmaceutical spending refers in most countries to "net" spending, i.e. adjusted for possible rebates payable by manufacturers, wholesalers or pharmacies.

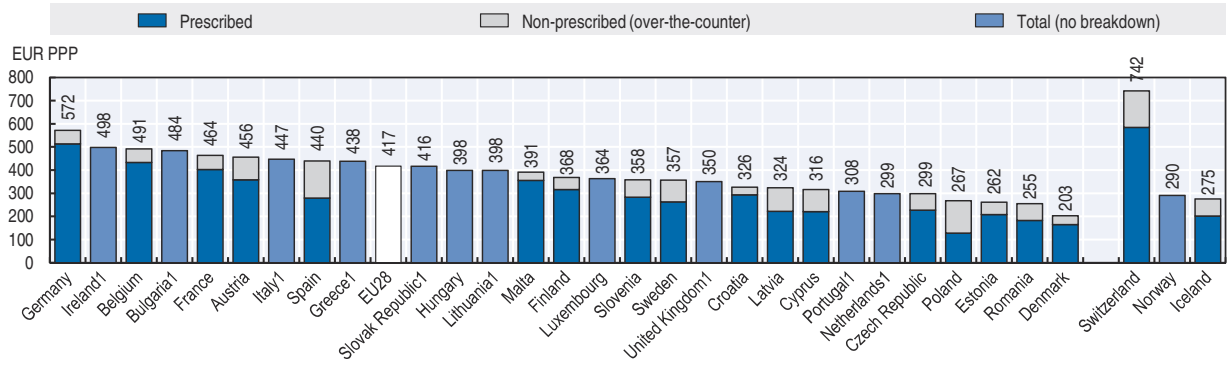
Pharmaceuticals consumed in hospitals and other health care settings as part of an inpatient or day case treatment are excluded (data available suggest that their inclusion would add another 30% to pharmaceutical spending on average). In some countries, expenditure associated with the administering and dispensing of pharmaceuticals for outpatients in hospitals may be incorrectly accounted for under curative care, affecting the comparability in retail pharmaceutical expenditure.

Pharmaceutical expenditure per capita is adjusted to take account of differences in purchasing power.

Reference

Belloni, A., D. Morgan and V. Paris (2016), "Pharmaceutical Expenditure and Policies: Past Trends and Future Challenges", *OECD Health Working Papers*, No. 87, OECD Publishing, Paris, *http://dx.doi.org/10.1787/5jm0q1f4cdq7-en*.

5.10. Expenditure on retail pharmaceuticals per capita, 2016

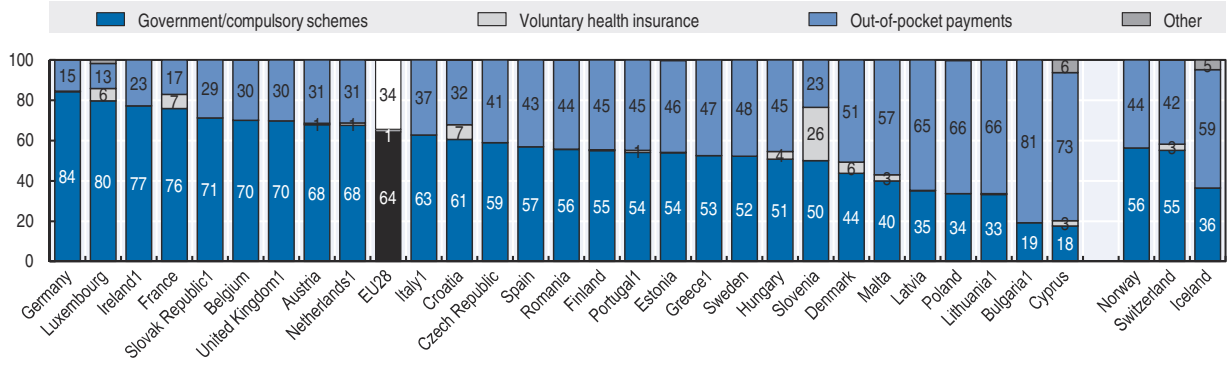


1. Includes medical non-durables (resulting in an overestimation of around 5-10%).

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835516

5.11. Expenditure on retail pharmaceuticals by type of financing, 2016



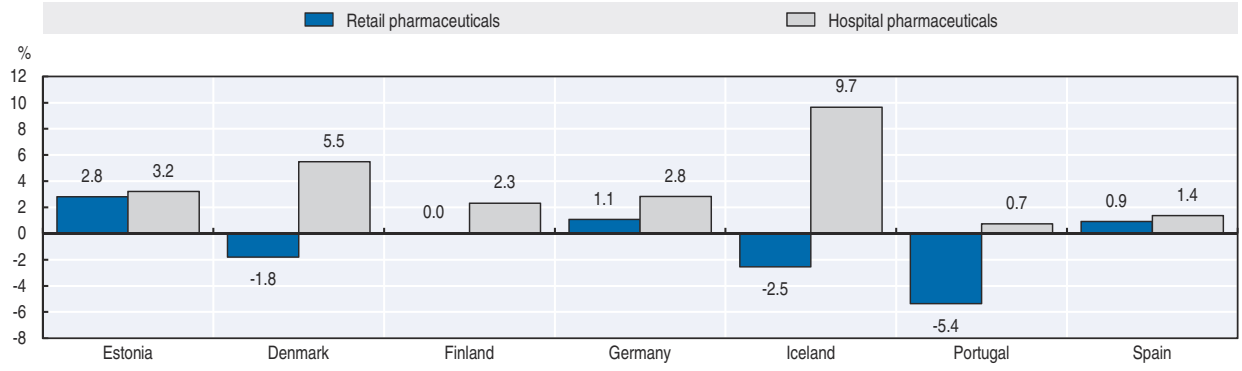
1. Includes expenditure on medical non-durables.

Note: "Other" includes non-profit-schemes, enterprises and rest of world.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835535

5.12. Annual average growth in retail and hospital pharmaceutical expenditure, in real terms, 2009 to 2016 (or nearest year)



Note: OECD estimates for Portugal exclude expenditure on other medical products from retail spending.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933835554

FINANCING OF HEALTH EXPENDITURE

Health care can be paid for through a variety of financing arrangements. In countries where individuals are entitled to health care services based, for example, on their residency, government schemes are the predominant arrangement. In others, some form of compulsory health insurance (either social health insurance or cover organised through private insurers) usually covers the bulk of health expenditure. In addition, payments by households (either standalone payments or as part of co-payment arrangements) as well as various forms of voluntary health insurance intended to replace, complement or supplement automatic or compulsory coverage make up the rest of health spending.

In 2016, around 77% of EU health spending was financed through government and compulsory insurance (Figure 5.13). In Denmark, Sweden and the United Kingdom, central, regional or local government financed around 80% or more of all health spending. In Germany, France, the Netherlands, the Slovak Republic and Croatia, compulsory health insurance financed more than three-quarters of all health expenditure. Cyprus was the only EU country where less than half of all health spending was financed through government or compulsory insurance schemes.

In five EU countries – Malta, Greece, Latvia, Bulgaria and Cyprus – households' out-of-pocket payments accounted for more than one-third of health spending, while only in Slovenia and Ireland did voluntary health insurance cover more than 10% of health spending.

Financing schemes can be funded by different types of revenue streams. Public revenues include governmental transfers (mainly coming from taxation) and social insurance contributions paid by employees, employers and others. Private revenues include the premiums paid to both voluntary and compulsory private insurance as well as any other resources coming directly from households and corporations. In 2016, among a group of 12 EU countries with comparable data, public sources funded 76% of all health spending, (Figure 5.14).

The types of revenues are closely related to the system of health care financing. In Denmark, for example, where health care is predominantly purchased through local government schemes, this is almost entirely funded via government transfers. Other types of financing may rely on a mix of different revenue sources. For example, if a social health insurance scheme exists, like in the case of Belgium and Germany, social insurance contributions will typically be a major revenue source. However, social health insurance schemes can also receive governmental transfers to a varying extent. Analysing the structure of financing schemes with the types of revenues that these schemes receive can give important insights into the overall financing of health: in many countries, the government's role in funding health care is typically more than being just a simple purchaser of health services (Mueller and Morgan, 2017).

Governments (including social security schemes) finance many different public services out of their overall budgets. Hence, health is competing for public funds with many other sectors such as education, defence and housing. In 2016, around 17% of total government expenditure was allocated to health in the EU (Figure 5.15). In Germany, the United Kingdom and Sweden the share of public spending dedicated to health care was closer to 20%, while in Hungary and Poland it was just over 10%.

Definition and comparability

The financing of health care can be analysed from the point of view of financing schemes (financing arrangements through which health services are paid for and obtained by people, e.g. social health insurance) and types of revenues of financing schemes (e.g. social insurance contributions) (OECD, Eurostat and WHO, 2011).

Financing schemes include government schemes, compulsory health insurance as well as voluntary health insurance and private funds such as households' out-of-pocket payments, NGOs and private corporations. Out-of-pocket payments are expenditures borne directly by patients, which can take the form of cost-sharing of services included in the publicly defined benefit package and also direct purchases of goods and services.

Health financing schemes have to raise revenues in order to pay for health care goods and service for the population they are covering. Financing schemes can receive transfers from the government, social insurance contributions, voluntary or compulsory prepayments (e.g. insurance premiums), other domestic revenues and revenues from abroad as part of development aid.

Total government expenditure is used as defined in the System of National Accounts and includes as major components: intermediate consumption, compensation of employees, interest, social benefits, social transfers in kind, subsidies, other current expenditure and capital expenditure payable by central, regional and local governments as well as social security funds.

References

Mueller, M. and D. Morgan (2017), "New insights into health financing: First results of the international data collection under the System of Health Accounts 2011 framework", *Health Policy*, Vol. 121/7, pp. 764-769, *http://dx.doi.org/10.1016/j.healthpol.2017.04.008*.

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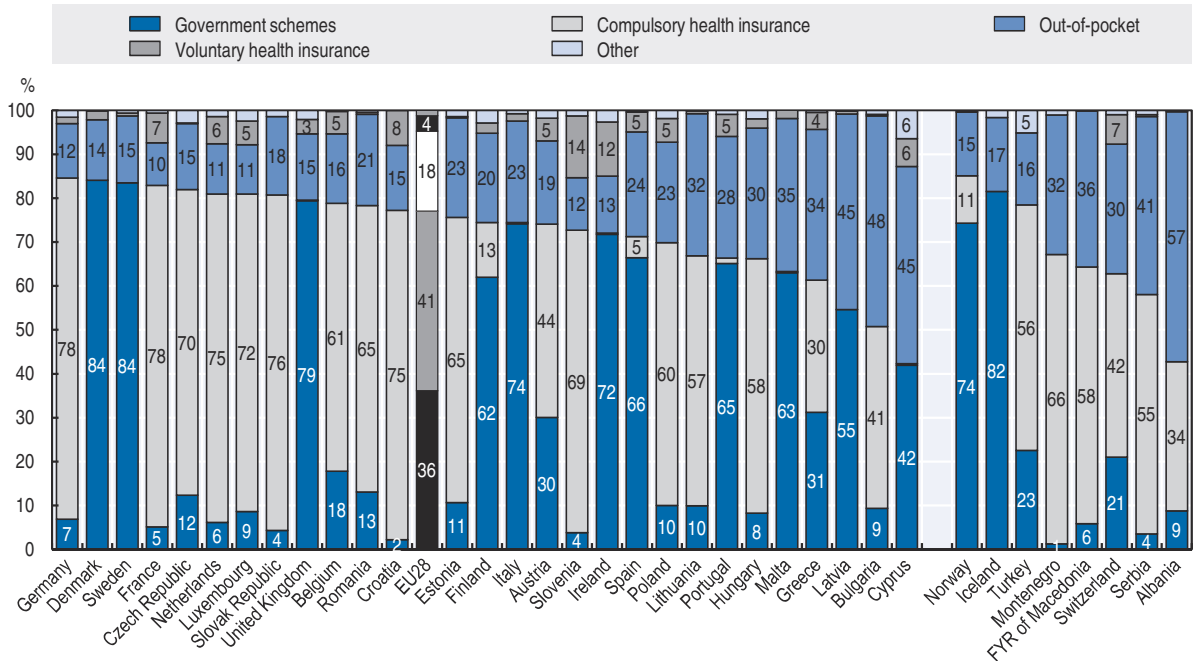
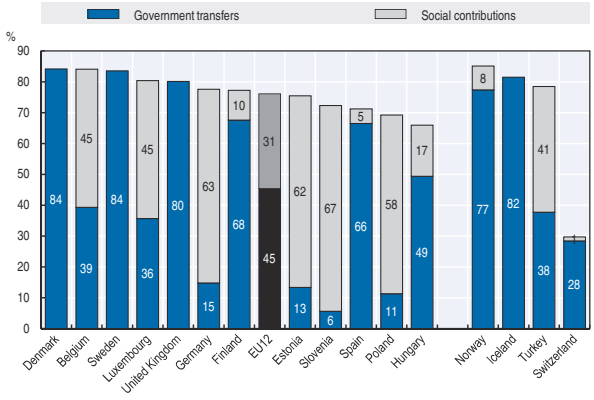
5.13. Health expenditure by type of financing, 2016 (or nearest year)



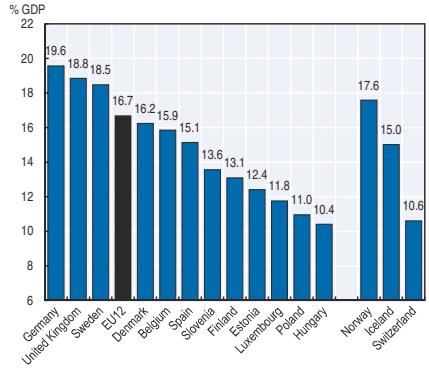
Note: Countries are ranked by government schemes and compulsory health insurance as a share of current health expenditure.
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database; WHO Global Health Expenditure Database.
StatLink http://dx.doi.org/10.1787/888933835573

5.14. Public financing as a share of health spending, by source of funding, 2016 (or nearest year)



Note: Chart only contains the countries reporting revenues of financing schemes.
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.
StatLink http://dx.doi.org/10.1787/888933835592

5.15. Government transfers and social contributions for health care as share of total government expenditure, 2016 (or nearest year)



Note: Chart only contains the countries reporting revenues of financing schemes.
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.
StatLink http://dx.doi.org/10.1787/888933835611

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State of Health in the EU Cycle
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PART II

Chapter 6

Effectiveness: Quality of care and patient experience

This chapter starts with a broad indicator of avoidable mortality, providing a general assessment of the effectiveness of public health and health care systems in reducing premature deaths. In 2015, more than 1.2 million people in EU countries died prematurely from diseases and injuries that could potentially have been avoided through more effective public health policies or health care. The main causes of avoidable mortality include ischaemic heart diseases, lung cancer and accidents.

Vaccine-preventable diseases have resurged in some parts of Europe in recent years, highlighting the importance of assuring effective vaccination coverage across all European countries. In some EU countries, at least 10% of children were not vaccinated against infectious diseases such as measles and hepatitis B in 2017, increasing the risk that these communicable diseases will spread.

The quality of acute care in hospital for life-threatening conditions has generally improved over the past decade. Mortality rates following a hospital admission for acute myocardial infarction (AMI) has reduced by 30% on average between 2005 and 2015, and mortality rates following an admission for stroke has also come down by over 20%. Yet, wide disparities in the quality of acute care persist not only between countries but also between hospitals within each country.

Health systems in Europe have also made progress in tackling cancer through the implementation of population-based screening programmes and the provision of effective and timely cancer care, as reflected by increased survival following diagnosis and reduced cancer mortality in most countries.

Health care needs to be provided by putting patients at the centre. While data on patient-reported experience remain limited, the available data indicate that patients generally report positive experiences from their contacts with doctors.

AVOIDABLE MORTALITY (PREVENTABLE AND AMENABLE)

Indicators of avoidable mortality provide a general "starting point" to assess the effectiveness of public health and health care systems in reducing premature deaths from various diseases and injuries, but further analysis is required to assess more precisely different causes of potentially avoidable deaths and possible interventions to reduce them.

In 2015, over 1 million deaths across EU countries were considered to be potentially preventable through effective public health and prevention interventions and more than 570 000 deaths were considered to be amenable (or treatable) through more effective and timely health care (Figure 6.1). The overall number of potentially avoidable deaths was around 1.2 million deaths in 2015, taking into account that some diseases are considered to be both preventable and amenable (Eurostat, 2018).

The main causes of preventable mortality are ischaemic heart diseases (which are also considered to be amenable to health care when these diseases occur), lung cancer, road accidents and other types of accidents, alcohol-related deaths, colorectal cancer and suicides. Combined, these causes of death account for over two-thirds of all deaths considered to be preventable through more effective public health and prevention interventions in EU countries.

The main causes of amenable (or treatable) mortality are ischaemic heart diseases and cerebrovascular diseases, which together account for nearly half of all amenable deaths. Mortality from colorectal cancer and breast cancer also account for a considerable number of amenable deaths (20% of the total) that could be reduced both through earlier detections and more effective and timely treatments (see indicators on screening, survival and mortality for breast cancer and colorectal cancer).

The age-standardised rate of preventable mortality is lowest in Italy, Cyprus and Spain, with rates at least 25% lower than the EU average. By contrast, preventable mortality rates are about two times greater than the EU average in Lithuania, Hungary and Latvia (Figure 6.2). The high rates of preventable mortality in these three countries are due mainly to much higher death rates from ischaemic heart diseases, accidents, alcohol-related deaths, suicides (particularly in Lithuania) and lung cancer (particularly in Hungary).

The age-standardised rate of amenable mortality is lowest in France, Spain and the Netherlands, due to these countries having among the lowest death rate from ischaemic heart diseases and cerebrovascular diseases. Lithuania, Latvia and Romania have the highest rates of amenable mortality, more than two-and-a-half times higher than the EU average (Figure 6.3), driven mainly by higher death rates from ischemic heart diseases and cerebrovascular diseases, but also by higher mortality from some types of cancer and other treatable diseases. These three countries are also among those that spend the least on health across the EU. Hence, additional expenditure on health could contribute to reductions in amenable mortality.

Looking at trends over time, the age-standardised rate of amenable mortality has declined by approximately 25% between 2005 and 2015 across the EU as a whole. This reduction has been particularly rapid in Denmark and Finland (over 30%), driven mainly by a rapid decline in ischaemic heart diseases mortality due partly to reduced mortality rates for people admitted to hospital for a heart attack (see indicator "Mortality following AMI").

Definition and comparability

Based on the Eurostat definitions, preventable mortality is defined as deaths that could be avoided through public health and prevention interventions, whereas amenable (or treatable) mortality is defined as deaths that could be avoided through effective and timely health care (Eurostat, 2018).

The two lists of preventable and amenable mortality focus on premature deaths, defined as deaths under age 75. However, a lower or higher age threshold is used for some selected causes of death.

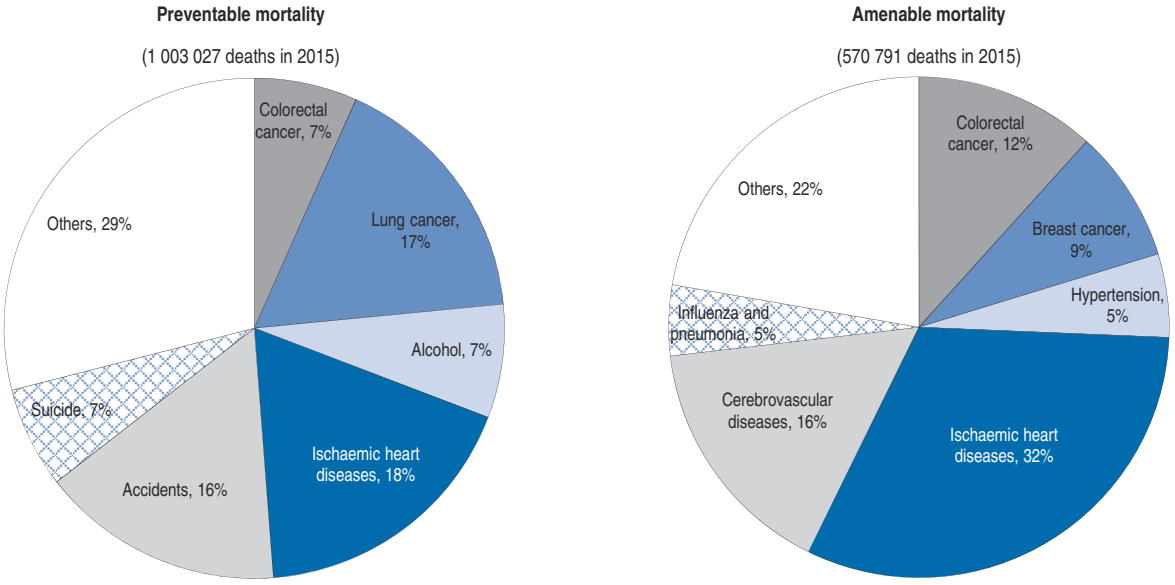
A number of causes of death are included in both the preventable and amenable mortality lists as they are considered to be both potentially preventable through public health interventions and treatable through effective and timely health care when they occur. For example, ischemic heart diseases, colorectal cancer and breast cancer are considered to be both 100% preventable and 100% amenable to health care. This "double counting" of several causes of death means that the sum of the preventable and amenable mortality lists is much greater than the overall number of avoidable deaths.

The two current lists of preventable and amenable mortality were adopted by a Eurostat Task Force in 2013. These lists may be subject to future revisions.

Reference

Eurostat (2018), *Amenable and preventable deaths statistics*, Statistics Explained, June 2018.

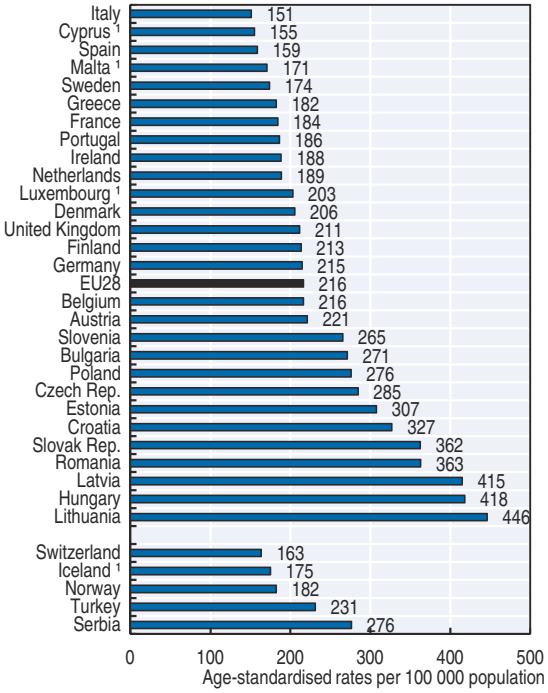
6.1. Leading causes of preventable and amenable mortality in the European Union, 2015



Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835630

6.2. Preventable mortality rates, 2015

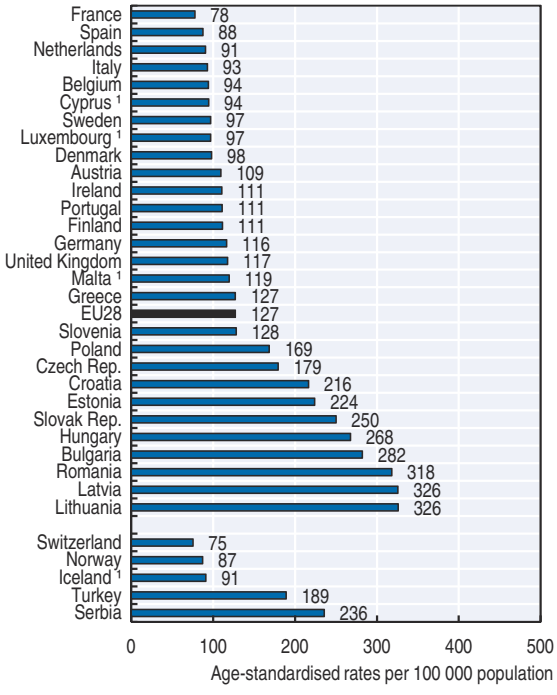


1. Three-year average (2013-15).

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835649

6.3. Amenable mortality rates, 2015



1. Three-year average (2013-15).

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835668

CHILDHOOD VACCINATIONS

Diseases such as measles, diphtheria, pertussis and influenza are highly infectious and spread through human contact, while the hepatitis B virus is transmitted by contact with blood or body fluids of an infected person, by sex or from mother to child. Effective vaccination is available to prevent all these infectious diseases. All EU countries have established childhood vaccination programmes, contributing to reducing many deaths related to these diseases, although the number and type of vaccines vary to some extent across countries.

Vaccine-preventable diseases have resurged in some parts of Europe recently due to a combination of declining vaccine coverage, increasing supply shortages and growing vaccine hesitancy. The European Commission has called for stronger efforts and cooperation to tackle hesitancy against vaccines, improve vaccination coverage and develop sustainable vaccination policies in the EU (European Commission, 2018).

Vaccination against measles is included in all national childhood vaccination programmes, whereas vaccination against hepatitis B has been included in a growing number of countries, but is available only for certain risk groups in a few Nordic countries (Denmark, Finland and Iceland). The WHO recommends at least 95% coverage with two doses of measles-containing vaccine by 2020 (WHO, 2012). As for hepatitis B, a proportion of infections become chronic, and this risk is high particularly among infants and children. Infected people are at high risk of death from cancer or cirrhosis of the liver. The hepatitis B vaccine is considered to be 95% effective in preventing infection and its chronic consequences. WHO recommends that all infants should receive their first dose of hepatitis B vaccine as soon as possible after birth (WHO, 2017).

On average across EU countries, 94% of children received at least one dose of measles vaccination before turning age 1 (Figure 6.4). However, the vaccination rate in 2017 did not reach more than 90% of children in Romania, Croatia, Cyprus and France.

Measles continues to spread in some parts of Europe. Between May 2017 and May 2018, 13 475 cases of measles were reported, up from 8 523 cases for the preceding 12-month period (see Chapter 3). Almost 85% of these cases were reported in Italy (4 032), Greece (2 752), France (2 436) and Romania (2 127). Most measles cases were reported among people who were not vaccinated, particularly children below age 1 who were too young to have received the first dose of the vaccine and older individuals who had missed vaccination (ECDC, 2018).

Small decreases in vaccination rates can result in large increases in measles cases. In Romania, vaccination coverage has decreased by 10 percentage points over the past decade. In Italy, the rate decreased from 91% in 2010 to 85% in 2016, but it went back up to 92% in 2017.

Viruses do not respect national borders. About 10% of all measles cases are due to infections acquired by people while travelling outside of their home country or imported by visitors from other countries (ECDC, 2018). This highlights the importance of maintaining high vaccination coverage across countries in an EU and global context.

On average, 93% of children at age 1 receive hepatitis B vaccination across EU countries where this vaccination is part of the national immunisation programme. The vaccination rates are particularly high in Latvia and Portugal, but less than 90% in Germany, Malta, Slovenia and Sweden (Figure 6.5). In Sweden, hepatitis B was included in the national childhood vaccination programme only in 2016, which partly explains why the coverage is still relatively low. In Denmark and Finland, where data are not available, hepatitis B vaccination is not yet part of the general infant vaccination programme, but is provided to high-risk groups. Hungary and Slovenia have also not yet included hepatitis B vaccine in their infant vaccination programme.

Between 2007 and 2017, vaccination rates for hepatitis B among children have increased by 8 percentage points on average across EU countries that have this vaccination included in their national immunisation programme. The increase was particularly large in France, the Netherlands and Sweden.

Definition and comparability

Vaccination rates reflect the percentage of children under one year old who have received the respective vaccination (at least one dose of measles-containing vaccine and three doses of hepatitis B vaccine) in a given year. The age of complete immunisation differs across countries due to different immunisation schedules. For those countries recommending the first dose of measles vaccine after age one, the indicator is calculated as the proportion of children less than two years of age who have received that vaccine. Thus, these data reflect the actual policy in a given country and are not always strictly comparable across countries.

References

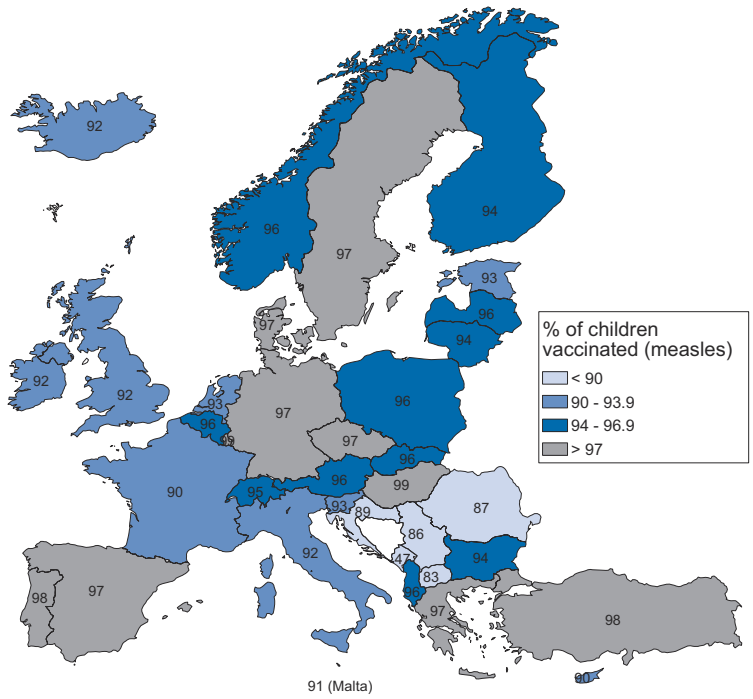
ECDC (2018), *Surveillance Report: Monthly measles and rubella monitoring report – June 2018*, ECDC, Stockholm.

European Commission (2018), *Proposal for a Council Recommendation on Strengthening Cooperation against Vaccine Preventable Diseases*, European Commission, Brussels.

WHO (2012), *Global Measles and Rubella: Strategic Plan 2012-20*, WHO, Geneva.

WHO (2017), *Global Hepatitis Report 2017*, WHO, Geneva.

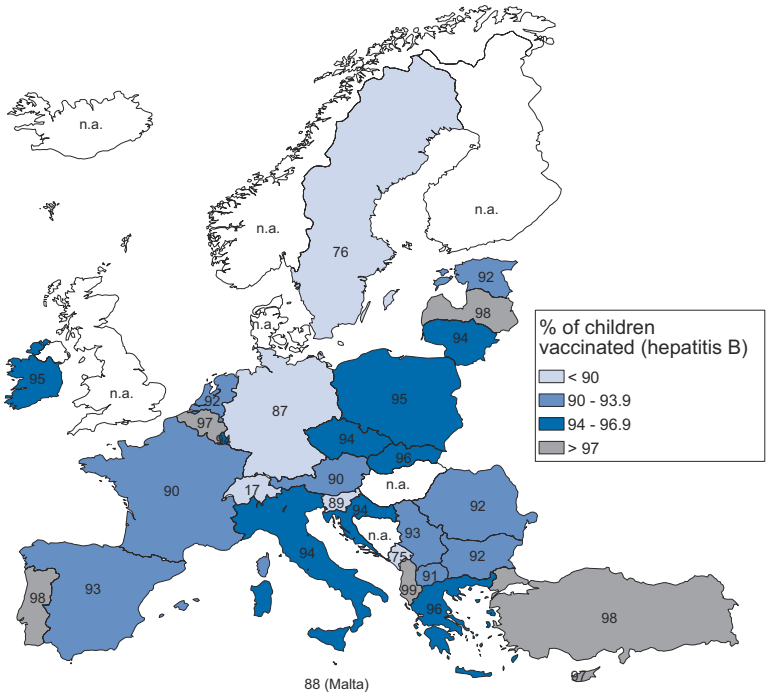
6.4. Vaccination against measles, children aged 1, 2017 (or nearest year)



Source: WHO/UNICEF.

StatLink http://dx.doi.org/10.1787/888933835687

6.5. Vaccination against hepatitis B, children aged 1, 2017 (or nearest year)



Note: Data for Denmark, Finland, Hungary, Iceland and Norway are not available because national infant vaccination programmes do not cover Hepatitis B. Data is not available for the United Kingdom.
Source: WHO/UNICEF.

StatLink http://dx.doi.org/10.1787/888933835706

PATIENT EXPERIENCE WITH AMBULATORY CARE

Across EU countries, delivering health care that is patient-centred is becoming a priority in health care policy. Given the importance of utilising people's voice for developing health systems and improving quality of care, national efforts to develop and monitor patient-reported measures have been intensified in recent years. In many countries, responsible organisations have been established or existing institutions have been identified for measuring and reporting patient experiences. These organisations develop survey instruments for regular collection of patient experience data and standardise procedures for analysis and reporting. An increasing number of countries collect not only Patient-Reported Experience Measures (PREMs) but also Patient-Reported Outcome Measures (PROMs) which collect patients' perception on their specific medical conditions and general health, including mobility, pain/discomfort and anxiety/depression, before and after a specific medical intervention (OECD, 2018).

Countries use patient-reported data differently to drive quality improvements in health systems. In order to promote quality of health care through increased provider accountability and transparency, many countries report patient experience data in periodic national health system reports and/or on public websites, showing differences across providers, regions and over time. In addition, Belgium and Norway use patient experience measures in payment mechanisms to promote quality improvement and patient-centred care. The Czech Republic, Denmark, France and the United Kingdom use patient experience data to inform health care regulators for inspection, regulation and/or accreditation. Patient-reported measures are also used in Belgium, Denmark and the Netherlands to provide specific feedback for providers' quality improvement. Several countries including Belgium and Denmark also use patient-reported outcome measures systematically for quality improvement (Fujisawa and Klazinga, 2017; Desomer et al., 2018).

Patients generally report positive experiences in relation to communication and autonomy in the ambulatory health care system. For example, the majority of patients reported that they spent enough time with a doctor during consultation (Figure 6.6) and a doctor involved them in care and treatment decisions (Figure 6.7). For these and other aspects of patient experience, Belgium and Luxembourg have high rates with above 95% of patients reporting positive experiences, while Poland has lower rates. For example, only one in two patients report having been involved in their care and treatment decisions during consultation in Poland. Across European countries, these patient experiences are generally consistent with the perceived quality of family doctor/GP or health centre services as reported in the European Quality of Life Survey. The perceived quality of care is high in Austria and Luxembourg, while it is low in Poland and Greece (Figure 6.8).

In recent years, reported patient experiences have not changed significantly in most countries. However, Estonia and Sweden have improved some aspects of patient experiences recently.

Definition and comparability

In order to monitor general patient experience with ambulatory care, the OECD recommends collecting data on patient experience with any doctor in ambulatory care settings. An increasing number of countries have been collecting patient experience data based on this recommendation through nationally representative population surveys, while Portugal collects them through a nationally-representative service user survey.

In 11 countries, the Commonwealth Fund's International Health Policy Surveys of 2010 and 2016 were used as a data source, even though there are limitations relating to the sample size and response rates. Data from this source refer to patient experience with a GP, instead of with any doctor including both GP and specialist. In 2016, the Netherlands developed a national population survey and this resulted in improved response rates and data quality. Poland collects data through national survey and the data refer to patient experience with a regular doctor.

Rates for Figure 6.6 and Figure 6.7 are age-sex standardised to the 2010 OECD population, to remove the effect of different population structures across countries.

