Health at a Glance: Europe 2020

STATE OF HEALTH IN THE EU CYCLE

OECD

European Commission

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Foreword

This 2020 edition of *Health at a Glance: Europe* marks the start of a new *State of Health in the EU* cycle – an initiative launched by the European Commission, in co-operation with the OECD and the European Observatory on Health Systems and Policies to assist EU Member States in improving the health of their citizens and the performance of their health systems.

This year, the COVID-19 pandemic has made clear how vulnerabilities in health systems can have profound implications for the health of our people, economic progress, trust in governments, and social cohesion across Europe and around the globe. The new coronavirus has caused severe human suffering and loss of life. As governments grappled with the spread of the virus – by closing down entire sectors of economic and social activity and imposing restrictions on mobility that are unprecedented in our lifetimes, the public health crisis evolved into a major economic and social crisis, with sharply rising unemployment rates and growing income inequalities.

There has been much talk of COVID-19 as a ‘once in a century’ shock, but this might not be the case. In the absence of important changes in our societies and health systems, the current coronavirus pandemic does not reduce the probability of new pandemics caused by emerging or already known pathogens. Nor does it diminish the likelihood that other low probability, high-impact risks might hit health systems, economies and societies in the near future. In fact, other looming crises, such as climate change and environmental degradation, are likely to increase the probability of repeated public health shocks. Building the resilience of our health systems and promoting a green recovery has never been so urgent.

Recognising the importance of national, European and broader international efforts to suppress the spread of the pandemic

The COVID-19 pandemic, as well as other global threats such as climate change and air pollution, have brought to light the need for effective and inclusive multilateralism and co-ordinated actions at national, European and global levels to effectively and equitably deal with these issues. The European Commission and the OECD have worked on many fronts, in co-operation with the WHO and other international organisations, to support countries in their efforts to contain the spread of the coronavirus. We have also worked together to share and promote best practices from European as well as non-European countries that have been leading the way in policy responses.

The race is on to find effective and safe treatments and vaccines for COVID-19 to treat infected people globally and contain the spread of the virus. The European Commission is participating in the COVAX Facility to promote equitable access to affordable COVID-19 vaccines and has contributed EUR 400 million in guarantees to COVAX. European countries also have the collective responsibility to ensure that all new vaccines are developed in a way that ensures the highest standards of quality and safety and, once available, are distributed with the objective of achieving fair access across and within countries.

Digitalising public health management

The COVID-19 pandemic has also highlighted the pressing need for improved data collection and exchange to better monitor and manage public health issues and health systems. Data fragmentation and the limited degree of interoperability of health information systems are inadequate to provide the right information to the right people at the right time. The 2017 OECD Council Recommendation on Health Data Governance lays out the framework to encourage greater availability of timely health data within countries and across borders, while ensuring that risks to privacy and security are minimised and appropriately managed.

To step up co-ordination between authorities across the EU, and as part of its effort to create a *European Health Data Space*, the European Commission is currently developing a governance framework to promote a better use of health data, as well as a digital health infrastructure supporting such access. Once operational, it will allow better use of data for health care, research, innovation and more evidence-based health policy-making. Two decades into the 21st century, health systems need to harness more fully the potential of new information and communication systems.

Giving priority to the prevention of non-communicable diseases is also crucial

The COVID-19 pandemic should not make us lose sight of the major impact of environmental and lifestyle risk factors in the current burden of chronic diseases, which also bear an increasing toll on mortality. In fact, the pandemic has compounded the harm of chronic diseases, given that severe cases of COVID-19 disproportionally affect not only older people, but also those who are obese or have preexisting conditions. Each year, hundreds of thousands of people across EU countries die because of air pollution, tobacco and alcohol consumption, unhealthy diets and lack of physical activity. Cross-sectoral policies need to be actively pursued to reduce population exposure to these health risks.

The prevention and early diagnosis of cancers must play a central part in *Europe's Beating Cancer Plan*. In 2020, 2.7 million people are expected to be diagnosed with cancer across the 27 EU Member States, and 1.3 million to die from it. Over 40% of cancer cases are preventable, and mortality can also be reduced through earlier diagnosis and improved care for cancer patients.

The prevention and early diagnosis of mental health issues has also too often been neglected in the past. The COVID-19 pandemic has increased the risk of development of various mental health conditions, particularly among young people and people in lower-income groups. The previous edition of *Health at a Glance: Europe,* published in 2018, made a strong case for preventing and addressing the huge burden of mental health issues in Europe. This has become an even greater priority now. The OECD Council Recommendation on Integrated Mental Health, Skills and Work Policy calls on governments to promote the provision of early and fully integrated services in order to improve social and labour market outcomes for people with mental health problems.

Promoting an economic recovery that improves people's health and the environment

Urgent actions are also needed to counter the huge consequences of the COVID-19 pandemic on the economy, labour markets and people's quality of life. GDP fell by more than 10% in the second quarter of 2020 in many European countries, and the initial impact of the COVID-19 crisis on labour markets has been ten times larger than that observed in the first months following the 2008 Global Financial Crisis. The EU recovery plan from the COVID-19 crisis provides a tremendous opportunity to promote a stronger, more sustainable, fairer and resilient economy.

We are encouraged to see many governments seizing this once-in-a-lifetime opportunity to ensure a truly sustainable recovery, respectful of the environment and people's health. Climate change, pollution and biodiversity loss are the next crises around the corner, and actions must be taken now to tackle them. Green recovery measures are a win-win option as they can boost economic activities while improving environmental outcomes and enhancing people's health and well-being. Decisions taken now must focus on achieving the national emissions reduction commitments by 2030, to reduce the serious health and mortality consequences of air pollution.

Promoting more resilient health systems through multilateralism

The COVID-19 pandemic has exposed the insufficient preparation of countries to cope with major public health emergencies. The costs of having more resilient health systems pale in comparison with the huge economic consequences of failing to do so. The new coronavirus is neither the first pandemic nor the last one, and many other more or less predictable events may have a huge impact on public health. It has thus become apparent that both the global and EU health security framework need significant strengthening. Fragmentation makes us all vulnerable and it is only through multilateral cooperation that we can face up to public health threats of the magnitude of COVID-19.

The initiatives aimed at setting out a more comprehensive approach to crisis preparedness, surveillance and response presented by the European Commission in November 2020 – including the *Pharmaceutical Strategy for Europe* and the proposals to build a European Health Union by reinforcing the mandates of the *European Centre for Disease Control* and the *European Medicines Agency* – are some of the first, important steps towards this goal. These initiatives provide examples of greater public health cooperation across borders, in the context of reforming and strengthening the WHO.

In addition, we must harness the lessons of this crisis and plan for a thorough assessment of health system resilience, drawing on the best practices from countries within and outside Europe and the support that the European Commission and the OECD can provide. This exercise should involve all stakeholders and lead to better preparedness for pandemics and other public health emergencies in the future.

The foremost lesson learnt from the COVID-19 pandemic is that there is no trade-off between lives and livelihoods. Public health and the global economy are inextricably linked. We cannot have one without the other. Healthy global economic systems depend on healthy citizens. Strengthening the preparedness and resilience of health systems will require additional resources. With the right investment – from better global public health governance, to stronger health information systems and support for a digital transformation of health systems – the return on the well-being of people and the functioning of economies and societies will be high and long-lasting.

Angel Gurría
OECD Secretary-General

Stella Kyriakides
European Commissioner for Health and Food Safety

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Health at a Glance: Europe 2020 is the first step in the *State of Health in the EU* cycle, an initiative launched by the European Commission in 2016 to assist EU Member States in improving the health of their citizens and the performance of their health systems. While the preparation of this publication was led by the OECD, the Commission provided guidance and substantive input throughout the process, as well as financial support.

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Executive summary

The COVID-19 outbreak has spread in 2020 to become the most severe pandemic in the last one hundred years. The public health crisis has led to a major economic crisis, which will have serious consequences on individual and societal well-being both now and in the future. COVID-19 has exposed latent health system fragilities that existed before the outbreak. Despite much talk of health spending being an investment rather than a cost, policy approaches had not changed significantly before the crisis. Health spending overwhelmingly goes on curative care, not prevention.

The staggering impact of COVID-19 on our society and economy has abruptly brought public health back to the top of the policy agenda. COVID-19 mortality has a clear social gradient, which is a bleak reminder of the importance of the social determinants of health.

The COVID-19 pandemic has highlighted the need to consider the resilience of health systems as an equally important dimension of health system performance alongside accessibility, quality of care and efficiency.

The resilience of health systems to COVID-19

By the end of October 2020, over 7 million people were infected and 220 000 had died from COVID-19 across EU countries, Iceland, Norway, Switzerland and the United Kingdom. During the first wave of the pandemic, the virus particularly affected a number of Western European countries, notably Belgium, France, Italy, the Netherlands, Spain and the United Kingdom, as well as Sweden. However, since August 2020, the virus also started to spread more widely across Europe.

A few countries have managed to minimise the health and economic impacts of COVID-19

Providing an overall assessment of country responses to COVID-19 is difficult at this time, given that the pandemic is still very active across the world. European countries struggled to varying degrees to respond to the first wave of the pandemic in Spring 2020 and to the second wave in Autumn 2020. Many countries struggled during the initial months of the crisis to increase the availability of masks and other personal protective equipment. Most countries also struggled to scale-up their testing capacity, which limited the effectiveness of testing, tracking and tracing efforts. This left them with few options to contain the spread of the virus during the first wave, necessitating more stringent confinement measures.

Outside of Europe, Korea is a good example of a country that has managed to control the COVID-19 outbreak through quick, effective and targeted measures, thereby avoiding full lockdowns. New Zealand has been another successful example. In Europe, up until October 2020, a few countries like Finland, Norway and Estonia were better able to contain the spread of the virus and mitigate the economic consequences, in part because of geographic factors (lower population density) but also because of timely implementation of targeted containment measures, and strong trust and compliance by populations.

Older people have been disproportionately hit, with residents in long-term care facilities particularly at risk

The virus has disproportionately hit older people and those with underlying health conditions. In nearly all countries, at least 90% of COVID-19 deaths were amongst people aged 60 and over. In many countries, about half or more of COVID-19 deaths were amongst residents in long-term care (LTC) facilities. The initial response in many countries focused on protecting patients and workers in hospitals. It was only later that similar measures were taken to protect residents and workers in LTC facilities. In several countries, there was at least a two-month lag between the first reported COVID-19 cases and the issuance of guidelines to prevent infections in LTC institutions. In a quarter of countries for which information is available, it took two weeks longer to restrict visits in nursing homes than the restrictions imposed in public spaces. The first wave of the pandemic highlighted the crucial importance of protecting older people and other vulnerable populations from COVID-19 to reduce hospitalisations and deaths.

There has been a clear social gradient in COVID-19 deaths

Poor people, people living in deprived areas and ethnic minorities have also been disproportionately affected. This highlights the need for a strong focus on policies to tackle the social determinants of health, including inclusive social and economic policies and interventions beyond the health system that address the root causes of inequalities.

Addressing the health and welfare impact of air pollution

Between 168 000 and 346 000 premature deaths across EU countries can be attributed to air pollution from fine particles alone

While most of the attention in 2020 was on COVID-19, it is important not to neglect other important risk factors to health, including environmental factors like air pollution. Although air quality has improved in most European countries over the past two decades, pollution levels remain above the WHO guidelines in most countries, particularly in large cities. This has serious consequences for people's health and mortality. Across EU countries, an estimated 168 000 to 346 000 premature deaths can be attributed to exposure to air pollution from fine particles ($PM_{2.5}$) alone in 2018. The mortality of air pollution is particularly high in Central and Eastern Europe because of greater use of fossil fuels. Within each country, disadvantaged groups are disproportionally affected due to greater exposure to air pollution and greater susceptibility to serious health consequences.

Air pollution causes about EUR 600 billion in economic and welfare losses annually across EU countries, equivalent to 4.9% of EU GDP in 2017

The economic and welfare losses from air pollution are substantial. New estimates of the impact of $PM_{2.5}$ and ozone show that losses amounted to about EUR 600 billion in 2017 or 4.9% of GDP across the EU as a whole. This is due mainly to the impact these air pollutants have on mortality, but also to the lower quality of life and labour productivity for people living with related diseases, and higher health expenditure.

Efforts to reduce air pollution need to focus on the main sources of emissions. These include the use of fossil fuels in energy production, transportation and the residential sector, as well as industrial and agricultural activities. The EU recovery plan from the COVID-19 crisis provides a unique opportunity to promote a green economic recovery by integrating environmental considerations in decision-making processes, thereby supporting the achievement of the 2030 EU national emission reduction targets.

The health sector itself can contribute to achieving this objective by minimising its own environmental footprint. Through multi-sectoral approaches, public health authorities can also contribute to environmentally friendly urban and transport policies, which may also promote greater physical activity.

Reducing other important risk factors to health

Beyond environmental issues, a number of modifiable risk factors also have important impacts on people's health and mortality, notably smoking, alcohol consumption, unhealthy nutrition, lack of physical activity and obesity.

Smoking remains the most important cause of premature mortality across the EU, accounting for about 700 000 deaths per year

Despite progress in reducing smoking rates over the last decades, tobacco consumption remains the largest behavioural risk factor to health, accounting for about 700 000 deaths per year across EU countries.

Harmful consumption of alcohol is responsible for another 255 000 to 290 000 deaths per year across EU countries. While alcohol control policies have reduced overall alcohol consumption in many countries over the past decade, heavy alcohol consumption remains an issue. One-third of adults report at least one "binge drinking" event in the past month, and more than one-fifth of adolescents aged 15 years old report having been drunk more than once in their life.

More than one in six adults are obese across EU countries, and there are wide socio-economic disparities in overweight and obesity rates

Adult obesity rates continue to increase in most EU countries, with more than one in six adults being obese in the EU. Obesity is also a recognised risk factor for complications from COVID-19. There are large socio-economic inequalities in overweight and obesity rates, often starting at a young age. For example, overweight and obesity rates among children are about two times greater among those living in the lowest income families compared to those living in the highest income families.

Ensuring universal and effective access to care for all the population

Most EU countries have achieved universal coverage for a core set of health services, which is crucial to deal effectively with the COVID-19 pandemic. However, the range of services covered and the degree of cost-sharing vary substantially. Effective access to different types of care can also be restricted because of shortages of health workers, long waiting times or long travel distances to the closest health care facility.

Only a small share of the population reported unmet needs for health care in most EU countries in 2018. Still, this proportion was nearly five times higher among low-income households than high-income households across the EU as a whole. Further, the affordability of health services can be restricted when they involve high out-of-pocket payments. On average across EU countries, around one-fifth of all health spending is paid out-of-pocket by households, but this proportion exceeds more than one-third in Latvia, Bulgaria, Greece and Malta. In general, countries that have a high share of out-of-pocket spending also have a higher proportion of the population facing catastrophic out-of-pocket payments for health services, particularly among low-income groups.

The COVID-19 pandemic highlighted the shortages of health workers in many countries, and the need for mechanisms to mobilise human resources quickly in times of crisis

Although the number of doctors and nurses has increased over the past decade in nearly all EU countries, shortages persist in many countries. These shortages were thrown into sharp relief during the COVID-19 pandemic, when health workers were put under intense pressure. Many countries have sought to mobilise additional staff quickly, often by recalling inactive and retired health professionals and mobilising students in medical, nursing and other health education programmes nearing the end of their studies. Some countries were also able to redeploy some of the staff from less affected regions to those that were more affected. This crisis also highlights the needs for creating additional reserve capacity that can be quickly mobilised.

Waiting times for elective surgery are likely to increase further following the COVID-19 pandemic

Long waiting times for health services like elective surgery have been a longstanding issue in many EU countries. Even before the COVID-19 pandemic, waiting times for elective surgery were on the rise in many countries, as the demand for surgery increased more rapidly than supply. These waiting times are likely to increase further in the short term in several countries as many elective surgeries were postponed during the pandemic. Countries like Denmark and Hungary that have succeeded in achieving lasting reductions in waiting times for many elective health services typically combine some supply-side and demand-side interventions along with a regular monitoring of progress.

Monitoring and improving the *State of Health in the EU*

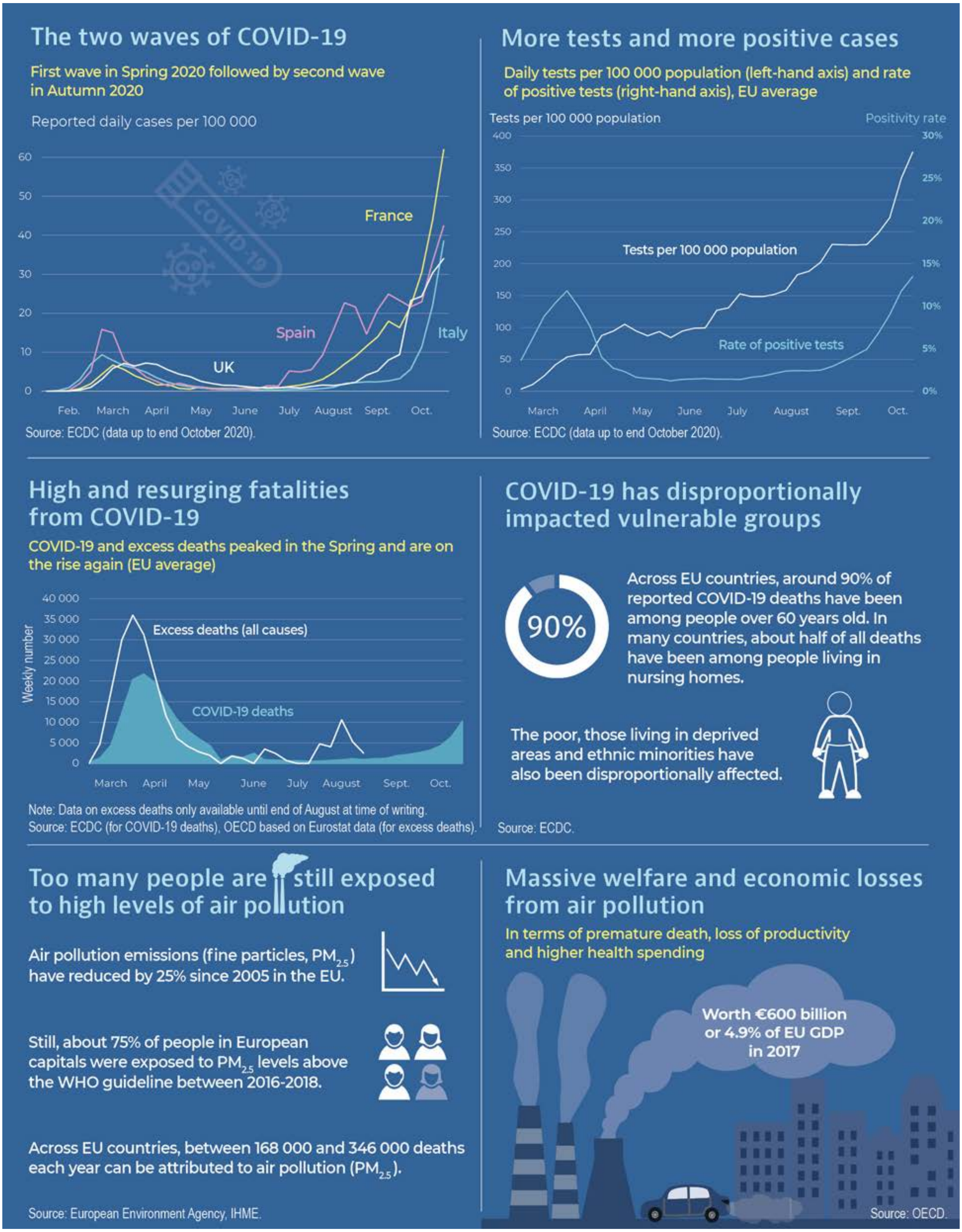
Health at a Glance: Europe 2020 is the result of ongoing close collaboration between the OECD and the European Commission to improve country-specific and EU-wide knowledge on health issues as part of the Commission's *State of Health in the EU* cycle.

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 2021 jointly with the European Observatory on Health Systems and Policies, and will highlight the particular characteristics and challenges for each country. A *Companion Report* from the European Commission accompanies the release of 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.

For more information, please consult: *ec.europa.eu/health/state*.

Infographic 1. **Key facts and figures from *Health at a Glance: Europe***



Readers' guide

Health at a Glance: Europe is the first step in the *State of Health in the EU* cycle of knowledge brokering. While the structure of the 2020 edition is still based on the 2014 European Commission Communication on effective, accessible and resilient health systems (https://ec.europa.eu/health/sites/health/files/systems_performance_assessment/docs/com2014_215_final_en.pdf), the chapter on resilience has been brought forward this year given the challenge that European health systems had to face in response to the COVID-19 pandemic.

The publication is divided in two parts. Part I contains two thematic chapters. Chapter 1 provides an initial assessment of how resilient European health systems have been to the COVID-19 pandemic and their ability to contain and respond to the worst pandemic over the past century. Chapter 2 reviews the health and welfare burden of air pollution across EU countries, and highlights the need for sustained efforts to reduce air pollution to mitigate its impact on health and mortality.

Part II includes the five regular chapters of this publication, providing an overview of key indicators of health and health systems across the 27 EU member states, 5 candidate countries, 3 European Free Trade Association countries and the United Kingdom. The selection of indicators is based largely on the European Core Health Indicators (ECHI) shortlist (*https://ec.europa.eu/health/indicators/echi/list_en*). New indicators have also been included to cover often neglected areas such as mental health issues and dental care.

The data presented in this publication come mainly 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 in the following way. The text provides a brief commentary highlighting the key findings conveyed by the data, defines the indicator and signals any significant data comparability limitation. This is accompanied by a set of figures that 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 EU averages include only EU member states and are calculated either as population-weighted averages (to be consistent with the averages that are calculated by Eurostat or JRC) or as unweighted averages (when these averages are calculated by the OECD or other organisations). The calculation method is generally mentioned in a footnote under each figure. By definition, a weighted average gives more weight to the most populated countries and can be interpreted as a measure of comparison with the EU as a whole, whereas an unweighted average gives equal weight to all countries regardless of their population size and can be interpreted as a measure of comparison with other countries.

Population data

The population data used to calculate rates per capita and population-weighted averages come from the Eurostat demographics database. The data relate to mid-year estimates (calculated as the average between the beginning and the 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 figures.

Data sources

Readers interested in using the data presented in this publication for further analysis and research are encouraged to consult the full documentation of definitions, sources and methods contained in *OECD Health Statistics* for all OECD member countries, including 22 EU member states and five additional countries (Iceland, Norway, Switzerland, Turkey and the United Kingdom). This information is available in OECD.Stat (*https://oe.cd/ds/health-statistics*). For the nine other countries (Albania, Bulgaria, Croatia, Cyprus, Malta, Montenegro, North Macedonia, 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 issues

Health at a Glance: Europe 2020
State of Health in the EU Cycle

PART I

Chapter 1

How resilient have European health systems been to the COVID-19 crisis?

This chapter provides an initial assessment of the impact of COVID-19 and the resilience of European health systems to the pandemic, bearing in mind that the pandemic is ongoing and so any definitive assessment would be premature. As of 31 October, over 7 million people were infected and 220 000 died from the virus across EU countries, Iceland, Norway, Switzerland and the United Kingdom. During the first wave, the virus had a much more adverse impact on a number of Western European countries, notably Belgium, France, Italy, Netherlands, Spain and the United Kingdom, as well as Sweden. Since August, COVID-19 also started to spread more widely across Europe. The virus has disproportionately hit older people, and there has been a clear social gradient in COVID-19 deaths.

*Countries that were better prepared and acted quickly to reduce the spread of the virus through rapid scaling-up of testing, tracking and tracing strategies, were more able to avoid the most stringent and costly containment and mitigation measures. In terms of treating COVID-19 patients, policies to temporarily boost hospital beds and equipment have helped deal with surges in demand. However, a lack of health personnel has been more of a binding constraint, putting health workers under intense pressure. Further, many non-COVID-19 patients were unable to access needed care during the peak of the pandemic in Spring 2020. Health system resilience therefore also requires strengthening primary health care and mental health services to minimise delays and forgone care for all health care needs.**

* Figure 1.8 was revised on 26 November 2020 to correct a miscalculation.

Introduction

Since late 2019, the COVID-19[1] outbreak has spread to become the most serious pandemic in a century. European countries have been severely affected, with over 7 million cases and 220 000 deaths reported across EU countries, Iceland, Norway, Switzerland and the United Kingdom as of 31 October 2020. As the pandemic continues through 2020 and beyond, the eventual death toll will rise.

One has to look back to 1918 to see similar numbers for an emerging virus in Europe in such a short space of time. Yet the health impact reaches well beyond these numbers. As well as some COVID-19 cases and deaths going undetected, COVID-19 has had a major indirect impact on people that did not contract the virus. For example, people with emergency health needs have sometimes struggled to receive timely acute care, and those with chronic health conditions have faced disruptions to routine care. In addition, the pandemic and the subsequent economic crisis have led to a growing burden of mental ill-health, with emerging evidence of higher rates of stress, anxiety and depression; compounded by disruptions to health care for those with pre-existing mental health conditions.

The socio-economic impacts have also been dramatic. In the second quarter of 2020, seasonally adjusted GDP fell by 13.9% across the EU, compared with the same quarter in 2019. Thanks to the widespread use of various short-term work schemes, employment was comparatively less affected, though there was still a registered decrease of 2.9% over the same time period (Eurostat, 2020[1]).

The COVID-19 pandemic has therefore put an immense strain on European countries, testing the resilience of every country's government and people. It has also tested the ability of EU Member States and the European Commission to develop a co-ordinated set of responses to a common threat (European Commission, 2020[2]). This chapter focuses predominantly on health system responses, and on a review of the resilience of European countries' health systems to the COVID-19 crisis. Analysis covers the first ten months of the year, with a focus on the first wave of the pandemic. Based on this review, the chapter draws out policy insights that are likely to contribute to better preparedness and more effective responses to the evolving pandemic and future health threats. Assessments made in this chapter and associated policy insights are based on information predominantly from the first half of 2020 (Box 1.1). As the data and evidence are still developing, results from this chapter are "initial findings", not a definitive review.

Defining health systems resilience

The concept of resilience has been applied to shocks and disruptive events such as epidemics, economic crises and environmental disasters. In the health sector, its usage has become more frequent following the Ebola epidemic in West Africa in 2013-16. Resilience was also a key concept in the 2014 European Commission Communication on effective, accessible and resilient health systems (European Commission, 2014[3]). In this chapter, conceptual work from both the OECD and the European Commission underpin assessments of health system resilience to the COVID-19 crisis. The OECD's New Approaches to Economic Challenges (NAEC) resilience framework analyses core attributes of resilient systems, within the context of tensions between resilience and efficiency (OECD, 2020[4]). It recognises the importance of risk management, but also that absolute prevention or avoidance of shocks such as COVID-19 is impossible given the unpredictable nature of systemic threats. Resilience is therefore seen to be as much about recovery and adaption, as it is about prevention and avoidance. That is:

> *"Resilience acknowledges that massive disruptions can and will happen – in future, climate disruption will likely compound other shocks like pandemics – and it is essential that core systems have the capacity for recovery and adaptation to ensure their survival, and even take advantage of new or revealed opportunities following the crises to improve the system through broader systemic changes… The new approach to resilience will focus on the ability of a system to anticipate, absorb, recover from, and adapt to a wide array of systemic threats." (OECD, 2020[4]).*

The EU Expert Group on Health Systems Performance Assessment (HSPA) provides complementary insights focused on health system resilience. It emphasises the importance of more general health system strengthening alongside preparedness to specific threats, and provides a working definition of resilience consistent with the work of the OECD. That is:

> *"Health system resilience describes the capacity of a health system to (a) proactively foresee, (b) absorb, and (c) adapt to shocks and structural changes in a way that allows it to (i) sustain required operations, (ii) resume optimal performance as quickly as possible, (iii) transform its structure and functions to strengthen the system, and (possibly) (iv) reduce its vulnerability to similar shocks and structural changes in the future" (EU Expert Group on HSPA, 2020[5]).*

Building on these conceptual analyses, the focus of this chapter is predominantly on the capacity of European countries' health systems to absorb and adapt to the shock of COVID-19.

The rest of this chapter is structured as follows. The next section provides an assessment of the initial health impact of COVID-19 in European countries. Analysis then turns to outbreak prevention strategies, analysing the range of containment and mitigation approaches adopted by governments, as well as how effective these have been in preventing and slowing down the spread of the virus. The focus is then on assessing curative efforts, investigating the capacity of European countries' health systems to treat COVID-19 patients and actions taken to respond to the massive surge in health care demand. Subsequently, the report analyses the impact of the virus on older people and other vulnerable groups, and the associated policy responses. Policy responses and approaches to maintaining high quality care for non-COVID-19 patients are then discussed. The concluding section presents some emerging insights on how health systems can become more resilient to the ongoing pandemic as well as future health crises.

Box 1.1. **Key sources of information on COVID-19 related policies and data**

The chapter builds on several recent publications and databases, particularly those provided by the:

- OECD Digital Hub on Tackling the Coronavirus, including policy briefs and policy trackers (*https://www.oecd.org/coronavirus*)
- COVID-19 Health System Response Monitor (HSRM) of the WHO Regional Office for Europe, the European Commission, and the European Observatory on Health Systems and Policies (*https://www.covid19healthsystem.org*)
- European Centre for Disease Prevention and Control (ECDC) datasets monitoring the COVID-19 pandemic (*https://www.ecdc.europa.eu/en/COVID-19-pandemic*)
- Eurostat COVID-19 datasets of weekly mortality data to calculate excess mortality (*https://ec.europa.eu/eurostat/web/COVID-19/data*)

These sources complement data collected for *Health at a Glance: Europe* that come from official national statistics, often collected through joint questionnaires of the OECD, Eurostat and WHO.