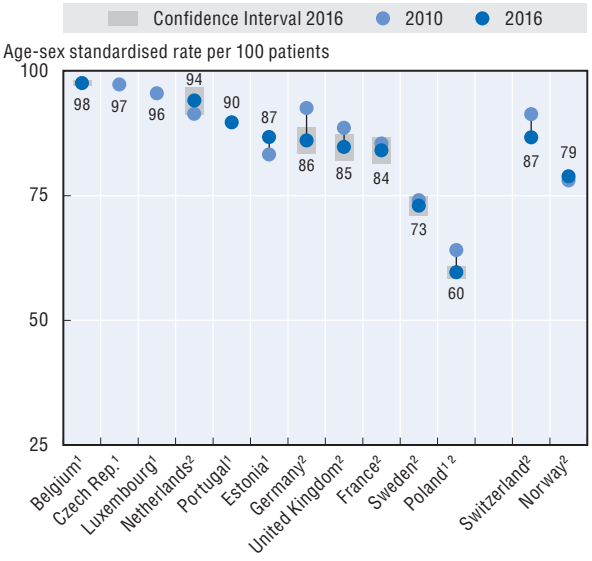
References

Desomer, A. et al. (2018), "Use of patient-reported outcome and experience measures in patient care and policy", *Health Care Knowledge Centre (KCE) Reports*, No. 303, Belgian KCE Health Services Research, Brussels.

Fujisawa, R. and N. Klazinga (2017), "Measuring Patient Experiences (PREMs): Progress Made by the OECD and its Member Countries 2006-2015", *OECD Health Working Papers*, No. 102, OECD Publishing, Paris, *https://doi.org/10.1787/893a07d2-en*.

OECD (2018), "Patient-Reported Indicators Survey (PaRIS)", *www.oecd.org/health/paris.htm*.

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



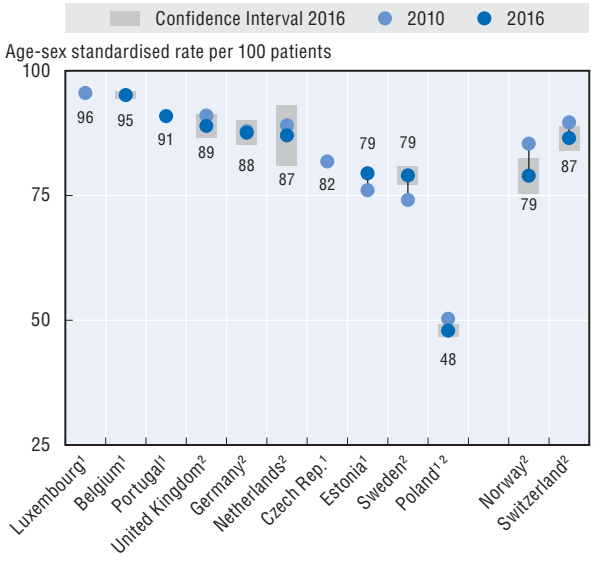
1. National sources.
2. Data refer to patient experiences with GP.

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

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

StatLink http://dx.doi.org/10.1787/888933835725

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



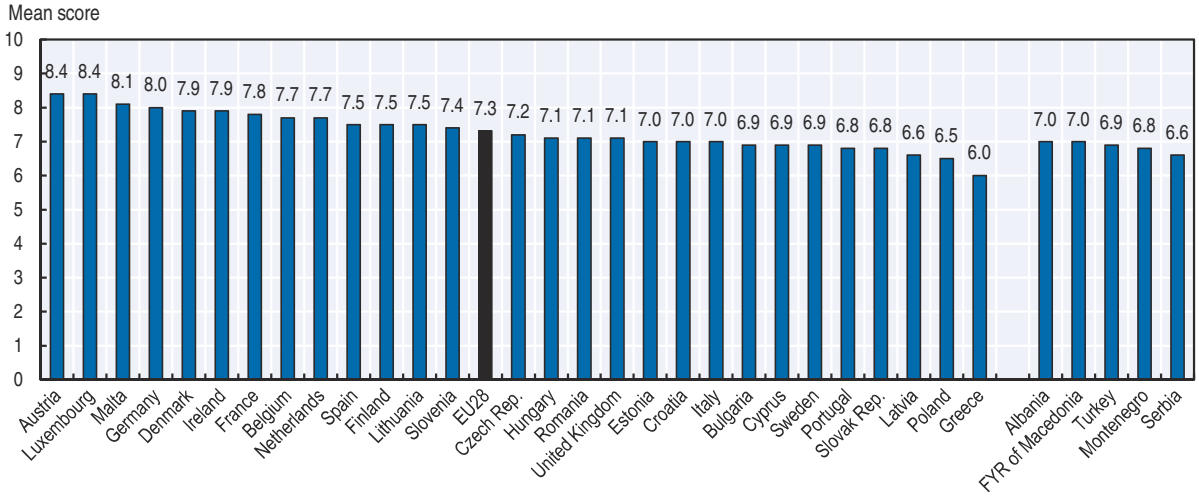
1. National sources.
2. Data refer to patient experiences with GP.

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

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

StatLink http://dx.doi.org/10.1787/888933835744

6.8. Perceived quality of GP (family doctor) or health centre services, 2016



Note: The mean score is based on a scale from 1 to 10, where 1 means very poor quality and 10 means very high quality. The EU average is unweighted.

Source: European Quality of Life Survey 2016.

StatLink http://dx.doi.org/10.1787/888933835763

MORTALITY FOLLOWING ACUTE MYOCARDIAL INFARCTION (AMI)

Mortality due to coronary heart diseases has declined substantially over the past few decades (see indicator "Mortality from circulatory diseases" in Chapter 3). Important advances in both public health policies, including reductions in smoking and improved treatment for heart diseases, have contributed to these declines (OECD, 2015). Clinical practice guidelines such as those developed by the European Society of Cardiology have helped optimise treatment. Despite these advances, acute myocardial infarction (AMI or heart attack) remains the leading cause of cardiovascular deaths across European countries, making further improvements a priority.

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

Figure 6.9 shows mortality rates within 30 days of admission to hospital for AMI using unlinked data to measure where the death occurs in the same hospital. Across EU countries, the lowest rates (below 4.5%) are found in Denmark and Sweden. The rate is also low in Poland but this is because the data refer mainly to patients admitted to cardiology wards while about 65% of patients with AMI are admitted to other wards. The highest rates are in Latvia and Estonia.

Using linked data, Figure 6.10 shows 30-day mortality rates where fatalities are recorded regardless of where they occur (in the hospital where the patient was initially admitted, after transfer to another hospital or after discharge). This is a more robust indicator because it records deaths more widely than the same-hospital indicator, but it requires a unique patient identifier and linked data which are not available in all countries. Using linked data, the AMI mortality rates range from less than 8% in Italy, Denmark and Sweden to over 14% in Latvia and Estonia.

Thirty-day mortality rates for AMI have decreased substantially between 2005 and 2015. Across the 20 EU countries for which data are available, they fell by 30% (from 9.7% to 6.8%) when considering deaths occurring only in the hospital where patients were initially admitted and by over 25% (from 12.8% to 9.5%) in the smaller group of countries providing data on deaths occurring in and out of hospital. Better access to high-quality acute care for heart attack, including timely transportation of patients, evidence-based medical interventions and specialised health facilities such as percutaneous catheter intervention-capable centres have helped to reduce 30-day mortality rates (OECD, 2015).

Figure 6.11 presents the differences in dispersion of AMI 30-day mortality rates across hospitals within countries based on data which include deaths occurring outside of these hospitals where patients were initially admitted. The differences between upper and lower quartile rates are largest in Latvia (over 7 deaths per 100 admissions between different hospitals) and the smallest in Sweden (about 2 deaths per 100 admissions).

Multiple factors contribute to variations in outcomes of care across hospitals, including hospital structure, processes of care and organisational culture. In Sweden, a system of evaluating and reporting quality and outcomes of care is likely to have contributed to the small variation in mortality of patients after an AMI (Chung et al., 2015).

Definition and comparability

The thirty-day mortality rate measures the percentage of people aged 45 and over who died within 30 days following admission to hospital for an AMI (heart attack). Rates based on unlinked data refer to a situation where the death occurred in the same hospital as the initial admission. Rates based on linked data refer to a situation where the death occurred in the same hospital, a different hospital, or out of hospital. Rates are age-sex standardised to the 2010 OECD population aged 45+ admitted to hospital for AMI (ICD-10 I21, I22).

The specific methodology used to calculate the hospital mortality rates presented in Figure 6.11 differs from that used for Figure 6.9 and Figure 6.10 and is likely to vary from the methods used by country for national monitoring and reporting purposes. Different analytical methods can result in quite different rates for and rankings of organisations and countries, limiting the comparability of results. For more details on the methodology used to calculate data presented in Figure 6.11, see Brownwood et al. (forthcoming).

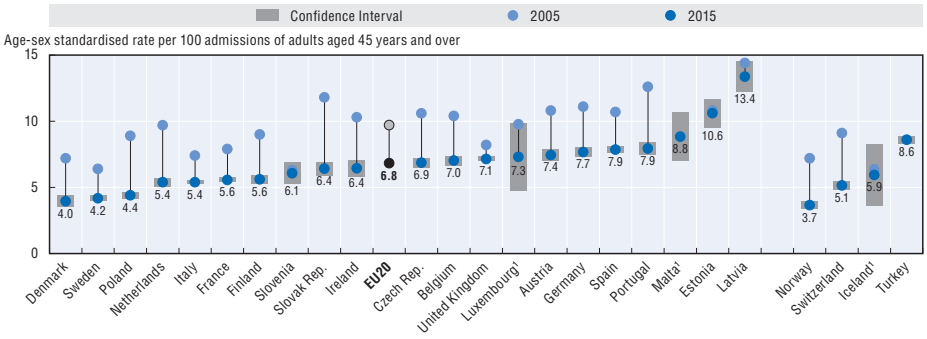
References

Brownwood, I. et al. (forthcoming), "OECD Hospital Performance Project: Methodological Development of International Measurement of Acute Myocardial Infarction 30-Day Mortality Rates at the Hospital Level", *OECD Health Working Papers*, OECD Publishing, Paris.

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

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

6.9. Thirty-day mortality after admission to hospital for AMI based on unlinked data, 2005 and 2015 (or nearest years)



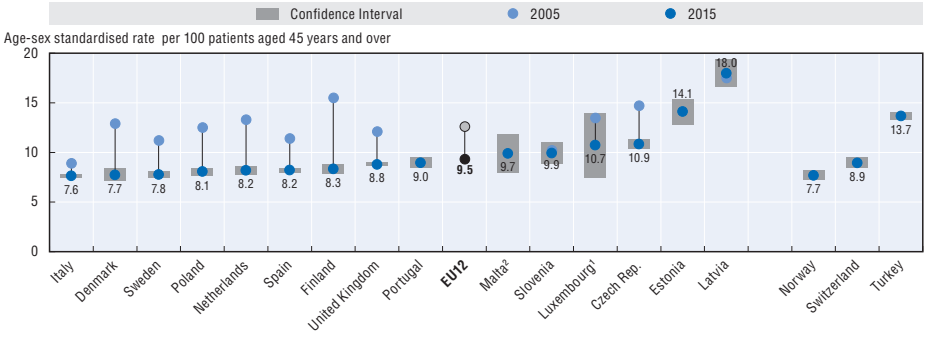
1. Three-year average.

Note: 95% confidence intervals for the latest year are represented by grey areas. The EU average is unweighted and only includes countries with data covering the whole time period.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933835782

6.10. Thirty-day mortality after admission to hospital for AMI based on linked data, 2005 and 2015



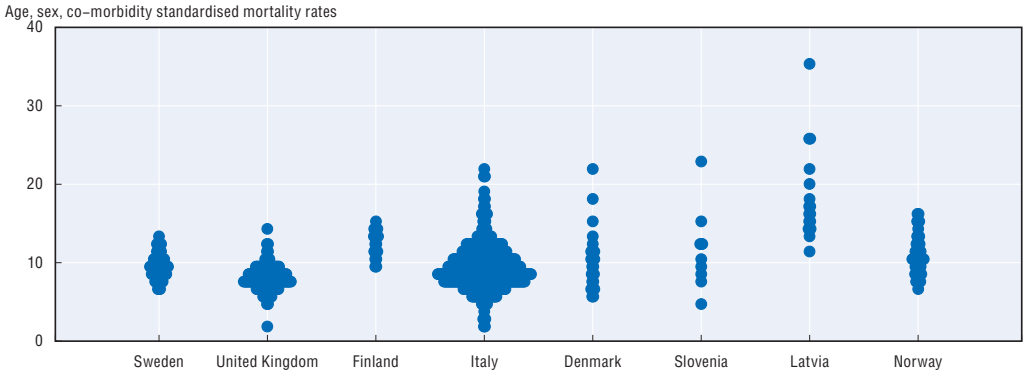
1. Three-year average.
2. Two-year average.

Note: 95% confidence intervals for the latest year are represented by grey areas. The EU average is unweighted and only includes countries with data covering the whole time period.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933835801

6.11. Thirty-day mortality after admission to hospital for AMI based on linked data, 2013-15 (or nearest years)



Note: The width of each line in the figure represents the number of hospitals (frequency) with the corresponding rate. The data for the United Kingdom relate to England only and are presented at trust-level (i.e. multiple hospitals). The countries are ranked by interquartile range of mortality rate.

Source: OECD Hospital Performance Data Collection 2017.

StatLink http://dx.doi.org/10.1787/888933835820

MORTALITY FOLLOWING STROKE

Across EU countries, some 610 000 stroke events occurred in 2015 and the number is expected to rise by one-third by 2035 due to population ageing and increases in some risk factors (King's College London, 2017). Stroke is the second leading cause of death after heart disease (see the indicator "Mortality from circulatory diseases" in Chapter 3), and is also the second leading cause of disability after depression.

A stroke occurs when the blood supply to a part of the brain is interrupted. Of the two types of stroke that exist, about 85% are ischaemic (caused by clotting) and 15% are haemorrhagic (caused by bleeding). Pneumococcal infections and influenza infections, both vaccine-preventable, have a marked effect on triggering strokes. Treatment for ischaemic stroke has advanced dramatically over the last decades with systems and processes now in place in many European countries, which include specialised stroke units that are devoted to care for stroke patients by a multidisciplinary team, and medical progress such as thrombolysis and thrombectomy.

Figure 6.12 shows the mortality rates within 30 days of admission for ischaemic stroke using unlinked data to measure deaths occurring in the same hospital. Using linked data, Figure 6.13 shows the mortality rate where deaths are recorded regardless of where they occurred (in the hospital admitted initially, after transfer to another hospital or after discharge). This indicator is more robust because it takes account of hospital transfers and captures fatalities more comprehensively. Although more countries report the same-hospital measure using unlinked data, an increasing number of countries are investing in their data infrastructure and using linked data to provide more comprehensive measures.

Across EU countries, 8.6% of patients admitted for ischaemic stroke in 2015 died within 30 days in the same hospital in which the initial admission for ischaemic stroke occurred (Figure 6.12). Thirty-day mortality rates were highest in Latvia (18.3%), Malta (15.9%) and Lithuania (15.3%). Rates were less than 5% in Denmark and Finland. Generally, countries that have 30-day mortality for ischaemic stroke lower than the EU average also tend to have lower 30-day mortality rates for acute myocardial infarction (AMI) (see indicator "Mortality following acute myocardial infarction"). This suggests that certain aspects of acute care may be influencing outcomes for both stroke and AMI patients.

Across those EU countries that reported in- and out-of-hospital mortality rates, 11.7% of patients died within 30-days of being admitted to hospital for stroke (Figure 6.13). This figure is higher than the same-hospital based indicator because it captures deaths that occur not just in the same hospital but also in other hospitals and out of hospital.

Between 2005 and 2015, 30-day mortality rates for ischaemic stroke have decreased in nearly all countries (and by over 25% on average), with the exception of Latvia where the rates have increased when considering fatalities in and out of hospital, although this may reflect improved data accuracy (OECD, 2016). The reduction in 30-day mortality rates was substantial in Denmark and the United Kingdom. Across European countries, better access to high-quality stroke care, including timely transportation of patients, evidence-based medical interventions and high-quality specialised facilities such as stroke units have helped to reduce 30-day mortality rates (OECD, 2015).

Despite the progress so far, there is still room to improve implementation of best practice acute care for stroke and other cardiovascular diseases across countries. Targeted strategies can be highly effective to shorten acute care treatment time. Advances in technology are now leading to models of care to deliver reperfusion therapy in an even more rapid and efficient manner, whether through pre-hospital triage via telephone, administration via telemedicine, or administering the therapy in the ambulance (Chang and Prabhakaran, 2017).

Definition and comparability

Thirty-day mortality rates are defined in the indicator "Mortality following acute myocardial infarction" in Chapter 6. Rates are age-sex standardised to the 2010 OECD population aged 45+ admitted to hospital for ischaemic stroke (ICD-10 I63-I64).

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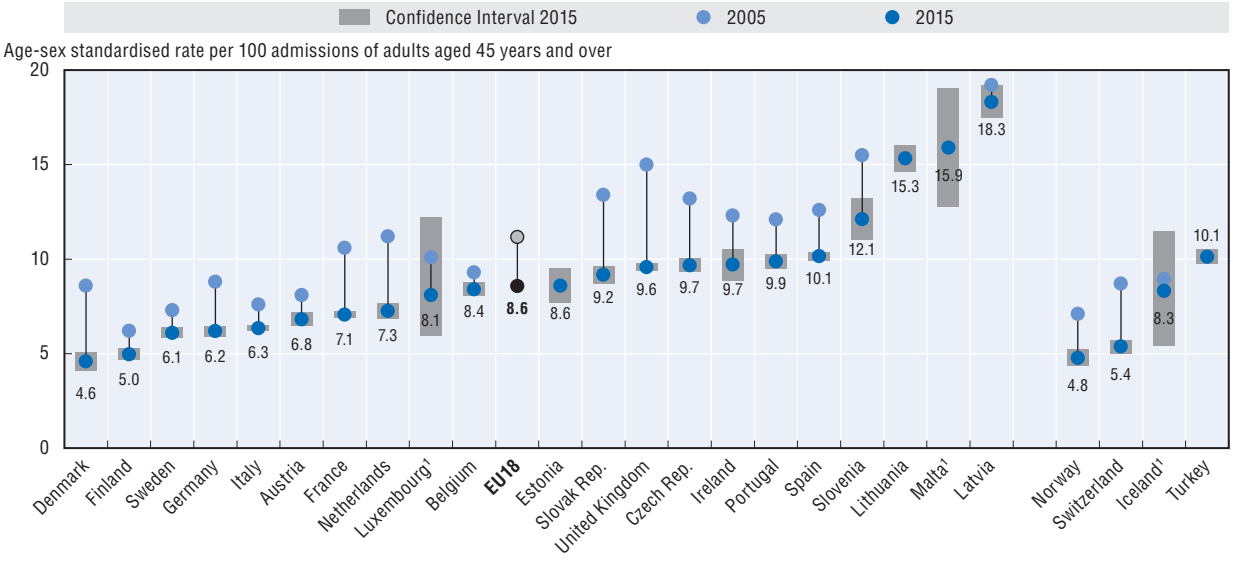
6.12. Thirty-day mortality after admission to hospital for ischaemic stroke based on unlinked data, 2005 and 2015 (or nearest years)



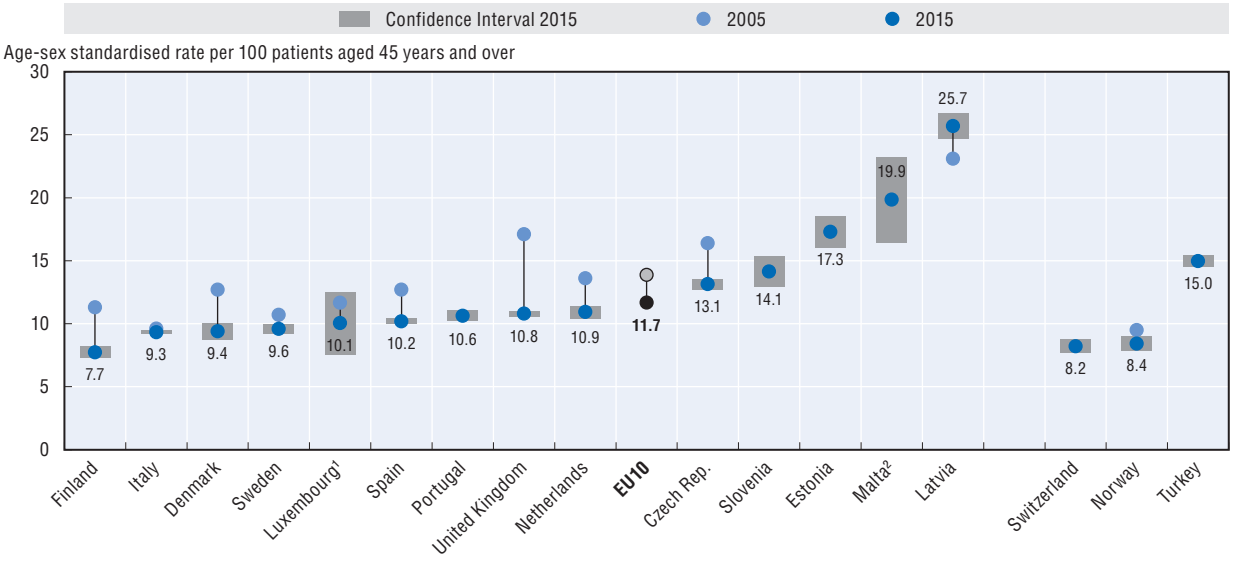
1. Three-year average.

Note: 95% confidence intervals for the latest year are represented by grey areas. The EU average is unweighted and only includes countries with data covering the whole time period.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933835839

6.13. Thirty-day mortality after admission to hospital for ischaemic stroke based on linked data, 2005 and 2015 (or nearest years)



1. Three-year average.
2. Two-year average.

Note: 95% confidence intervals for the latest year are represented by grey areas. The EU average is unweighted and only includes countries with data covering the whole time period.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933835858

WAITING TIMES FOR HIP FRACTURE SURGERY

The main risk factors for hip fractures are associated with ageing, including an increased risk of falling and loss of skeletal strength from osteoporosis. With increasing life expectancy, it is anticipated that hip fractures will become an even greater public health issue in the coming years.

In nearly all instances following a hip fracture, surgical intervention is required to repair or replace the hip joint. There is general agreement that early surgical intervention maximises patient outcomes and minimises the risk of complications, and that surgery should occur within two days (48 hours) of hospitalisation. The guidelines in some countries stipulate even more rapid intervention. For example, in the United Kingdom, the National Institute for Health and Care Excellence (NICE) clinical guidelines recommend hip fracture surgery to be performed on the day of hospital admission or the next day (NICE, 2017).

On average across EU countries, more than three quarters (77%) of patients aged 65 and over admitted for a hip fracture were operated within two days in 2015, with most of them being treated in fact either on the same day of their admission or the next day (Figure 6.14). In Denmark and the Netherlands, the proportion of patients operated within two days was greater than 95%. By contrast, only about half of patients aged 65 and over were operated within two days following their admission for a hip fracture in Latvia, Portugal, Spain and Italy in 2015.

However, substantial progress has been achieved over the past 10 years in Italy and Spain in meeting the recommended clinical guideline of operating patients within two days following a hip fracture (Figure 6.15). In Italy, this proportion nearly doubled from 28% in 2005 to 53% in 2015, whereas it increased from 36% to 48% in Spain. Remarkable improvement also occurred in Switzerland, where the proportion doubled from 46% to 91%.

In Italy, the progress in providing more rapid surgical treatment for patients admitted with a hip fracture was mainly achieved by reducing the waiting time in those regions and hospitals that were lagging behind a decade ago. Italian authorities implemented a policy of public reporting of hospital performance indicators that included the waiting time for surgery for patients admitted with a hip fracture, which helped to identify those regions and hospitals that were falling short of meeting the recommended target (OECD, 2014).

In Portugal, the proportion of patients operated within two days after a hip fracture has decreased from 57% in 2008 to 47% in 2015, despite greater efforts to monitor this performance target at the hospital level and the provision of financial incentives to achieve more timely hip fracture repairs (OECD, 2015).

The waiting time for surgery after a hip fracture is influenced by many factors, including hospitals' surgical theatre capacity and flow, and targeted policy interventions, including public reporting and monitoring of performance (Siciliani et al., 2013).

Definition and comparability

This indicator is defined as the proportion of patients aged 65 years and over admitted to hospital for an upper femur fracture, who had surgery initiated within two calendar days of their admission. Data are also provided for the proportion of patients who had surgery within one day of their admission to hospital, and for patients who had surgery on the same day as their admission.

The capacity to capture time of admission and surgery in hospital administrative data varies across countries, resulting in the inability to precisely record surgery within 48 hours. Recent research and development data indicate that the impact of measuring days rather than hours may result in marginally higher rates.

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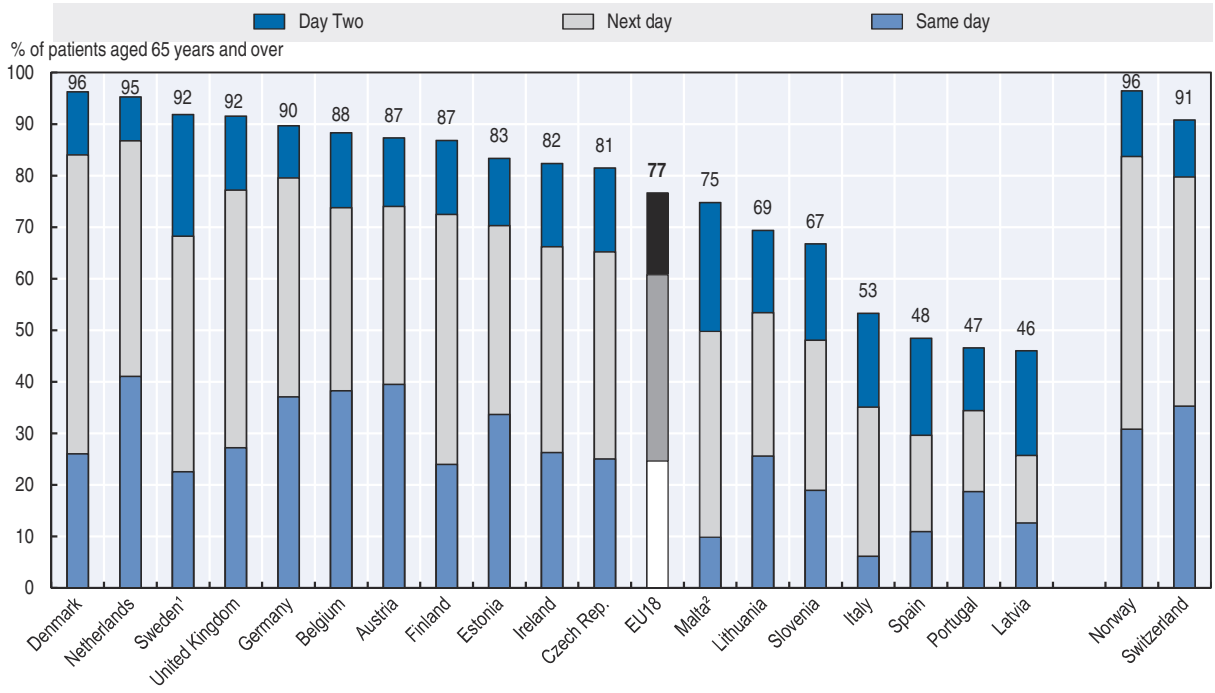
6.14. Hip fracture surgery initiation after admission to the hospital, 2015 (or nearest year)



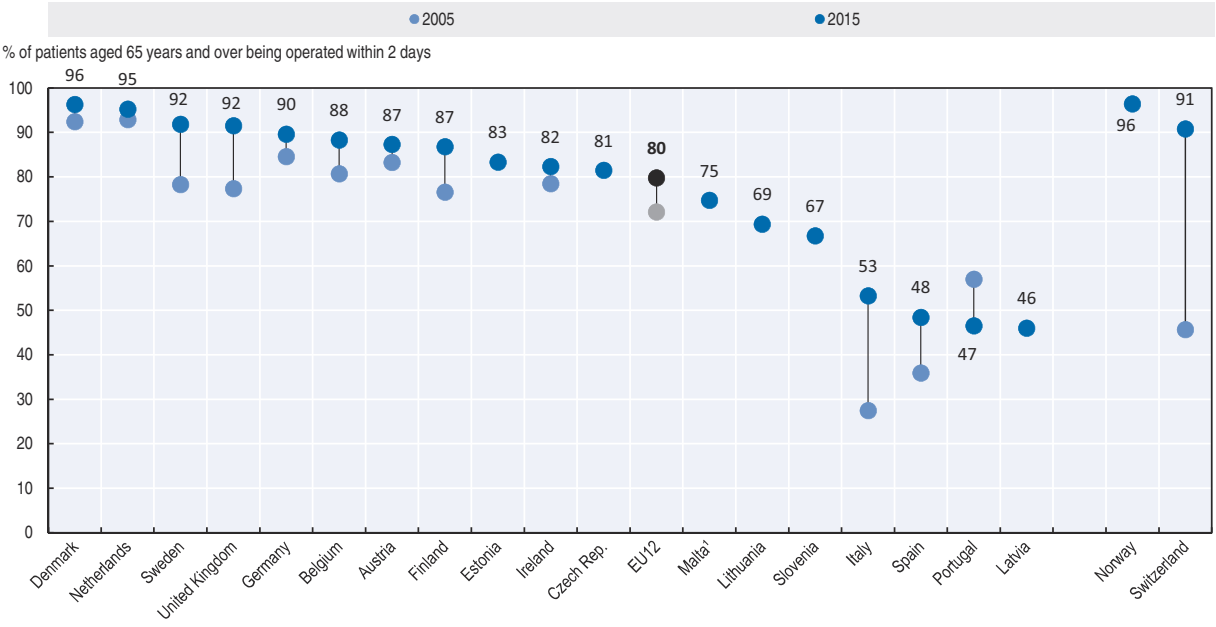
1. Sweden provided data within 12, 24 and 48 hours.
2. Three-year average.

Note: The EU average is unweighted.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933835877

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



1. Three-year average.

Note: The EU average is unweighted and only includes countries with data covering the whole time period.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933835896

SCREENING, SURVIVAL AND MORTALITY FOR CERVICAL CANCER

More than 100 000 women in EU countries are diagnosed each year with cervical cancer (see indicator on "Cancer incidence" in Chapter 3). Cervical cancer is highly preventable if precancerous cells are detected and treated before progression occurs. The human papilloma virus (HPV) is found in over 90% of cervical cancers (European Commission, 2018), and vaccination against the main types of HPV responsible for cervical cancer is expected to reduce incidence.

European countries follow various approaches to the prevention and early diagnosis of cervical cancer. Over half of the countries have implemented population-based cervical cancer screening programmes (IARC, 2017). WHO recommends HPV vaccination for girls aged 9-13 years (WHO, 2018). Most European countries now have national HPV vaccination programmes, but the target populations vary, based on epidemiological and other evidence such as cost-effectiveness that is specific to each country (ECDC, 2014). Vaccination for boys is also considered effective when coverage for girls is low.

On average, the proportion of women in EU countries aged 20-69 years who have been screened for cervical cancer within the past three years has increased from 56% to 61% over the past decade. However, the proportion has fallen in several countries. The proportion of screened women across EU countries still varies widely, from about 25% only in Latvia and Romania to over 80% in Austria and Sweden (Figure 6.16).

Cancer survival is one of the key measures of the effectiveness of health care systems in managing cancer, reflecting both early detection and the effectiveness of treatment. Among women diagnosed with cervical cancer between 2010 and 2014, age-standardised five-year net survival ranged from 70% in Denmark to 54% in Latvia (Figure 6.17). The average among EU countries has increased from 61% to 63% over the past decade. The variation across countries has decreased, because some of the countries that had among the lowest survival have converged to some extent towards the best performers.

Trends in cervical cancer mortality rates reflect the underlying trends in incidence and survival. The mortality rates for cervical cancer have declined across EU countries from 6.0 per 100 000 women in 2000 to 5.1 in 2015 (Figure 6.18).

However, in many Central and Eastern European countries, cervical cancer screening rates are low, incidence has not yet declined, five-year net survival remains low and mortality is still high or even rising. These trends suggest the need for greater policy attention to prevention, early diagnosis and effective treatment for cervical cancer.

Definition and comparability

Screening rates are based on programme or survey data. Programme data are collected to monitor national screening programmes, but differences in target population and screening frequency may lead to variations in the data reported across countries. Survey data may be affected by recall bias.

Five-year net survival is the cumulative probability that cancer patients survive their cancer for at least 5 years, after controlling for the risks of death from other causes. Net survival is expressed as a percentage in the range of 0-100%. Five-year net survival for patients diagnosed during 2000-04 is based on a cohort approach, since all patients have been followed up for at least 5 years. For patients diagnosed during 2010-14, a period approach was used, allowing estimation of 5-year survival when complete 5-year follow-up data were not yet available for all patients. Survival estimates are age-standardised with the International Cancer Survival Standard weights.

Data collection, quality control and analysis were performed as part of the CONCORD programme, the global programme for the surveillance of cancer survival (Allemani et al., 2018). In some countries, not all regional registries participated. Survival estimates for cervical cancer are based on the International Classification of Diseases for Oncology (ICD-O-3 C53.0-C53.1 and C53.8-C53.9).

See indicator "Mortality from cancer" in Chapter 3 for the definition of cancer mortality rates. Mortality from cervical cancer is based on ICD-10 C53.

References

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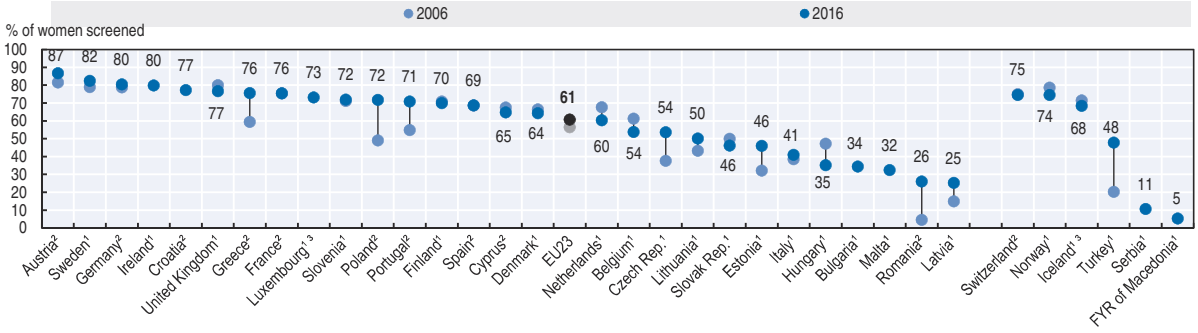
6.16. Cervical cancer screening in women aged 20-69 within the past 3 years, around 2006 and around 2016

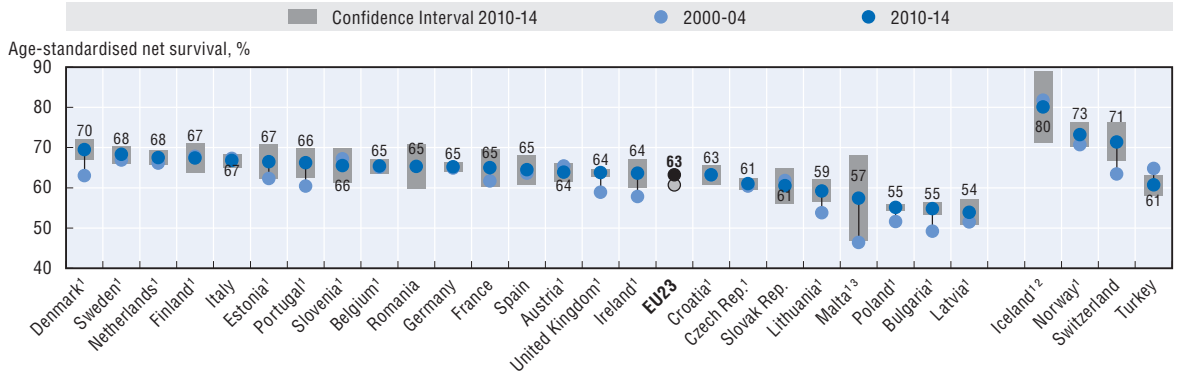


1. Programme.
2. Survey.
3. Three-year average.

Note: The EU average is unweighted and only includes countries with data covering the whole time period.
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933835915

6.17. Cervical cancer five-year net survival, 2000-04 and 2010-14

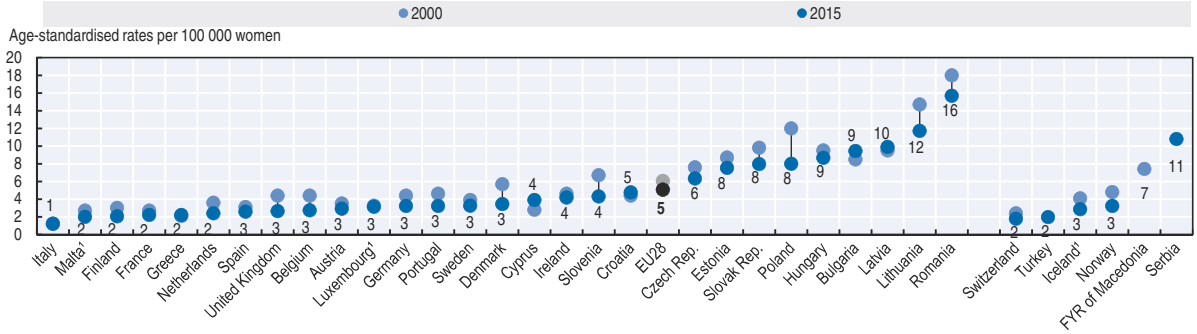


1. Data with 100% coverage of the national population.
2. Data not age-standardised.
3. Data for 2000-04 not age-standardised.

Note: 95% confidence intervals have been calculated for all countries, represented by grey areas. The EU average is unweighted and only includes countries with data covering the whole time period.
Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

StatLink http://dx.doi.org/10.1787/888933835934

6.18. Cervical cancer mortality in women, 2000 and 2015



1. Three-year average.

Note: EU average for 2000 has been calculated by the OECD.
Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933835953

SCREENING, SURVIVAL AND MORTALITY FOR BREAST CANCER

Breast cancer is the most frequent cancer among women across EU countries, with more than 400 000 cases diagnosed each year across EU countries (see indicator "Cancer incidence" in Chapter 3). The main risk factors for breast cancer are age, genetic predisposition, oestrogen replacement therapy, and lifestyle factors including obesity, physical inactivity, nutrition habits and alcohol consumption.

Most European countries have adopted breast cancer screening programmes as an effective way for detecting the disease early (OECD, 2013; IARC, 2017). However, due to recent progress in treatment outcomes and concerns about false-positive results, over-diagnosis and overtreatment, breast cancer screening recommendations have been re-evaluated in recent years. WHO now recommends organised population-based mammography screening for women aged between 50 and 69 in EU countries, if specific criteria are met such as whether women are able to make an informed decision based on the benefits and risks of mammography screening. Other criteria are related to quality assurance and monitoring and evaluation mechanisms (WHO, 2014).

The proportion of women in the EU aged 50-69 who have been screened for breast cancer within the past two years is lowest in Romania, Bulgaria and Latvia, and highest in Nordic countries (Sweden, Finland and Denmark) and Portugal (Figure 6.19). On average across EU countries, the proportion of screened women increased from 54% to 58% between 2006 and 2016. A large increase has occurred in some countries that had a low screening rate a decade ago, such as Lithuania, Poland and the Czech Republic. However, breast cancer screening rate has decreased substantially over the past decade in several countries, likely due partly to concerns over potential harms related to mammography screening, although a number of studies have found that the benefits overweigh the potential risks (IARC, 2015).

Breast cancer survival reflects early diagnosis as well as effective treatment. All Western European countries have attained five-year net survival of at least 80%, but survival is still lower in several Central and Eastern European although it has increased in recent years (Figure 6.20).

Over the last decade, the five-year net survival improved from 79% to 83% on average across EU countries. Net survival increased particularly rapidly in Bulgaria, the Czech Republic, Estonia, Latvia and Lithuania, converging towards the level of other EU countries. In the Czech Republic, survival improved following the introduction of a breast cancer screening programme and a National Cancer Control Programme in the early 2000s (OECD, 2014). Survival also increased strongly in Denmark, Malta, Portugal and the United Kingdom.

Mortality from breast cancer has fallen in most EU countries since 2000. On average across EU countries, the age-standardised rates of mortality from breast cancer fell from 39 to 33 per 100 000 women per year between 2000 and 2015 (Figure 6.21). Particularly strong reductions occurred in Denmark and Malta, although these countries still have higher age-standardised mortality rates. Croatia is one of the few EU countries where breast cancer mortality rate has increased since 2000 and now has the highest mortality rates of all EU countries.

Definition and comparability

Screening coverage and survival are defined in the indicator "Screening, survival and mortality for cervical cancer". Survival estimates for breast cancer are based on the International Classification of Diseases for Oncology (ICD-O-3 C50.0-C50.6 and C50.8-C50.9). See indicator "Mortality from cancer" in Chapter 3 for the definition of cancer mortality rates. Mortality from breast cancer is based on ICD-10 C50.

References

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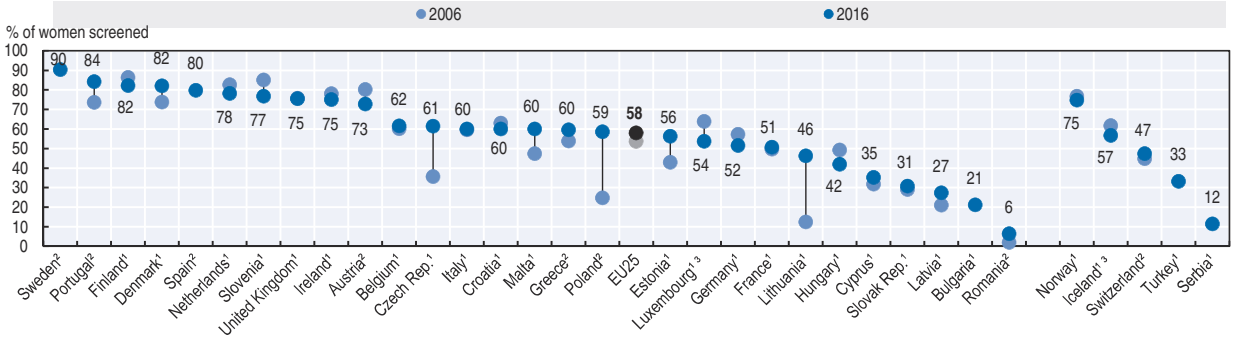
6.19. Mammography screening in women aged 50-69 within the past 2 years, around 2006 and around 2016

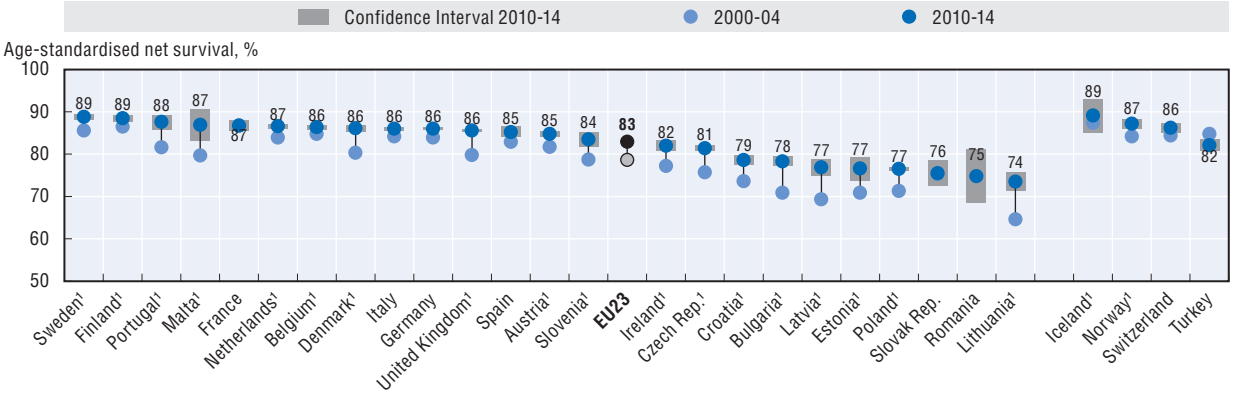


1. Programme.
2. Survey.
3. Three-year average.

Note: The EU average is unweighted and only includes countries with data covering the whole time period.
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933835972

6.20. Breast cancer five-year net survival, 2000-04 and 2010-14

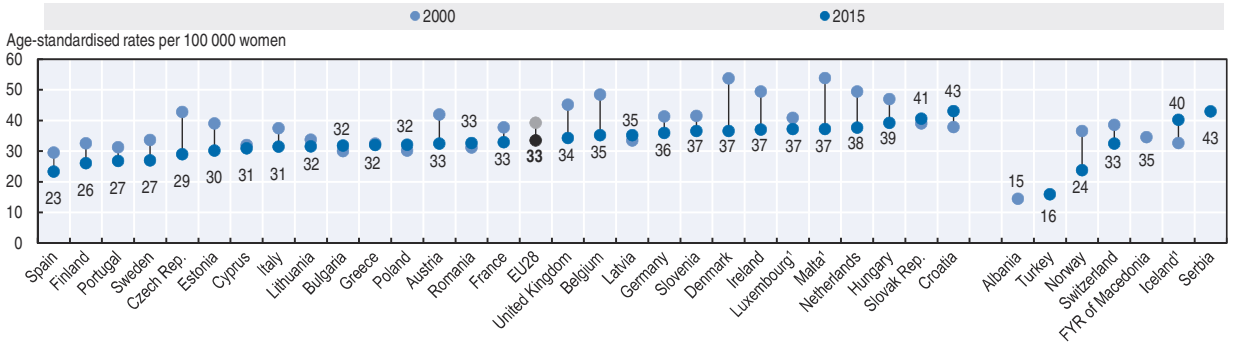


1. Data with 100% coverage of the national population.

Note: 95% confidence intervals have been calculated for all countries, represented by grey areas. The EU average is unweighted and only includes countries with data covering the whole time period.
Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

StatLink http://dx.doi.org/10.1787/888933835991

6.21. Breast cancer mortality in women, 2000 and 2015



1. Three-year average.

Note: EU average for 2000 has been calculated by the OECD.
Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836010

SURVIVAL AND MORTALITY FOR COLORECTAL CANCER

Colorectal cancer is the second most common cause of cancer deaths after lung cancer among men, and the third most common cause of cancer deaths after breast and lung cancers among women across EU countries (see indicator "Mortality from cancer" in Chapter 3). The main risk factors for colorectal cancer include age, ulcerative colitis, a personal or family history of colorectal cancer or polyps, and lifestyle factors such as a diet high in fat and low in fibre, physical inactivity, obesity, tobacco and alcohol consumption. The incidence of colorectal cancer is significantly higher among men. Generally, rectal cancer is more difficult to treat than colon cancer due to a higher probability of spreading to other tissue, recurrence and postoperative complications.

Following screening programmes for cervical and breast cancers, a growing number of countries have introduced free population-based colorectal cancer screening programmes over the past few years, targeting people in their 50s and 60s (OECD, 2013). In most countries that use the faecal occult blood test, screening is available every two years. The screening schedule is less frequent with colonoscopy and flexible sigmoidoscopy, generally every ten years (IARC, 2017). These differences complicate international comparisons of screening coverage. Based on survey data collected in 2014, less than half of people aged 50 to 74 in EU countries reported having ever been screened for colorectal cancer through a faecal occult blood test (Eurostat, 2017).

Advances in diagnosis and treatment of colorectal cancer, including improved surgical techniques such as mesorectal excision, radiation therapy and combined chemotherapy, and wider and more timely access, have contributed to increased survival over the last decade. On average across EU countries, five-year net survival for colon cancer improved from 54% to 60% between 2000-04 and 2010-14, and from 52% to 58% for rectal cancer over the same period (Figure 6.22 and Figure 6.23). Survival for colon cancer increased particularly rapidly in Denmark, Estonia, Latvia, Lithuania and Slovenia, and the same countries along with Ireland achieved the biggest progress in survival for rectal cancer.

Nonetheless, differences across countries in survival following a diagnosis for colon and rectal cancer is larger than for other types of cancer, such as cervical and breast cancer. This indicates that there is still large room for improvements in early detection and treatment in countries (mainly in Central and Eastern Europe) that are lagging behind.

Looking at overall mortality rates from colorectal cancer, they fell by over 10% on average across EU countries between 2000 and 2015 (Figure 6.24). The decline was particularly large in Austria, Belgium, the Czech Republic and Germany with a reduction of over 30% in age-standardised mortality rates. However, mortality rates from colorectal cancer have increased in some countries, notably in Romania and Croatia, reflecting higher incidence.

Definition and comparability

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

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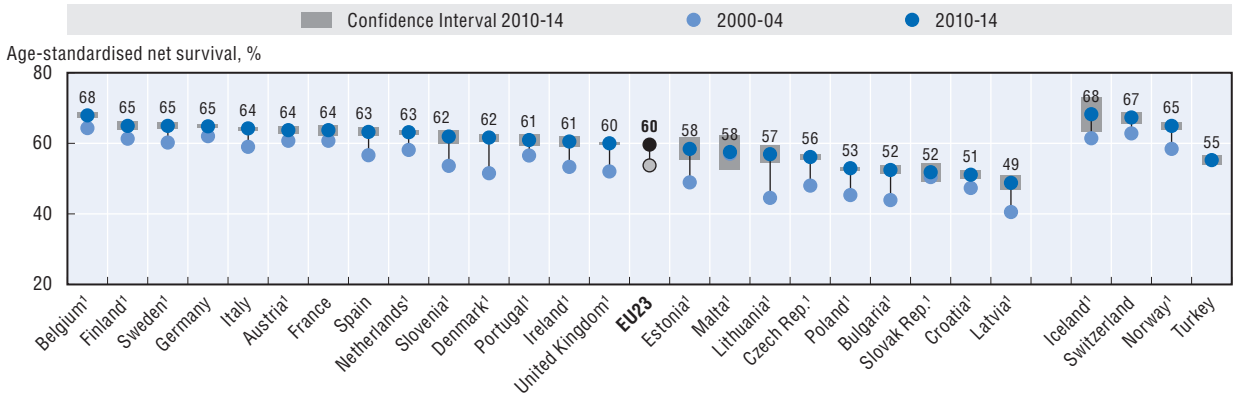
OECD (2013), *Cancer Care: Assuring Quality to Improve Survival*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264181052-en*.

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



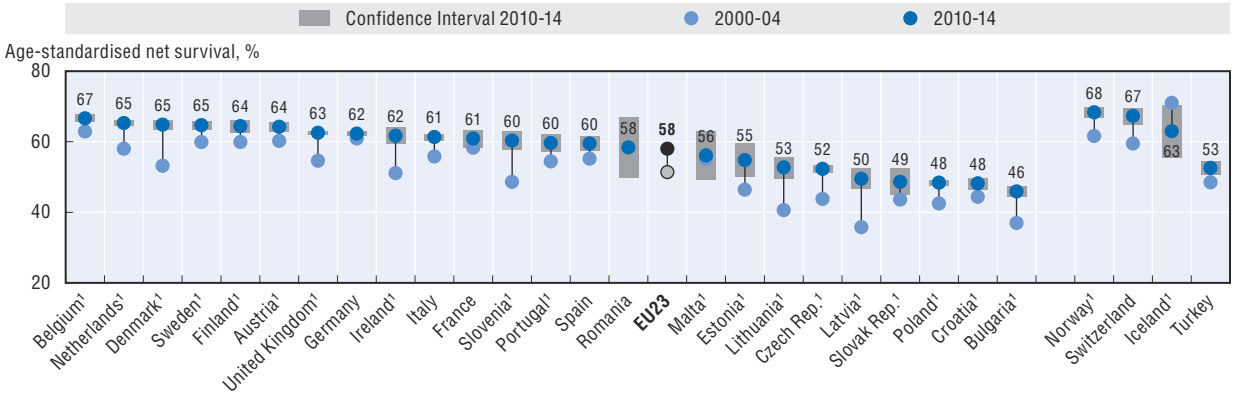
1. Data with 100% coverage of the national population.

Note: 95% confidence intervals have been calculated for all countries, represented by grey areas. The EU average is unweighted.

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

StatLink http://dx.doi.org/10.1787/888933836029

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



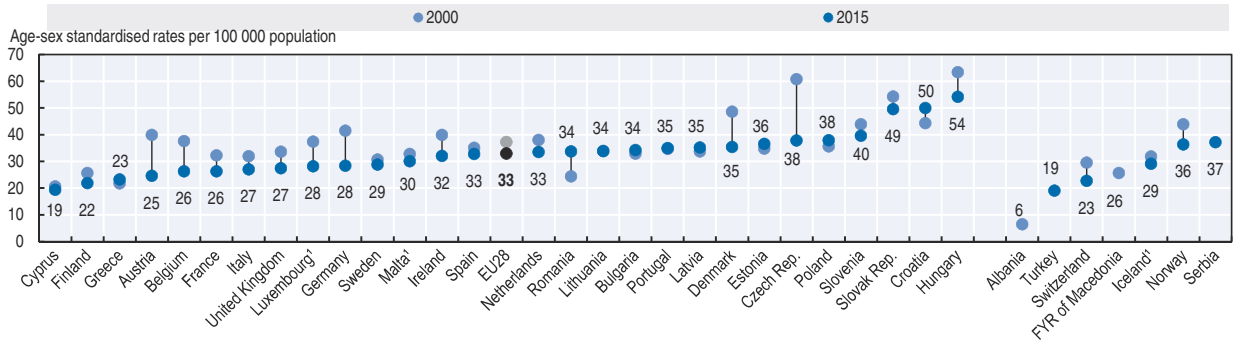
1. Data with 100% coverage of the national population.

Note: 95% confidence intervals have been calculated for all countries, represented by grey areas. The EU average is unweighted.

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

StatLink http://dx.doi.org/10.1787/888933836048

6.24. Colorectal cancer mortality, 2000 and 2015



1. Three-year average.

Note: EU average for 2000 has been calculated by the OECD.

Source: Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836067

LATE-DIAGNOSED HIV AND TUBERCULOSIS TREATMENT OUTCOMES

The prevention and management of infectious diseases such as the Human Immunodeficiency Virus (HIV) and tuberculosis remain a high priority in many European countries. The EU is committed to play an important role in achieving target 3.3 of the United Nations' Sustainable Development Goals, which is to end the epidemics of Acquired Immunodeficiency Syndrome (AIDS), tuberculosis and other communicable diseases by 2030 (European Commission, 2018).

Although HIV is preventable through effective public health measures, significant HIV transmission continues in Europe with nearly 30 000 newly-diagnosed cases reported in EU countries in 2016. In some countries such as Latvia and Malta, rates of HIV transmission have increased in recent years (see indicator "New reported cases of HIV/AIDS and tuberculosis" in Chapter 3).

HIV weakens the human immune system, leaving those affected vulnerable to infections and other health issues including tuberculosis or hepatitis C. The most advanced stage of HIV infection is AIDS. Early testing for HIV allows infected individuals to be put on treatment quickly leading to earlier viral suppression, thus allowing them to continue to live a normal life and to avoid infecting others.

Figure 6.25 shows the percentage of late diagnosis among newly diagnosed HIV cases in 2016. The Czech Republic, the Slovak Republic and Belgium report the lowest proportion of late diagnosis cases among newly diagnosed HIV infections, with percentages of 18% or less. The proportion in Romania, Greece, Italy, Lithuania and Malta is two-times greater (at 36% or more). The high rates in some countries suggest that screening and testing services need to be substantially improved to identify and treat HIV cases earlier, particularly among at-risk populations.

Tuberculosis also remains an important public health issue in some European countries. Although the number of new cases of tuberculosis has generally declined over the past decade, further efforts are needed to prevent the spread of this disease in some countries (see indicator "New reported cases of HIV/AIDS and tuberculosis" in Chapter 3).

Figure 6.26 shows the percentage of new tuberculosis cases and relapses with successful treatment outcome after 12 months. Sweden, the Netherlands, the Slovak Republic, Romania and Bulgaria have rates of 85% or more of successful treatment outcomes, while Croatia has the lowest success rate. Success rates are driven by the availability of treatment programmes, patient adherence, and the proportion of multi-drug resistant tuberculosis infections.

Drug-resistant tuberculosis can occur when the drugs used to treat the condition are misused or mismanaged, including where people do not complete a full course of treatment, providers prescribe the wrong treatment or where proper treatments are not available. Multi-drug resistant tuberculosis requires longer and more intensive treatment and is associated with lower success rates.

Figure 6.27 shows the percentage of newly diagnosis tuberculosis cases classified as being Rifampicin-resistant or multi-drug resistant. While a number of countries did not report any case, the Baltic countries (Estonia, Lithuania and Latvia) reported the highest proportions of multi-drug resistant cases in 2016.

Definition and comparability

Late diagnosis of HIV cases is defined as patients with a CD4 cell count under 200 per mm3 of blood at diagnosis (ECDC and WHO Regional Office for Europe, 2017). Surveillance systems for HIV are not identical across Europe and differences in data collection methods and testing policies can affect data comparability. Official reports of newly diagnosed cases of HIV do not represent true incidence. Newly reported HIV diagnoses include recently infected individuals as well as those who were infected several years ago but only recently tested for HIV. These reports are also influenced by several factors such as the uptake of HIV testing, patterns of reporting, the long incubation period and a slow progression of the disease.

New tuberculosis cases include patients who have never been treated for tuberculosis or have taken anti-tuberculosis drugs for less than one month. All pulmonary cases of tuberculosis have been bacteriologically confirmed. Successful treatment outcomes are defined as the sum of: 1) cured: a TB patient with bacteriologically-confirmed TB at the beginning of treatment who was smear or culture-negative in the last month of treatment and on at least one previous occasion; and 2) treatment completed, but does not meet the criteria to be classified as cure or treatment failure (a TB patient whose smear or culture is positive at month five or later during treatment) (ECDC, 2018).

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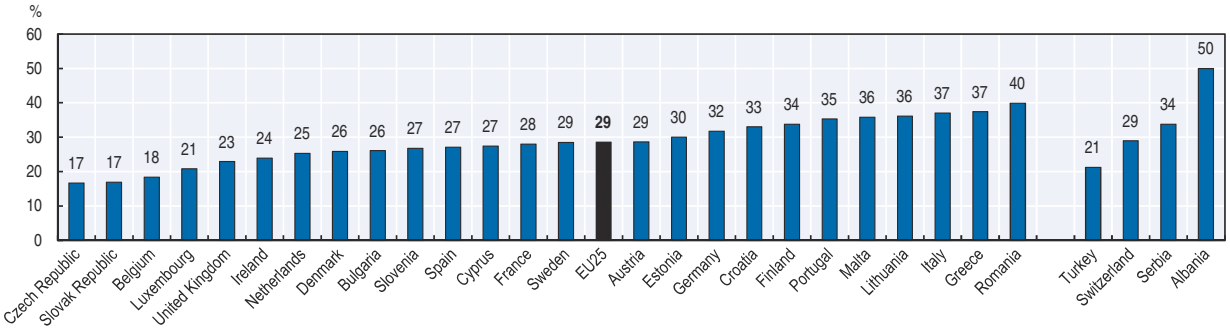
ECDC (2018), *Tuberculosis Surveillance and Monitoring in Europe 2018 – 2016 data*, ECDC, Stockholm.

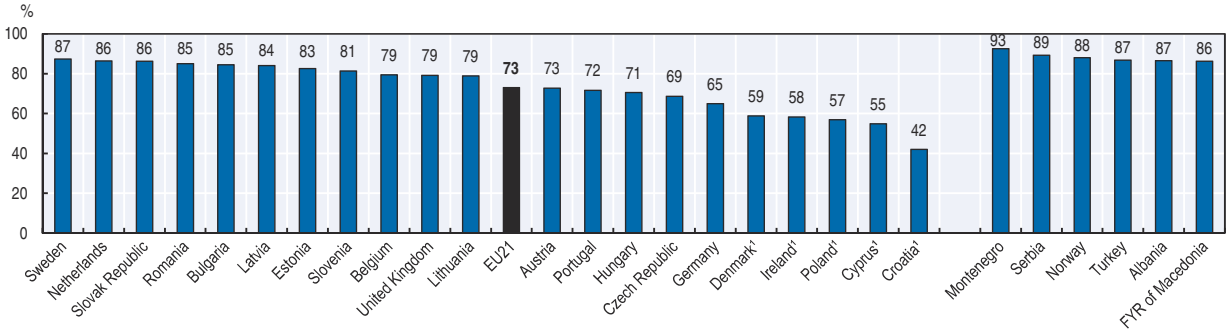
6.25. Percentage of late diagnosis among newly diagnosed HIV cases, 2016



Note: Minimum of 30 HIV cases needed for inclusion. EU average unweighted.
Source: ECDC (2017).

StatLink http://dx.doi.org/10.1787/888933836086

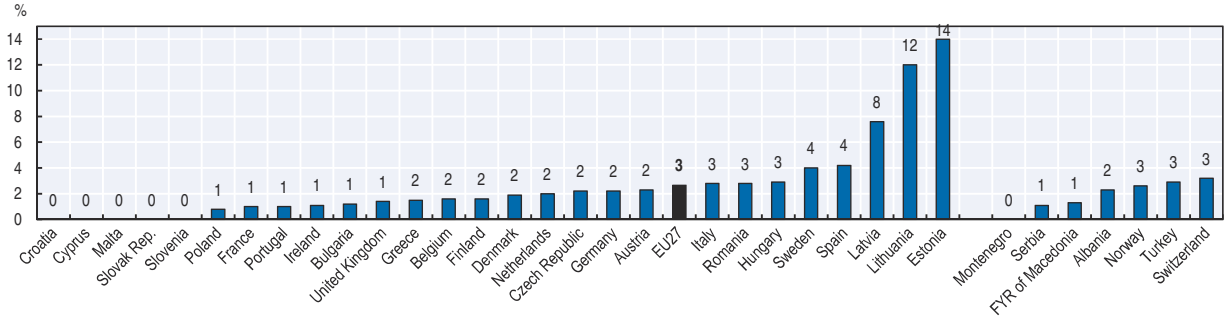
6.26. Percentage of treatment success after 12 months of new TB cases and relapses, 2015



1. Three-year average.
Note: Minimum of 30 TB cases needed for inclusion. EU average unweighted.
Source: ECDC (2018).

StatLink http://dx.doi.org/10.1787/888933836105

6.27. Estimated percentage of notified new tuberculosis cases with multi-drug resistance, 2016



Note: Minimum of 30 TB cases needed for inclusion. EU average unweighted.
Source: ECDC (2018).

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HEALTHCARE-ASSOCIATED INFECTIONS

The European Centre for Disease Control estimates that 3.8 million people acquire a healthcare-associated infection each year in acute care hospitals in EU countries and Norway and Iceland (Suetens et al., 2018), and an estimated 90 000 people in the EU die each year due to the six most common infections in health care settings (Cassini, 2016). At least 20% of healthcare-associated infections are considered to be avoidable through better infection prevention and control (Harbath, 2003).

Figure 6.28 shows the percentage of patients reported by selected hospitals in EU countries to have acquired a healthcare-associated infection in 2016-17, together with the predicted percentage of patients that would be expected to have acquired such an infection based on patient characteristics. On average across EU countries (weighted), 5.5% of patients acquired an infection during their hospital stay in 2016-17. The observed percentage was lowest in Lithuania, Bulgaria, Germany, Latvia, the Netherlands and Romania (less than 4%), and highest in Greece, Portugal, Italy, Finland and Cyprus (more than 8%).

Figure 6.29 shows the proportion of healthcare-associated infections by type of care (specialty). Across EU countries, patients in medical specialty areas (including general medicine, cardiology, oncology, neurology) accounted for 40% of all infection cases in 2016-17. Patients in surgical specialty areas represented another 33% of cases, while intensive care patients accounted for 13% of infections. Geriatrics, paediatrics and other specialty areas made up the remaining 14% of healthcare-associated infections.

As shown in Figure 6.30, the most common types of healthcare-associated infections were pneumonia (accounting for 26% of all cases), urinary tract infections (19%), surgical site infections (18%), bloodstream infections (11%) and gastrointestinal infections (9%).

Compounding the impact of healthcare-associated infections are infections due to antimicrobial resistant bacteria, which can lead to complications, longer hospital stays, or death. A single resistant infection has been estimated to cost about EUR 8 500 to 34 000 more than a non-resistant infection, due to additional hospital days and additional treatment costs (OECD, 2017). Inappropriate use of antibiotics contribute to antimicrobial-resistant bacteria in hospitals and in the community.

Healthcare-associated infections can be prevented by implementing a series of measures, as set out in the Council of the European Union's Recommendation on Patient Safety, including the Prevention and Control of Healthcare-Associated Infections (2009/C 151/01). At the hospital level, key components of effective infection prevention and control strategies include: the creation of a local infection control team; staff training; use of evidence-based guidelines; infection surveillance and feedback; and rigorous maintenance of environmental hygiene (WHO, 2016). Most European countries have established their own national guidelines for infection control programmes (ECDC, 2018).

Definition and comparability

The data are based on a point prevalence survey (PPS) of healthcare-associated infections conducted in 2016-17 in 1 275 acute care hospitals covering all EU countries (except Denmark and Sweden), Norway, Iceland and Serbia (Suetens et al., 2018). Validation studies of national PPS data were carried out in a subgroup of hospitals and generally found an underestimation of the true prevalence, which allowed to make a more robust estimation of the burden of healthcare-associated infections. Different sensitivities and specificities of infections' detection may explain, in part, differences between the observed versus expected prevalence. Estimates were used for Denmark and Sweden to come up with a total burden for the EU, Norway and Iceland as a whole, using EU averages to the hospital discharge data for these two countries. Norway participated in this survey with a protocol that required the imputation of data for missing types of infections. In Bulgaria and the Netherlands, country representativeness is limited because of a low number of participating hospitals, resulting in potential selection bias.

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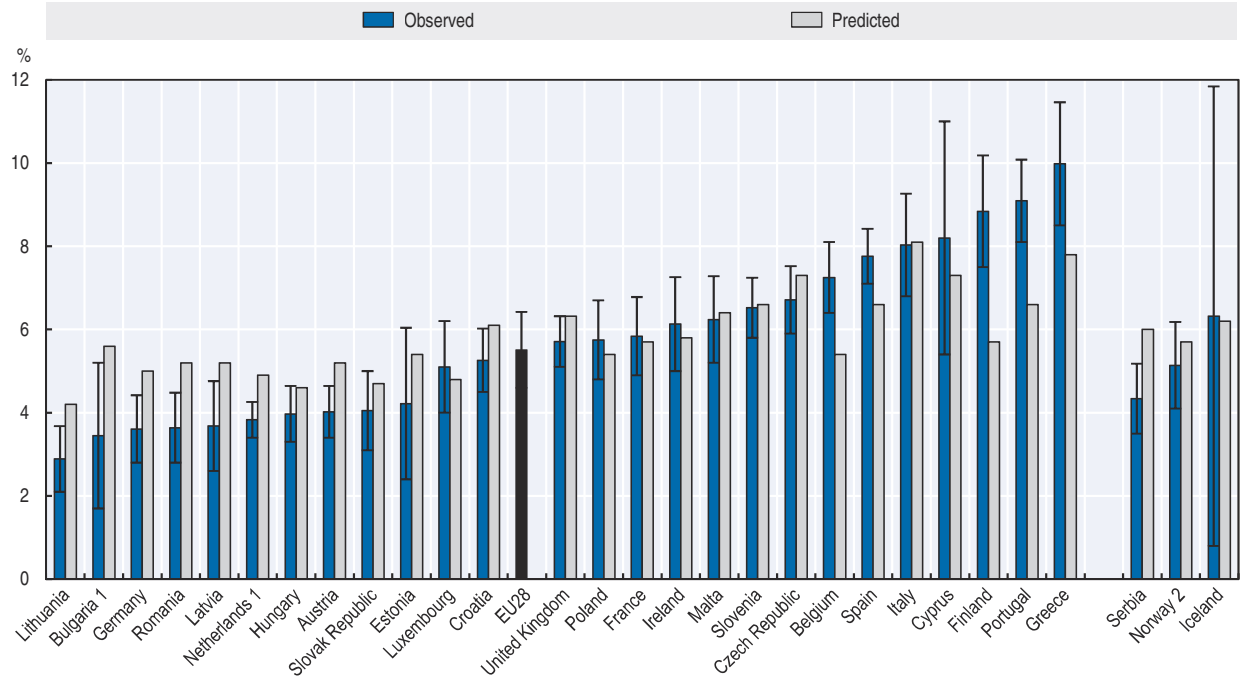
6.28. Observed and predicted percentage of hospitalised patients with at least one healthcare-associated infection, 2016-17



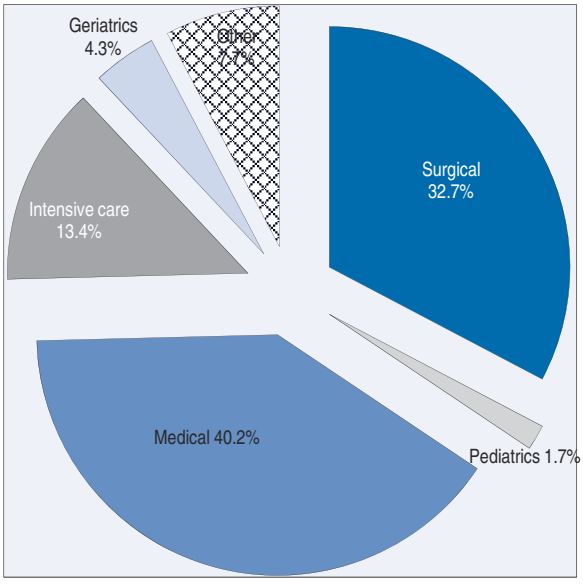
1. Country representativeness of data is limited in Bulgaria and the Netherlands.
2. Data from Norway includes partial imputation for missing types of infections.

Note: 95% confidence intervals represented by H. Data for Denmark and Sweden are not available. The EU average includes Iceland and Norway.

Source: ECDC 2016-17 Point prevalence survey.

StatLink http://dx.doi.org/10.1787/888933836143

6.29. Healthcare-associated infections by type of care (specialty) across EU countries, 2016-17



Source: ECDC 2016-17 Point prevalence survey.