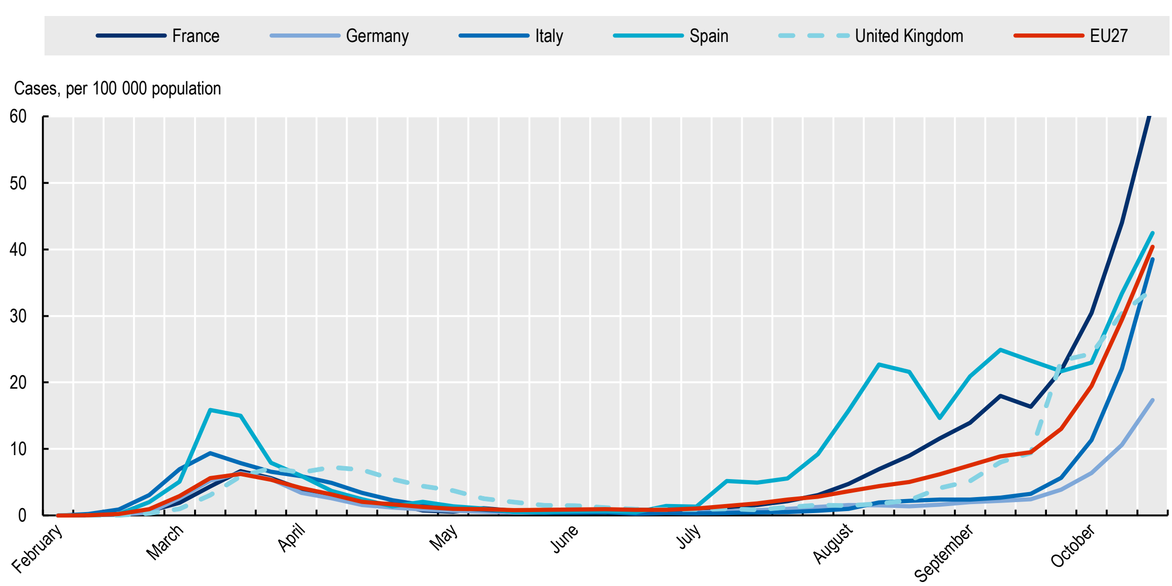
In this chapter, data and analysis cover 31 European countries, including all 27 EU countries plus Iceland, Norway, Switzerland and the United Kingdom.

The health impact of COVID-19 in European countries

The first officially reported COVID-19 death in Europe was on 15 February 2020, with the virus circulating on the continent from January or earlier (Spiteri et al., 2020[6]). The virus spread rapidly across Europe, with Spain, France and the United Kingdom each reporting over one million COVID-19 confirmed cases as of 31 October. In the first ten months of 2020 reported infection rates were highest in Belgium, the Czech Republic, Luxembourg, and Spain, all of which reported over 25 000 confirmed cases per million people. It is important to note, though, that the number of confirmed COVID-19 cases are influenced by cross-country differences in testing strategies, intensity of testing and differences in the actual transmission of the virus.

Most people who are infected with COVID-19 survive – infection fatality rate estimates have ranged between 0.17-1.7% (Meyerowitz-Katz and Merone, 2020[7]). Yet the number of deaths are still striking due to the sheer number of people infected: as of 31 October 2020, over 7 million Europeans have been infected by the virus. In most Western and Northern European countries, the first wave of the outbreak occurred in March 2020. Over the summer period, most of these countries reported few cases before facing a surge in the number of infections from late August (Figure 1.1). Central and Eastern European countries did not experience many cases during the first half of 2020, but the numbers have increased exponentially since August (Figure 1.2).

Figure 1.1. **Evolution in reported COVID-19 cases, EU average and most populated European countries, February to end of October 2020**



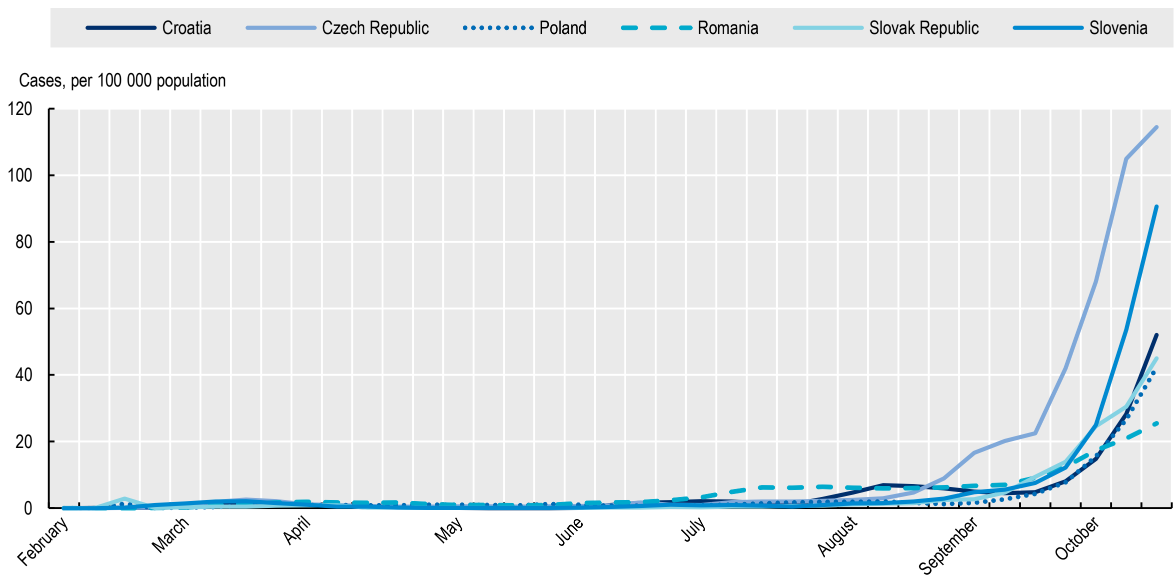
Note: The EU average is weighted.
Source: European Centre for Disease Prevention and Control (ECDC).

StatLink https://stat.link/rphivu

In terms of reported COVID-19 deaths, as of 31 October 2020, the United Kingdom reported the highest absolute number (over 46 000), followed by Italy, France and Spain with each reporting more than 35 000 deaths. Adjusting for population size, Belgium reported over 1 000 COVID-19 deaths per million people; followed by Spain, the United Kingdom, Italy, Sweden and France, all with over 500 COVID-19 reported deaths per million people. During the first wave, daily COVID-19 deaths peaked in early April for these countries, before gradually declining from May through July, though from late August deaths have started to increase again (Figure 1.3). Reported rates up until the end of October

2020 were lowest in some Nordic countries (Finland, Iceland, Norway), the Baltic countries (Estonia, Latvia, Lithuania), the Slovak Republic, Greece, and Cyprus (Figure 1.4 and Table 1.1).

Figure 1.2. **Evolution in reported COVID-19 cases, selected Central and Eastern European countries, February to end of October 2020**



Source: European Centre for Disease Prevention and Control (ECDC).

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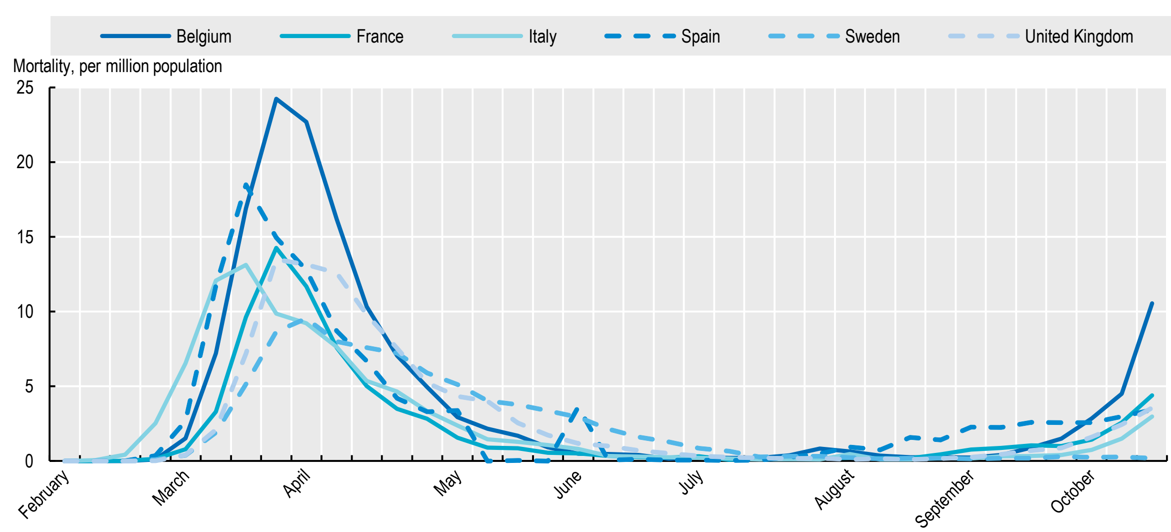
Figure 1.3. **Evolution in reported COVID-19 mortality rates in some of the most adversely affected countries in Europe, February to end of October 2020**



Source: European Centre for Disease Prevention and Control (ECDC).

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Whilst reported COVID-19 deaths are a critical measure of the health impact of the pandemic on countries, comparability of this indicator is limited by differences in recording, registration and coding practices across countries. Moreover, other factors, such as the low availability of diagnostic tests at the start of the pandemic are likely to have impinged on the accuracy of attributing the causes of death. Therefore the reported count of deaths due to COVID-19 may well be underestimated to varying degrees across countries.

An analysis of mortality from all causes – and particularly excess mortality, a measure of deaths from all causes over and above what would have normally been expected at a given time of the year – provides a broader measure of mortality due to COVID-19 that is less affected by the limiting factors mentioned above. Although data on excess mortality is not a direct measure of COVID-19 deaths, this measure has the advantage of encompassing all deaths directly attributable to COVID-19 and those indirectly linked to it. This indicator therefore captures the net effect of the various actions taken by governments and individuals during the pandemic that impact all-cause mortality rates. For example, the number of indirect deaths may increase due to disruptions to patients' care for other conditions, or may decrease as a result of fewer deaths from traffic and workplace accidents following the lockdown measures. Nonetheless, caution is needed when comparing excess mortality across countries at a given point in time, notably because of cross-country variations in population age structures, underlying death rates and evolution of the virus. Box 1.2 outlines the main methodological issues for both variables. In this chapter, excess mortality is measured by comparing total recorded deaths from March-June 2020 with the average for the same time period over the past five years (2015-19).

Box 1.2. **Limitations of COVID-19 deaths and excess mortality indicators**

Main methodological issues limiting the cross-country comparability of COVID-19 deaths data

For reported COVID-19 deaths, cross-country comparability is linked to different registrations depending on where the death occurred and the availability of testing (particularly early on in the pandemic), and different coding practices. In particular:

- Whether COVID-19 deaths occurring outside of hospitals are fully recorded. Belgium, France and Italy, among others, put in place improved and faster reporting procedures early on to count deaths occurring in other settings, notably care homes.
- Coding differences, especially whether suspected cases are counted alongside those confirmed by tests. Belgium and the Netherlands are examples of countries coding probable as well as confirmed cases in their data on COVID-19 deaths.
- Differences in testing capacity across countries and over time, with many countries having faced severe constraints in testing capacities early in the pandemic.

Main methodological issues limiting the cross-country comparability of excess mortality data

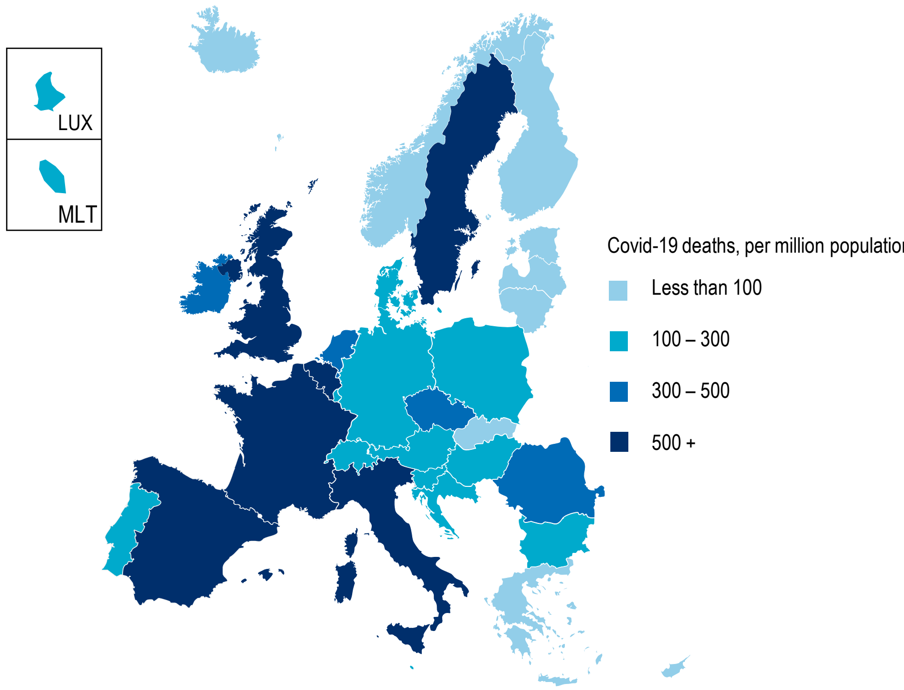
Excess mortality has less severe cross-country comparability limitations than reported COVID-19 deaths. However, it is not a direct measure of COVID-19 deaths, as it captures all excess deaths irrespective of their cause. National variations in underlying death rates related to various events and evolution of the virus mean that caution is needed when comparing excess mortality at a given point in time. In particular:

- Cross-country differences in other significant events this year and in previous years, such as severe or mild flu seasons, heatwaves and natural disasters, can lead to under- or over-estimates of the impact of COVID-19 on excess mortality. In this report a five-year period (2015-19) is chosen to help smooth out such variations.
- Differences in timing of the onset of COVID-19 can affect comparability. But the March-June timeframe used is wide enough to include the first wave of the pandemic experienced in European countries to date.

For COVID-19 and excess deaths, different delays in reporting deaths can affect cross-country comparisons.

Source: Morgan et al. (2020[8]), "Excess mortality: Measuring the direct and indirect impact of COVID-19", *https://doi.org/10.1787/c5dc0c50-en*.