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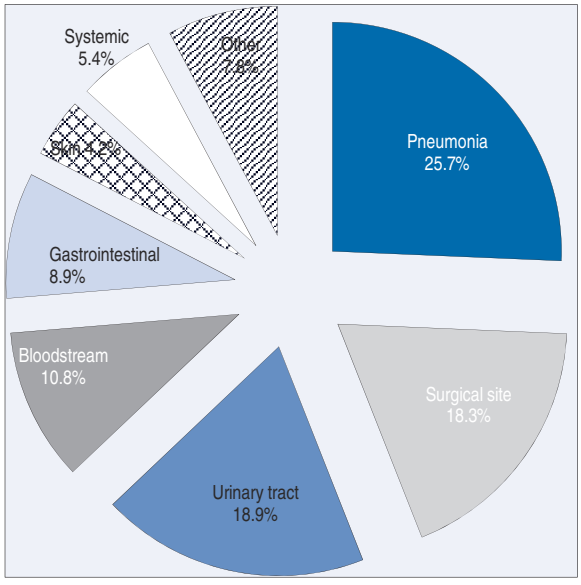
6.30. Healthcare-associated infections by type of infection across EU countries, 2016-17



Source: ECDC 2016-17 Point prevalence survey.

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PART II

Chapter 7

Accessibility: Affordability, availability and use of services

Accessibility is one of the key objectives of any health system. If access to care is limited for some population groups or the population at large, the result may be poorer health outcomes and greater health inequalities. Access to care can be limited for different reasons: it may not be affordable, the distance to the closest health care facility may be too great or waiting times for treatment too long.

Unmet needs for health care is an important indicator of accessibility problems as reported by the population itself. Recent survey data show that the share of the population reporting unmet care needs is generally low in most EU countries, but low-income households are much more likely to report unmet care needs than high-income households, mainly for financial reasons.

The affordability of health services can be restricted when they involve high out-of-pocket payments. On average across EU countries, 18% of health spending is paid out-of-pocket by households, but with wide variations. In general, countries that have a high share of out-of-pocket spending also have a high proportion of the population facing catastrophic payments for health services, particularly among low-income groups. To promote access to care for the whole population, most EU countries have achieved universal coverage for a core set of health services, although the range of services covered and the degree of cost-sharing vary.

In addition to being affordable, health services also need to be accessible when and where people need them. Although the number of doctors and nurses per population has increased over the past decade in nearly all EU countries, shortages of general practitioners persist in many countries, particularly in rural and remote areas. The use of health services varies widely across EU countries. While these variations may reflect differences in health care needs, they also suggest either some under-use of some services for population groups facing accessibility issues or a possible over-use of some services.

Long waiting time for elective surgery is an important policy issue in many EU countries, as it restricts timely access to care and generates patient dissatisfaction. In countries where this is an issue, waiting times have frequently gone up in recent years as the demand for surgery increased more rapidly than the supply, following some success in bringing waiting times down before 2010.

UNMET HEALTH CARE NEEDS

Accessibility to health care can be limited for a number of reasons, including cost, distance to the closest health facility and waiting times. Unmet care needs may result in poorer health for people forgoing care and may increase health inequalities if such unmet needs are concentrated among poor people. As noted by the Expert Panel on Effective Ways of Investing in Health, there are many challenges in measuring unmet needs for particular interventions, but the data from the EU Statistics on Income and Living Conditions survey (EU-SILC) are the only timely and comparable source of information available across all Member States (Expert Panel on Effective Ways of Investing in Health, 2018).

In all European countries, most of the population in 2016 reported that they had no unmet care needs for financial reasons, geographic reasons or waiting times, based on EU-SILC (Figure 7.1). However, in Estonia and Greece, at least 10% of the population reported some unmet needs for health care, with the burden falling mostly on low-income groups, particularly in Greece. Nearly one in five Greek people in the lowest income quintile reported going without some medical care when they needed it mainly for financial reasons. In Estonia, the main reason for people to report unmet care needs is because of long waiting times. This can be partly explained by the limited volume of some services (such as specialist consultations) fully reimbursed by public health insurance.

In most countries, a larger proportion of the population indicates some unmet needs for dental care than for medical care (Figure 7.2). This is mainly because dental care in many countries is only partially included (or not included at all) in public schemes and so must either be paid out-of-pocket or covered through purchasing private health insurance (see the indicator Extent of health care coverage). More than one in eight people (13%) in Portugal, Greece and Latvia reported unmet needs for dental care in 2016, mainly for financial reasons. On the other hand, a very small proportion of people reported unmet dental care needs in the Netherlands, Austria, Germany, Slovenia and the Czech Republic in 2016, with very little difference across income groups.

Unmet needs for medical care and dental care have decreased since 2015 on average across EU countries, although part of the reduction in some countries is simply due to a change in the survey question (Figure 7.3 and Figure 7.4). However, the gap in unmet medical and dental care needs between poor people and rich people has remained the same: people in the lowest income quintile are still five times more likely to report unmet medical care needs than those in the highest quintile, and they are six times more likely to report unmet dental care needs.

Indicators of self-reported unmet care needs should be assessed together with other indicators of affordability and accessibility to care, such as the extent of health care coverage, the amount of out-of-pocket payments, and the actual use of health services. Strategies to improve access to care for poor people and disadvantaged groups need to tackle not only affordability issues, but also effective access to services by promoting an adequate supply and distribution of health workers and services throughout the country.

Definition and comparability

Questions on unmet health care needs are included in the European Union Statistics on Income and Living Conditions survey (EU-SILC). People are asked whether there was a time in the previous 12 months when they felt they needed medical care or dental care but did not receive it, followed by a question as to why the need for care was unmet. The data presented here focus on three reasons: the care was too expensive, the distance to travel too far or waiting times too long.

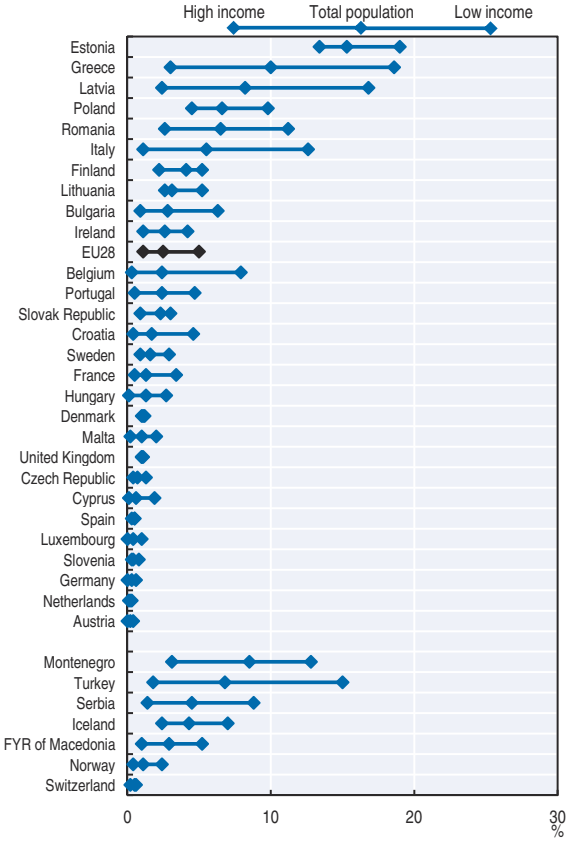
Cultural factors may affect responses to questions about unmet care needs. There are also some variations in the survey question across countries: while most countries refer to both a medical examination and treatment, the question in some countries (e.g. Czech Republic, Slovenia and Spain) only refer to a medical examination or a doctor consultation, resulting in lower rates of unmet needs. The question in Germany refers to unmet needs for "severe" illnesses, also resulting in some under-estimation compared with other countries. Some changes in the survey question in some countries in 2015 and 2016 have also led to substantial reductions. Caution is therefore required in comparing variations across countries and over time.

Income quintile groups are computed on the basis of the total equivalised disposable income attributed to each member of the household. The first quintile group represents the 20% of the population with the lowest income, and the fifth quintile group the 20% of the population with the highest income.

Reference

Expert Panel on Effective Ways of Investing in Health (2018), Opinion on Benchmarking Access to Healthcare in the EU, European Union, *https://ec.europa.eu/health/expert_panel/sites/expertpanel/files/docsdir/opinion_benchmarking_healthcareaccess_en.pdf*.

7.1. Unmet need for medical examination for financial, geographic or waiting times reasons, by income quintile, 2016 (or nearest year)



Source: Eurostat Database, based on EU-SILC.

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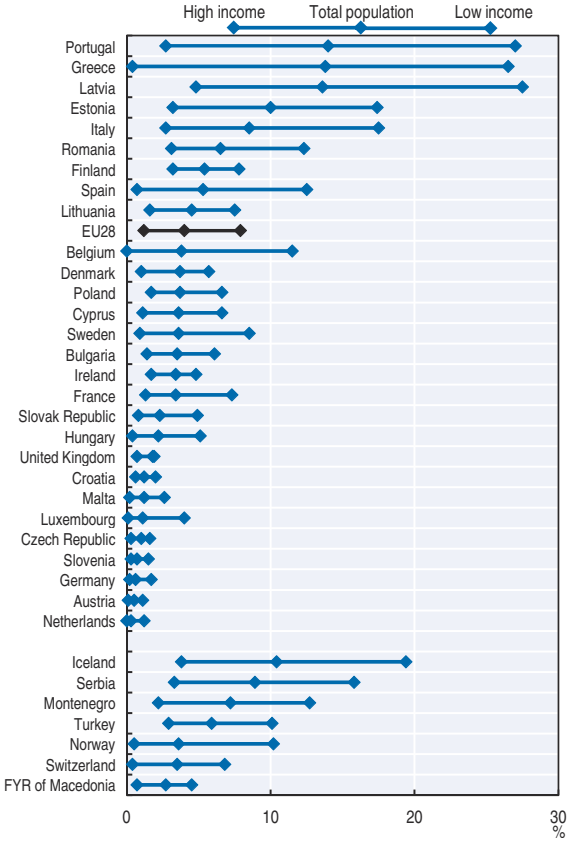
7.2. Unmet need for dental examination for financial, geographic or waiting times reasons, by income quintile, 2016 (or nearest year)



Source: Eurostat Database, based on EU-SILC.

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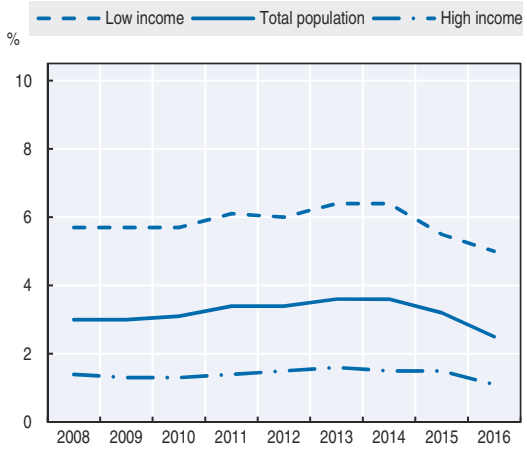
7.3. Change in unmet medical care need for financial, geographic or waiting times reasons, by income quintile, all EU countries, 2008 to 2016



Source: Eurostat Database, based on EU-SILC.

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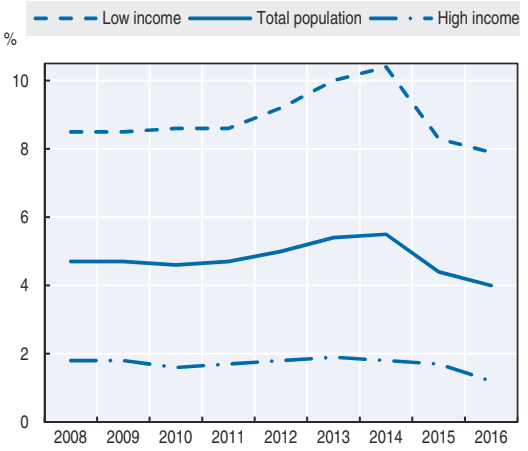
7.4. Change in unmet dental care need for financial, geographic or waiting times reasons, by income quintile, all EU countries, 2008 to 2016



Source: Eurostat Database, based on EU-SILC.

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FINANCIAL BURDEN OF OUT-OF-POCKET EXPENDITURE

People experience financial hardship when direct out-of-pocket payments – formal and informal – are large in relation to their ability to pay for health care. Even small out-of-pocket payments can cause financial hardship for poor households and those who have to pay for long-term treatment such as medicines for chronic illness. Where health systems fail to provide adequate financial protection, people may not have enough money to pay for health care or to meet other basic needs. As a result, lack of financial protection may reduce access to health care, undermine health status, deepen poverty and exacerbate health and socioeconomic inequalities. Because all health systems involve a degree of out-of-pocket payments, financial hardship can be a problem in any country.

At an aggregate level, the share of out-of-pocket spending in total health spending reflects the degree of financial protection in a country along the three dimensions of coverage – the share of the population covered, the range of services included in a public benefit basket and the proportion of costs covered by collective third-party payer schemes for each service. Thus, the share of out-of-pocket payments are higher in those countries where significant groups of the population are excluded from coverage, important health services not included in the public benefit package or the cost-sharing of public payers limited for some services. Across the EU, around a fifth of all health spending is borne directly by private households (Figure 7.5). This figure ranges from around 10% in France, Luxembourg or the Netherlands to over 40% in Bulgaria, Latvia and Cyprus.

The indicator most widely used to measure the financial hardship associated with out-of-pocket payments for households is the incidence of catastrophic spending on health (Cylus et al., 2018). The incidence of catastrophic health spending varies considerably across EU countries, ranging from fewer than 2% of households in France, Ireland, Slovenia, Sweden and the United Kingdom, to over 8% of households in Greece, Hungary, Latvia, Lithuania, Poland and Portugal (Figure 7.6). Across Europe, poor households (i.e. those in the bottom quintile in terms of consumption) are most likely to experience catastrophic health spending, despite the fact that many countries have put in place policies to safeguard financial protection.

Countries with comparatively high levels of public spending on health and low levels of out-of-pocket payments typically have a lower incidence of catastrophic out-of-pocket payments. However, policy choices are also important, particularly choices around coverage policy (WHO Regional Office for Europe, 2018). Financial protection is demonstrably stronger in countries that cover the whole population, although this in itself is not enough to guarantee protection. Countries with a low incidence of catastrophic spending on health are also more likely to exempt poor people and regular users of care from co-payments; use low fixed co-payments instead of percentage co-payments, particularly for outpatient medicines; and cap the co-payments a household has to pay over a given time period (e.g. Austria, Czech Republic, Ireland and United Kingdom).

There is clear evidence of the impact of changes in user charges policy in some countries. For example, looking at catastrophic spending over time in Latvia, the introduction of exemptions from all co-payments for very poor people in 2009, the extension of exemptions to other poor people in 2010 and the abolition of exemptions in 2012 for all except the very poorest households coincided with an improvement and then deterioration in financial protection among the poor (Thomson et al., 2018).

Definition and comparability

Out-of-pocket payments are expenditures borne directly by a patient where neither public nor private insurance cover the full cost of the health good or service. They include cost-sharing and other expenditure paid directly by private households and should also in principle include estimations of informal payments to health care providers.

Catastrophic health spending is an indicator of financial protection used to monitor progress towards universal health coverage (UHC) at global, regional and national levels. It is defined as out-of-pocket payments that exceed a predefined percentage or threshold of a household's ability to pay for health care. Ability to pay may be defined in different ways, leading to measurement differences (Cylus et al., 2018). In the data presented here, ability to pay is defined as household consumption spending minus a standard amount representing basic spending on food, rent and utilities (water, electricity, gas and other fuels); the threshold used to define households with catastrophic spending is 40%. Microdata from national household budget surveys are used to calculate this indicator.

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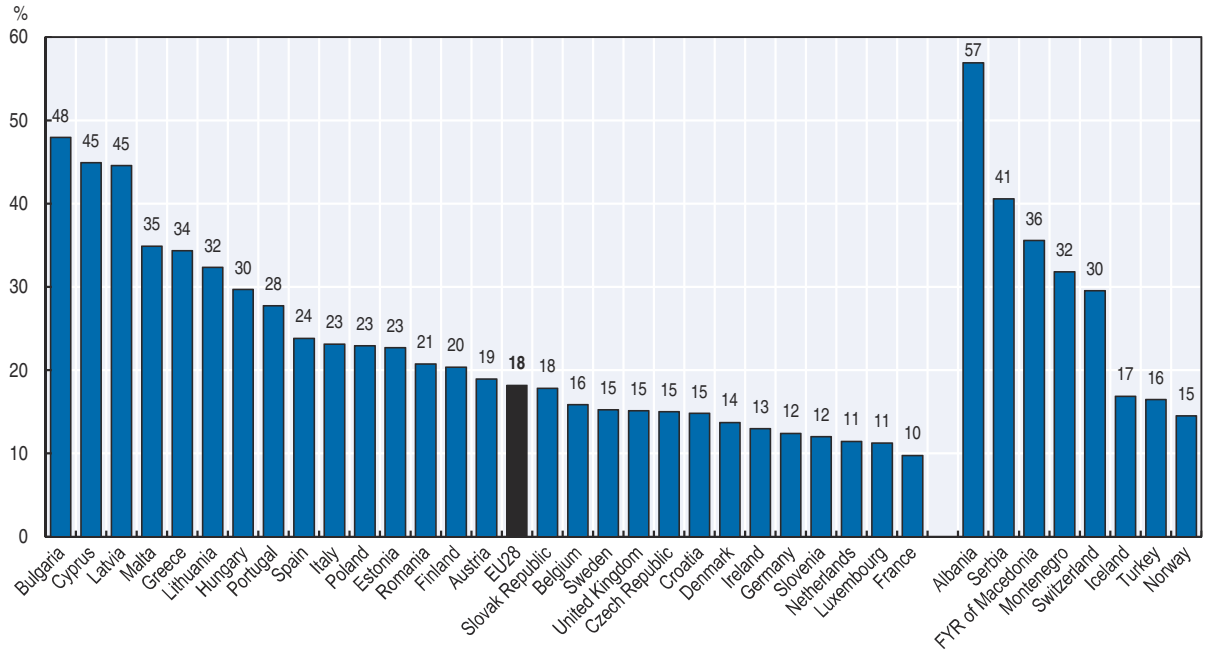
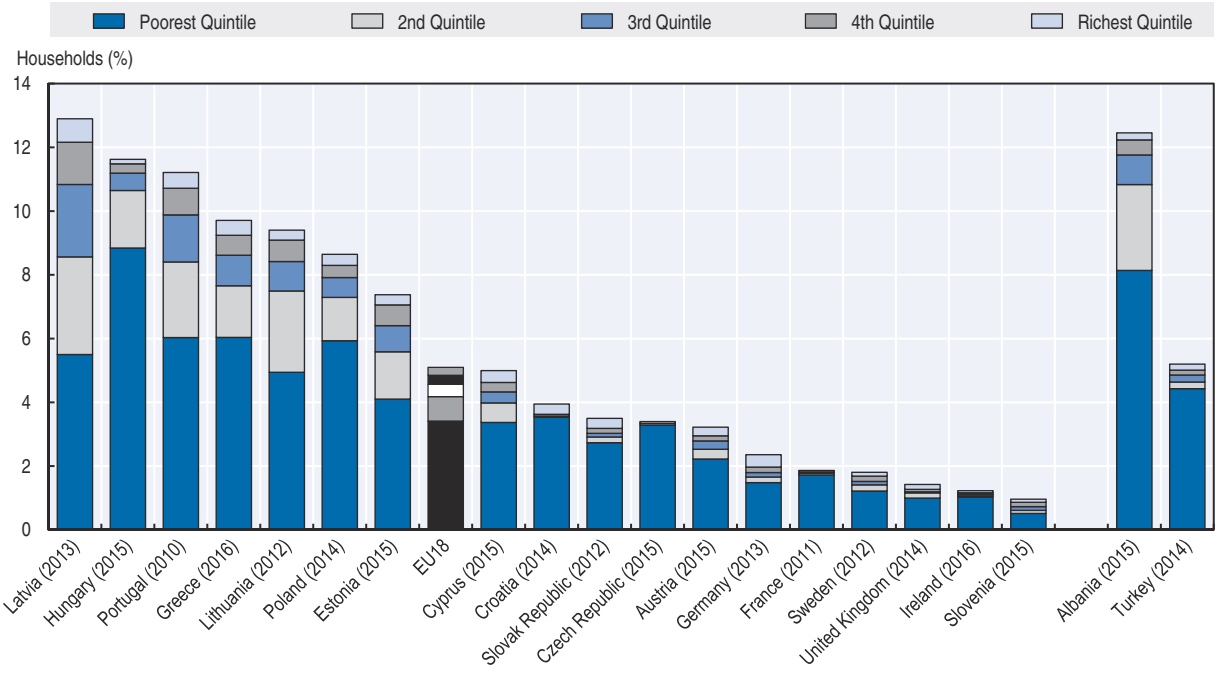
7.5. Share of total health spending financed by out-of-pocket payments, 2016 (or latest year)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933836276

7.6. Share of households with catastrophic spending on health by consumption quintile, latest year available



Source: WHO Regional Office for Europe 2018.

StatLink http://dx.doi.org/10.1787/888933836295

POPULATION COVERAGE FOR HEALTH CARE

The share of the population covered by a public or private scheme provides some indication of the financial protection against the costs associated with health care, but this is not a complete indicator of affordability as the range of services covered and the degree of cost-sharing applied to those services also matter. These three dimensions – the "breadth", "depth" and "height" of coverage – define how comprehensive health care coverage is in a country. The indicator presented here on population coverage looks at the first dimension only, whereas the next indicator on the extent of health care coverage takes a broader look at these three dimensions together.

Most European countries have achieved universal (or near-universal) coverage for a core set of services, which usually include consultations with doctors, tests and examinations and hospital care (Figure 7.7). Yet, in some countries coverage of these core services may not be universal. In Ireland, for example, only around 50% of the population is covered for the costs of GP visits, although recent reform proposals suggest a gradual roll out of primary care coverage to the entire population (OECD/European Observatory on Health Systems and Policies, 2017). In Greece, a new law in 2016 (Law 4368/2016) provided universal health coverage for the whole population, closing the coverage gap for the 10% of the population that were previously uninsured. These previously uninsured people now have legally-recognised access to a broad range of services and goods (including hospital care and prescribed pharmaceuticals), like any other Greek citizen.

Three European countries (Cyprus, Bulgaria and Romania) still have at least 10% of their population not covered for health services. In Bulgaria, the share of the population covered has decreased since 2010 when a tightening of the law resulted in people losing their social health insurance coverage if they failed to pay their contribution (Dimova et al., 2012). However, it is common for uninsured people who need medical care to go to emergency services in hospital, where they will be encouraged to get insurance (without paying any financial penalty for not having had an insurance prior to that). In Romania, although social health insurance is compulsory, only 89% of the population was covered in 2017. The uninsured population include mainly people working in agriculture, self-employed or unemployed people who are not registered for unemployment or social security benefits, and Roma people who do not have identity cards (which precludes them from enrolling into the social security system). The uninsured can only access a minimum benefits package, covering emergency care, treatment of communicable diseases and care during pregnancy (Vlădescu et al., 2016).

Basic primary health coverage generally covers a defined set of benefits, but in many cases with cost sharing. In some countries, additional health coverage can be purchased through private insurance to cover any cost-sharing left after basic coverage (complementary insurance), add additional services (supplementary insurance) or provide faster access or larger choice of providers (duplicate insurance). In most European countries, only a small proportion of the population has an additional private health insurance. But in five countries (France, Netherlands, Slovenia, Belgium and Croatia), half or more of the population has private coverage (Figure 7.8).

In France, nearly all the population (96%) has a complementary private health insurance to cover cost sharing in the social security system. The Netherlands has the largest supplementary market (87% of the population), whereby private insurance pays for dental care that is not publicly reimbursed. Duplicate private health insurance, providing faster private-sector access to medical services where there are waiting times in public systems, is largest in Ireland (45%).

The population covered by private health insurance has increased in some countries over the past decade, particularly in Denmark, Slovenia and Belgium (Figure 7.9). The development of private health insurance is linked to several factors, including gaps in access to publicly financed services, government interventions directed at private health insurance markets and historical development.

Definition and comparability

Population coverage for health care is defined as the share of the population covered for a defined set of health care goods and services under public programmes and through private health insurance. Public coverage refers both to government programmes, generally financed by taxation, and social health insurance, generally financed by payroll taxes. The take-up of private health insurance is often voluntary, although it may be mandatory by law or compulsory for employees as part of their working conditions. Premiums are generally non-income-related although the purchase of private coverage can be subsidised by the government.

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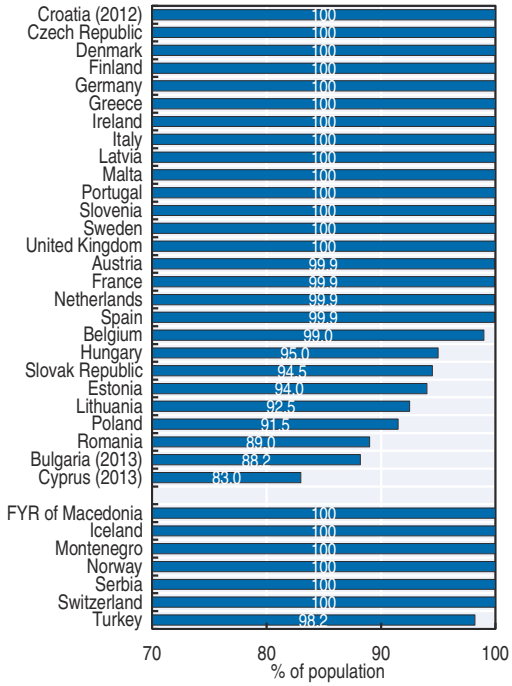
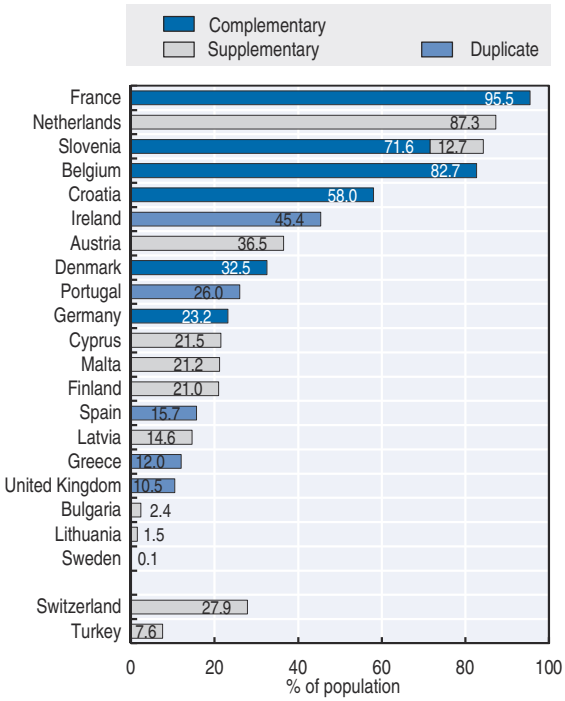
7.7. Population coverage for a core set of services, 2016 (or nearest year)



Note: This includes public coverage and primary private health coverage. Data for Luxembourg is not available.
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; European Observatory Health Systems in Transition (HiT) Series for non-OECD countries.

StatLink http://dx.doi.org/10.1787/888933836314

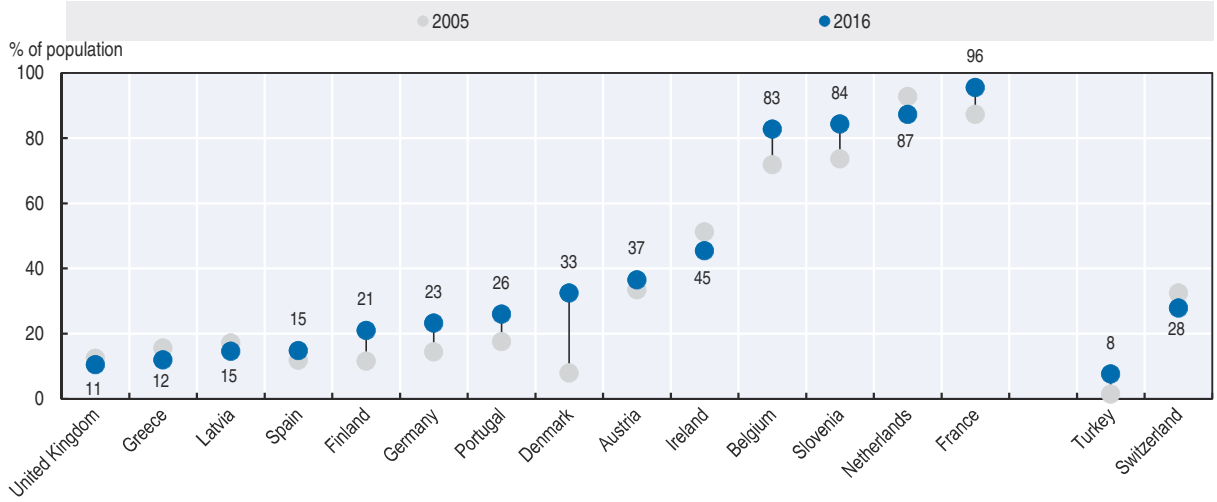
7.8. Private health insurance coverage, 2016 (or nearest year)



Note: This excludes primary PHI. PHI can be both complementary and supplementary in Denmark and Germany.
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; and Voluntary health insurance in Europe: country experience, Observatory Studies Series, 2016, for non-OECD countries.

StatLink http://dx.doi.org/10.1787/888933836333

7.9. Trends in private health insurance coverage, 2005 to 2016 (or nearest year)



Note: These data exclude primary private health insurance.
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933836352

EXTENT OF HEALTH CARE COVERAGE

In addition to the share of the population entitled to basic health services, the range of services included in a publicly defined benefit package and the proportion of costs covered are the other dimensions defining the extent of health care coverage in a country. Figure 7.10 assesses these three dimensions of coverage for a selected number of key health care functions. For each function, it displays the share of the costs that is funded collectively – either by government schemes or compulsory insurance arrangements. Differences across countries in the share of the costs covered can be due to the fact that some specific goods and services are included in the public benefit package in one country but not in another (e.g. a particular drug or medical procedure), that cost-sharing arrangements for the same goods and services vary or that some services are only covered for specific population groups in a country.

In the EU, inpatient services in hospitals are more comprehensively covered than any other type of care. Across the EU, 93% of all inpatient costs are borne by government or compulsory insurance schemes. In many countries, patients have access to free acute inpatient care. This is the case, for example, in Denmark, Hungary, Poland, Spain and the United Kingdom, so government and compulsory schemes cover more than 90% of these costs in those countries. In the Netherlands, these services are also free of charge once the annual general deductible has been met. Only in Cyprus, Greece and Ireland is the financial coverage for costs of inpatient care below 70%. In those countries, patients frequently choose treatment in facilities not included in the public benefit package.

More than three-quarters of spending on outpatient care in the EU are borne by government and compulsory health financing schemes (77%). With the exception of Bulgaria and Cyprus, at least 50% of all outpatient medical care costs are financed by compulsory third-party payers in EU countries. In a number of countries, outpatient primary and specialist care are generally free at the point of service but user charges may still apply for specific services or if providers outside the public sector are consulted. This is, for example, the case in Denmark, where 92% of total costs are covered but user charges exist for visits to psychologists and physiotherapists, and the United Kingdom (84%), where care provision outside of NHS commissioned services are not covered.

Public coverage for dental care costs is more limited in the EU with more restricted service packages (frequently limited to children) and higher levels of cost-sharing. Around 30% of total dental care costs are borne by government schemes or compulsory insurance in Europe. More than half of this spending is only covered in a few EU countries: Slovenia (51%), the Slovak Republic (56%), Croatia (61%) and Germany (68%). By contrast, in countries like Italy and the United Kingdom, dental care costs for adults without any specific entitlement are not covered. In countries where dental care is not comprehensively included in the public benefit package, voluntary health insurance may play an important role in providing financial protection. This is the case in the Netherlands where more than 70% of total costs are borne by these schemes.

Public coverage for pharmaceuticals is also typically less comprehensive than coverage for inpatient and outpatient care. Across the EU, around 64% of all pharmaceutical costs are covered by government and compulsory schemes. Over-the-counter medications – which are available without prescription and are typically not covered by basic coverage schemes – play an important role in some countries (see indicator "Pharmaceutical Expenditure" in Chapter 5). Less than 20% of pharmaceutical costs are covered by government schemes in Cyprus and Bulgaria. In Germany, this proportion reaches 84% as cost-sharing is only moderate with patients generally having to pay a co-insurance rate of 10% for each prescribed pharmaceutical capped at EUR 10 per item within an annual Co-payment Cap.

Therapeutic appliances such as glasses and other eye products, hearing aids and other medical devices are typically covered to a lesser extent than other health services. Government and compulsory insurance schemes cover more than 50% of these expenses in only four EU countries. In case of corrective eye products, compulsory coverage is often limited to paying partially for the cost of glasses, while private households are left to bear the full cost of the frames if they are not covered by complementary insurance.

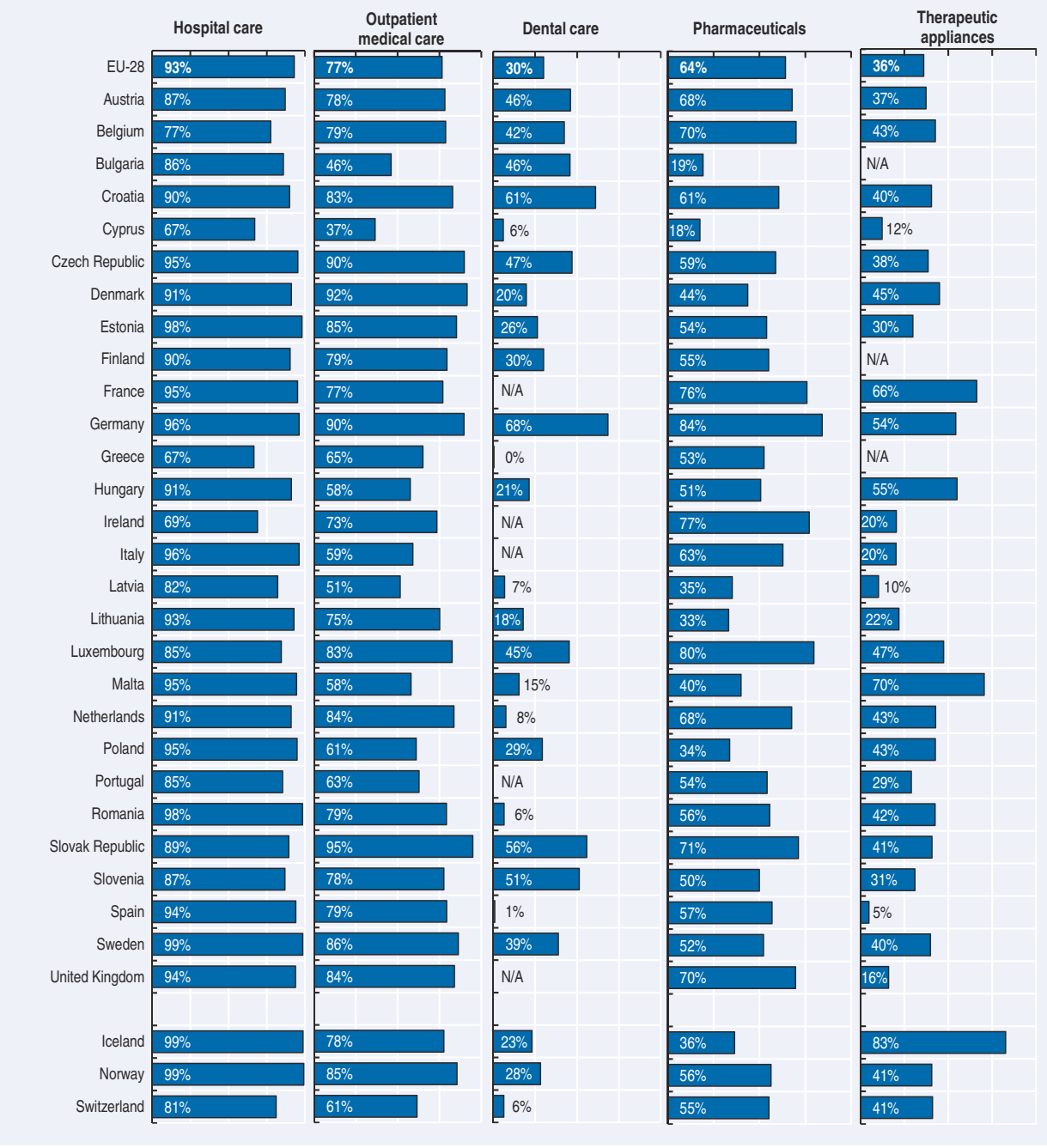
Definition and comparability

Health care coverage is defined by the share of the population entitled to services ("breadth of coverage"), the range of services included in a benefit package ("depth of coverage") and the proportion of costs covered ("height of coverage") by government schemes and compulsory insurance schemes. Financial coverage provided by voluntary health insurance is not considered. The core functions analysed here are defined based on the definitions in the System of Health Accounts (SHA, 2011). Inpatient care refers to inpatient curative and rehabilitative care in hospitals, outpatient medical care to all outpatient curative and rehabilitative care excluding dental care, pharmaceuticals to prescribed and over-the-counter medicines including medical non-durables, and therapeutic appliances mainly to eyewear, hearing aids and other medical devices.