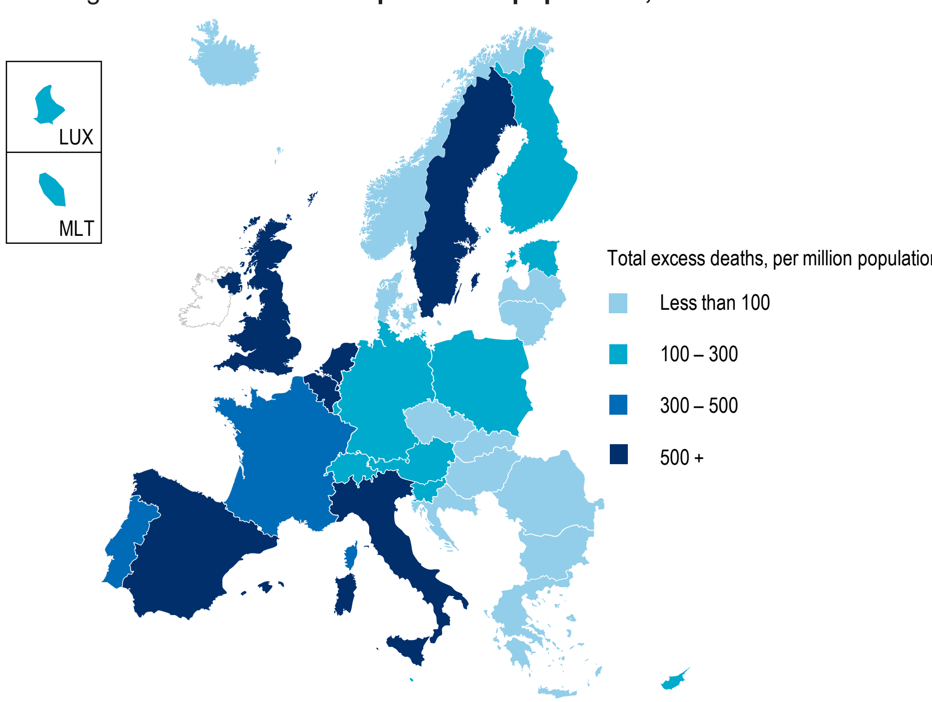
Figure 1.4. **Reported COVID-19 deaths per million population, up to end of October 2020**



Note: Data comparability is limited due to different reporting practices.
Source: European Centre for Disease Prevention and Control (ECDC).

StatLink https://stat.link/nowzuk

Figure 1.5. **Excess deaths per million population, March to June 2020**



Note: Data on Ireland are missing because of late registrations of deaths.
Source: Eurostat, except for the United Kingdom where data come from the Office for National Statistics; National Records of Scotland; Northern Ireland Statistics and Research Agency.

StatLink https://stat.link/wfk9ep

Table 1.1. **Confirmed COVID-19 cases, reported COVID-19 deaths and excess mortality**

Country	COVID-19 confirmed cases (up to end of October)		Reported COVID-19 deaths (up to end of October)		Excess mortality (March-June)	
	COVID-19 cases	COVID-19 cases per 1m pop	COVID-19 deaths	COVID-19 deaths per 1m pop	Excess deaths	Excess deaths per 1m pop
Austria	106 584	12 031	1 097	124	1 460	165
Belgium	429 134	37 461	11 625	1 015	8 388	732
Bulgaria	52 844	7 549	1 279	183	-1 346	-192
Croatia	49 316	12 098	546	134	-415	-102
Cyprus	4 366	4 985	26	30	141	161
Czech Republic	335 102	31 466	3 251	305	477	45
Denmark	46 351	7 983	721	124	208	36
Estonia	4 905	3 702	73	55	143	108
Finland	16 113	2 920	358	65	970	176
France	1 364 625	20 364	36 788	549	29 993	448
Germany	532 930	6 419	10 481	126	9 707	117
Greece	39 251	3 660	626	58	880	82
Hungary	79 199	8 104	1 819	186	-387	-40
Iceland	4 865	13 628	12	34	-14	-40
Ireland	61 456	12 531	1 913	390	..	..
Italy	679 430	11 256	38 618	640	44 654	740
Latvia	5 894	3 070	71	37	-362	-188
Lithuania	14 824	5 305	165	59	52.2	19
Luxembourg	17 134	27 910	152	248	135	220
Malta	6 042	12 242	62	126	93	188
Netherlands	350 764	20 296	7 385	427	9 710	562
Norway	19 563	3 672	282	53	-24	-5
Poland	362 731	9 552	5 631	148	4 060	107
Portugal	141 279	13 748	2 507	244	3 554	346
Romania	241 339	12 431	6 968	359	-1 007	-52
Slovak Republic	57 664	10 580	219	40	-59	-11
Slovenia	34 307	16 487	231	111	251	120
Spain	1 185 678	25 261	35 878	764	47 904	1 021
Sweden	124 355	12 156	5 938	580	5 407	528
Switzerland	153 728	17 991	2 035	238	1 715	201
United Kingdom	1 011 660	15 179	46 555	699	64 022	961
EU27/26 (total)	**6 343 617**	**14 197**	**174 428**	**390**	**164 612**	**372**

Note: EU averages are weighted. EU totals and averages include 27 countries for COVID-19 cases and deaths, and 26 for excess mortality. Data refer to the number of cases and deaths reported as of 31 October 2020; data for the most recent weeks may be under-reported and subject to revision. The calculation of excess deaths is with reference to the average of 2015-19 and with 2020 figures for weeks 10 to 26. Data were extracted on 1 November 2020.
Source: European Centre for Disease Prevention and Control (ECDC) for COVID-19 cases and deaths. Eurostat for excess mortality in EU and EFTA countries. Office for National Statistics, National Records of Scotland, Northern Ireland Statistics and Research Agency for excess mortality in the United Kingdom.

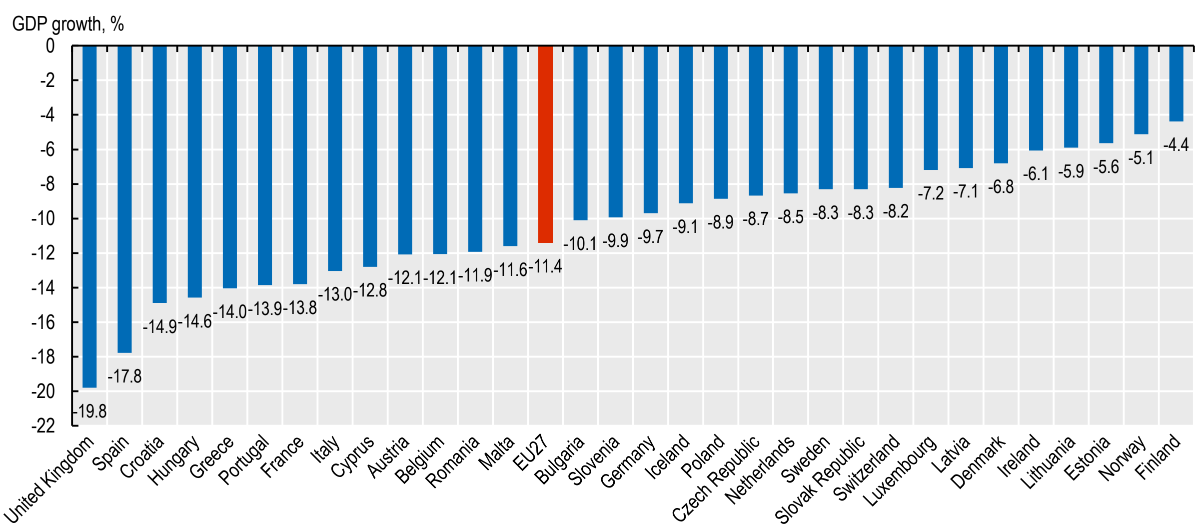
Analysis of excess mortality data shows broadly consistent results with reported COVID-19 deaths in terms of which countries were most adversely affected by COVID-19, with some exceptions. Spain and the United Kingdom recorded the highest excess death rates between March and June 2020 (over 950 excess deaths per million people), followed by Italy, Belgium, the Netherlands, Sweden and France (between 400 and 750 deaths per million people). Excess mortality rates were under 100 deaths per million people in 12 countries (Figure 1.5 and Table 1.1), including negative rates in Bulgaria, Croatia, Latvia, Hungary, Iceland, Norway, Romania and the Slovak Republic.

Negative rates are indicative of fewer deaths overall between March and June 2020 as compared to previous years. All these countries also had relatively few reported COVID-19 deaths.

It is critical to stress, though, that higher COVID-19 and/or excess death rates do not necessarily equate to less effective government responses to the virus. Some countries may be more susceptible to COVID-19 due to inherent factors that go beyond policy makers' responses to the virus. In particular, the share of older people, the prevalence of certain risk factors such as obesity and diabetes in a population, the intensity of tourism and international travel in and out of the country, and population density are all likely to have affected the number of COVID-19 deaths. Further, countries that were first hit by large outbreaks (e.g. Italy) had necessarily less time to develop and implement comprehensive policy responses, thus contributing to higher cases and deaths (see next section on containment and mitigation policies).

The health crisis has also led to a major economic crisis, with countries hardest hit by COVID-19 typically experiencing the largest economic contractions. All 31 European countries in this report experienced negative economic growth in the second quarter of 2020, with the United Kingdom and Spain most adversely affected, and Finland, Norway, Estonia and Lithuania less affected (Figure 1.6).

Figure 1.6. **GDP growth in the second quarter of 2020, compared to first quarter of 2020**



Note: The EU average is weighted.
Source: Eurostat.

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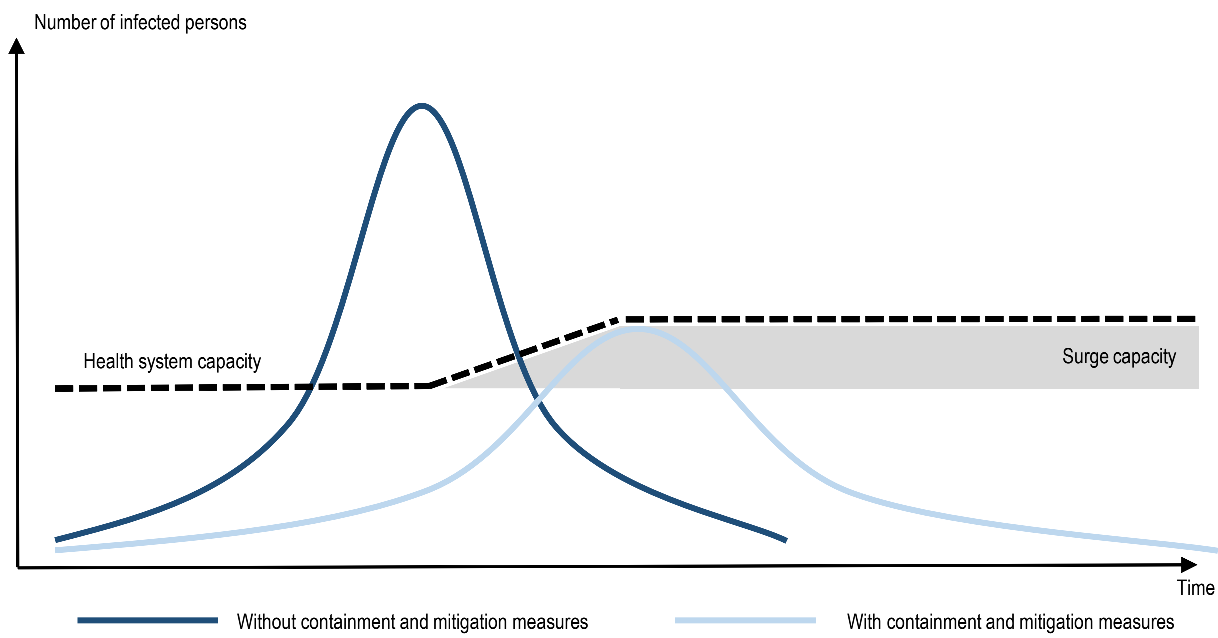
To what extent have containment and mitigation strategies adopted in European countries contributed to slowing the spread of COVID-19 during the first wave?

From the onset of the pandemic until the end of October 2020, non-medical containment and mitigation actions[2] were the only policy options countries had to prevent the spread of COVID-19. This reflects a context of limited information on the natural history of the infection and absence of a vaccine or effective prophylactic treatment. This section describes the different policy measures implemented by countries in the first half of 2020 and discusses their effects on citizens' mobility as well as on the dynamics of the epidemic.

The majority of European countries implemented similar containment and mitigation measures during the first wave of the pandemic

Containment and mitigation strategies aim to minimise the risk of transmission of infections and slow the spread of the virus. Without any intervention, the spread of a viral infectious disease generally follows an S-shaped curve. That is, infections grow slowly at the beginning of the outbreak, accelerate exponentially in its central phase when a critical mass of people are infected and many others are still susceptible, and slow in its final phase when enough people are immune (either through natural infection or vaccination). The central phase of this cycle corresponds to the peak of the infection. The different policy options described in this section aimed to prevent the COVID-19 outbreak from reaching its exponential acceleration phase, or to at least curb it to alleviate the burden on health care systems (Figure 1.7) (OECD, 2020[9]).

Figure 1.7. **Flattening the epidemic curve to allow the health system to cope with surges in demand**



Containment and mitigation strategies can be grouped into three broad policy categories:

- Social distancing measures, notably: closing workplaces and non-essential services; school closures; banning mass gatherings; travel restrictions; and full society lockdowns.
- Improved personal and environmental hygiene, including the use of personal protective equipment such as face masks.
- Testing, tracking and tracing of infected individuals, with confinement of affected persons. This can be targeted or more large-scale testing and quarantine policies.

Table 1.2 summarises the main containment and mitigation strategies adopted by European countries in the first half of 2020 in order to tackle the first wave of the pandemic. The information reported in this section is retrieved from the European Centre for Disease Prevention and Control (ECDC), the OECD health system policy tracker, and the European Observatory Health System Response Monitor (see Box 1.1).

Table 1.2. **Containment and mitigation strategies adopted by European countries to address the first wave of the pandemic**

Country	Stay-at-home orders for the general population (days)	Closure of educational institutions (days)		Closure of public spaces of any kind (days)[1]	Use of masks in public transports and closed environments after confinement measures (until 3 July)	Travel restrictions
		Primary schools	Secondary schools			
Austria	45	63	48	28	Compulsory	Full closure
Belgium	53	65	65	51	Compulsory	Selective closure
Bulgaria	No formal stay-at-home order	Maintained until summer break	Maintained until summer break	65	Compulsory	Selective closure
Croatia	No formal stay-at-home order	55	55	60	Compulsory	Selective closure
Cyprus	40	72	61	51	Compulsory	Selective closure
Czech Republic	39	88	88	59	Compulsory	Selective closure
Denmark	No formal stay-at-home order	30	63	33	Recommended	Full closure
Estonia	No formal stay-at-home order	62	62	65	Recommended	Full closure
Finland	No formal stay-at-home order	57	Maintained until summer break	74	Recommended	Selective closure
France	55	98	55	55	Recommended	Selective closure
Germany	No formal stay-at-home order[2]	52	52	49	Compulsory	Selective closure
Greece	42	82	60	50	Compulsory	Selective closure
Hungary	52	80	80	66	Compulsory	Full closure
Ireland	51	Maintained until summer break	Maintained until summer break	120	Compulsory	Selective closure
Italy	55	Maintained until summer break	Maintained until summer break	55	Compulsory	Full closure
Latvia	No formal stay-at-home order	Maintained until summer break	Maintained until summer break	55	Recommended	Full closure
Lithuania	76	62	62	76	Compulsory	Full closure
Luxembourg	32	70	48	34	Compulsory	Selective closure
Malta	No formal stay-at-home order	109	109	64	Compulsory	Full closure
Netherlands	No formal stay-at-home order	55	77	47	Recommended	Selective closure
Poland	26	73	73	50	Compulsory	Selective closure
Portugal	No formal stay-at-home order	Maintained until summer break	62	51	Compulsory	Selective closure
Romania	52	77	77	56	Compulsory	Full closure
Slovak Republic	No formal stay-at-home order	81	81	65	Compulsory	Selective closure
Slovenia	46	66	80	44	Compulsory	
Spain	50	Maintained until summer break	Maintained until summer break	50	Compulsory	Full closure
Sweden	No formal stay-at-home order	No formal closure	89	No formal closure	Not recommended	Selective closure
Iceland	No formal stay-at-home order	Maintained until summer break	49	48	Not recommended	Selective closure

Table 1.2. **Containment and mitigation strategies adopted by European countries to address the first wave of the pandemic** *(cont.)*

Country	Stay-at-home orders for the general population (days)	Closure of educational institutions (days)		Closure of public spaces of any kind (days)[1]	Use of masks in public transports and closed environments after confinement measures (until 3 July)	Travel restrictions
		Primary schools	Secondary schools			
Norway	No formal stay-at-home order	46	64	64	Not recommended	Full closure
Switzerland	No formal stay-at-home order	58	75	34	Recommended	Selective closure
United Kingdom	46	69	83	54	Recommended	Selective closure

1. Public spaces refer to all leisure places (parks, restaurants, bars, cinemas, etc.) and all non-essential shops and services. 2. In Germany, some federal states imposed general stay-at-home orders.
Source: ECDC, OECD health system policy tracker, European Observatory Health System Response Monitor.

Social distancing measures were implemented in almost all European countries, but with different levels of stringency

Social (physical) distancing refers to policies that deliberately increase physical space between people. These come in many forms, including banning large gatherings; school closures; encouraging people to work from home; closing non-essential stores, restaurants and cafes, and formal stay-at-home orders. They can be implemented across an entire community, or target specific at-risk groups such as the elderly and those with pre-existing health conditions (Anderson et al., 2020[10]). Several challenges are associated with the implementation of social distancing measures. These include: reduced economic activity, loss of human capital due to the closure of schools, neglect of vulnerable populations (such as the elderly), and psychological damage (Boddy, Young and O'Leary, 2020[11]; Brooks et al., 2020[12]).

Among the European countries analysed in this report, just over half (16 out of 31) adopted formal stay-at-home orders (with different degrees of stringency, for instance in terms of authorisations to circulate) during the first wave of the pandemic. Such orders lasted an average of 47.5 days, ranging from 26 days in Poland to 76 days in Lithuania. Some countries also adopted specific measures targeting specific population groups. For instance, the United Kingdom subjected highly vulnerable individuals with pre-existing health conditions to even more stringent isolation and confinement measures relative to the general population. Closure of public spaces such as non-essential stores, bars, or restaurants was enforced in all countries except Sweden, for an average duration of 56 days. This measure was enforced for the shortest duration in Austria (28 days), Denmark (33 days) and Switzerland (34 days), with the longest duration in Ireland (120 days).

All countries but Sweden and Iceland closed primary schools, for an average of 68 days. In seven countries (Bulgaria, Ireland, Italy, Latvia, Poland, Portugal and Spain), primary school closures were maintained until the respective start dates of their school summer holidays. Denmark reported the shortest duration of primary school closure (30 days). For secondary schools, all European countries opted for closure, for an average of 69 days. Austria and Luxembourg reported the shortest duration of secondary school closure (48 days), and in six countries (Bulgaria, Finland, Ireland, Italy, Latvia and Spain) closures were maintained until the summer break. All countries closed higher education institutions until the new academic year.

To prevent or delay the entry of a disease into a country, governments have also implemented travel restrictions. Such measures included, among others, bans on non-essential travel, voluntary or legally mandated isolation upon arrival into a new country, and border closures. On 17 March 2020, EU Member States agreed on a co-ordinated action at external borders, restricting non-essential travel for a specific period (which was extended a number of times). This meant that travel to the EU and Schengen Area countries were not allowed for third country citizens. As for cross-border movement within the EU and the Schengen Area, most countries (20 out of 31) only closed access to their territory to citizens from selected countries. The remaining 11 countries closed their borders entirely at some point during the outbreak.

In response to the second wave of COVID-19, countries initially adopted more geographically targeted social distancing measures. In France, for instance, containment and mitigation decisions were taken region by region, and included a four level gradation (based on epidemiologic indicators), with progressive restrictions. In Spain, the Inter-territorial Council agreed to a set of restrictive measures to be taken in municipalities with more than 100 000 inhabitants if certain epidemiologic thresholds were reached. Such measures included restrictions on exit and entries from the affected municipality, limits on maximum capacity of retail and services businesses open to the public, and early closures of restaurants and bars.

Yet, such measures have not managed to slow the spread of the virus in Autumn, with many European countries implementing stronger containment measures from late October 2020. For example, France re-installed a new nationwide lockdown from October 30, very similar to their first lockdown other than initially keeping primary and secondary schools open. The United Kingdom took similar measures as of November 5. In Germany, a partial nationwide lockdown was enforced from November 2 (during the first wave, such decisions were made by regional authorities), with schools kept open but non-essential businesses closed. Belgium and the Czech Republic are other recent examples of countries introducing more stringent containment and mitigation measures in the Autumn.

Wearing face masks in indoor public spaces became compulsory in most European countries

Personal hygiene measures include frequent hand washing, use of hand sanitisers, coughing and sneezing etiquette, and the use of protective face masks (e.g. surgical-type). For the COVID-19 outbreak, the most vigorous discussions focused on face masks as a means to prevent contamination in public spaces. Official recommendations on mask wearing by the general population often evolved substantially over the course of the outbreak, despite existing evidence available suggesting their potential effectiveness to help contain the spread of the virus. For instance, studies of influenza, influenza-like illness, and human coronaviruses (not including COVID-19) showed that medical masks can prevent the spread of infectious droplets from a symptomatic infected person (Canini et al., 2010[13]; MacIntyre et al., 2016[14]; Asadi et al., 2020[15]). Similarly, a study of the SARS outbreak in Hong Kong, China found that people who became infected were less likely to have frequently worn a face mask in public or to have regularly washed their hands (Lau et al., 2004[16]). Overall, even if the possibility of aerosol transmission (on top of droplet transmission) has not been formally demonstrated, such means of contamination (particularly in specific indoor locations, e.g. crowded and inadequately ventilated spaces, over a prolonged period of time) cannot be totally ruled out and adds credit to the utilisation of face masks in situations where social distancing rules cannot be properly enforced (WHO, 2020[17]).

Following the gradual easing of confinement measures, mask wearing was made compulsory in closed public areas such as shops or public transport in the majority of European countries (18 out of 31). For instance, France required the use of face masks on public transit and in public whenever appropriate physical distancing could not be maintained. Violations could be met with a EUR 135 fine. Some countries imposed even more stringent measures: in Italy, an August 2020 decree of the Ministry of Health made mask wearing mandatory at night (defined as 6pm to 6am) in “all spaces open to the public”. In eight countries, government authorities recommended the use of face masks, but without imposing fines for non-compliance. Only three countries (Iceland, Norway[3] and

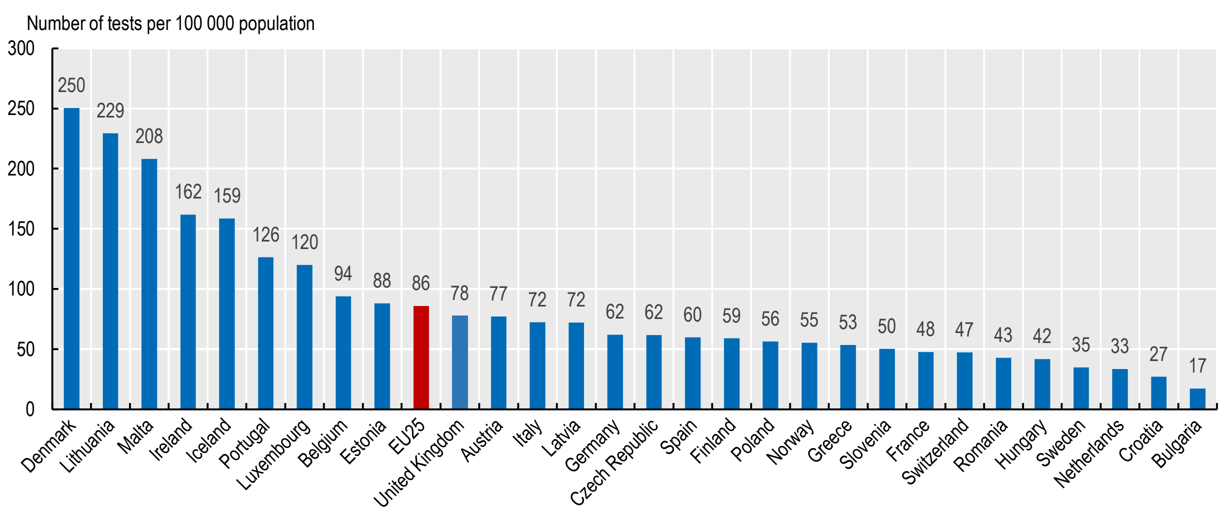
Sweden) did not make any recommendation to the general population regarding the utilisation of face masks.

Limited testing capacities in some countries hampered early large-scale population testing

Large-scale population testing and associated quarantines are an essential means to control the outbreak. From the beginning of the outbreak, OECD and the WHO have recommended prioritising active, exhaustive case finding and immediate testing and isolation, along with rigorous contact tracing and quarantine of close contacts (OECD, 2020[18]; WHO, 2020[19]). Ensuring an adequate availability of diagnostic laboratory equipment and a sustained supply of related products needed to perform testing has been a major concern for health policy makers. Large-scale testing for COVID-19 infections requires trained staff, supplies, testing kits and equipment, in addition to the entire workflow from logistics of collecting samples from patients to the reporting of results to them and to public health authorities. This has proven to be particularly challenging in larger or more populated countries.

One way to estimate the initial COVID-19 testing capacity of countries is to look at the number of daily tests performed at the beginning of the outbreak. Figure 1.8 reports the daily number of tests per 100 000 population by country, 30 days after each country reached a mortality rate of ten deaths per million population.[4] Denmark reported the highest number of daily tests performed, with 250 tests per 100 000 population, followed by Lithuania, Malta, Ireland and Iceland (between 150-230 tests).

Figure 1.8. **Daily number of tests per 100 000 population 30 days after the country recorded 10 deaths per million population (averaged over a week)**



Note: The EU average is unweighted. In order to mitigate daily fluctuations in reporting, values displayed correspond to an average of the daily number of tests performed on the week of analysis. The analysis covers the period between February and June 2020.
Source: Roser et al. (2020[20]), "Our World in Data", *https://ourworldindata.org/coronavirus*, accessed 6 July 2020.

StatLink *https://stat.link/i5txc1*

However, daily tests at the start of the outbreak in each country provide only a partial picture of the situation. The number of cumulated COVID-19 tests performed in each country in the early phase of the outbreak provides further insights. All studied countries increased their initial testing capacity, sometimes substantially. Between the first and second months after reaching ten deaths per million population, nine countries – Belgium, Denmark, Ireland, Italy, Portugal, Romania, Spain, Sweden and the United Kingdom – managed to at least double the cumulated number of tests per population. Yet, two months after each country reached ten deaths per million population, the cumulated number of tests per 1 000 population still varied substantially across countries, ranging from less than 20 in Croatia, France and the Netherlands, to more than 100 in Denmark, Luxembourg, Lithuania, Iceland and Malta.

Variation in countries' testing capacities can be explained by a mix of strategic, logistic, capacity, and regulatory considerations. For instance, in Italy and France, at the beginning of the outbreak authorities decided to limit testing to patients in serious conditions while in Iceland, a large-scale testing regime was implemented early on in the outbreak. From mid-March, Iceland started mass screening for COVID-19 on the basis of voluntary self-referrals to identify the extent of the spread of the virus in the general population; screening was performed on any volunteers, regardless of their health status. Some countries also brought testing closer to where people lived. For instance, in Lithuania municipalities were asked to set up mobile points for testing so as to facilitate access in remote areas. Digital tools to track cases frequently complemented testing capacities in countries (see below).

Finally, wastewater-based epidemiology (measuring chemical signatures in sewage, such as fragment biomarkers from COVID-19) has the potential to complement countries' surveillance efforts – by helping to detect early on possible infection outbreaks across an entire community (Daughton, 2020[21]). Some countries such as the Netherlands are currently studying whether this method could become a valuable tool for rapid outbreak detection and intervention[5].

Mobile technologies to help track, trace and isolate SARS-CoV-2 infections have been developed

Contact tracing is an investigative process through which the recent contacts of confirmed cases are traced backwards, so that they can in turn be tested and isolated as a means to "break the chain" of contagion. Especially when the prevalence of infection is still relatively low and geographically limited, contact tracing can thus be an important component of an effective containment strategy. However, it is a very labour-intensive activity, which requires trained investigators to manually track down people who have been exposed to infected individuals. As the number of professional contact tracers was insufficient in most countries, and the speed at which contacts are traced is a crucial variable for the success of this strategy, several countries have looked into the possibility of automating at least part of this process using digital instruments such as smartphone apps and related technologies.

Across Europe, digital contact-tracing apps have either been developed or launched in at least 23 European countries. Based on a self-report system by users who have been diagnosed as infected, these apps use data on proximity (Bluetooth) and location (cell towers and global positioning system, i.e. GPS) to identify individuals who may have been exposed to confirmed cases. Alerts are then sent to those individuals, recommending that they should be tested or even self-isolate. Some apps send broad alerts that cases have been confirmed in a certain area, and other apps target alerts at specific individuals who may have been in contact with a confirmed case. Some apps are used by traditional face-to-face contact-tracers to assist them in interviewing potential contacts, while other apps are fully automated. The data generated by these apps can be communicated to, and stored in, a central server or it can be decentralised, saved only in the mobile devices of users (this is the case with the Google/Apple protocol that some countries have adopted).

Some digital tools – like the Google COVID-19 Mobility Report – use aggregate data from many individuals to monitor changes in mobility in response to lockdowns, social distancing and quarantine policies. Other digital applications take advantage of data on specific individuals to enforce policies to contain the spread of the virus. In Poland, the Home Quarantine app uses facial recognition and location data to monitor and enforce quarantine, including by levying fines, and can be used by the police. In France, cities are using artificial intelligence and CCTV to monitor the use of masks in public spaces. Lichtenstein is the first European country to use electronic bracelets to collect biometric data in real time, and the United Kingdom is using an app to collect self-reported symptoms from users.[6]

Over 50 million Europeans downloaded digital contact tracing apps in the first nine months of 2020.[7] Close to 40% of the Icelandic population has downloaded its *Rakning C-19* app; and between 20-30% of populations in Finland, Germany, Ireland, Norway, Switzerland and the United Kingdom have downloaded national apps. Most apps target 50-60% penetration to reduce the reproduction number (i.e. the expected number of cases directly generated by one case in an infection-naïve population).