Comparing the shares of financial coverage for different types of services is a simplification as reality is more complex and does not reflect possible trade-offs. For example, a country with more restricted population coverage but a very high depth of coverage may display a lower share of financial coverage than a country where the entire population is entitled to services but with a more limited benefit basket.

7.10. Health care coverage for selected goods and services, 2016

Government and compulsory insurance spending as proportion of total health spending by type of service



Note: Outpatient medical services mainly refer to services provided by generalists and specialists in the outpatient sector. Pharmaceuticals include prescribed and over-the-counter medicines as well as medical non-durables. Therapeutic appliances refer to vision products, hearing aids, wheelchairs and other medical devices. N/A means data not available.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933836371

AVAILABILITY OF DOCTORS

Access to medical care requires an adequate number of doctors, with a proper mix between generalists and specialists and a proper distribution in all parts of the country.

The number of doctors per capita varies widely across EU countries (Figure 7.11). In 2016, Greece had the highest number with 6.6 doctors per 1 000 population, but this number is an over-estimation as it includes all doctors who are licensed to practice (including retired physicians and those who might have emigrated to other countries). Austria and Portugal also had a high number of doctors per population, but the number in Portugal is also over-estimated for the same reason as in Greece (without this over-estimation, the number of practising doctors in Portugal would likely be slightly below the EU average). The number of doctors per capita was lowest in Poland, the United Kingdom and Romania.

Since 2000, the number of doctors per capita has increased in all EU countries, except in France, Poland and the Slovak Republic where it has remained stable. On average across EU countries, the number increased from 2.9 doctors per 1 000 population in 2000 to 3.6 in 2016. In most countries, the global economic crisis that started in 2008 did not have much impact on the growth in the number of doctors.

Projecting the future supply and demand of doctors is challenging given the high levels of uncertainty concerning retirement and migration patterns and possible changes in the demand for their services. Many EU countries have anticipated the current and future retirement of a significant number of doctors by increasing their education and training efforts so that there would be enough new doctors to replace those who will retire (OECD, 2016).

In many countries, the main concern is about current and future shortages of general practitioners, particularly in rural and remote regions. Whereas the overall number of doctors per capita has increased in nearly all countries, the share of general practitioners (GPs) has come down in most countries. On average across EU countries, GPs made up less than 25% of all physicians in 2016 (Figure 7.12). Greece and Poland have the lowest share of GPs, while Portugal, France, Finland and Belgium have been able to maintain a better balance between GPs and specialists. In response to these concerns about shortages of generalists, several countries have taken steps to increase the number of post-graduate training places in general medicine. In France, the number of post-graduate training places filled in general medicine more than doubled between 2005 and 2015, rising from 1 500 to over 3 500. However, in most countries, specialists earn much more than GPs, providing financial incentives for doctors to specialise (OECD, 2016).

The uneven geographic distribution of doctors and the difficulties in recruiting and retaining doctors in certain regions is another important policy issue in many European countries, especially those with remote and sparsely populated areas. The density of physicians is consistently greater in urban regions, reflecting the concentration of specialised services such as surgery and physicians' preferences to practice in urban settings. Differences in the density of doctors between urban regions and rural regions are highest in the Slovak Republic, the Czech Republic and Greece (OECD, 2017).

Many countries provide different types of financial incentives to attract and retain doctors in underserved areas, including one-time subsidies to help them set up their practice as well as recurrent payments such as income guarantees and bonus payments. A number of countries have also introduced measures to encourage students from underserved regions to enrol in medical schools (Ono et al., 2014).

Definition and comparability

Practising physicians are defined as doctors who are providing care for patients. In some countries, the numbers also include doctors working in administration, management, academic and research positions ("professionally active" physicians), adding another 5-10% of doctors. Greece and Portugal report all physicians entitled to practice, resulting in an even greater overestimation. In Belgium, a minimum threshold of activities (500 consultations per year) is set for general practitioners to be considered to be practising, resulting in an under-estimation compared with other countries which do not set such a threshold.

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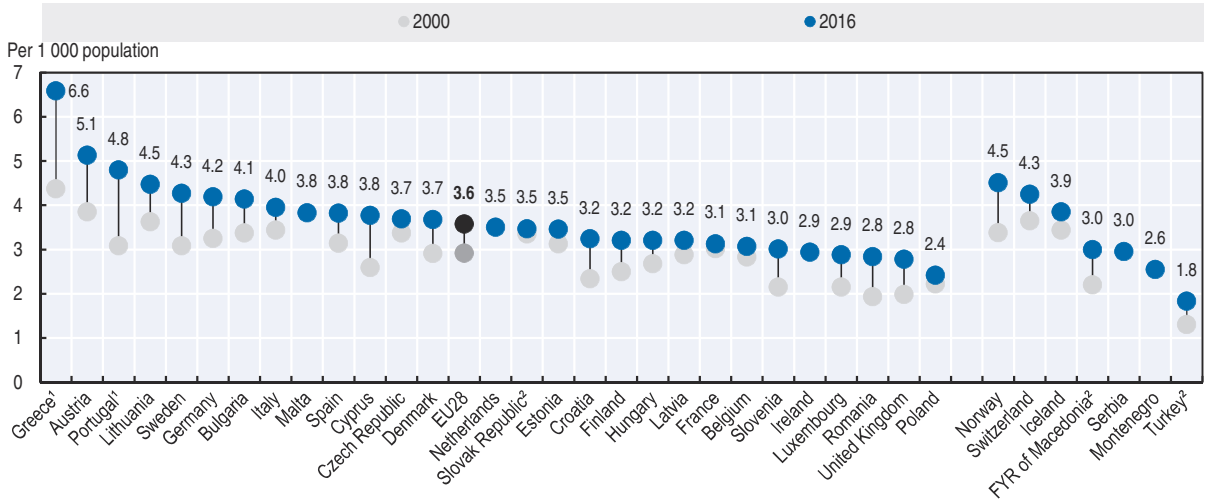
7.11. Practising doctors per 1 000 population, 2000 and 2016 (or nearest year)

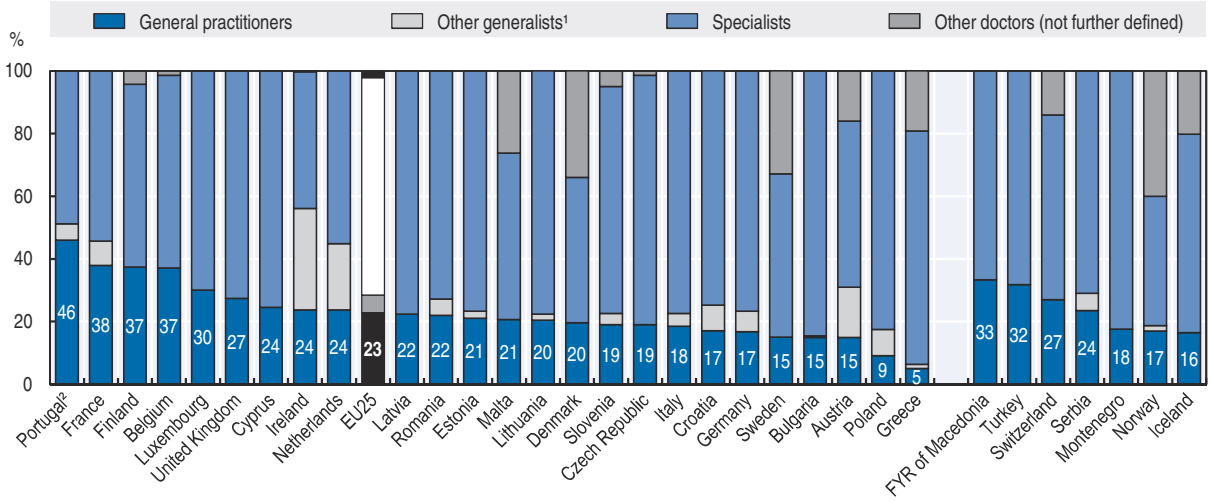


1. Data refer to all doctors licensed to practice, resulting in a large over-estimation of the number of practising doctors (e.g. of around 30% in Portugal).
2. Data include not only doctors providing direct care to patients, but also those working in the health sector as managers, educators, researchers, etc. (adding another 5-10% of doctors).

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836390

7.12. Share of different categories of doctors, 2016 (or nearest year)



1. Other generalists include non-specialist doctors working in hospital and recent medical graduates who have not started yet their post-graduate specialty training.
2. In Portugal, only about 30% of doctors employed by the public sector (NHS) are working as GPs in primary care, with the other 70% working in hospital.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836409

AVAILABILITY OF NURSES

Nurses greatly outnumber physicians in most EU countries, with a ratio of two to four nurses per doctor in many countries. Nurses play a critical role in providing health care not only in hospitals and long-term care institutions, but increasingly also in primary care and in home care settings.

There are concerns in many countries about possible future shortages of nurses, given that the demand for nurses is expected to rise in a context of population ageing and the retirement of the current "baby-boom" generation of nurses. These concerns have prompted actions in many countries to increase the training of new nurses, while some countries have addressed current shortages by recruiting nurses from other countries (OECD, 2016).

On average across EU countries, there were 8.4 nurses per 1 000 population in 2016, a rise from 6.7 in 2000 (Figure 7.13). The number of nurses per capita is highest in Denmark and Finland, although about one-third of nurses in these two countries are trained at a lower level than general nurses and perform lower tasks. This is also the case in Switzerland and Iceland. In other countries such as Italy and Spain, a large number of health care assistants (or nursing aids) provide assistance to nurses. Greece has the lowest number of nurses per capita among EU countries, but the data only include nurses working in hospital. Bulgaria, Latvia, Poland and Cyprus also have a relatively low number of nurses.

Since 2000, the number of nurses per capita has increased in most European countries, except in the Baltic countries (Estonia, Latvia and Lithuania) where the number of nurses per capita has remained stable (meaning that there has been a reduction in the absolute number of nurses given that the overall population has come down in these countries) and the Slovak Republic where the number of nurses has come down both in absolute number and on a per capita basis. Most of this reduction in the Slovak Republic has occurred between 2000 and 2010, with the number stabilising at a lower level since then.

The increase in the number of nurses per capita has been particularly large in Denmark, Finland, Germany, Luxembourg, France and Malta. Malta has taken a series of measures to train more nurses domestically and also to attract more nurses from other countries to address current shortages. The university degree to become a nurse in Malta is free of charge for students; and once students have graduated, they are also encouraged to take time off to pursue their training while continuing to receive at least part of their salary.

Most nurses in EU countries continue to work in hospital. Relative to the overall size of the population, the number of nurses working in hospital, when measured both in absolute numbers and full-time equivalents, has increased over the past decade in many countries (e.g. Austria, Belgium, Denmark, Germany and Malta). In France, the number of nurses working in hospital per population also increased slightly, but the number of full-time equivalents has remained relatively stable, meaning that the average number of working hours has decreased slightly (Figure 7.14). In many countries, the ratio of full-time equivalent nurses to the absolute number ranges from 0.80 to 0.95, and it has been fairly stable over time. However, this ratio is much lower in Belgium and Germany (0.70 to 0.75), indicating that nurses generally work fewer hours in these countries.

A growing number of nurses also work in primary care in many countries. In response to shortages of general practitioners, some countries have introduced or extended advanced roles for nurses to improve access to primary care. Evaluations of the experience with (advanced) nurse practitioners in countries like Finland and the United Kingdom indicate that these nurses can improve access to care and reduce waiting times, while providing the same quality of care as doctors for a range of patients (e.g. those with minor illnesses or requiring routine follow-up) (Maier et al., 2017).

Definition and comparability

The number of nurses includes those providing services for patients ("practising"), but in some countries also those working as managers, educators or researchers ("professionally active"). In countries where there are different levels of nurses, the data include both "professional" nurses (including general and specialist nurses) and "associate professional" nurses who have a lower level of qualifications but are nonetheless recognised and registered as nurses in their country. Health care assistants (or nursing aids) who are not recognised as nurses are excluded.

Austria and Greece report only nurses working in hospitals (resulting in an underestimation).

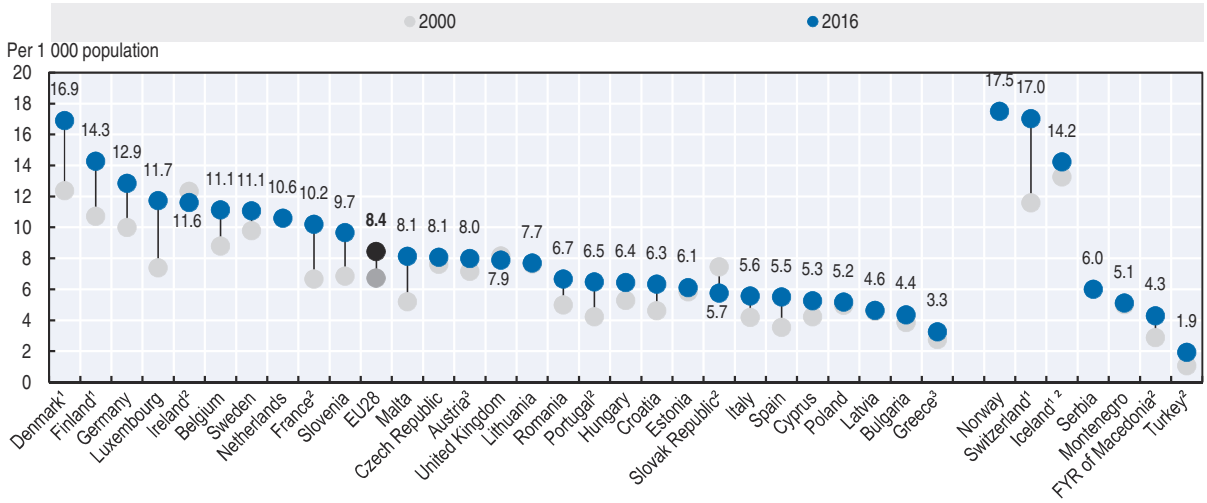
Full-time equivalent employment is defined as the number of hours worked divided by the average number of hours worked in full-time jobs, which may vary across countries.

References

Maier, C. et al. (2017), "Nurses in Advanced Roles in Primary Care: Policy Levers for Implementation", *OECD Health Working Papers*, No. 98, OECD Publishing, Paris, *http://dx.doi.org/10.1787/a8756593-en*.

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

7.13. Practising nurses per 1 000 population, 2000 and 2016 (or nearest year)

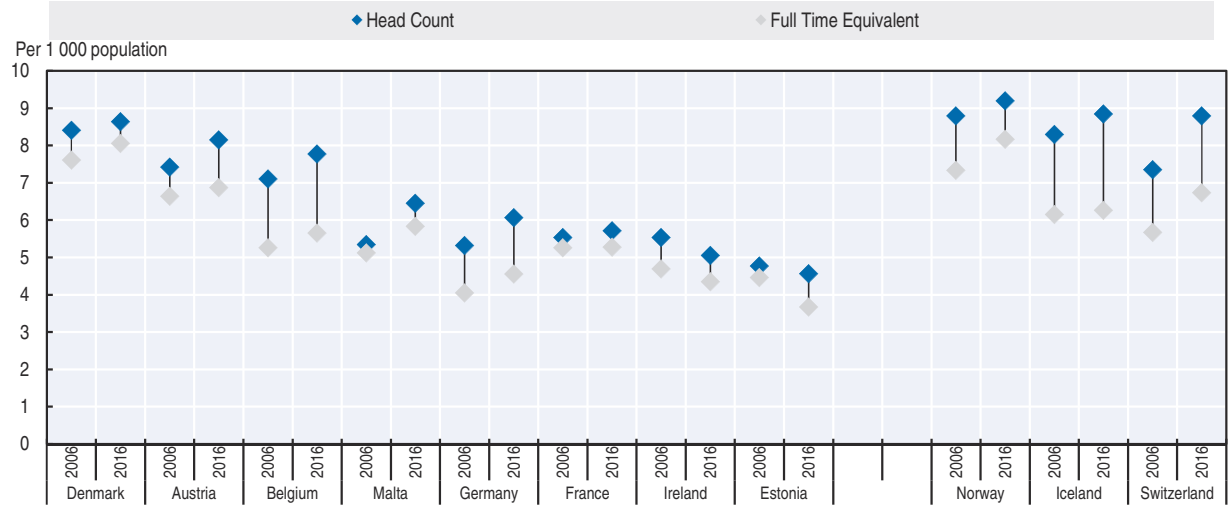


1. In Denmark, Finland, Iceland and Switzerland, about one-third of nurses are "associate professional" nurses with a lower level of qualifications. In Denmark and Switzerland, most of the growth in the number of nurses since 2000 has been in this category of associate professional nurses.
2. Data include not only nurses providing care for patients, but also those working as managers, educators, etc.
3. Austria and Greece report only nurses employed in hospital.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836428

7.14. Nurses working in hospital, head count vs full time equivalent, 2006 and 2016 (or nearest year)



Note: Data include professional and associate professional nurses as well as midwives working in hospital.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836447

CONSULTATIONS WITH DOCTORS

Consultations with doctors are, for most people, the most frequent contacts with health services. These consultations can take place either in doctors' offices or clinics, in hospital outpatient departments or, in some cases, in patients' own homes.

In 2016, the number of doctor consultations per person per year was highest in the Slovak Republic, the Czech Republic, Hungary and Germany, with 10 consultations or more per year. It is lowest in Sweden, Finland and Denmark with less than 5 consultations per person per year (Figure 7.15). The EU average is 7.5 consultations per person per year, with most countries reporting 5 to 8 visits. Some differences in health service delivery and payment methods can explain some of the variations across countries. In Sweden and Finland, the low number of doctor consultations can be explained partly by the fact that nurses and other health professionals play an important role in primary care centres, lessening the need for consultations with doctors (Maier et al., 2017). Some countries which pay their doctors mainly by fee-for-service (e.g. the Slovak Republic and the Czech Republic) tend to have higher consultation rates than other countries where doctors are mainly paid by salaries or capitation.

The estimated number of consultations per doctor is highest in Hungary, the Slovak Republic, Poland and the Czech Republic, with more than 3 000 consultations per doctor per year. It is lowest in Sweden, Denmark, Austria and Finland, with less than 1 500 consultations per doctor per year (Figure 7.16). This indicator should not be taken as a measure of doctors' productivity, since consultations can vary in length and effectiveness, and also because it excludes the services doctors deliver for hospital inpatients and other tasks. The duration of consultations with a primary care doctor in Sweden, as reported by doctors themselves, tends to be longer than in other countries such as the Netherlands and Germany (Commonwealth Fund, 2015). However, from a patient's perspective, a lower proportion of patients in Sweden report that their primary care doctors spent enough time with them in consultation (see indicator on Patient experience in Chapter 6).

Looking at trends over time in the estimated number of consultations per doctor per year, the number has decreased at least slightly since 2000 in Sweden, Denmark, Austria and France, as the number of doctors has increased more rapidly than the number of consultations, whereas it has remained relatively stable in Germany and has increased in Poland but mainly between 2000 and 2008 (Figure 7.17).

Definition and comparability

Consultations with doctors refer to the number of contacts with physicians, including both generalists and specialists. There are variations across countries in the coverage of different types of consultations, notably in outpatient departments of hospitals. The data come mainly from administrative sources, although in some countries (Ireland, Italy, the Netherlands, Spain and Switzerland) the data come from health interview surveys. Data from administrative sources tend to be higher than those from surveys because of problems with recall and non-response rates and also because the surveys used only cover the adult population, leading to an under-estimation.

In Hungary, the data include consultations for diagnostic exams, such as CT and MRI scans (resulting in an over-estimation). The data for the Netherlands exclude contacts for maternal and child care. In Germany, the data include only the number of cases of physicians' treatment according to reimbursement regulations under the Social Health Insurance Scheme (a case only counts the first contact over a three-month period, even if the patient consults a doctor more often, leading to an under-estimation). Telephone contacts are included in a few countries (e.g. Spain).

References

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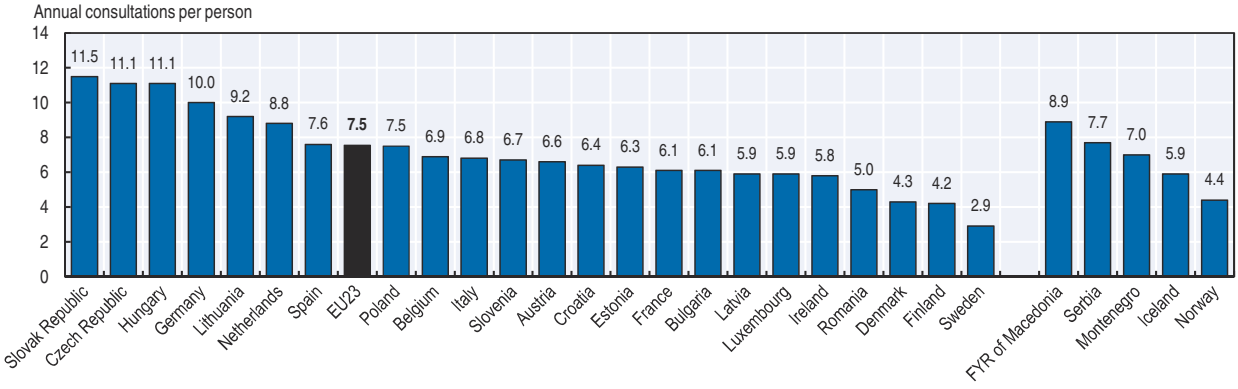
Maier, C. et al. (2017), "Nurses in Advanced Roles in Primary Care: Policy Levers for Implementation", *OECD Health Working Papers*, No. 98, OECD Publishing, Paris, *http://dx.doi.org/10.1787/a8756593-en*.

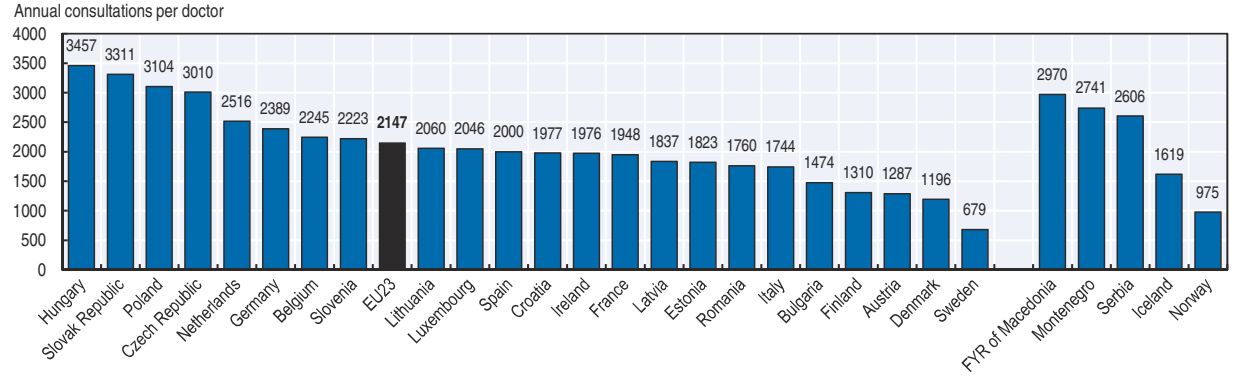
7.15. Number of doctor consultations per person, 2016 (or nearest year)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836466

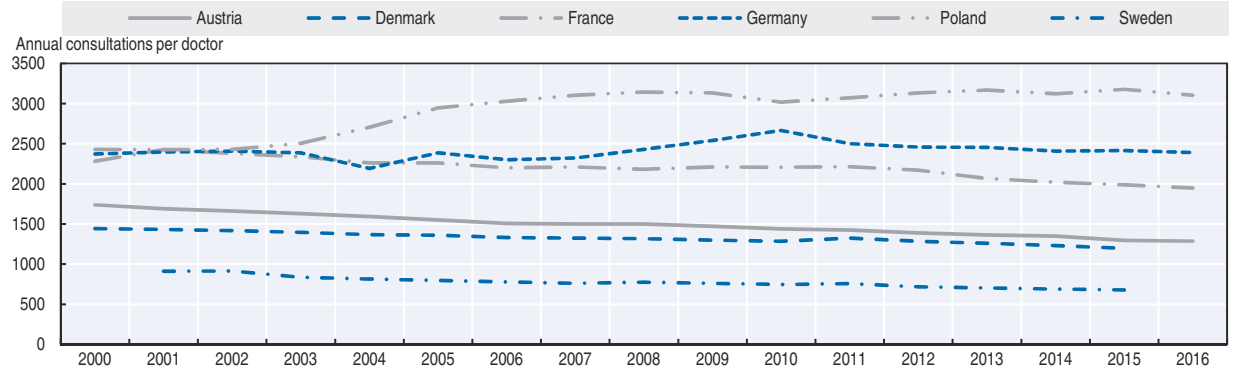
7.16. Estimated number of consultations per doctor, 2016 (or nearest year)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836485

7.17. Evolution in the estimated number of consultations per doctor, selected EU countries, 2000 to 2016



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836504

AVAILABILITY AND USE OF DIAGNOSTIC TECHNOLOGIES

This section presents data on the availability and use of two diagnostic imaging technologies: computed tomography (CT) scanners and magnetic resonance imaging (MRI) units. CT and MRI exams help physicians diagnose a wide range of conditions. Unlike conventional radiography and CT scanning, MRI exams do not expose patients to ionising radiation.

There is no general guideline or benchmark regarding the ideal number of CT scanners or MRI units or exams per population. However, if there are too few units, this may lead to access problems in terms of geographic proximity or waiting times. If there are too many, this may result in an overuse of these costly diagnostic procedures, with little if any benefits for patients.

The availability and use of CT scanners and MRI units have increased rapidly in most European countries over the past two decades, but there remain large differences. Hungary, Romania and the United Kingdom have the lowest number of MRI units and CT scanners per capita among EU countries, whereas Germany, Italy, Greece and Finland have the highest number of MRI units per capita, and Denmark, Greece, Latvia and Germany have the highest number of CT scanners per capita (Figure 7.18 and Figure 7.19).

In Greece, many MRI and CT scanners are over 10 years old, and considered to be outdated and no longer adequate for conducting some exams, because all exams are reimbursed at the same rate regardless of the age of the equipment. In other countries like France, the reimbursement for an MRI or CT exam is reduced after a number of years, once the equipment is considered to be depreciated.

Data on the use of these diagnostic machines show that the number of MRI exams and CT exams per capita is lowest in Bulgaria and Romania, while they are highest in Germany (for MRI exams only), France, Belgium and Luxembourg (Figure 7.20 and Figure 7.21). These large variations in MRI and CT exams may indicate either an under-use in some countries or an over-use in others.

There are wide variations in MRI and CT exams not only across countries, but also within countries, suggesting differences in clinical practices. For example, in Belgium, recent analysis shows a 50% variation in the use of diagnostic exams of the spine between those provinces with the highest and lowest rates in 2017, and this variation is even larger across smaller areas (INAMI/RIVIZ, forthcoming). In the United Kingdom, the 2nd Atlas of Variation in NHS Diagnostic Services in England found large variations in CT and MRI exams across geographic regions, and concluded that there is a need for certain types of imaging tests to be increased in some places, which could be funded by reducing imaging tests of lower value in other places (Public Health England and NHS Right Care, 2017).

Clinical guidelines have been developed in some European countries to promote a more rational use of these diagnostic technologies. Through the Choosing Wisely® campaign, which began in the United States in 2012 and emulated in a growing number of countries since then, some medical societies have identified different cases when an MRI or CT exam is not necessary. For example, the Royal College of Physicians in the United Kingdom has recommended, based on evidence from the National Institute for Health and Clinical Excellence (NICE), that patients with low back pain or with suspected migraine do not routinely need an imaging test (Choosing Wisely UK, 2018).

Definition and comparability

While the data in most countries cover CT scanners and MRI units installed both in hospitals and the ambulatory sector, the data coverage is more limited in some countries. CT scanners and MRI units outside hospitals are not included in some countries (e.g. Belgium, Portugal and Sweden, as well as Switzerland for MRI units). For the United Kingdom, the data only include scanners in the public sector. For Hungary, the data cover only equipment eligible for public reimbursement. Denmark provides data on the number of CT scanners, but not on the number of MRI units.

Similarly, MRI and CT exams performed outside hospitals are not included in some countries (e.g. Austria, Cyprus, Portugal, Switzerland and the United Kingdom). Furthermore, MRI and CT exams for Cyprus not only cover public hospitals. The Netherlands only report data on publicly financed exams. Ireland and Sweden do report any data on MRI and CT exams.

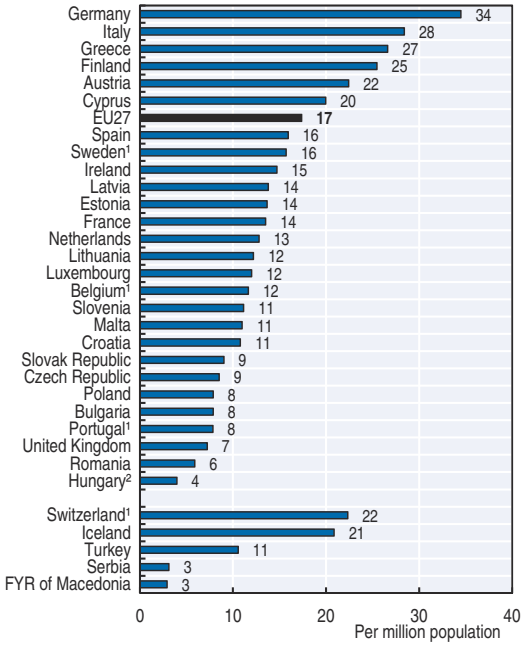
References

Choosing Wisely UK (2018), Clinicians Recommendations: Royal College of Physicians, *www.choosingwisely.co.uk/i-am-a-clinician/recommendations/#1528717718592-17c3e7e1-94f2*.

INAMI/RIVIZ (forthcoming), Medical Practice Variations – Medical Imaging, Brussels.

Public Health England and NHS RightCare (2017), The 2nd Atlas of Variation in NHS Diagnostic Services in England, January 2017, London.

7.18. MRI units, 2016 (or nearest year)

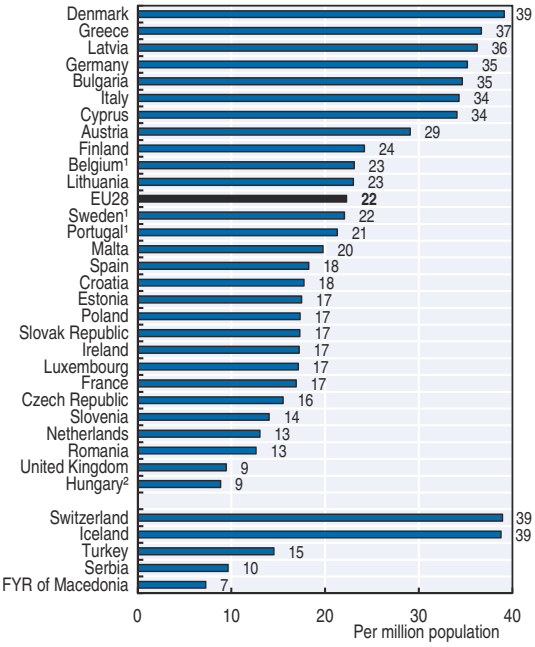


1. Equipment outside hospital not included.
2. Only equipment eligible for public reimbursement.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836523

7.19. CT scanners, 2016 (or nearest year)

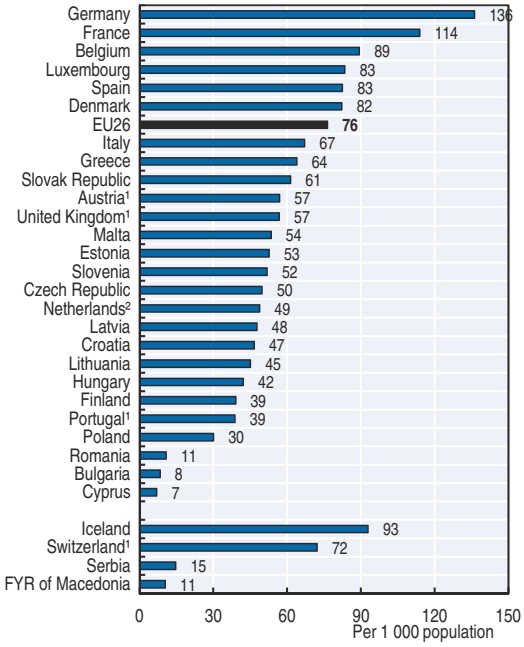


1. Equipment outside hospital not included.
2. Only equipment eligible for public reimbursement.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836542

7.20. MRI exams, 2016 (or nearest year)

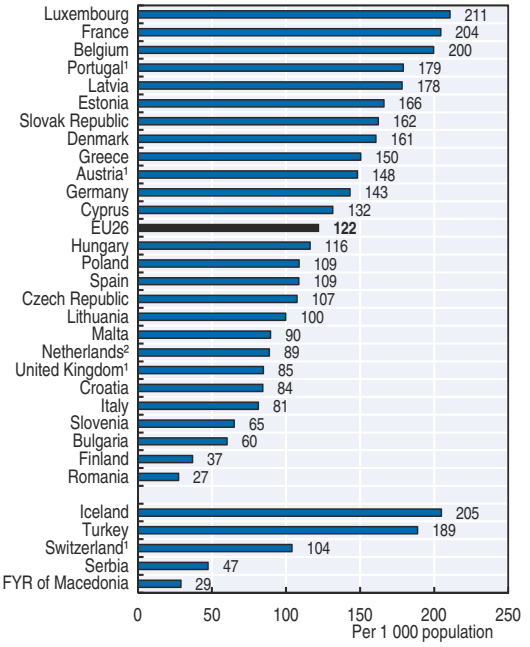


1. Exams outside hospital not included.
2. Exams privately-funded not included.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836561

7.21. CT exams, 2016 (or nearest year)



1. Exams outside hospital not included.
2. Exams privately-funded not included.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836580

HOSPITAL BEDS AND DISCHARGES

The number of hospital beds provides an indication of the resources available for delivering services to inpatients in hospitals. The influence of the supply of hospital beds on hospital admission rates has been widely documented, confirming that a greater supply generally leads to greater admissions (Rohmer's law that a "built bed is a filled bed").