While lower adoption rates may still have some benefits, low rates will inevitably fail in their objective of facilitating traditional contact tracing efforts. There are also questions regarding the reliability and accuracy of the underlying data, and the potential for false positives and false negatives. Furthermore, in 2019, around 27% of individuals aged 16-74 years old did not use mobile devices to access the internet in the EU, going up to 51% among individuals aged 55-74. For all this, a fully automated digital contact-tracing strategy is unlikely to be successful, although it can complement traditional contact-tracing efforts (ECDC, 2020[22]).There are also significant concerns regarding the potential for misuse and privacy abuses. A recent assessment of 17 contact-tracing apps (including apps from Europe) found them to be insecure and easy to hack (Guardsquare, 2020[23]). There is also a fear of "mission creep", and that once new powers of surveillance are introduced, they are difficult to reverse, even when the crisis has passed (OECD, 2020[24]).

Routinely collected data from electronic health records are underutilised but could be instrumental to containment and mitigation strategies

Beyond innovative uses of mobile technology, there are rich opportunities to take advantage of the massive amount of data that are collected every day in health systems across Europe. Countries with standardised national electronic health records (EHRs) can extract high quality routine data from those systems for real-time surveillance, but only six European countries (Austria, Denmark, Estonia, Finland, Slovak Republic and the United Kingdom), have high technical and operational readiness to generate information from EHRs (Colombo, Oderkirk and Slawomirski, 2020[25]; Oderkirk, 2017[26]). Finland and Iceland both have national EHR systems with patient portals and, as a result, were able to quickly develop the capability to track COVID-19 patients' longitudinal progress, offer integrated tools for people to report their symptoms, and triage people to appropriate services as their symptoms progressed. In England, where an analytics platform for research with primary care EHRs was already established, data from records covering over 17 million primary care patients were linked to deaths in-hospital from February through to the end of April to identify risk factors for death from COVID-19, with results published online in early May (Williamson et al., 2020[27]).

OECD data from 2019/20 indicate that ten EU countries are prepared to undertake national dataset linkages in support of COVID-19 research because they routinely link at least hospital and mortality data (Austria, Czech Republic, Denmark, Finland, France, Latvia, Netherlands, Norway, Slovenia and Sweden). However, very few of these countries had data timely enough to be useful for decision-making. Only 3 out of 16 surveyed European countries had hospital and emergency care data that were updated either daily or weekly, and only two had mortality data in real time. Further, only six countries (Austria, Denmark, Estonia, Finland, Slovak Republic and the United Kingdom) made a range of health care data readily and securely available to the research community through real-time remote access services or a research data centre. These services increase the probability of having a strong cadre of researchers familiar with the data who could respond quickly to generate new information to address the crisis.

Time of implementation has been the main factor differentiating countries' strategies

Overall, apart from Sweden, most European countries implemented similar containment and mitigation measures during the first wave of the pandemic. Sweden encouraged social distancing but largely limited mandatory restrictions to prohibiting gatherings above 50 people. In addition, even in countries with no formal stay-at-home orders, the closure of both academic institutions and public spaces has contributed to similar intended effects on people's mobility (see Table 1.2).

However, one of the elements differentiating countries' policy interventions is the timing of their enforcement. Not all countries were able to implement measures at an early stage of the first wave of the pandemic. Countries that were first hit by the outbreak implemented mitigation and containment strategies at a moment when the disease was already spreading widely in the communities. For instance, public spaces were closed less than ten days before the country reached the threshold of ten deaths per million population in Italy (one day), Spain (four days), France (seven days), Belgium (seven days), the United Kingdom (ten days). In contrast, Hungary, Lithuania, Poland, Latvia and the Slovak Republic enforced containment and mitigation strategies more than one month before reaching the threshold of ten deaths per million population. Being able to learn from the experiences of countries first hit by COVID-19 appears to have helped these countries control the first outbreak of the pandemic.

Containment and mitigation policies, particularly early targeted interventions, have contributed to control the first wave of the pandemic

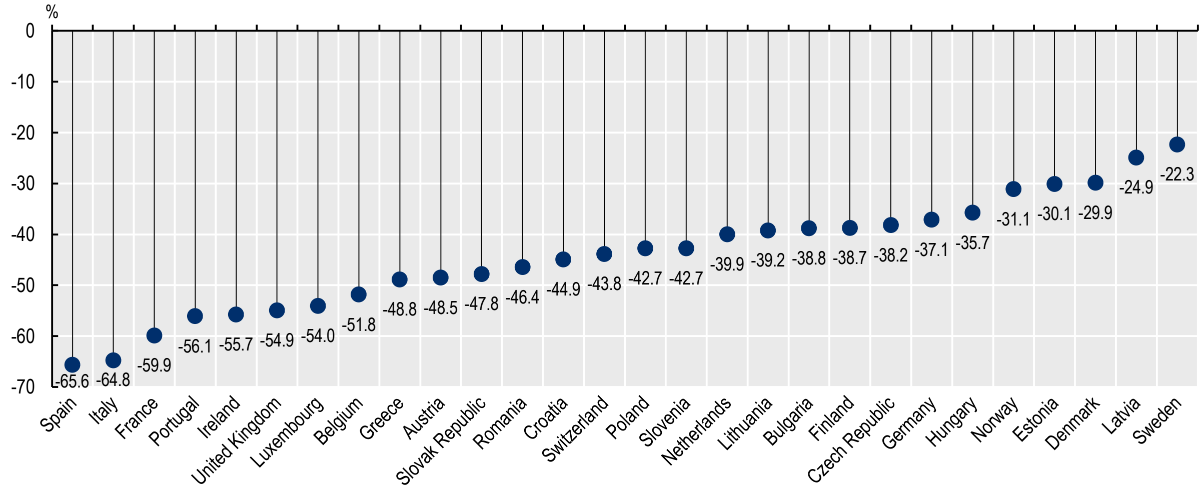
There is no commonly accepted method to estimate the relative efficacy of the different containment and mitigation strategies adopted by countries during the first wave of the pandemic. In this section, analysis focuses first on the general effect of these policies on population mobility, relying on Google Community Mobility data. Then, in order to compare the relative effects of these policies on the control of the outbreak, two indicators are used: the reproduction number and daily patient admissions in intensive care units (ICUs).

Containment and mitigation strategies substantially reduced people's mobility

Google Community Mobility data show how visits to (or time spent in) categorised places changed compared to a baseline reference. This reference was defined as the median value from the period 3 January to 6 February 2020. In order to estimate the overall stringency of the containment and mitigation measures taken by countries, an average reduction in mobility was calculated over March to May 2020 (i.e. from when most European countries enforced general social distancing measures), as compared with the reference period (Figure 1.9). Analysis focused on leisure activities (notably restaurants, cafes, shopping centres, theme parks, museums, libraries, movie theatres) and public transport (notably metros/subways, bus hubs and train stations).

As shown in Figure 1.9, containment and mitigation strategies have had a substantial impact on people's mobility. All countries reported a reduction in the mobility of their populations over the studied period, ranging from -22% in Sweden to over -60% in Spain and Italy. In the first weeks following the enforcement of these policy options, the mobility of the population in certain countries was almost total, with reductions of -85% or more in Spain, Italy or France. Differences in the measures adopted can explain some of the variation observed across countries. For example, places with formal stay-at-home orders had an average reduction of -50% compared to -37% for those without. Overall, it appears that general lockdowns and closures of public spaces reached their intended objective to limit people's mobility and as a result their potential interactions.

Figure 1.9. **Reduction in populations' mobility over the March-May 2020 period, compared to baseline**



Note: This figure represents an average of the reduction in mobility of populations over a three-month period (March to May 2020). It combines reductions in public transport and leisure activities. The baseline reference was defined as the median value from the 5-week period 3 Jan to 6 Feb 2020.
Source: Google LLC (2020[28]), "Google COVID-19 Community Mobility Reports", *https://www.google.com/covid19/mobility*.

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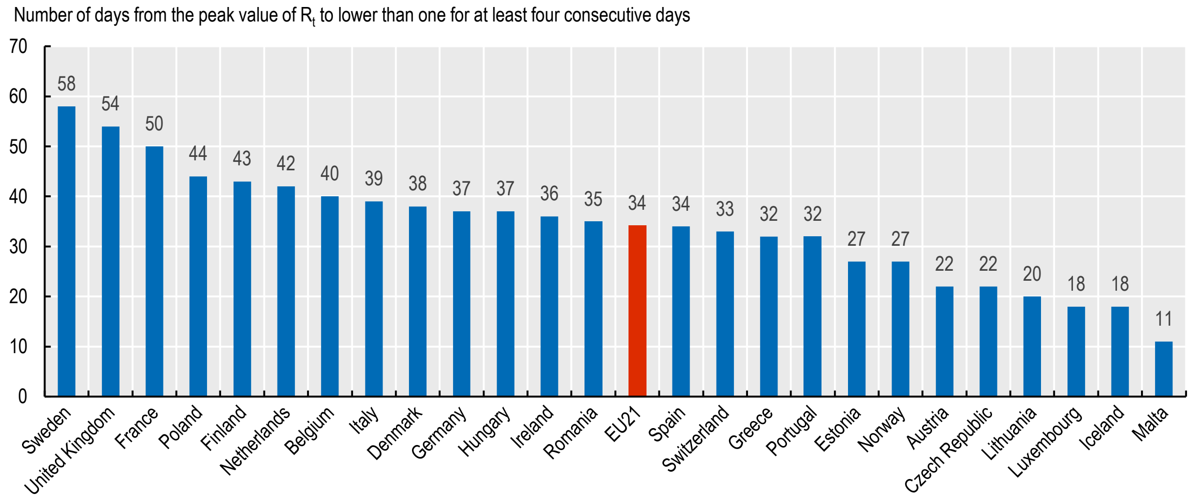
It took on average 34 days to European countries to control the first wave of the outbreak

However, other indicators are needed to assess whether containment and mitigation strategies were effective in actually controlling the epidemic. One measure of viral spread is the R_0, the *expected* number of secondary infectious cases produced by a primary infectious case. This calculation is used to determine the potential for epidemic spread in a susceptible population. In order to estimate the dynamic of an epidemic over time, the *effective* reproduction number (R_t), can be used. It describes the potential for epidemic spread at a specific time *t* under the control measures in place (Pan et al., 2020[29]; Xiao et al., 2020[30]; Inglesby, 2020[31]).

The objective of prevention interventions, including containment and mitigation strategies, is therefore to bring the value of R_t to below one, that is, when the number of infected persons will decrease over time. Figure 1.10 presents the number of days needed to bring the R_t from its highest value in each country to below one for at least four consecutive days. On average, it took 34 days for countries to bring this indicator to below one after the epidemic started spreading in the country. The country with the shortest period was Malta (11 days), with Sweden reporting the longest period (58 days).

Many of the countries that have been most severely hit by the COVID-19 outbreak – such as Belgium, France, Italy, the Netherlands, Sweden and the United Kingdom – required a greater number of days to bring down their R_t to below one from their respective peak levels. Simple correlations of the rates at which R_t declined with the duration and intensity of lockdowns shed some interesting preliminary insights – notwithstanding that correlations do not equal causation, with multivariate analysis needed to better identify the relative effect of each factor. First, there was no clear association between the implementation of lockdown measures (using the mobility data reported in Figure 1.9 above) and decreases in the R_t, nor between the duration of general lockdown orders and the rate at which the R_t decreased below one. Conversely, a moderate correlation was identified between earlier closure of public spaces and higher rates of R_t decrease. Countries that could enforce early closures of general public spaces (i.e. more than two weeks before the country reached ten deaths per million population) reported an average of 30 days to reduce the R_t, compared to 39 days for countries with later dates of public spaces closure.

Figure 1.10. **Number of days to bring estimated R_t below one**



Note: The EU average is unweighted. Values displayed are sensitive to a number of factors that may limit comparability. In particular, the serial interval of the disease (i.e. time between onset of symptoms in a first case and subsequent cases) is set at seven days – for COVID-19 this value has been estimated to be somewhere between four-eight days.

Source: Real-Time Estimates of the Effective Reproduction Rate of COVID-19, *http://trackingr-env.eba-9muars8y.us-east-2.elasticbeanstalk.com/*, accessed 23 July 2020; Arroyo Marioli et al. (2020[32]), "Tracking R of COVID-19: A New Real-Time Estimation Using the Kalman Filter", *https://doi.org/10.1101/2020.04.19.20071886*.

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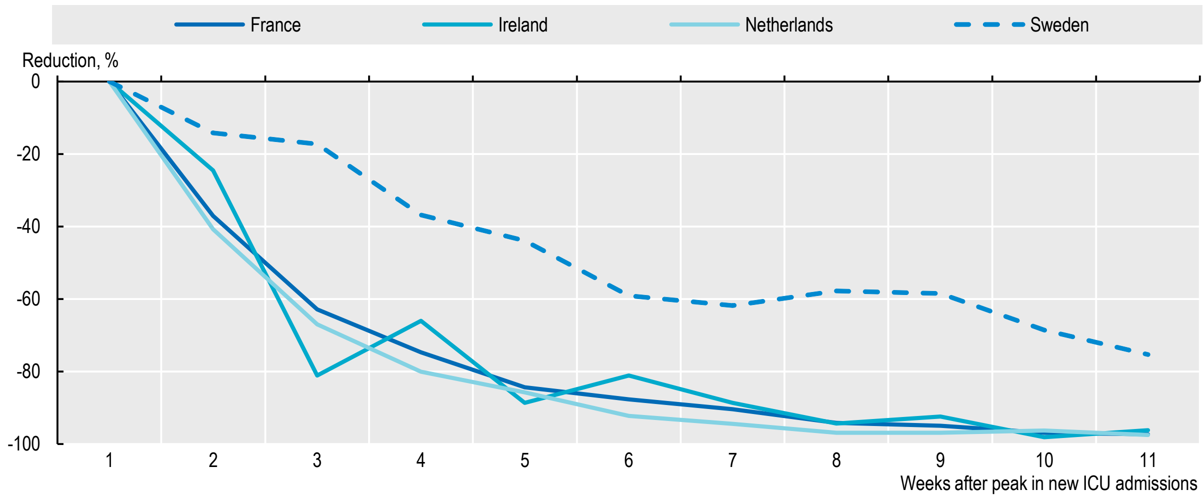
Along with the R_t, another indicator that reflects the impact of containment and mitigation strategies is the number of daily ICU admissions for patients suffering from critical forms of COVID-19. This indicator is useful to analyse the dynamic of the epidemic, since admission criteria to ICUs are similar across European countries, and changes in the propagation of the virus may quickly be reflected in the number of admissions in these wards.

Figure 1.11 reports the evolution in the weekly number of new ICU admissions after the peak in the number of new admissions for selected countries. In France, Ireland and the Netherlands (which have enforced similar containment and mitigation strategies), the number of weekly admissions decreased sharply while for Sweden, which relied on a different strategy for containment and mitigation, this reduction was much less marked.

The effectiveness of containment and mitigation strategies depends on the rapidity of policy action, with population density and the degree of trust in government also important

Overall, it appears that the containment and mitigation strategies enforced by countries during the first wave of the pandemic achieved their intended effects of reducing people's interactions (measured using mobility data as a proxy), thereby contributing to limiting the spread of the virus. Yet it remains challenging to determine the relative effect of each of the decisions taken in the evolution of the situation at country level, and how they interact with other characteristics of each country and of their populations. Preliminary findings suggest that early targeted interventions are more likely to pay off, but this needs to be further studied via more complex statistical models[8]. It is also useful to compare approaches taken by European countries with actions taken by some Asian Pacific countries that successfully controlled COVID-19, such as Korea (see Box 1.3) and New Zealand. In New Zealand, an "elimination strategy" (as opposed to a "mitigation strategy") was implemented very early on, in an effort to prevent the introduction and local transmission of COVID-19. This approach had a strong focus on border control (easier to apply on an island state) and emphasised case

Figure 1.11. **Weekly reduction in the number of new ICU admissions**



Note: Variation in the number of new admissions are compared to the value at the peak of admissions. Data refer to first wave of the pandemic.
Source: European Centre for Disease Prevention and Control (ECDC).

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isolation and quarantine of contacts to "stamp out" chains of transmission (Baker, Wilson and Anglemyer, 2020[33]).

Low population density and relatively high level of trust and compliance with government recommendations have also contributed to the effectiveness of containment and mitigation strategies in New Zealand as well as in some European countries. Up until the end of October 2020, countries like Estonia, Finland and Norway were better able to limit the health and economic impacts from the pandemic. These countries had the advantage of having amongst the lowest population density in Europe. In addition, relatively high level of trust in government may have contributed to increased compliance with government containment and mitigation strategies (OECD, 2019[34]).

Box 1.3. **Korea managed to control the COVID-19 outbreak without relying on severe social distancing policies**

Korea has been praised for its successful containment of COVID-19. Following substantial transmission among the members of a large religious group that fuelled early virus transmission, the country was quickly able to bring COVID-19 under control. Korea's response stands out because it flattened the epidemic curve swiftly without closing businesses, issuing stay-at-home orders, or implementing many of the stricter measures adopted by European countries.

This success seems first to stem from the lessons learnt by the country following the 2015 outbreak of MERS. After this outbreak, the country enforced a series of policy changes to improve pandemic preparedness and response. When COVID-19 struck, the authorities were ready to establish an aggressive response and the population was experienced in the use of facemasks or contact-tracing activities.

As a result, when the first COVID-19 cases were reported, Korea focused on setting-up large-scale population testing. Many biotechnology companies were created in the aftermath of the MERS crisis and this facilitated the establishment of public-private partnerships to develop and scale up testing for SARS-CoV-2. Following instructions from the Korean Centre for Disease Control, companies were quickly able to produce thousands of test kits daily. By the end of April 2020, 118 institutions were available to run diagnostic tests. Collectively, these institutions had the capacity to run an average of 15 000 tests per day.

After expanding testing capacity, the government designed a large population screening policy. Authorities opened 600 screening centres using innovative approaches to increase capacity such as drive-through or phone-booth style

Box 1.3. **Korea managed to control the COVID-19 outbreak without relying on severe social distancing policies** *(cont.)*

testing centres. To prevent infected people from entering hospitals, screening clinics were set up outside entrances. Some facilities were also transformed into temporary isolation wards so as to avoid transmission within households and reduce hospital occupancy rates. Health care workers regularly monitored these patients who did not warrant inpatient treatment.

Widespread contact-tracing was also key. Authorities scaled up their network of contact-tracers and gave them access to different types of data, in addition to what they might be able to learn from the classic patient interview. Lastly, massive public communication campaigns were set up to encourage citizens to assist the health system with contact tracing.

The Korean experience may not necessarily be relevant to all countries. The country is urbanised and is isolated in terms of borders. Yet the country's investments in preparedness and an early decision to focus on a massive testing and tracing strategy certainly are important lessons for European countries.

Source: Roser et al. (2020[20]), "Our World in Data", *https://ourworldindata.org/coronavirus*; OECD (2020[18]) "Testing for COVID-19: A way to lift confinement restrictions", *http://www.oecd.org/coronavirus/policy-responses/testing-for-covid-19-a-way-to-lift-confinement-restrictions-89756248/*.

Have European countries' health systems had sufficient capacity to treat patients infected with COVID-19 during the first wave of the pandemic?

Despite efforts to limit the spread of COVID-19, the first wave of the pandemic subjected health systems across Europe to an overwhelming and sudden surge in the number of patients in need of urgent treatment. This section evaluates the ability of European countries' health systems to respond to this unprecedented increase in demand for care. It includes an analysis of government spending to bolster the health system response; and the adequacy of pre-existing capacity, as well as policies adopted to provide surge capacity. Analysis is concentrated on health system responses to immediate needs and do not include collective efforts on the search for effective future treatment, tests and vaccines.

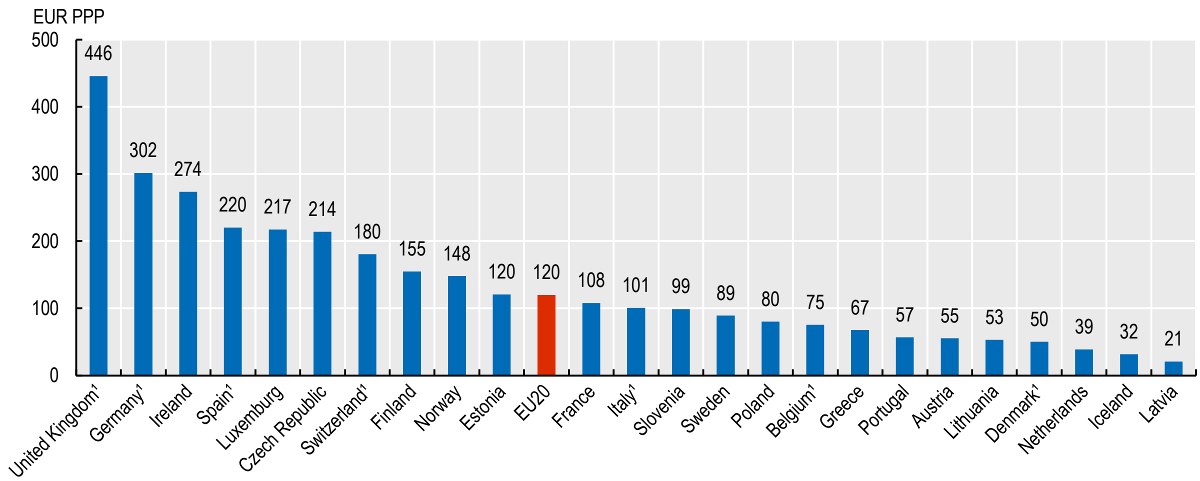
Governments freed up additional resources to strengthen health system responses to COVID-19

Governments put together substantial financial packages to respond to the COVID-19 pandemic. These resources were used to protect people's jobs and businesses, as well as to strengthen health system responses to COVID-19. Across European countries, most fiscal responses – including direct budgetary measures related to spending and revenue policies, alongside other interventions such as loans, equity injections and government guarantees – amounted to between 5-20% of GDP (OECD, forthcoming[35]).

The health sector was naturally among the first recipients of additional financial resources. Amongst European countries with comparable data, central government budgetary commitments to health system responses to COVID-19 ranged from almost EUR 450 per person in the United Kingdom, and around EUR 300 per person in Germany and Ireland, to under EUR 50 per person in Latvia, Iceland and the Netherlands, adjusted for purchasing power parity (Figure 1.12).

Common COVID-19-related budget measures in the health sector include: financing the procurement of specialised medical and personal protective equipment (PPE), expanding testing capacities, hiring of additional workforce and bonus payments, support to hospitals and to subnational governments, and contributions to vaccine development (Table 1.3). For example, the first response package in Spain contained EUR 3.9 billion additional spending measures for the health sector, of which EUR 1 billion went as direct budget support to the Ministry of Health, EUR 2.8 billion was given as advance transfers to regions for regional health services, and EUR 0.1 billion went on research on new drugs and vaccines.

Figure 1.12. **Central government additional COVID-19 health spending commitments per capita, 2020 (between March and September 2020)**



Note: The EU average is unweighted. These figures represent estimates from official announcements of spending measures against COVID-19. They are commitments rather than actual expenditures. Figures reflect central government spending commitments only, excluding commitments by subnational governments, external donors or private donations. Cross-country comparability is limited by differences in the date of the latest available official announcement. See Table 1.3 for details on the exact timing of official announcements across countries.

1. Denotes countries with a significant budgetary response at the subnational level.

Source: OECD member country governments (typically from ministries of finance or parliamentary reports).

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These figures constitute only central government spending commitments, with differences in per capita spending levels attributable in part to the different roles of sub-national governments (SNGs) in the COVID-19 response. For example, in Belgium, the government of Wallonia set EUR 115 million earmarked to help the health and social sector (Walloon Government, 2020[36]). Spain and Switzerland are further examples of countries where SNGs have dedicated significant budgetary resources for the health sector.

In addition, compulsory health insurance played a significant role in financing emergency responses (in countries with such health financing arrangements). For instance, in Germany health insurance funds have contributed EUR 5 billion together with the federal government for a Protective Shield that provides funding to hospitals to mitigate against revenue shortfalls and higher costs.

Given the scale of government financial support to health systems, a number of countries have implemented specific expenditure tracking and performance monitoring measures. In Austria, the Ministry of Finance has set up separate accounts for COVID-19 expenditure, which are then shared in a monthly report to the Parliament. In the United Kingdom, the government asked the NHS to use unique COVID-19 cost centres and budget codes to help account for the resources used to tackle COVID-19. In France, an amended state budget law has created a new budget mission and two new budgetary programmes on COVID-19, with associated objectives, spending measures and performance indicators.

Health professionals have been at the forefront of the response to the COVID-19 outbreak

As doctors, nurses and other health professionals mobilised on the frontline to respond to the pandemic, health systems sought ways to increase the number of staff available during the peak of the pandemic and to make the most efficient use of their work.

The first wave of the COVID-19 pandemic made pre-existing shortages of doctors and nurses more visible and acute in many countries. Some countries, such as Norway, Switzerland and

Table 1.3. **Additional central government COVID-19 health expenditure commitments, 2020 (latest available official announcement)**

Country	Additional commitment (millions, national currency)	Additional commitment (per capita, Euro PPPs)	Main expenditure areas	Date of latest available official announcement
Austria	579	55	Purchase of PPE and medical equipment, research	6 May
Belgium[1]	1 000	75	Purchase of medical equipment and PPE	20 April
Czech Republic	40 300	214	Health insurance payments, salaries, PPE, medical devices, hospital debt relief	7 May
Denmark[1]	3 100	50	Procurement of PPE	29 May
Estonia	213	120	Transfer to Estonian Health Insurance Fund	2 April
Finland	1 087	155	Additional health costs, testing, PPE and medical equipment, research on diagnosis and vaccines	24 September
France	8 000	108	Extraordinary health care expenses including equipment and masks, staff remuneration	10 June
Germany[1]	26 790	302	Central procurement of PPE, vaccine development and treatment measures	18 September
Greece	610	67	Purchase and distribution of PPE and medical goods, hiring additional health workforce, enhance laboratory capacities	21 September
Iceland	2 500	32	Hospital services, testing capacities, mental health services, health workforce bonuses	21 April
Ireland	1 800	274	Expand hospital capacity, develop primary and community-based responses, procurement of medical equipment	12 May
Italy[1]	6 312	101	Hiring of medical and nursing personnel, expanded private hospital capacity, purchase of medical equipment	17 March
Latvia	59	21	Health personnel expenditures, procurement of PPE, testing equipment, ventilators, surveillance, laboratory network	4 September
Lithuania	249	53	Purchasing PPE, equipment, bonuses and social guarantees for health care workers	1 July
Luxembourg	194	217	Medical equipment and health infrastructure, testing capacities	4 April
Netherlands	800	39	Purchase, distribution and sale of medical devices, contribution to vaccine research, training additional health care personnel	24 April
Norway	12 160	148	Expenses for medicines and medical equipment, laboratory expenses, vaccination development	12 May
Poland	7 500	80	Creating and equipping infection hospitals, medical transport, additional health care services, purchasing PPE	1 April
Portugal	504	57	Health personnel expenditures, acquisition of medical equipment	18 June
Slovenia	247	99	Purchase of medical, protective equipment	30 August
Spain[1]	10 030	220	Ministry of Health support, transfer to regions, research on drugs and vaccine development	12 July
Sweden	12 366	89	Public Health Agency, National Board of Health and Welfare, Swedish Medical Produce agency, transfers to municipalities and regions for costs associated with testing and tracking	21 September
Switzerland[1]	2 910	180	Procurement of PPE, tests, medical supplies, medicines, funds for Coalition for Emergency Preparedness and Innovations	12 August
United Kingdom[1]	32 000	446	PPE; Test, Trace, Contain and Enable programme, procurement of additional ventilators	8 July

1. Denotes countries with a significant budgetary response at the subnational level.
Source: OECD member country governments (typically from ministries of finance or parliamentary reports).

Germany, had a relatively high number of doctors and nurses per capita prior to the start of the pandemic relative to other countries. This provided them with a greater potential to respond to the steep rise in demand for care, assuming that the activities of some of these health professionals could be reallocated to deal with the crisis (for instance via additional training). Countries in Central and Eastern Europe, such as Poland, Latvia and Romania, had comparatively fewer doctors and nurses per population, and therefore less capacity to respond to the epidemic (Figure 1.13). During the first phase of the pandemic in the spring of 2020, the COVID-19 outbreak did not reach the same peak in cases and mortality as in many countries in Western and Northern Europe. Still, since August, the situation has deteriorated in some Central and Eastern European countries such as the Czech Republic and Romania, overstretching an already limited staffing capacity.

Figure 1.13. **Number of practising doctors and nurses per 1 000 population, 2018 (or latest year)**

Note: The EU average is unweighted. In Portugal and Greece, data refer to all doctors licensed to practice, resulting in a large overestimation of the number of practising doctors (e.g. of around 30% in Portugal). In Austria and Greece, the number of nurses is underestimated as it only includes those working in hospital.
Source: OECD Health Statistics 2020; Eurostat Database.

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Regardless of countries' health workforce size and composition before the onset of the first wave, the COVID-19 pandemic substantially increased the workload of most health workers – particularly frontline workers in hospitals, in all countries. In the United Kingdom, 60% of hospital doctors in England and Wales reported having worked additional hours between March and August 2020 as part of the response to COVID-19 (BMA, 2020[37]). The pay rate for the overtime work of frontline workers in hospitals was increased in many countries as a recognition of the exceptional circumstances and workload. In France, for example, the overtime premium for people working in public hospitals was increased markedly in March and April 2020, and an exceptional lump-sum bonus was also granted to those working in the most affected regions to recognise their effort and commitment (Service Public France, 2020[38]). Similar measures were taken in Germany and Belgium.

Most countries that were hard-hit by COVID-19 tried to mobilise additional staff to respond to the surge in demand for care during the peak of the pandemic. France already had in place before the crisis some "reserve list" ("*Réserve Sanitaire*") established in response to previous epidemics, which was mobilised and expanded during the COVID-19 outbreak, while Belgium, Ireland and Iceland (among others) quickly set up new "reserve lists" to deal with the outbreak and reallocate staff across regions.