Germany, Austria and Bulgaria have the highest number of hospital beds per capita, with more than seven beds per 1 000 population in 2016, well above the EU average of just over five beds, and more than two-times greater than the supply in Sweden, the United Kingdom and Denmark (Figure 7.22).

Since 2000, the number of hospital beds per capita has decreased to some extent at least in all EU countries. On average, it fell by almost 20%. This reduction has been particularly pronounced in Finland, Estonia, Latvia and Lithuania. The reduction in the supply of hospital beds has been accompanied by a reduction in hospital admissions in some countries and a reduction in average length of stays in nearly all countries (see indicator on average length of stay in Chapter 8).

Hospital admissions and discharges are highest in the three countries that have the highest number of hospital beds – Bulgaria, Germany and Austria. Hospital discharge rates in these countries are about 50% higher than the EU average. While differences in the clinical needs of patients may explain some of the variations in admission and discharge rates, these variations also likely reflect differences in the supply of beds, clinical practices and payment systems. Since 2000, hospital discharge rates have increased in Bulgaria and Germany.

Across EU countries, the main conditions leading to hospitalisation in 2016 were circulatory diseases, pregnancy and childbirth, injuries and other external causes, diseases of the digestive system, respiratory diseases and cancers.

Hospital discharge rates vary not only across countries but also within countries. In several European countries (e.g. Finland, Germany, Italy, Portugal, Spain and the United Kingdom), hospital medical admissions (excluding admissions for surgical interventions) vary by more than two-fold across different regions in the country. This may be related not only to differences in the supply of hospital beds, but also in the availability and quality of primary care services (OECD, 2014).

Hospital bed occupancy rates have increased over time in some countries that have relatively low number of hospital beds. This has been notably the case in Ireland where occupancy rates for curative (acute) care was approaching 100% in 2016, far above any other countries. In countries like Belgium and Germany, bed occupancy rates have remained relatively stable since 2000, at around 80%. The EU average has also been stable at 77% (Figure 7.24).

Definition and comparability

Hospital beds include all beds that are regularly maintained and staffed and are immediately available for use. They include beds in general hospitals, mental health and substance abuse hospitals, and other specialty hospitals. Beds in nursing and residential care facilities are excluded. Data for some countries do not cover all hospitals. In the United Kingdom, data are restricted to public hospitals. In Ireland, data refer to publicly funded acute hospitals only.

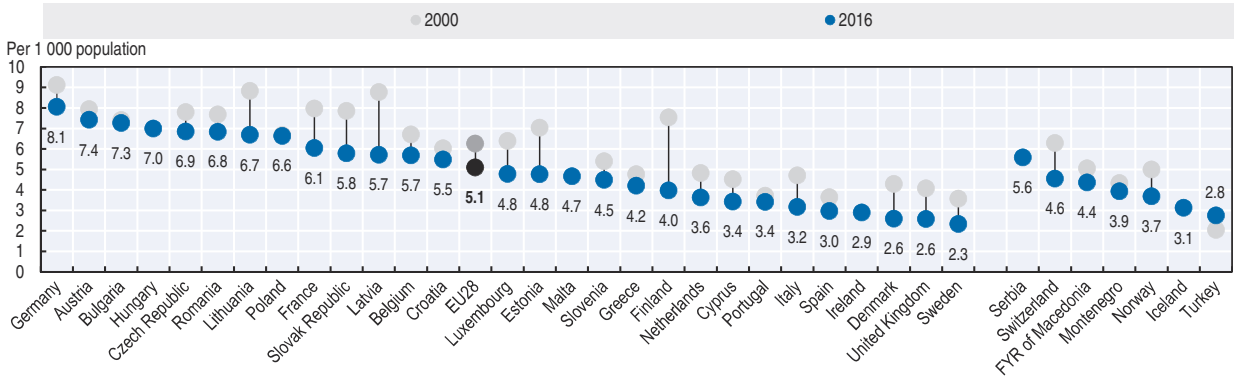
Discharge is defined as the release of a patient who has stayed at least one night in hospital. Same-day separations are excluded. Healthy babies born in hospitals are excluded completely (or almost completely) from hospital discharge rates in several countries (e.g. Austria, Estonia, Finland, France, Greece, Ireland, Latvia, Luxembourg and Spain). These comprise between 3% and 10% of all discharges. Data for some countries do not cover all hospitals. In Ireland, Latvia and the United Kingdom, data are restricted to public or publicly funded hospitals only. Data for Portugal relate only to public hospitals on the mainland. Data for Cyprus are not shown as they only include discharges from public hospitals, resulting in a large under-estimation given that most hospitals are private. Data for Belgium, Ireland and the Netherlands include only acute care/short-stay hospitals, also resulting in some under-estimation.

The occupancy rate for curative (acute) care beds is calculated as the number of hospital bed-days related to curative care divided by the number of available curative care beds (multiplied by 365).

Reference

OECD (2014), *Geographic Variations in Health Care Use: What Do We Know and What Can Be Done to Improve Health System Performance?*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264216594-en*.

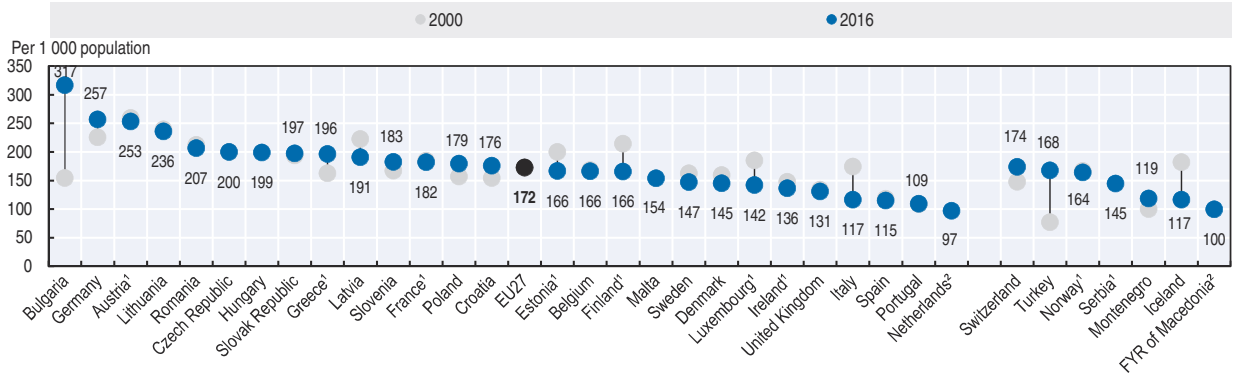
7.22. Hospital beds per 1 000 population, 2000 and 2016 (or nearest year)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836599

7.23. Hospital discharges per 1 000 population, 2000 and 2016 (or nearest year)

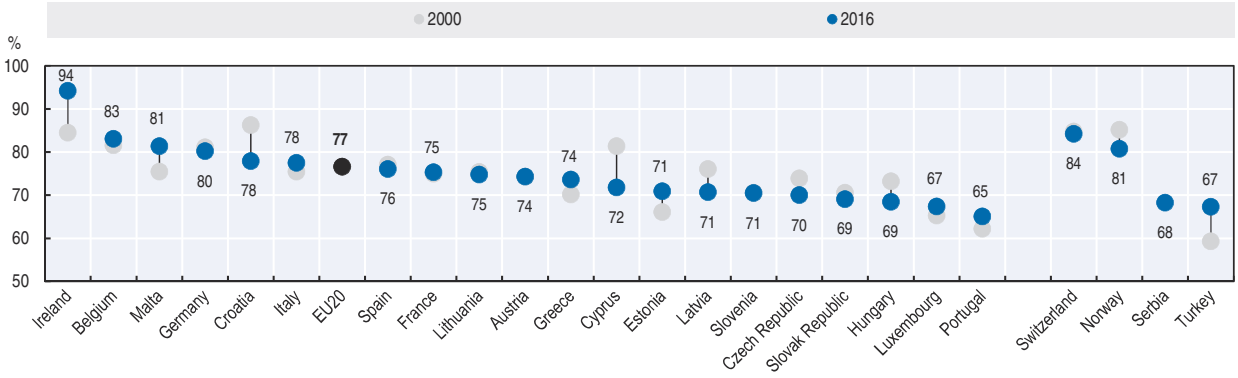


1. Data exclude discharges of healthy babies born in hospital (between 3-10% of all discharges).
2. Data include discharges for curative (acute) care only.

Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836618

7.24. Occupancy rate of curative (acute) care beds, 2000 and 2016 (or nearest year)



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836637

WAITING TIMES FOR ELECTIVE SURGERY

Long waiting times for elective (non-emergency) surgery are an important policy issue in many European countries as they generate dissatisfaction for patients because the expected benefits of treatments are postponed, and the pain and disability remain while waiting.

Waiting times are the result of a complex interaction between the demand and supply of health services. The demand for elective surgery is determined by the health needs of the population, progress in medical and surgical technologies, and patient preferences. However, doctors play a crucial role in the decision to operate a patient or not. On the supply side, the availability of surgeons and other staff in surgical teams, as well as the supply of the required equipment affect surgical activity rates.

The data presented here focus on two high-volume procedures: cataract surgery and hip replacement.

In 2016, the average waiting times for people who were operated on for a cataract surgery ranged from just over a month in the Netherlands, to three to four months in Finland, Spain and Portugal, and to well over a year in Poland (Figure 7.25). The median waiting times (which are lower than the average in all countries) ranged from about one month in Italy and Hungary, to about three months in Finland and Spain, but still to well over a year in Poland. Looking at trends over time, in many countries, waiting times to get a cataract surgery declined fairly rapidly up to around 2010, but have started to rise again in recent years.

The average waiting times to get a hip replacement in 2016 ranged from about one to two months in the Netherlands and Denmark, to four to five months in Hungary, Portugal and Spain, and to well over a year in Poland (Figure 7.26). The median waiting times were about 40 days in Denmark and 50 days in Italy, while they reached over 200 days in Poland and Estonia. In the United Kingdom, the waiting times for a hip replacement fell sharply up to 2008, but have remained stable since then at around 80 days. In Portugal, the waiting times for a hip replacement followed the same pattern as for a cataract surgery: they fell substantially up to 2010, but have gone up since then to over 100 days, despite a slight reduction in 2016. The waiting times for a hip replacement have also increased in Spain since 2011 and in Estonia since 2014.

Poland has the longest waiting times for both cataract surgery and hip replacement among EU countries reporting these data, and these waiting times have increased substantially since 2010. Surgical activities in Poland are constrained by the low number of surgeons and the lack of equipment. The uneven geographic distribution of resources and services also contributes to the problem: the waiting times for some surgical specialties can be very long for people living in underserved regions. The Polish government has taken a series of measures in recent years to try to reduce these long waiting times.

Looking at people who are still on the waiting lists, the percentage of patients who have been waiting for more than three months also varies widely across the group of countries for which data are available. While only about 12% of people in Sweden have been on the waiting lists for a cataract surgery or a hip replacement for more than three months, this is the case for over 85% of people in Estonia and Poland (Figure 7.27 and Figure 7.28). In Ireland, the percentage of people still on the waiting lists after three months has increased sharply between 2010 and 2016, from about 50% to 77% for cataract surgery and from about 50% to 63% for hip replacement. A number of initiatives have been launched in recent years to try to address long waiting times in Ireland, but these initiatives do not appear to have had any lasting effect.

Over the past decade, waiting time guarantees have become the most common policy tool to tackle long waiting times in several countries. However, these guarantees are only effective if they are enforced. There are two main approaches to enforcement: setting waiting time standards and holding providers accountable for achieving these standards; or allowing patients to choose alternative health providers (including the private sector) if they have to wait beyond a maximum amount of time (Siciliani et al., 2013).

Definition and comparability

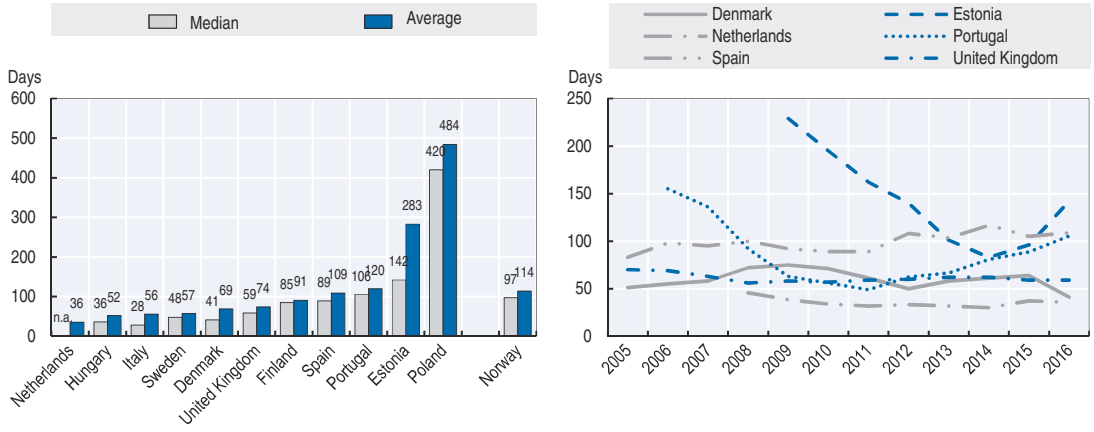
Two different measures of waiting times are presented here: 1) the period from the time that a specialist adds a patient to the waiting list for an operation to the time that the patient receives the operation; and 2) the waiting times for patients who are still on the waiting lists at a given point in time. Waiting times for the first measure are reported both in terms of the average and the median number of days. The median is the value which separates a distribution in two equal parts (meaning that half the patients have longer waiting times and the other half lower waiting times). Compared with the average, the median minimises the influence of outliers (patients with very long waiting times).

The data come from administrative databases (not surveys). The management of administrative data can vary across countries: in some countries, patients who refuse on several occasions to receive the procedure are removed from the list, while they continue to be kept on the list in other countries (e.g. Estonia).

Reference

Siciliani, L., M. Borowitz and V. Moran (eds.) (2013), *Waiting Time Policies in the Health Sector: What Works?*, OECD Health Policy Studies, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264179080-en*.

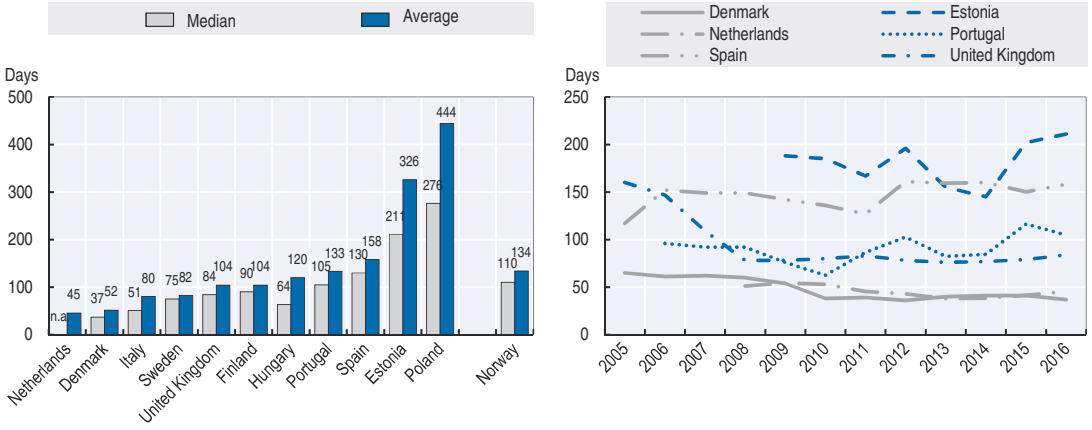
7.25. Waiting times of patients for cataract surgery, 2016 and trends since 2005



Note: On the right panel, data relate to median waiting times, except for the Netherlands and Spain (average waiting times).
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933836656

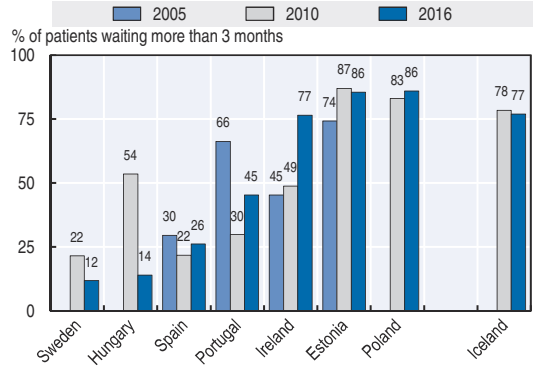
7.26. Waiting times of patients for hip replacement, 2016 and trends since 2005



Note: On the right panel, data relate to median waiting times, except for the Netherlands and Spain (average waiting times).
Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933836675

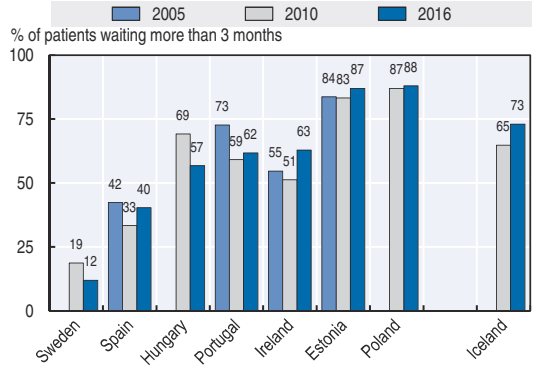
7.27. Waiting times of patients still on waiting list for cataract surgery, 2005 to 2016



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933836694

7.28. Waiting times of patients still on waiting list for hip replacement, 2005 to 2016



Source: OECD Health Statistics 2018, *https://doi.org/10.1787/health-data-en*.

StatLink http://dx.doi.org/10.1787/888933836713

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PART II

Chapter 8

Resilience: Innovation, efficiency and fiscal sustainability

This chapter presents a series of indicators related to the resilience of health systems, defined as the capacity of health systems to adapt efficiently to changing economic, technological and demographic environments.

Digital technology offers great opportunities to deliver health services more efficiently, and the European Commission supports a digital transformation of health systems to empower citizens to have access to their health data and to promote exchange of health data among health care providers across the EU. The use of eHealth and ePrescribing continues to grow in many EU countries, although some countries are lagging behind.

The ageing of the population requires profound transformations in health systems, from a focus on acute care in hospitals to more integrated and people-centred care in the community. Many EU countries have begun this transformation over the past 15 years – for example by reducing the average length of stay in hospitals and promoting a greater use of day surgery combined with follow-up care, but the process still requires ongoing, long-term effort.

Population ageing means not only that there will be growing needs for health care in the years ahead, but also growing needs for long-term care. The latest projections from the EC confirm that public spending on long-term care is projected to grow faster than public spending on health care over the coming decades, highlighting the importance to find more innovative ways to respond to health care and long-term care needs more efficiently.

ADOPTION AND USE OF ELECTRONIC MEDICAL RECORDS AND EPRESCRIBING

Health care that is safe, effective, timely, efficient and patient-centred relies on the right information reaching the right person (or organisation) at the right time. A digitalised information infrastructure that ensures timely and reliable sharing of clinical and other information can improve health outcomes and efficiency, and also create a repository of valuable data for researchers and system managers (OECD, 2017). Enabling people to access, and interact with, their electronic medical record (EMR) is an important feature that can help people become more involved in their health and their care.

The European Commission's Digital Single Market Strategy includes three pillars to improve the health and care sector across the EU: 1) to secure access to and sharing of personal health information across borders, with the intention of going beyond ePrescriptions and patient summaries and establish full interoperability of member states' EMRs and a European exchange format for electronic records; 2) to connect and share health data to enable research, better diagnosis and improved health; and 3) to strengthen citizen empowerment and individual care through eHealth solutions and new care models (European Commission, 2018).

Many countries are implementing EMRs across health care settings, including primary care. In 2016, the proportion of primary care practices using an EMR was about 80% on average across 15 EU countries, although there are wide variations (Figure 8.1). While an EMR was used in all or nearly all primary care practices in Denmark, Estonia, Finland, Greece, Spain, Sweden and the United Kingdom, its use was much more limited in Croatia and Poland. In Denmark and the United Kingdom, the proportion of primary care practices using an EMR doubled between 2012 and 2016.

In most of these 15 countries, patients are able to view information contained in their electronic record (with the only exceptions being Croatia, the Czech Republic and Ireland), and in half of these countries (Denmark, Estonia, France, Greece, Latvia, Luxembourg, Spain and Sweden), patients are also able to interact with their record, for example to add or amend information (Oderkirk, 2017).

ePrescribing, which allows prescribers to write prescriptions that can be retrieved by a pharmacy electronically, can improve the accuracy and efficiency of pharmaceutical drug dispensing. Most countries are transitioning from paper-based to ePrescribing, but the implementation of ePrescribing varies greatly across the EU (Figure 8.2). In 2018, over 90% of prescriptions were transmitted to community pharmacies electronically in Finland, Estonia, Sweden, Denmark, Portugal and Spain. On the other hand, ePrescribing has not been implemented yet in several countries (such as Bulgaria, Cyprus, France, Germany, Ireland, Luxembourg, Malta and Poland), although all these countries have stated that they plan to start implementing ePrescribing at regional or national levels over the next few years.

Definition and comparability

An Electronic Medical Record (EMR) is a computerised medical record created in an organisation that delivers care, such as a hospital or physician's office, for patients of that organisation. Ideally, EMRs should be shared between providers and settings to provide a detailed history of contact with the health care system for individual patients from multiple organisations (Oderkirk, 2017). The figures presented on EMR implementation come from a 2016 survey of OECD countries to which 15 EU countries responded. The same survey was carried out in 2012, with 8 responses from EU countries.

ePrescribing is the computer-based electronic generation, transmission and filing of a medicine prescription. It allows prescribers to write prescriptions that can be retrieved by a pharmacy electronically without the need for a paper prescription. ePrescribing systems may also be linked or integrated to the reimbursement and claiming system. The figures presented on ePrescribing are derived from a 2018 survey of the Pharmaceutical Group of the European Union (PGEU).

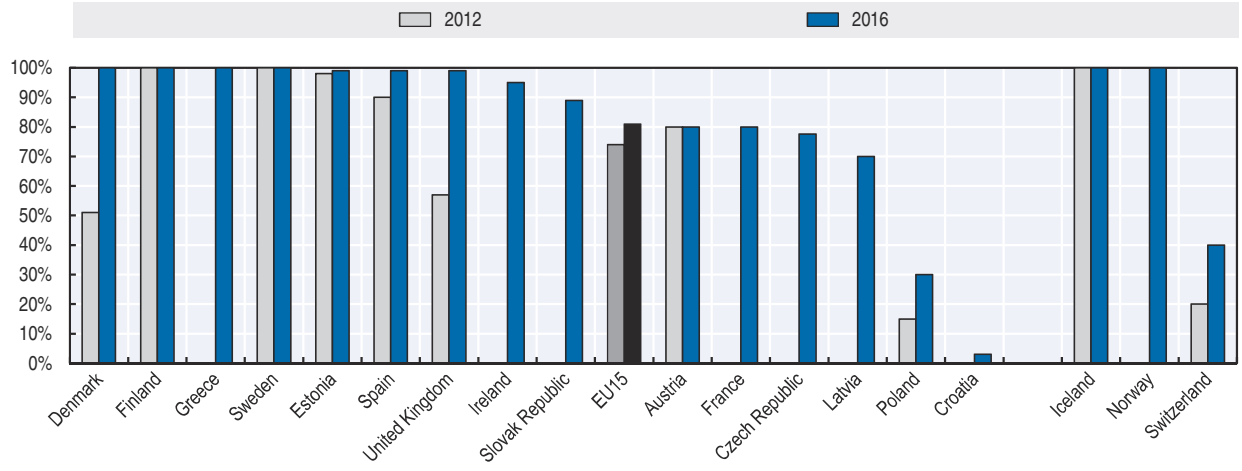
References

European Commission (2018), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on enabling the digital transformation of health and care in the Digital Single Market; empowering citizens and building a healthier society, *https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:233:FIN*.

Oderkirk, J. (2017), "Readiness of electronic health record systems to contribute to national health information and research", *OECD Health Working Papers*, No. 99, OECD Publishing, Paris, *https://doi.org/10.1787/9e296bf3-en*.

OECD (2017), *New Health Technologies: Managing Access, Value and Sustainability*, OECD Publishing, Paris, *https://doi.org/10.1787/9789264266438-en*.

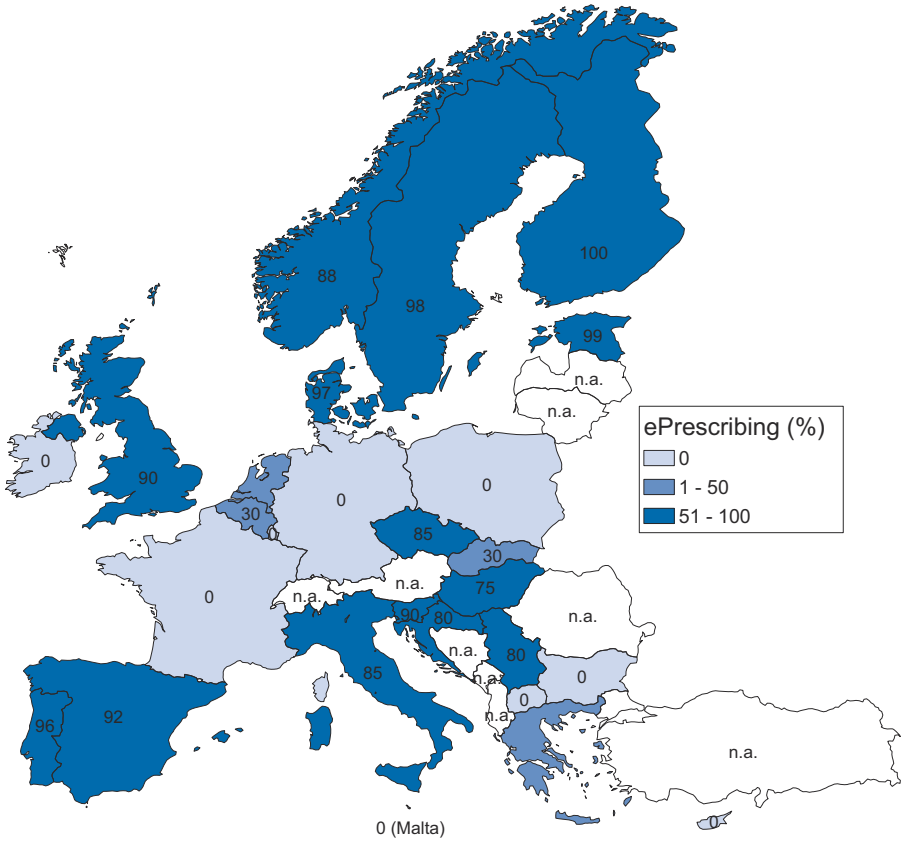
8.1. Percentage of primary care physician offices using electronic medical records, 2012 and 2016



Source: OECD Survey of Electronic Health Record System Development and Use, 2012 and 2016.

StatLink http://dx.doi.org/10.1787/888933836732

8.2. Percentage of ePrescriptions in community pharmacies, 2018



Note: Greece and the Netherlands are implementing ePrescribing but the percentage was not reported.
Source: Pharmaceutical Group of the European Union (PGEU).

StatLink http://dx.doi.org/10.1787/888933836751

INDIVIDUALS USING THE INTERNET TO ACCESS HEALTH SERVICES AND HEALTH INFORMATION

Access to the internet among Europeans is rising (85% of EU households had internet access in 2016) and people are increasingly going on line to access information and interact with the provider of different services. Health is no exception. The amount of information regarding health and illness available on line is growing, as are the opportunities of interacting with health care providers electronically, for example to make medical appointments. Digital technologies can improve patient experience and outcomes, and the efficiency of services, but some may generate minimal benefit (at a considerable expense), and protecting individuals' privacy is a frequent problem and a policy priority (OECD, 2017). While online medical information can be a useful way to help people manage their health, regulation is difficult and many people are not in a position to check the veracity of this type of information.

One in eight EU residents (13%) made an appointment with a health care practitioner on line in 2016, up from one in twelve (8%) in 2012 (Figure 8.3). Almost half (49%) of Danish residents made a medical appointment on line in 2016 (up from 29% in 2012). Finland and Spain had the second and third highest proportion of residents making a medical appointment this way in 2016, with 35% and 30% respectively. Virtually no Cypriots reported making a medical appointment on line in either year. The figure was also low in Greece and Bulgaria (2% and 3% respectively in 2016). In all countries except Cyprus, the proportion of residents making appointments on line increased between 2012 and 2016, on average by 63%. The greatest increases were observed in Denmark, Belgium, the Netherlands, Luxembourg and Hungary.

Making medical appointments on line had a weak correlation with internet access (r2 = 0.34), suggesting that internet access is not a sufficient condition to making medical appointments on line. A moderate correlation (r2 = 0.51) was observed with internet banking, which was performed by 49% of EU residents in 2016, suggesting that individuals who conduct their banking on line also tend to book medical appointments this way. The correlation with the percentage of individuals booking travel and accommodation on line (41% across the EU) was weak (r2 = 0.32). These figures suggest that internet use for making medical appointments is lagging behind use for other personal services.

Half of all EU residents sought health information on line in 2017, a figure that has almost doubled since 2008 (Figure 8.4). The highest proportions of people seeking health information on line were in the Netherlands and Finland (about 70%). Almost 60% of Cypriots sought health information on line in 2017, a large increase from only about 10% in 2008. Less than 40% of Romanian, Italian, Bulgarian and Irish residents reported that they sought health information on line in 2017.

Disparities by age and socioeconomic groups exist in using the internet for health-related purposes. In 2017, only about 30% of people in EU countries aged 65-74 accessed health information on line, compared to 55% of those aged 25-64. This "age gap" in using the internet for health-related information was particularly large in Croatia, Greece and Malta. In terms of socioeconomic status, about 40% of people in EU countries living in households in the lowest income quartile accessed health information on line, compared to over 60% in the highest income quartile. This "income gap" in accessing health information on the internet was particularly large in Hungary, Lithuania and Portugal.

Definition and comparability

The figures presented here come from an annual European Information and Communication Technologies (ICT) survey of households and individuals. Data are collected by National Statistical Institutes based on Eurostat's model questionnaire on ICT usage. The model questionnaire changes every year.

Around 150 000 households and 200 000 individuals aged 16-74 in the EU were surveyed in 2016 (Eurostat, 2016).

In the 2016 survey, the question related to the activities described here was:

- *For which of the following activities did you use the Internet in the last 3 months for private purpose? (tick all that apply)*
  - *Seeking health-related information (e.g. injury, disease, nutrition, improving health, etc.)*
  - *Making an appointment with a practitioner via the website (e.g. of a hospital or a health care centre)*

The 2017 survey did not include the question on making an appointment via the website.

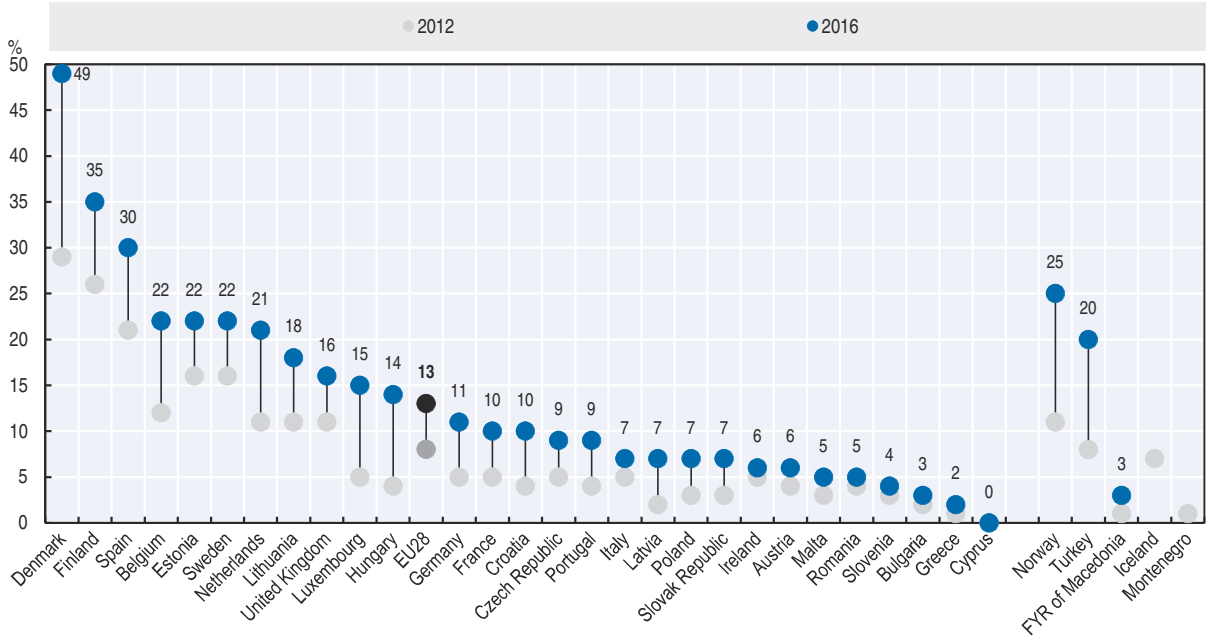
Data on internet access and use for personal banking and booking travel and accommodation come from the same surveys.

References

OECD (2017), *New Health Technologies: Managing Access, Value and Sustainability*, OECD Publishing, Paris, *https://doi.org/10.1787/9789264266438-en*.

Eurostat (2016), Methodological manual for statistics on the Information Society, *https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp*.

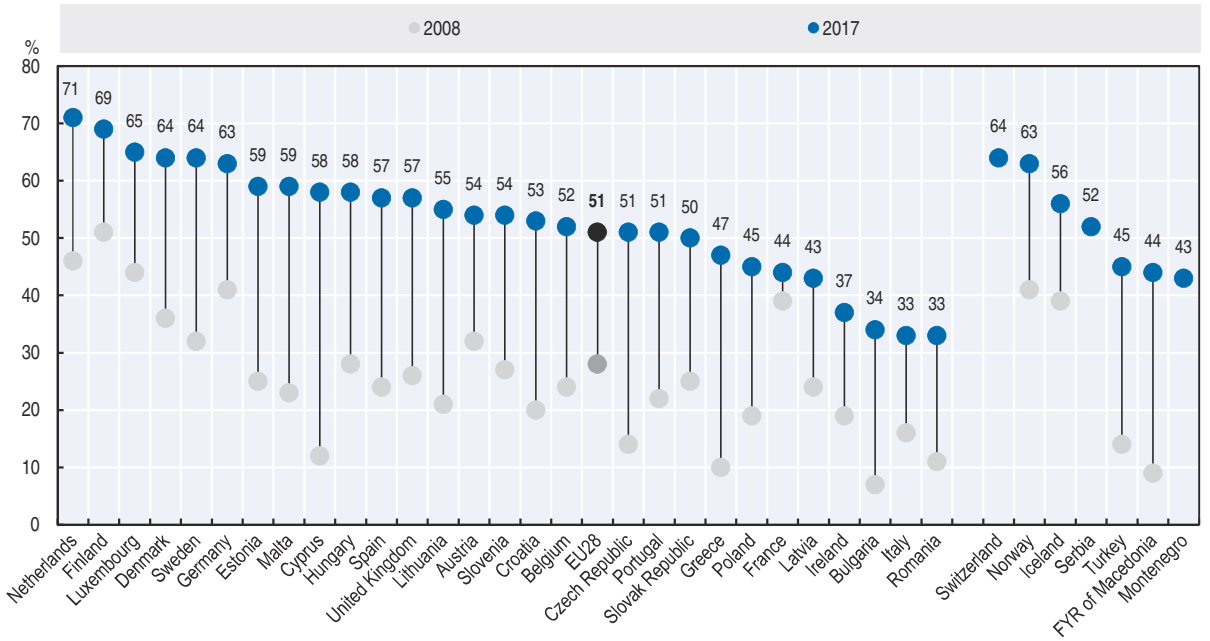
8.3. Percentage of people who made an appointment with a health practitioner on line, 2012 and 2016



Source: Eurostat Database, based on the European ICT survey of individuals aged 16-74.

StatLink http://dx.doi.org/10.1787/888933836770

8.4. Percentage of people who sought health-related information on line, 2008 and 2017



Source: Eurostat Database, based on the European ICT survey of individuals aged 16-74.

StatLink http://dx.doi.org/10.1787/888933836789

PUBLIC HEALTH LABORATORY CAPACITY TO CONTROL INFECTIOUS DISEASES THREATS

Infectious diseases and resistance to antibiotics are global public health threats. Resilient health systems depend on the ability to detect emerging diseases accurately in time to stop outbreaks and avert major international crises such as the recent Ebola epidemic (Albiger, 2018). Public health preparedness requires adequate capacity of microbiology laboratories to: 1) ensure rapid infection diagnostics to guide treatment, detect and control epidemics; 2) characterise infectious agents for designing effective vaccines and control measures; and 3) monitor the impact of prevention of infections and containment of antimicrobial resistance (AMR).

The ECDC is operating the EULabCap (European Laboratory Capability Monitoring System) to assess whether laboratory systems in EU/EEA countries have the critical capabilities and capacities for reliable communicable disease and antimicrobial resistance surveillance and control at Member State and EU levels (ECDC, 2018). In 2016, the EULabCap Index average for EU countries was 7.5 on a maximum scale of 10 (Figure 8.5). Country scores ranged from a low of 5.6 in Cyprus to a high of 9.6 in France. These results indicate that the EU has strong public health microbiology services that largely meet communicable disease surveillance and response requirements. However, only 18 EU countries (and Norway) showed sufficient laboratory capacity levels (defined as intermediate to high score) for at least 10 of the 12 EULabCap targets (ECDC, 2018).

National improvements in the areas of vulnerability have taken place in 24 EU countries since 2015. Steady increases in the EULabCap Index, and a narrowing score range between countries, indicate convergence towards more balanced laboratory capacities across countries.

Capabilities to diagnose EU notifiable diseases and antimicrobial resistance as well as laboratory contribution to surveillance networks are well in line with EU legislation and case definitions across the EU. Capacities for detection and surveillance of antimicrobial resistance improved steadily between 2013 and 2016 with wider use of standardised methods (Figure 8.6). EU capabilities of national reference laboratories for rapid detection of (re-) emerging diseases and drug resistance and participation in outbreak investigations also progressed over the years (Figure 8.7).

Some remaining gaps and inefficiencies still need to be addressed, including the development of clinical guidance for and adequate utilisation of diagnostic tests, upgrading surveillance programme to integrate microbial genomic sequencing methods and digital connectivity of laboratory information with public health monitoring systems at national and EU levels (ECDC, 2018; Revez, 2018).

Definition and comparability

The results presented here are derived from the EULabCap monitoring surveys conducted annually in EU countries, Iceland and Norway by ECDC jointly with National Microbiology Focal Points since 2013. The EULabCap Index is a composite index composed of 60 technical indicators of laboratory structure, service range and outputs related to 12 public health targets aligned with EU policies and international standards and health regulations. The target measures are aggregated into the EULabCap Country system index, with 10 being the maximum score. The methodology is described in further detail in the EULabCap report (ECDC, 2018).

Data completeness is robust with 100% of countries and 97% of indicators data reported. However, the following limitations should be taken into account: 1) variable relevance for applicability of some indicators according to differences in national health systems or epidemiology; 2) country self-reported data; 3) indirect measurement of national capacity using EU-reported surveillance data; and 4) threat to comparability over time caused by annual updates of indicators following laboratory technology innovation.

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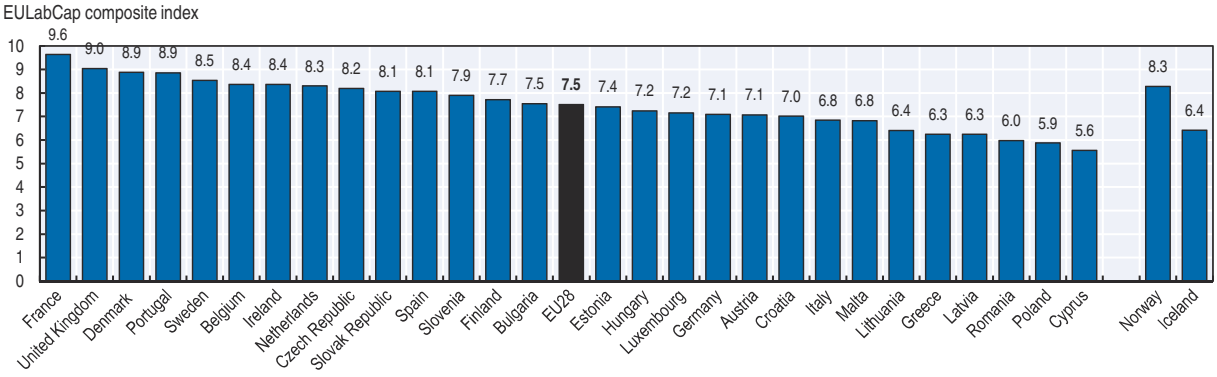
ECDC (2018), "EU Laboratory Capability Monitoring System (EULabCap) – Report on 2016 survey of EU/EEA country capabilities and capacities", Stockholm, *https://ecdc.europa.eu/sites/portal/files/documents/2016_EULabCap_EUreport_web_300418_final.pdf*.

Revez, J. et al. (2018), "Survey on the Use of Whole-Genome Sequencing for Infectious Diseases Surveillance: Rapid Expansion of European National Capacities, 2015-2016", *Frontiers in Public Health*, Vol. 5, Issue 347.

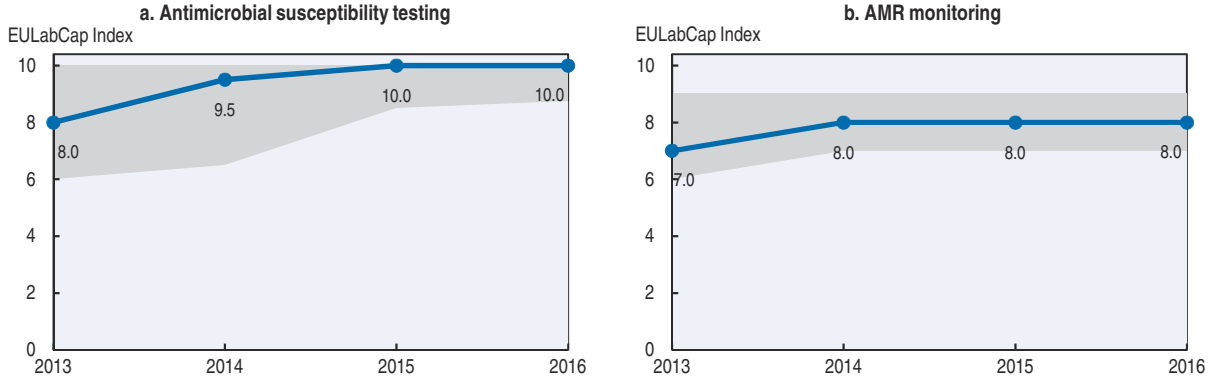
8.5. Composite index of national public health laboratory capacities, 2016



Note: The maximum score for this indicator is 10.
Source: ECDC (2018).

StatLink http://dx.doi.org/10.1787/888933836808

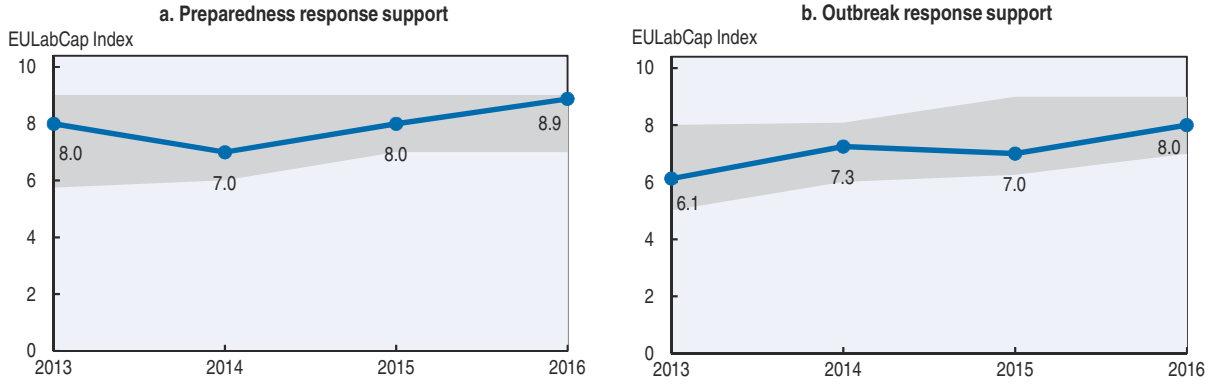
8.6. Antimicrobial susceptibility testing and resistance monitoring, average across EU countries, 2013 to 2016



Note: The shaded area shows the minimum and maximum values.
Source: ECDC (2018).

StatLink http://dx.doi.org/10.1787/888933836827

8.7. (Re-) emerging disease preparedness and outbreak response support, average across EU countries, 2013 to 2016



Note: The shaded area shows the minimum and maximum values. Preparedness refers to capabilities of laboratories to detect and characterise various infectious diseases.
Source: ECDC (2018).

StatLink http://dx.doi.org/10.1787/888933836846

AVERAGE LENGTH OF STAY IN HOSPITAL

The average length of stay in hospital is often regarded as an indicator of efficiency in health service delivery. All else being equal, a shorter stay will reduce the cost per discharge and shift care from inpatient to less expensive settings. Longer stays can be a sign of poor care coordination, resulting in some patients waiting unnecessarily in hospital until rehabilitation or long-term care can be arranged (see the discussion on delayed discharges in Chapter 2). At the same time, some patients may be discharged too early, when staying in hospital longer could have improved their health outcomes or reduced chances of re-admission.

In 2016, the average length of stay in hospital for all causes of hospitalisation was the lowest in the Netherlands, but the length of stay in the Netherlands is under-estimated because it only includes stays for curative (acute) care that are typically shorter. Taking into account all types of care, the average length of stay was relatively short in Bulgaria, Denmark and Sweden (Figure 8.8). It was highest in France, mainly because of relatively long stays for rehabilitative and psychiatric care provided in general or specialised hospitals: the length of stay in acute care units in France is no longer than in most other countries. Hungary and the Czech Republic also have relatively long average length of stay, partly because many hospitals have long-term care units.

The average length of stay in hospital has decreased since 2000 in nearly all EU countries, falling from almost ten days in 2000 to less than eight days in 2016 on average. It fell particularly quickly in some countries that had relatively long stays in 2000 (e.g. Bulgaria, Croatia, Finland, Germany, Latvia, Slovak Republic and United Kingdom). This reduction in average length of stay has generally been accompanied by a reduction in the number of hospital beds. For example, in Finland, the 30% reduction in average length of stay since 2000 has come along with an almost 50% reduction in the number of hospital beds per capita (see indicator on hospital beds and discharges in Chapter 7).

Focusing on average length of stay for specific diseases or conditions can remove some of the effect of different case mix and severity of patients admitted to hospital. Figure 8.9 shows that the average length of stay for a normal delivery in EU countries ranges from less than two days in the United Kingdom and the Netherlands, to almost five days in Hungary, Croatia and the Slovak Republic. The length of stay for a normal delivery has become shorter in nearly all countries, dropping from more than four days in 2000 to about three days in 2016 on average in EU countries.

The average length of stay following acute myocardial infarction (AMI or heart attack) was around seven days on average in EU countries in 2016 (Figure 8.10). It was lowest in Denmark, Bulgaria and Sweden (less than five days) and highest in Germany (ten days).

Beyond differences in clinical needs, several factors can explain these cross-country variations in lengths of stay. The combination of an abundant supply of beds together with hospital payment methods may provide incentives for hospitals to keep patients longer. A growing number of countries (e.g. France, Germany, Poland) have moved to prospective payment methods often based on diagnosis-related groups (DRGs) to set payments based on the estimated cost of hospital care for different patient groups in advance of service provision. These payment methods have the advantage of encouraging providers to reduce the cost of each hospitalisation.

Strategic reductions in hospital bed numbers alongside the development of community care services can shorten the average length of stay. Lengths of stay could often be shortened through better coordination between hospitals and post-discharge care settings. An important constraint in many countries is the shortage of capacity in intermediate or long-term care facilities, or in providing home-based care. Many countries (for example, the Netherlands, Sweden, Norway and parts of the United Kingdom) have taken steps in recent years to increase the capacity of intermediate care facilities and home-based care to reduce lengths of stay and the risk of hospital re-admission (see Chapter 2).

Definition and comparability

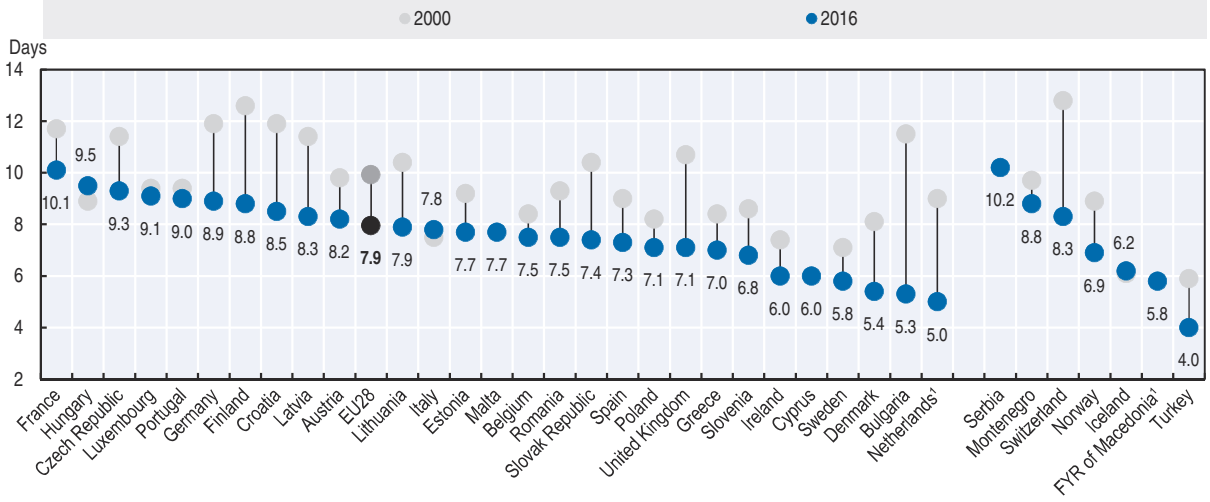
Average length of stay refers to the average number of days that patients spend in hospital. It is generally measured by dividing the total number of days stayed by all inpatients during a year by the number of admissions or discharges. Day cases are excluded.

The data cover all inpatient cases (including not only curative/acute care cases), with the exception of the Netherlands where the data refer to curative/acute care only (resulting in a substantial under-estimation).

Average length of stay of healthy babies born in hospitals are excluded in several countries (e.g. Austria, Cyprus, Estonia, Finland, France, Greece, Ireland, Luxembourg), resulting in a slight over-estimation of average length of stay compared with other countries.

Data for normal delivery refer to ICD-10 code O80, and for AMI to ICD-10 codes I21-I22.

8.8. Average length of stay in hospital, 2000 and 2016 (or nearest year)



Note: Data refer to average length of stay for curative (acute) care (resulting in an under-estimation).
Source: OECD Health Statistics 2018; Eurostat Database.

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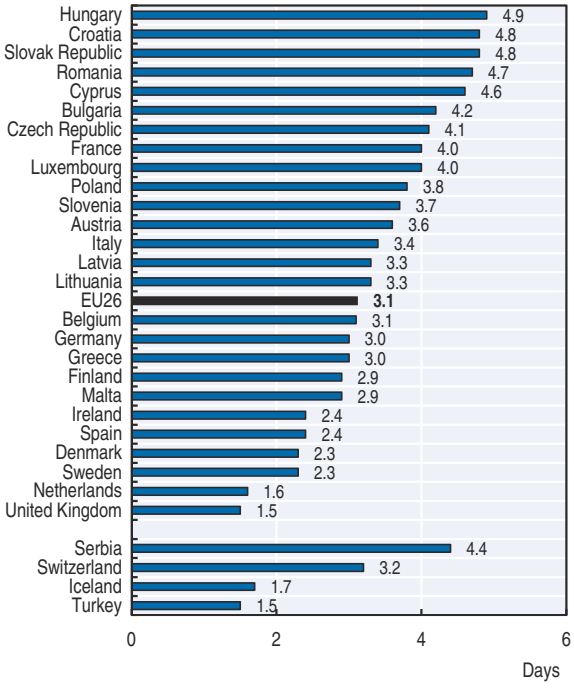
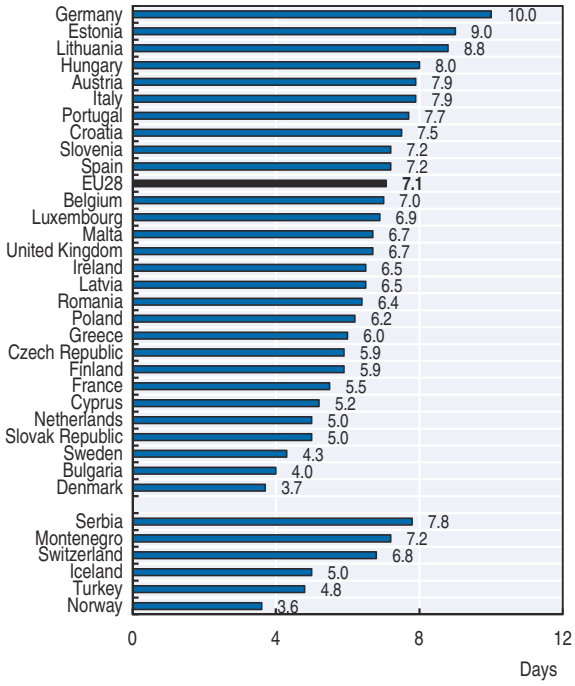
8.9. Average length of stay for normal delivery, 2016 (or nearest year)



Source: OECD Health Statistics 2018; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836884

8.10. Average length of stay for acute myocardial infarction (AMI), 2016 (or nearest year)



Source: OECD Health Statistics 2018; Eurostat Database.

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DAY SURGERY

Day surgery has expanded in EU countries over the past few decades, thanks to progress in surgical techniques and anaesthesia, although the pace of diffusion has varied widely across countries.

Cataract surgery, repair of inguinal hernia and tonsillectomy provide good examples of surgical procedures that are now carried out mainly as day surgery in many, but not all, EU countries.

More than 95% of all cataract surgery are performed as day surgery in about half of EU countries (Figure 8.11). Yet, the use of day surgery remains much more limited in some Central and Eastern European countries (e.g. Romania, Poland, Bulgaria and Lithuania), accounting for less than half of all cataract operations. Beyond possibly reflecting some limitations in data coverage, this low share of day surgery may also be due to higher reimbursement for inpatient stays, or legal or capacity constraints imposed on the development of day surgery. In Hungary, the government recently abolished the budget cap on the number of day surgery that can be performed in hospital, which has led to a substantial growth in the number of day surgery for cataract.

More than half of all inguinal hernia repair interventions in many EU countries are now performed as day surgery, whereas this proportion still remains close to zero in other countries. On average across countries, the share of day surgery for inguinal hernia repair rose from about 20% in 2000 to over 40% in 2016. Day surgery for inguinal hernia repair increased particularly rapidly in countries like France and Portugal, which have moved closer to the share of over 80% in leading countries (Denmark and the Netherlands).

Tonsillectomy is one of the most frequent surgical procedures in children. Although the operation is performed under general anaesthesia and generally involves a post-operative observation period of about 6 to 8 hours, it is now carried out mainly as a day surgery in many countries, with children returning home the same day. As shown in Figure 8.13, more than half of all tonsillectomies are now performed as day surgery in several EU countries, but there has not been any movement yet towards day surgery in other countries (e.g. Slovenia, Hungary, Austria, Cyprus and Bulgaria). These variations in clinical practice likely reflect persisting differences in the perceived risks of postoperative complications and the maintenance of a clinical tradition in some countries of keeping children for at least one night in hospital after the operation.

As noted in Chapter 2, at least three broad policy levers can be used to promote the expansion of day surgery: 1) publicly monitoring the progress in the use of day surgery at different levels (national, regional and hospital levels); 2) supporting behavioural and clinical changes, notably by promoting constructive exchanges between the most innovative hospitals or hospital units and those lagging behind; and 3) providing proper financial incentives to ensure that health care providers (hospitals and surgical teams) do not lose revenue by moving towards a greater use of day surgery, and may even be financially better-off. These interventions are likely to be more effective if they are part of a comprehensive strategy to promote day surgery. In Portugal, the strong growth in day surgery for cataracts and other interventions since 2000 has been supported by a comprehensive national plan (Lemos, 2011). In Belgium, recent proposals for a further expansion of day surgery have also recognised the importance of addressing various barriers and enabling factors at the same time (Leroy et al., 2017).

Definition and comparability

Cataract surgery consists of removing the lens of the eye because of the presence of cataracts that are partially or completely clouding the lens, and replacing it with an artificial lens. Repair of inguinal hernia is a surgery to repair a weakness in the abdominal wall; the operation is now commonly performed laparoscopically (using minimally invasive surgery), allowing patients to return home more quickly. Tonsillectomy consists of removing the tonsils (glands at the back of the throat).

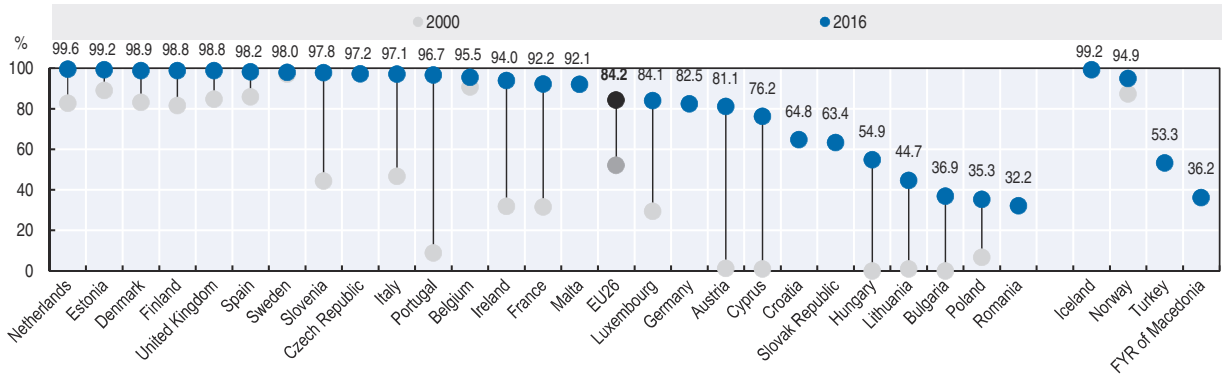
Day surgery is defined as the release of a patient who was admitted to a hospital for a planned surgical procedure and was discharged the same day. For cataract surgery and tonsillectomy, the data also include outpatient cases (i.e. patients not formally admitted and discharged) where available. However, several countries are not able to report outpatient cases, leading to some underestimation. In Ireland, Portugal and the United Kingdom, the data only include cataract operations performed in public or publicly funded hospitals, which may affect the share of day surgery if the volume of activities in private hospitals is substantial and if the practice pattern in private hospitals differs from public hospitals.

References

Lemos, P. (2011), "A huge increase in ambulatory surgery practice in Portugal", *Ambulatory Surgery*, Vol. 17, No. 1, March 2011.

Leroy, R. et al. (2017), Proposals for a further expansion of day surgery in Belgium, Belgian Health Care Knowledge Centre, KCE Reports 282.

8.11. Share of cataract surgery performed as day cases, 2000 and 2016 (or nearest year)



Source: OECD Health Statistics 2018; Eurostat Database.

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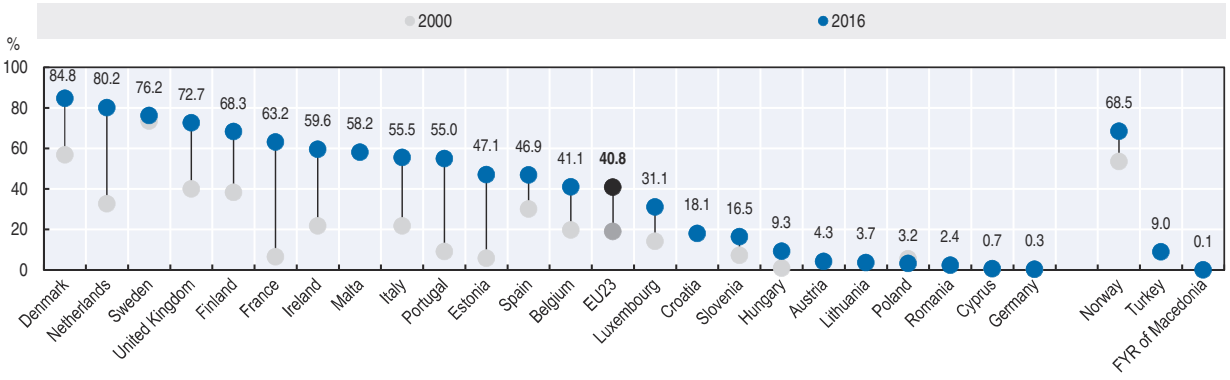
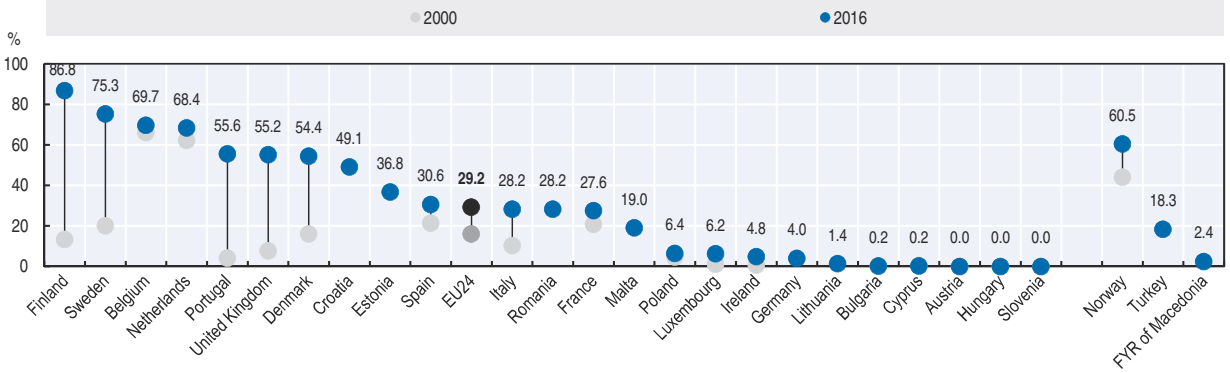
8.12. Share of inguinal hernia repair performed as day cases, 2000 and 2016 (or nearest year)



Note: Day cases do not include outpatient cases in countries where patients are not formally admitted to hospital.
Source: OECD Health Statistics 2018; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836941

8.13. Share of tonsillectomy performed as day cases, 2000 and 2016 (or nearest year)



Source: OECD Health Statistics 2018; Eurostat Database.

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CAPITAL EXPENDITURE IN THE HEALTH SECTOR

While the health sector remains highly labour-intensive, capital investment in infrastructure and medical equipment has been an increasingly important factor of production of health services in recent decades, as reflected for example by the growing importance of diagnostic and therapeutic devices or the expansion of information and communications technology (ICT) in health care (see the indicator on the adoption and use of Electronic Medical Records and ePrescribing). However, the level of resources invested in buildings, machinery and technology tends to fluctuate more than current spending on health services, often responding to the economic climate whereby investment decisions may be postponed or brought forward.

In 2016, it is estimated that the European Union as a whole allocated around 0.6% of its total GDP on capital spending in the health sector (Figure 8.14). This compares to 9.6% of GDP allocated to current spending on health services and medical goods (see the indicator on health expenditure as a share of GDP in Chapter 5). As with current spending, there are differences both in the current levels of investment between countries and in recent trends.

As a proportion of GDP, Germany was the biggest spender on capital investment in the health sector in 2016 with around 1.1% of its GDP allocated, followed by a group of countries – Belgium, Malta, Spain and Austria – that spent between 0.7-0.85% of their GDP. At the lower end, the Czech Republic, Hungary and Croatia invested less than 0.15% of their GDP on capital infrastructure and equipment in the health sector.

By its nature, capital spending fluctuates more than current spending from year to year in line with capital projects on construction (i.e. building of hospitals and other health care facilities) and investment programmes on new equipment (e.g. medical and ICT equipment), but decisions on capital spending also tend to be more affected by economic cycles with spending on health system infrastructure and equipment often being a prime target for reduction or postponement during periods of economic uncertainty. While capital spending grew strongly prior to the crisis – overall capital spending in the EU rose by more than 30% between 2005 and 2008 in real terms – it fell to a level almost 10% below this over the next five years. From 2013 onwards, overall investment has increased again by about 15% and was higher than its pre-crisis levels overall by 2016 (Figure 8.15).

Despite the economic crisis, capital spending continued to increase fairly steadily in countries like Austria, Belgium and Sweden. France has seen spending levels generally maintained over the period, and are typically 50% higher than in 2005. On the other hand, a number of European countries experienced severe reductions in capital spending. In Greece, spending in 2016 was still less than half its 2005 level, dropping to about a quarter of the level in 2012 and 2013. In Italy, investment has also continued to drift downwards since 2010. While capital spending increased in the United Kingdom in the immediate aftermath of the crisis, spending in 2015 and 2016 was still 20-30% down in real terms on 2005 levels.

In making capital investment decisions, policy makers need to carefully assess not only the short-term costs, but also the potential benefits in the short, medium and longer term. Slowing down investment in health infrastructure and equipment may also reduce the capacity to treat patients and contribute to increases in waiting times for different types of services.

Definition and comparability

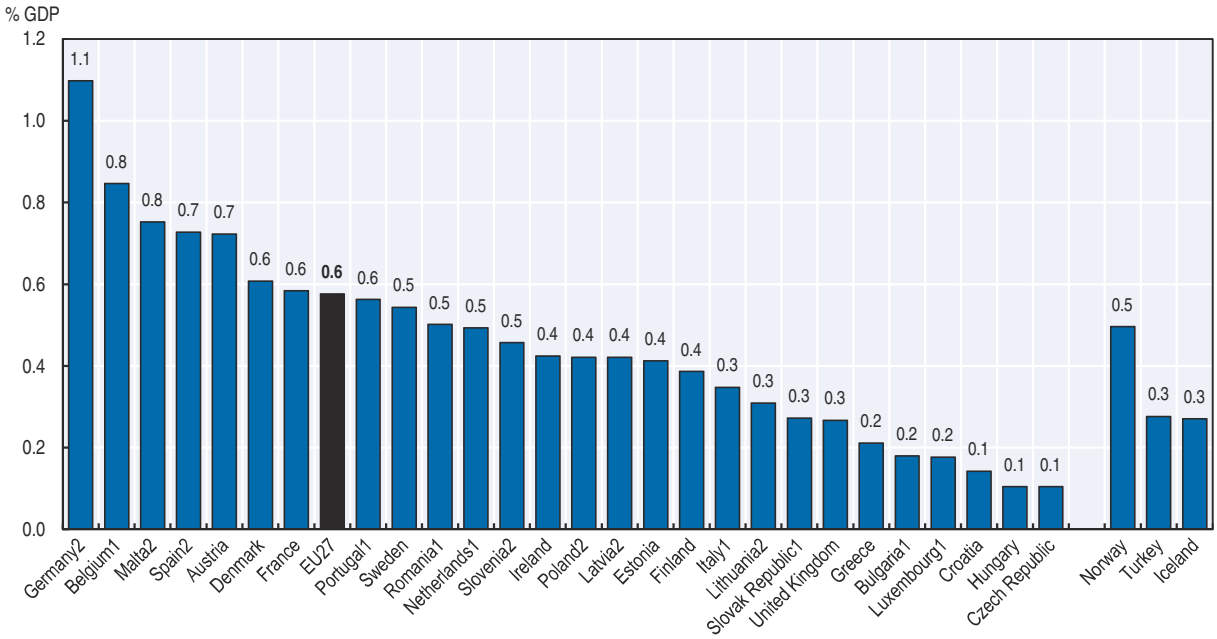
Gross fixed capital formation in the health sector is measured by the total value of the fixed assets that health providers have acquired during the accounting period (less the value of the disposals of assets) and that are used repeatedly or continuously for more than one year in the production of health services. The breakdown by assets includes infrastructure (e.g. hospitals, clinics, etc.), machinery and equipment (including diagnostic and surgical machinery, ambulances, and ICT equipment), as well as software and databases.

Gross fixed capital formation is reported by many countries under the System of Health Accounts. It is also reported under the National Accounts broken down by industrial sector according to the International Standard Industrial Classification (ISIC) Rev. 4 using Section Q: Human health and social work activities or Division 86: Human health activities. The former is normally broader than the SHA boundary while the latter is narrower.

Reference

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

8.14. Gross fixed capital formation in the health sector as a share of GDP, 2016 (or nearest year)

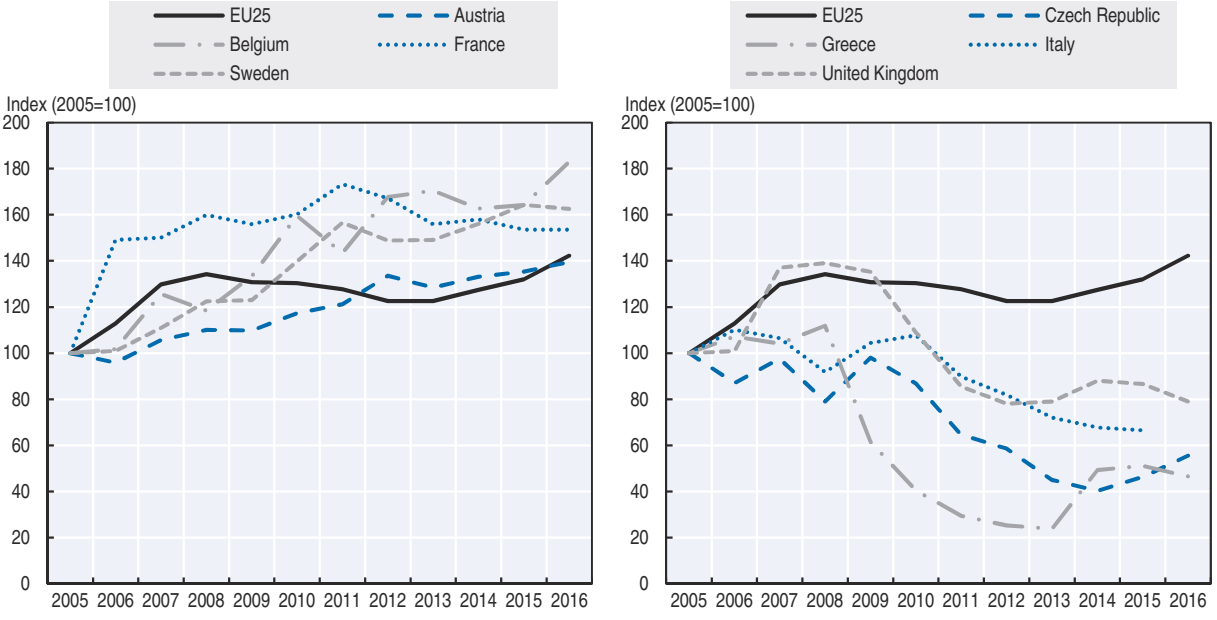


1. Refers to gross fixed capital formation in ISIC 86: Human health activities (ISIC Rev. 4).
2. Refers to gross fixed capital formation in ISIC Q: Human health and social work activities (ISIC Rev. 4).

Source: OECD Health Statistics 2018; OECD National Accounts; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836979

8.15. Changes in gross fixed capital formation, selected countries, 2005 to 2016



Source: OECD Health Statistics 2018; OECD National Accounts; Eurostat Database.

StatLink http://dx.doi.org/10.1787/888933836998

PROJECTIONS OF PUBLIC EXPENDITURE ON HEALTH AND LONG-TERM CARE

Despite a dramatic slowdown in spending on health and long-term care in many EU member states following the 2008 economic and financial crisis, more recent estimates show that spending is back on an upward path. Since, on average, around three-quarters of health spending is financed out of public sources, this represents a sizeable share of government spending, meaning that growth in health and long-term care spending can have a considerable impact on a country's budgetary position. In addition, ageing populations will continue to exert pressures on health and long-term care spending while at the same time reducing the size of the working-age population able to finance such expenditures, thereby raising concerns around the fiscal sustainability of health and long-term care systems (OECD, 2015).

Projections of public expenditure on both health and long-term care are regularly carried out by the Ageing Working Group of the Economic Policy Committee (AWG), using the European Commission services' models (EC and EPC, 2017). In both health and long-term care projection models, a range of scenarios tests the potential impact of different determinants of public spending (including both demographic and non-demographic factors) to project how each may contribute to the evolution of public spending over the next 50 years.

The results presented here are based on the reference (or baseline) scenario. Among the main assumptions are that half of the future gains in life expectancy are assumed to be spent in good health and that there is a convergence of income elasticity of health care spending from 1.1 in 2016 to unity by 2070. The main outcome of the 2018 projection exercise, based on these set of assumptions, is an increase of public spending on health of almost one percentage point (0.9) of GDP in total for the 28 EU countries by 2070 (Figure 8.16). At the lower end of the projections, public expenditure on health is forecast to rise by only 0.3 of GDP in Bulgaria and Estonia, while it is projected to increase by more than 2 percentage points of GDP in Portugal and Malta (EC and EPC, 2018).

Long-term care expenditure represents an increasing share of GDP in many EU countries and as such is important in the long-term sustainability of public finances. Under the same AWG reference scenario of healthy life expectancy gains and converging income elasticity, the main result from the baseline scenario is a projected increase in public spending on long-term care across the 28 EU countries by slightly more than one percentage point, from 1.6% of GDP in 2016 to 2.7% of GDP in 2070 (Figure 8.17). The results vary widely across countries, from only 0.1 percentage point of GDP in Greece and Bulgaria up to more than 2 percentage points of GDP in Luxembourg, the Netherlands and Denmark (EC and EPC, 2018).

Additional OECD studies have shown that different policy and institutional factors (such as financing mechanisms, decentralisation, organisation of health provision, etc.), can all have a substantial impact on the growth in public spending on health care (de la Maisonneuve et al., 2016).

Definition and comparability

Public expenditure on health is defined as the "core" health care categories (SHA 1.0 categories HC.1 to HC.9), excluding long-term nursing care category (HC.3), but including capital investment in health (HC.R.1). It excludes private expenditure in the form of direct out-of-pocket payments by households and private health insurance.

Long-term care is defined as a range of services required by persons with reduced degree of functional capacity (physical or cognitive) and who are consequently dependent on help with basic and/or instrumental activities of daily living for an extended period of time. Basic Activities of Daily Living (ADL) or personal care services are frequently provided in combination with basic medical services such as nursing care, prevention, rehabilitation or services of palliative care. Instrumental Activities of Daily Living (IADL) or assistance care services are mostly linked to home help.

The data, methodology and assumptions used for the health and long-term care expenditure projections are explained in detail in the 2017 report prepared by the European Commission (DG ECFIN) and the Economic Policy Committee (Ageing Working Group). The "AWG reference scenario" is used as the baseline scenario when calculating the overall budgetary impact of ageing. The EU averages are weighted according to GDP.

References

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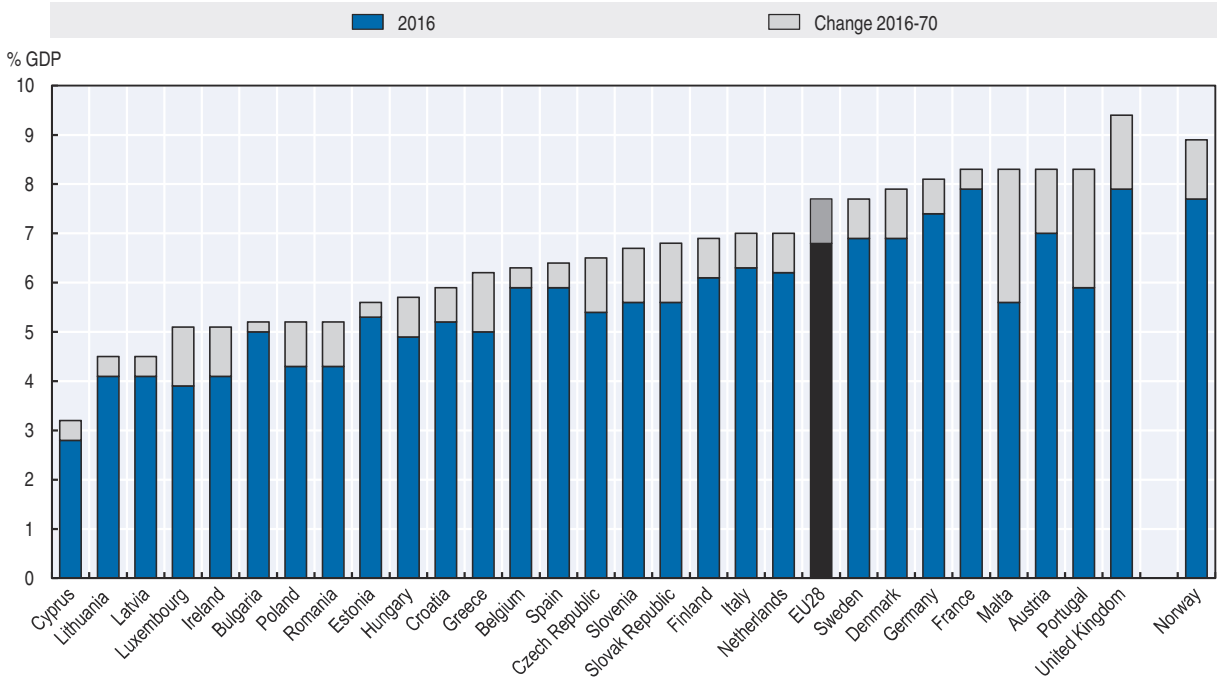
8.16. Public spending on health care as a percentage of GDP, 2016 to 2070 – Ageing Working Group reference scenario



Note: The EU28 total is weighted by GDP.
Source: EC and EPC (2018).

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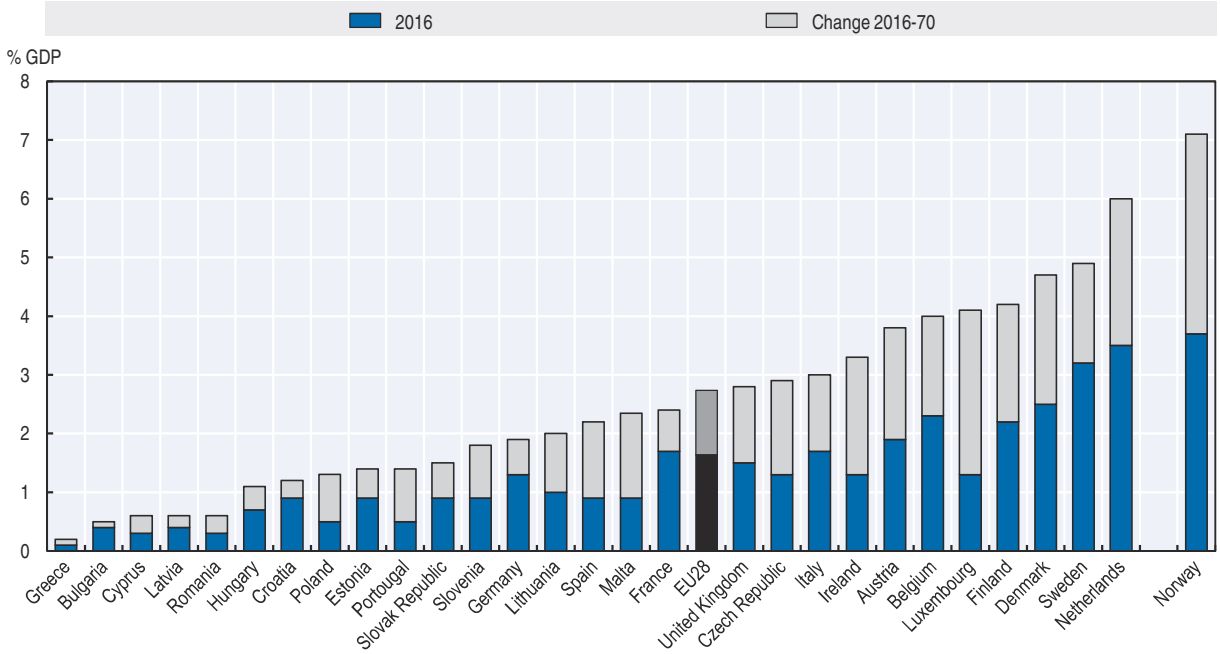
8.17. Public spending on long-term care as a percentage of GDP, 2016 to 2070 – Ageing Working Group reference scenario



Note: The EU28 total is weighted by GDP.
Source: EC and EPC (2018).

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Statistical annex

Table A.1. **Total population, mid-year, thousands, 2000 to 2017**

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Austria	8 012	8 228	8 363	8 392	8 430	8 480	8 546	8 643	8 737	8 773
Belgium	10 251	10 479	10 896	11 038	11 107	11 159	11 209	11 274	11 331	11 352
Bulgaria	8 170	7 659	7 396	7 348	7 306	7 265	7 224	7 178	7 128	7 102
Croatia	4 468	4 312	4 296	4 283	4 269	4 254	4 236	4 208	4 172	4 154
Cyprus	694	739	829	851	864	862	853	848	852	855
Czech Republic	10 255	10 211	10 474	10 496	10 511	10 514	10 525	10 546	10 566	10 579
Denmark	5 340	5 419	5 548	5 571	5 592	5 615	5 643	5 683	5 728	5 749
Estonia	1 397	1 355	1 331	1 327	1 323	1 318	1 315	1 315	1 316	1 316
Finland	5 176	5 246	5 363	5 388	5 414	5 439	5 462	5 480	5 495	5 503
France	60 762	63 001	64 819	65 128	65 439	65 771	66 084	66 593	66 860	66 989
Germany	82 212	82 469	81 777	80 275	80 426	80 646	80 983	81 687	82 349	82 522
Greece	10 806	10 987	11 121	11 105	11 045	10 965	10 892	10 821	10 776	10 768
Hungary	10 211	10 087	10 000	9 972	9 920	9 893	9 866	9 843	9 814	9 798
Ireland	3 805	4 160	4 560	4 580	4 600	4 624	4 658	4 702	4 755	4 784
Italy	56 942	57 969	59 277	59 379	59 540	60 234	60 789	60 731	60 627	60 589
Latvia	2 368	2 239	2 098	2 060	2 034	2 013	1 994	1 978	1 960	1 950
Lithuania	3 500	3 323	3 097	3 028	2 988	2 958	2 932	2 905	2 868	2 848
Luxembourg	436	465	507	518	531	543	556	570	583	596
Malta	390	404	415	416	420	426	435	445	455	460
Netherlands	15 926	16 320	16 615	16 693	16 755	16 804	16 865	16 940	17 030	17 082
Poland	38 259	38 165	38 043	38 063	38 063	38 040	38 012	37 986	37 970	37 973
Portugal	10 290	10 503	10 573	10 558	10 515	10 457	10 401	10 358	10 325	10 310
Romania	22 443	21 320	20 247	20 148	20 058	19 984	19 909	19 815	19 702	19 644
Slovak Republic	5 389	5 373	5 391	5 398	5 408	5 413	5 419	5 424	5 431	5 435
Slovenia	1 989	2 000	2 049	2 053	2 057	2 060	2 062	2 064	2 065	2 066
Spain	40 568	43 653	46 577	46 743	46 773	46 620	46 481	46 445	46 484	46 528
Sweden	8 872	9 030	9 378	9 449	9 519	9 600	9 696	9 799	9 923	9 995
United Kingdom	58 893	60 401	62 766	63 259	63 700	64 128	64 613	65 129	65 596	65 809
EU28 (total)	**487 822**	**495 517**	**503 808**	**503 519**	**504 605**	**506 087**	**507 660**	**509 409**	**510 900**	**511 528**
Albania	3 061	3 011	2 913	2 905	2 900	2 895	2 894	2 889	2 881	2 877
FYR of Macedonia	2 026	2 037	2 055	2 059	2 061	2 064	2 067	2 070	2 072	2 074
Iceland	281	297	318	319	321	324	327	331	335	338
Montenegro	605	613	619	620	621	621	622	622	622	622
Norway	4 491	4 623	4 889	4 953	5 019	5 080	5 137	5 190	5 235	5 258
Serbia	7 516	7 441	7 291	7 234	7 199	7 164	7 131	7 095	7 058	7 040
Switzerland	7 184	7 437	7 825	7 912	7 997	8 089	8 189	8 282	8 373	8 420
Turkey	65 809	68 435	73 142	74 224	75 176	76 148	77 182	78 218	79 278	79 815

Note: Data for 2017 are provisional and subject to revisions.
Source: Eurostat Database (data extracted in June 2018).

StatLink http://dx.doi.org/10.1787/888933837055

Table A.2. **Share of the population aged 65 and over, January 1st, 1960 to 2017**

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016	2017
Austria	12.1	14.0	15.5	14.9	15.4	17.6	17.6	17.8	18.1	18.3	18.5	18.4	18.5
Belgium	12.0	13.3	14.3	14.8	16.8	17.2	17.1	17.4	17.6	17.8	18.1	18.2	18.5
Bulgaria	7.4	9.4	11.8	13.0	16.2	18.2	18.5	18.8	19.2	19.6	20.0	20.4	20.7
Croatia	..	..	..	..	16.1	17.8	17.7	17.9	18.1	18.4	18.8	19.2	19.6
Cyprus	6.4	9.5	10.8	10.8	11.2	12.5	12.7	12.8	13.2	13.9	14.6	15.1	15.6
Czech Republic	9.5	11.9	13.6	12.5	13.8	15.3	15.6	16.2	16.8	17.4	17.8	18.3	18.8
Denmark	10.5	12.2	14.3	15.6	14.8	16.3	16.8	17.3	17.8	18.2	18.6	18.8	19.1
Estonia	10.5	11.7	12.5	11.6	14.9	17.4	17.4	17.7	18.0	18.4	18.8	19.0	19.3
Finland	7.2	9.0	11.9	13.3	14.8	17.0	17.5	18.1	18.8	19.4	19.9	20.5	20.9
France	11.6	12.8	14.0	13.9	16.0	16.8	16.9	17.3	17.7	18.0	18.4	18.8	19.2
Germany[1]	10.8	13.0	15.6	15.3 |	16.2	20.7	20.7	20.7	20.8	20.9	21.0	21.1	21.2
Greece	9.4	11.1	13.1	13.7	17.3	19.0	19.3	19.7	20.1	20.5	20.9	21.3	21.5
Hungary	8.9	11.5	13.5	13.2	15.0	16.6	16.7	16.9	17.2	17.5	17.9	18.3	18.7
Ireland	11.1	11.1	10.7	11.4	11.2	11.2	11.5	11.9	12.2	12.6	12.9	13.2	13.5
Italy	9.3	10.8	13.1	14.7	18.1	20.4	20.5	20.8	21.2	21.4	21.7	22.0	22.3
Latvia	..	11.9	13.0	11.8	14.8	18.1	18.4	18.6	18.8	19.1	19.4	19.6	19.9
Lithuania	..	10.0	11.3	10.8	13.7	17.3	17.9	18.1	18.2	18.4	18.7	19.0	19.3
Luxembourg	10.8	12.5	13.7	13.4	14.3	14.0	13.9	14.0	14.0	14.1	14.2	14.2	14.2
Malta	..	..	8.4	10.4	11.8	14.9	15.7	16.4	17.1	17.7	18.2	18.5	18.8
Netherlands	8.9	10.1	11.5	12.8	13.6	15.3	15.6	16.2	16.8	17.3	17.8	18.2	18.5
Poland	5.8	8.2	10.2	10.0	12.1	13.6	13.6	14.0	14.4	14.9	15.4	16.0	16.5
Portugal	7.8	9.2	11.2	13.2	16.0	18.3	18.7	19.0	19.4	19.9	20.3	20.7	21.1
Romania	..	8.5	10.3	10.3	13.2	16.1	16.1	16.1	16.3	16.5	17.0	17.4	17.8
Slovak Republic	6.8	9.1	10.6	10.3	11.4	12.4	12.6	12.8	13.1	13.5	14.0	14.4	15.0
Slovenia	..	..	10.9	10.6	13.9	16.5	16.5	16.8	17.1	17.5	17.9	18.4	18.9
Spain	8.2	9.5	11.1	13.4	16.5	16.8	17.1	17.4	17.7	18.1	18.5	18.7	19.0
Sweden	11.7	13.6	16.2	17.8	17.3	18.1	18.5	18.8	19.1	19.4	19.6	19.8	19.8
United Kingdom	11.7	12.9	14.9	15.7	15.8	16.3	16.4	16.8	17.2	17.5	17.7	17.9	18.1
EU28 (total)	**9.8**	**11.3**	**13.1**	**13.7**	**15.8**	**17.5**	**17.6**	**17.9**	**18.2**	**18.5**	**18.9**	**19.2**	**19.4**
Albania	..	..	..	..	8.1	..	..	..	..	12.0	12.4	12.9	13.1
FYR of Macedonia	..	..	..	8.4	9.8	11.6	11.7	11.8	12.0	12.4	12.7	13.0	13.3
Iceland	8.0	8.8	9.8	10.6	11.6	12.0	12.3	12.6	12.9	13.2	13.5	13.9	14.0
Montenegro	..	..	..	..	12.2	12.9	12.8	12.9	13.1	13.3	13.7	14.1	14.4
Norway	10.9	12.8	14.7	16.3	15.3	14.9	15.1	15.4	15.7	15.9	16.1	16.4	16.6
Serbia	..	..	..	..	16.0	17.0	17.2	17.3	17.6	18.0	18.5	19.0	19.4
Switzerland	10.2	11.2	13.8	14.6	15.3	16.8	16.9	17.2	17.4	17.6	17.8	18.0	18.1
Turkey	3.5	4.4	4.7	4.3	5.4	7.0	7.2	7.3	7.5	7.7	8.0	8.2	8.3

| Break in series.

1. Population figures for Germany prior to 1991 refer to West Germany.

Source: Eurostat Database (data extracted in June 2018).

StatLink http://dx.doi.org/10.1787/888933837074

Table A.3. **Crude birth rate, per 1 000 population, 1960 to 2016**

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016
Austria	17.9	15.0	12.0	11.8	9.8	9.4	9.3	9.4	9.4	9.6	9.8	10.0
Belgium	16.8	14.7	12.6	12.4	11.4	11.9	11.7	11.5	11.3	11.2	10.8	10.8
Bulgaria	17.8	16.3	14.5	12.1	9.0	10.2	9.6	9.5	9.2	9.4	9.2	9.1
Croatia	18.4	13.8	14.8	11.6	9.8	10.1	9.6	9.8	9.4	9.3	8.9	9.0
Cyprus	26.2	19.2	20.4	18.3	12.2	11.8	11.3	11.8	10.8	10.9	10.8	11.1
Czech Republic	13.4	15.0	14.9	12.6	8.9	11.2	10.4	10.3	10.2	10.4	10.5	10.7
Denmark	16.6	14.4	11.2	12.3	12.6	11.4	10.6	10.4	10.0	10.1	10.2	10.8
Estonia	16.7	15.8	15.0	14.2	9.4	11.9	11.1	10.6	10.3	10.3	10.6	10.7
Finland	18.5	14.0	13.2	13.1	11.0	11.4	11.1	11.0	10.7	10.5	10.1	9.6
France	17.9	16.7	14.9	13.4	13.1	12.8	12.5	12.4	12.4	12.4	12.0	11.7
Germany[1]	17.4	13.3	10.1	11.5 |	9.3	8.3	8.3	8.4	8.5	8.8	9.0	9.6
Greece	18.9	16.5	15.4	10.0	9.6	10.3	9.6	9.1	8.6	8.5	8.5	8.6
Hungary	14.7	14.7	13.9	12.1	9.6	9.0	8.8	9.1	9.0	9.5	9.4	9.7
Ireland	21.5	21.8	21.7	15.1	14.4	16.5	16.2	15.6	14.9	14.4	13.9	13.4
Italy	18.1	16.7	11.3	10.0	9.5	9.5	9.2	9.0	8.5	8.3	8.0	7.8
Latvia	16.7	14.6	14.1	14.2	8.6	9.4	9.1	9.8	10.2	10.9	11.1	11.2
Lithuania	22.5	17.7	15.2	15.4	9.8	9.9	10.0	10.2	10.1	10.4	10.8	10.7
Luxembourg	16.0	13.0	11.4	12.9	13.1	11.6	10.9	11.3	11.3	10.9	10.7	10.4
Malta	26.2	17.6	17.7	15.2	11.3	9.4	10.0	9.8	9.5	9.6	9.7	9.8
Netherlands	20.8	18.3	12.8	13.2	13.0	11.1	10.8	10.5	10.2	10.4	10.1	10.1
Poland	22.6	16.8	19.6	14.4	9.9	10.9	10.2	10.1	9.7	9.9	9.7	10.1
Portugal	24.1	20.8	16.2	11.7	11.7	9.6	9.2	8.5	7.9	7.9	8.3	8.4
Romania	19.1	21.1	17.9	13.6	10.4	10.5	9.7	10.0	9.4	10.0	10.0	10.2
Slovak Republic	21.7	17.8	19.1	15.1	10.2	11.2	11.3	10.3	10.1	10.2	10.3	10.6
Slovenia	17.6	15.9	15.7	11.2	9.1	10.9	10.7	10.7	10.2	10.3	10.0	9.9
Spain	21.7	19.5	15.2	10.3	9.8	10.4	10.1	9.7	9.1	9.2	9.0	8.8
Sweden	13.7	13.7	11.7	14.5	10.2	12.3	11.8	11.9	11.8	11.9	11.7	11.8
United Kingdom	17.5	16.2	13.4	13.9	11.5	12.9	12.8	12.8	12.1	12.0	11.9	11.8
EU28 (total)	**18.5**	**16.3**	**14.0**	**12.4**	**10.6**	**10.7**	**10.5**	**10.4**	**10.0**	**10.1**	**10.0**	**10.1**
Albania	43.3	32.5	26.5	25.1	16.7	..	11.2	..	12.3	12.4	11.3	11.0
FYR of Macedonia	31.7	23.2	21.0	18.8	14.5	11.8	11.1	11.4	11.2	11.4	11.1	11.1
Iceland	28.0	19.7	19.8	18.7	15.3	15.4	14.1	14.1	13.4	13.4	12.5	12.0
Montenegro	..	..	..	..	15.2	12.0	11.6	12.0	12.0	12.1	11.9	12.2
Norway	17.3	16.7	12.5	14.4	13.2	12.6	12.2	12.0	11.6	11.5	11.3	11.3
Serbia	..	..	..	..	9.8	9.4	9.1	9.3	9.2	9.3	9.3	9.2
Switzerland	17.7	16.1	11.7	12.5	10.9	10.3	10.2	10.3	10.2	10.4	10.5	10.5
Turkey	..	..	..	..	21.1	16.9	16.7	17.0	16.8	17.3	16.9	16.5

| Break in series.

1. Population figures for Germany prior to 1991 refer to West Germany.

Note: Crude birth rate is defined as the number of live births per 1 000 population.

Source: Eurostat Database (data extracted in June 2018).

StatLink http://dx.doi.org/10.1787/888933837093

Table A.4. **Total fertility rate, number of children per women aged 15-49, 1960 to 2016**

	1960	1970	1980	1990	2000	2010	2011	2012	2013	2014	2015	2016
Austria	2.69	2.29	1.65	1.46	1.36	1.44	1.43	1.44	1.44	1.46	1.49	1.53
Belgium	2.54	2.25	1.68	1.62	1.67	1.86	1.81	1.80	1.76	1.74	1.70	1.68
Bulgaria	2.31	2.17	2.05	1.82	1.26	1.57	1.51	1.50	1.48	1.53	1.53	1.54
Croatia	2.20	1.80	1.90	1.70	1.46	1.55	1.48	1.51	1.46	1.46	1.40	1.42
Cyprus	..	..	2.48	2.41	1.64	1.44	1.35	1.39	1.30	1.31	1.32	1.37
Czech Republic	2.09	1.92	2.08	1.90	1.15	1.51	1.43	1.45	1.46	1.53	1.57	1.63
Denmark	2.57	1.95	1.55	1.67	1.77	1.87	1.75	1.73	1.67	1.69	1.71	1.79
Estonia	1.98	2.17	2.02	2.05	1.36	1.72	1.61	1.56	1.52	1.54	1.58	1.60
Finland	2.72	1.83	1.63	1.78	1.73	1.87	1.83	1.80	1.75	1.71	1.65	1.57
France	2.73	2.47	1.95	1.78	1.87	2.02	2.00	1.99	1.99	2.01	1.96	1.92
Germany[1]	2.37	2.03	1.56	1.45 |	1.38	1.39	1.39	1.41	1.42	1.47	1.50	1.60
Greece	2.23	2.40	2.23	1.39	1.25	1.48	1.40	1.34	1.29	1.30	1.33	1.38
Hungary	2.02	1.98	1.91	1.87	1.32	1.25	1.23	1.34	1.35	1.44	1.45	1.53
Ireland	3.78	3.85	3.21	2.11	1.89	2.05	2.03	1.98	1.93	1.89	1.85	1.81
Italy	2.37	2.38	1.64	1.33	1.26	1.46	1.44	1.43	1.39	1.37	1.35	1.34
Latvia	1.94	2.02	1.90	2.01	1.25	1.36	1.33	1.44	1.52	1.65	1.70	1.74
Lithuania	..	2.40	1.99	2.03	1.39	1.50	1.55	1.60	1.59	1.63	1.70	1.69
Luxembourg	2.29	1.97	1.50	1.60	1.76	1.63	1.52	1.57	1.55	1.50	1.47	1.41
Malta	..	..	1.99	2.04	1.68	1.36	1.45	1.42	1.36	1.38	1.37	1.37
Netherlands	3.12	2.57	1.60	1.62	1.72	1.79	1.76	1.72	1.68	1.71	1.66	1.66
Poland	2.98	2.20	2.28	2.06	1.37	1.41	1.33	1.33	1.29	1.32	1.32	1.39
Portugal	3.16	3.01	2.25	1.56	1.55	1.39	1.35	1.28	1.21	1.23	1.31	1.36
Romania	..	..	2.43	1.83	1.31	1.59	1.47	1.52	1.46	1.56	1.58	1.64
Slovak Republic	3.04	2.41	2.32	2.09	1.30	1.43	1.45	1.34	1.34	1.37	1.40	1.48
Slovenia	2.18	2.21	1.93	1.46	1.26	1.57	1.56	1.58	1.55	1.58	1.57	1.58
Spain	2.86	2.90	2.22	1.36	1.22	1.37	1.34	1.32	1.27	1.32	1.33	1.34
Sweden	2.20	1.92	1.68	2.13	1.54	1.98	1.90	1.91	1.89	1.88	1.85	1.85
United Kingdom	2.72	2.43	1.90	1.83	1.64	1.92	1.91	1.92	1.83	1.81	1.80	1.79
EU28 (total)	**2.61**	**2.35**	**1.92**	**1.66**	**1.46**	**1.62**	**1.59**	**1.59**	**1.55**	**1.58**	**1.57**	**1.60**
Albania	..	..	..	..	1.79	..	..	..	1.73	1.73	..	1.54
FYR of Macedonia	..	..	..	2.23	1.88	1.56	1.46	1.51	1.49	1.52	1.50	1.50
Iceland	4.26	2.81	2.48	2.30	2.08	2.20	2.02	2.04	1.93	1.93	1.80	1.74
Montenegro	..	..	..	..	..	1.70	1.65	1.72	1.73	1.75	1.74	..
Norway	2.94	2.50	1.72	1.93	1.85	1.95	1.88	1.85	1.78	1.75	1.72	1.71
Serbia	..	..	..	..	1.48	1.40	1.40	1.45	1.43	1.46	1.46	1.46
Switzerland	2.44	2.10	1.55	1.58	1.50	1.52	1.52	1.52	1.52	1.54	1.54	1.54
Turkey	6.40	5.00	4.63	3.07	2.27	2.04	2.03	2.09	2.08	2.17	2.14	2.11

| Break in series.

1. Population figures for Germany prior to 1991 refer to West Germany.

Source: Eurostat Database (data extracted in June 2018).

StatLink http://dx.doi.org/10.1787/888933837112

Table A.5. **GDP per capita in 2017 and average annual growth rates, 2009 to 2017**

	GDP per capita in EUR PPP	Annual growth rate per capita in real terms							
	2017	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Austria	38 222	1.6	2.6	0.2	-0.6	0.0	0.0	0.4	2.5
Belgium	34 860	1.8	0.5	-0.4	-0.3	0.8	0.8	0.9	1.5
Bulgaria	14 733	2.0	2.6	0.6	1.4	1.9	4.3	4.7	3.9
Croatia	18 250	-1.2	0.0	-1.9	-0.3	0.3	3.0	4.0	3.2
Cyprus	25 192	-1.3	-2.2	-4.5	-5.7	-0.3	2.6	2.9	3.5
Czech Republic	26 454	2.0	1.6	-0.9	-0.5	2.6	5.1	2.4	4.2
Denmark	37 496	1.4	0.9	-0.1	0.5	1.1	0.9	1.2	1.9
Estonia	23 085	2.5	7.9	4.7	2.3	3.2	1.6	2.0	4.9
Finland	32 681	2.5	2.1	-1.9	-1.2	-1.0	-0.2	1.8	2.5
France	31 172	1.5	1.6	-0.3	0.1	0.5	0.3	0.8	1.6
Germany	36 910	4.3	3.7	0.3	0.2	1.5	0.9	1.1	2.0
Greece	20 062	-5.6	-9.0	-6.8	-2.5	1.4	0.4	0.2	1.4
Hungary	20 410	0.9	2.0	-1.1	2.4	4.5	3.6	2.5	4.2
Ireland	55 360	1.2	2.5	-0.4	1.1	7.5	24.4	4.0	7.1
Italy	28 660	1.4	0.4	-3.1	-2.9	-0.8	1.0	1.0	1.6
Latvia	19 978	-1.9	8.3	5.3	3.5	2.8	3.8	3.1	5.1
Lithuania	23 178	3.8	8.5	5.2	4.6	4.4	3.0	3.7	4.6
Luxembourg	84 402	3.2	0.7	-2.5	1.7	4.0	1.4	1.4	0.5
Malta	29 023	3.0	0.9	1.8	3.2	6.0	7.3	3.1	5.4
Netherlands	38 304	0.9	1.2	-1.4	-0.5	1.1	1.8	1.7	2.9
Poland	21 112	3.9	5.0	1.6	1.5	3.4	3.9	3.0	4.6
Portugal	22 999	1.9	-1.7	-3.6	-0.6	1.4	2.2	1.9	2.8
Romania	18 740	-2.2	2.5	1.7	3.9	3.5	4.5	5.4	7.3
Slovak Republic	23 016	4.9	2.7	1.5	1.4	2.7	3.8	3.2	3.3
Slovenia	25 372	0.8	0.4	-2.9	-1.3	2.9	2.2	3.1	5.0
Spain	27 664	-0.4	-1.3	-3.0	-1.4	1.7	3.5	3.2	3.0
Sweden	36 821	5.1	1.9	-1.0	0.4	1.6	3.4	1.9	1.7
United Kingdom	31 574	0.9	0.7	0.8	1.4	2.3	1.5	1.2	1.5
EU28 (total)	**29 964**	**1.8**	**1.5**	**-0.6**	**0.0**	**1.5**	**2.0**	**1.7**	**2.5**
Albania	8 283	4.2	2.8	1.6	1.2	1.8	2.4	3.6	..
FYR of Macedonia	11 045	3.1	2.2	-0.6	2.8	3.5	3.7	2.8	0.0
Iceland	38 997	-3.5	1.7	0.8	3.3	1.1	3.2	6.0	2.8
Montenegro	12 743	4.7	3.1	-2.8	3.4	1.7	3.3	2.9	..
Norway	44 874	1.6	4.2	2.2	-0.7	-1.3	-3.6	-3.5	4.1
Serbia	10 948	1.0	2.2	-0.5	3.1	-1.4	1.3	3.3	2.1
Switzerland	47 305	1.9	0.6	-0.1	0.7	1.2	0.1	0.3	0.5
Turkey	19 503	6.9	9.5	3.5	7.1	3.8	4.7	1.8	6.7

Note: EU28 displays a weighted average and is calculated based on total GDP divided by the total population of the 28 EU member states.

Source: Eurostat Database; OECD National Accounts Database.

StatLink http://dx.doi.org/10.1787/888933837131

OECD PUBLISHING, 2, rue André-Pascal, 75775 PARIS CEDEX 16
(81 2018 70 1 P) ISBN 978-92-64-30334-8 – 2018

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Co-funded by
the Health Programme
of the European Union

ISBN 978-92-64-30334-8
81 2018 70 1 P

9 789264 303348