At least half of the countries in Europe started by recalling inactive and retired health professionals, offering them some short training to update and upgrade their skills. Several countries decided against deploying older health professionals coming back to work, to avoid exposing them to the greater risk of severe complications should they become infected. Most countries mobilised students nearing the end of their studies in medical, nursing and other health education programmes to respond to concerns and questions of the population through telephone hotlines and support service delivery to patients. Two-thirds of countries also transferred some health workers to hospitals in regions that were more affected by the pandemic (see Table 1.4 and Annex Table 1.A.1 in Annex 1.A).

Table 1.4. **Overview of policies to boost the supply of health workers in response to COVID-19, during the first wave of the pandemic**

Country	Mobilising health care students (medical, nursing, other)	Mobilising retired and non-practicing health workers	Mobilising foreign health workers (already in country or coming from abroad)	Existence of official reserve list (before COVID-19 or new list during the epidemic)	Transfer of health workers to localities with greater needs
Austria	✓		✓		✓
Belgium	✓			✓	
Bulgaria	✓	✓			
Croatia					
Cyprus	✓				✓
Czech Republic	✓	✓	✓		✓
Denmark	✓	✓			
Estonia	✓				✓
Finland	✓				✓
France	✓	✓	✓	✓	✓
Germany	✓		✓		
Greece	✓	✓			✓
Hungary	✓	✓			✓
Iceland				✓	
Ireland	✓	✓		✓	✓
Italy	✓	✓	✓		✓
Latvia	✓				
Lithuania	✓	✓			
Luxembourg	✓	✓	✓	✓	✓
Malta	✓	✓			✓
Netherlands		✓			✓
Norway	✓			✓	✓
Poland	✓	✓			✓
Portugal	✓	✓			✓
Romania	✓				✓
Slovak Republic					
Slovenia	✓	✓			
Spain	✓	✓			✓
Sweden	✓	✓			✓
Switzerland	✓				✓
United Kingdom	✓	✓	✓		✓

Source: OECD health system policy tracker, European Observatory COVID-19 Health System Response Monitor.

The need to maximise the efficiency of available resources also led to several innovations in the roles and responsibilities of different health professionals. The role of community pharmacists, for instance, was broadened in many countries at least temporarily to address urgent needs and reduce the need for doctor consultations for non-COVID-19 patients. In France, Ireland and Portugal, community pharmacists were allowed to renew and dispense the prescription for patients with certain chronic conditions (PGEU, 2020[39]). The later section on maintaining high quality care for non-COVID-19 patients provides further examples on task-shifting at the primary care level.

Since health professionals were at the forefront of the response to the outbreak, ensuring they received adequate personal protective equipment to avoid the emergence of clusters at the point of care was of paramount importance. During the initial phase of the pandemic, most countries faced an acute shortage of medical masks and other personal protective equipment for health workers, which left many of them vulnerable to infection. Such shortages were particularly marked in outpatient and long-term care settings. Over 30 000 health workers were infected by the virus in France and Italy during the first few months of the pandemic, and this number reached over 50 000 health workers in Spain (Santé Publique France, 2020[40]; Istituto Superiore di Sanità, 2020[41]; Ministerio de Sanidad, 2020[42]).[9] The number was lower in Germany where about 15 000 people working in hospital and other health care facilities were infected, but this number does not include people working in long-term care facilities. About three-quarters of all workers in health care facilities who were infected in Germany were women as they account for a larger share of health workers (Robert Koch Institute, 2020[43]).

The exceptional workload and psychological drain on health professionals led to a considerable mental health burden, with possible long-term effects for their well-being. For example, in August 2020, 35% of hospital doctors from England and Wales reported increased rates of depression, anxiety, stress or other mental health conditions relative to before the pandemic began (BMA, 2020[37]). In Italy, a survey of health care workers in March 2020 found increased symptoms of stress, anxiety, depression and insomnia, especially amongst frontline workers and young females (Rossi et al., 2020[44]). In Spain, research found that in April 2020, 57% of health workers presented with symptoms of post-traumatic stress disorder (Luceño-Moreno et al., 2020[45]). Support services for mental health and well-being of doctors, nurses and other hospital workers were expanded by many countries to help them deal with the high level of stress, fatigue and psychological distress during these extremely challenging times, for example through peer support groups or dedicated phone support lines.

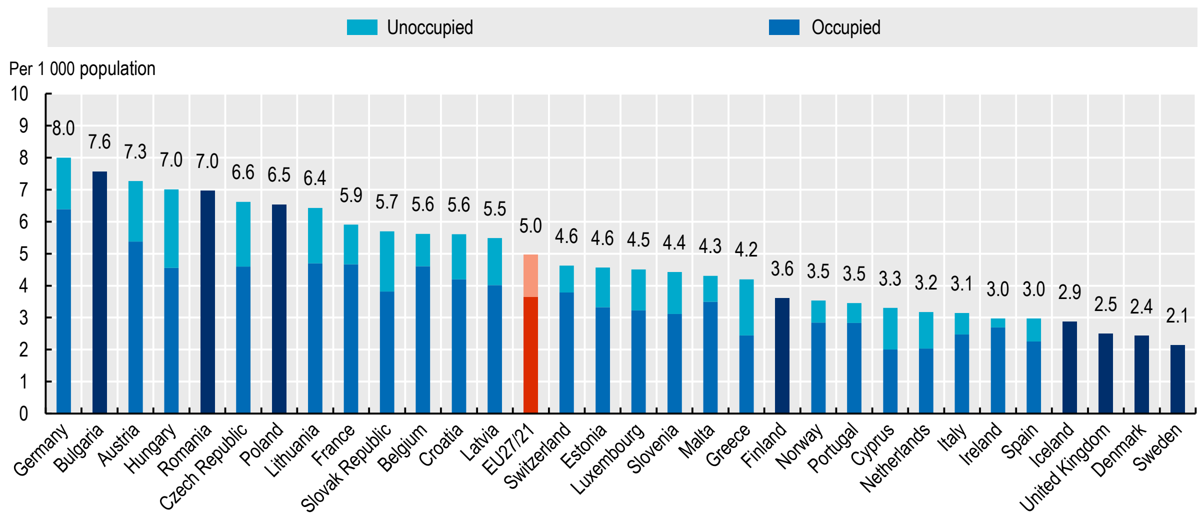
Some health systems lacked sufficient hospital beds, equipment, supplies and medicines to treat COVID-19 patients, but policies to boost surge capacity have helped

Hospitals have often been placed under immense strain, but governments found innovative solutions to increase surge capacity, particularly for intensive care units

While the pandemic has put all health services under severe strain, its impact on hospitals has been particularly drastic. In this context, having a high number of beds per population is a useful general proxy of the capacity of hospitals to meet surges in demand (Figure 1.14). In terms of existing capacities, Germany had the most hospital beds per capita in 2018, with eight beds per 1 000 population, followed by Bulgaria and Austria. Most European countries have between three and seven hospital beds per 1 000 population, but numbers are lower in Sweden, Denmark, Iceland and the United Kingdom.

Bed occupancy rates provide complementary information to analyse hospital capacity, with (in the current context) high occupancy rates symptomatic of a health system with limited capacity to handle unexpected surges in patients requiring hospitalisation. In 2018, bed occupancy rates for

Figure 1.14. **General hospital capacity – hospital beds and average share occupied before the COVID-19 crisis, 2018 (or nearest year)**



Note: The EU average is unweighted. The EU27 average refers to unoccupied beds, and the EU21 to occupied beds. Hospital beds include all beds regularly maintained and staffed within general hospitals, mental health and substance abuse hospitals, and other specialty hospitals. Beds in residential long-term care facilities are excluded. Note that occupancy rates are calculated on the basis of curative (acute) care beds – within which, intensive care beds are a small sub-category.

Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/sb6p4o

curative (acute) care averaged 73% across EU Member States. However, they were 91% in Ireland, and just over 80% in Portugal, Belgium and Malta. Curative (acute) care occupancy rates broadly mirror overall bed numbers (e.g. in Ireland, Italy and Spain), with the exception of Greece, which has relatively few hospital beds and relatively low bed occupancy rates. National averages hide wide variations in occupancy rates within countries, as well as cyclical differences throughout the year, meaning that occupancy rates can reach or even surpass 100% in some hospitals during peak periods.

Whilst general hospital bed capacity matters, intensive care unit (ICU) capacity is paramount. This is because a certain share of patients infected by the COVID-19 will develop a severe form of the disease requiring ICU-level care. The number of ICU beds – which typically are equipped with core devices such as ventilators and monitoring equipment – is therefore an important indicator of a health system's capacity to respond to a crisis such as this one.

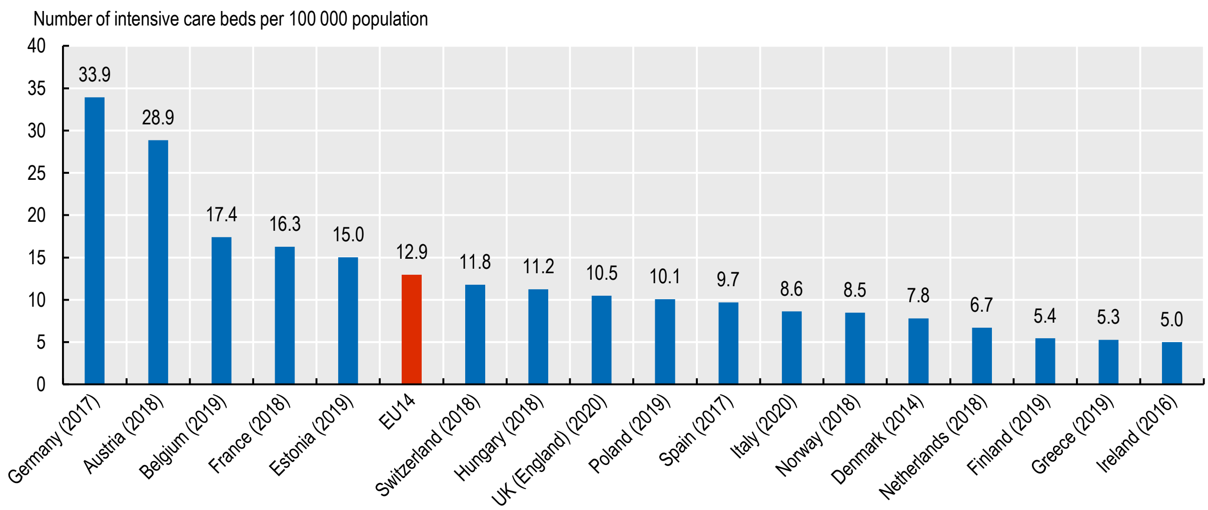
Notwithstanding definitional differences, the most recent publicly available data suggest that, before the COVID-19 crisis, the variation in ICU capacity across 17 European countries ranged from 34 ICU beds per 100 000 people in Germany, to five ICU beds per 100 000 people in Ireland (Figure 1.15).

These data on overall hospital bed capacity and ICU beds provide an indication of European countries' core hospital capacity prior to the crisis. Combining data on the maximum daily number of COVID-19 patients occupying ICU beds during the first half of 2020 with estimates of total ICU beds available provides further insights on countries' resilience to the outbreak (Figure 1.16). This shows, for example, that at the height of the outbreak in Italy in the first half of 2020, an equivalent to almost 80% of regular pre-crisis ICU beds would have been occupied by COVID-19 patients. For Belgium, Ireland and France, the equivalent figure was around 65% of regular ICU beds.

Even if some capacity remains at the national level, these numbers point to local ICU capacity in the worst hit areas of these countries being severely overstretched during the height of the outbreak.

For example, in France ICU capacity was almost reached in the greater Paris area and Eastern region but almost untouched in most other regions. In contrast, COVID-19 patients occupied less than 15% of regular pre-crisis ICU beds in Austria and Hungary on the worst day of the outbreak in these countries.

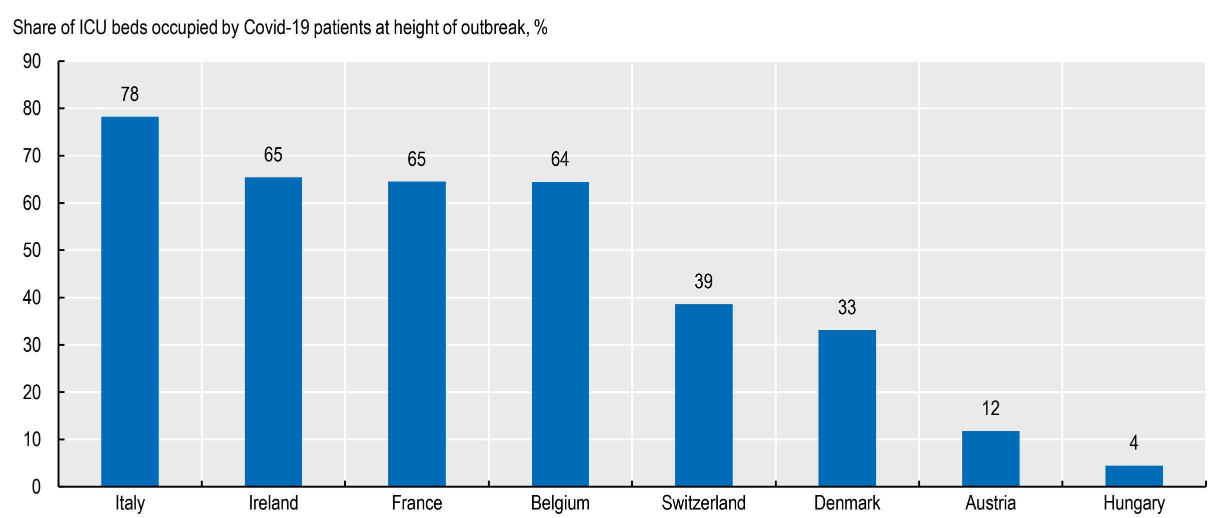
Figure 1.15. **Intensive care capacity – ICU beds before the COVID-19 crisis, latest year available**



Note: The EU average is unweighted. There may be differences in the notion of intensive care affecting the comparability of the data. Data refer to adults only in Belgium and Ireland; to all ages in Germany, England and Spain. Data in France exclude beds in constant monitoring units and paediatric ICUs.
Source: German Federal Statistical Office, Austrian Ministry of Health, Belgian Ministry of Health, French Ministry of Health, Hungarian National Health Insurance Fund, NHS England, Polish Ministry of Health, Spanish Ministry of Health, Italy: (Remuzzi and Remuzzi, 2020[46]), Norwegian Health Ministry, Danish Society of Anesthesiology and Intensive Medicine, Dutch Intensive Care Society, Irish Department of Health.

StatLink https://stat.link/v1lk48

Figure 1.16. **Estimated ICUs capacity to cope with the surge in COVID-19 patients during the first wave of the pandemic in 2020 (selected countries)**



Note: Values are based on when the number of COVID-19 patients in ICU beds was at its highest, and relate this to the total number of regular ICU beds, for each country. Therefore this is an estimation only, as additional temporary ICU beds are not included in calculations.
Source: European Centre for Disease Prevention and Control (ECDC) for number of COVID-19 patients occupying ICU beds, national sources detailed in Figure 1.15 for number of ICU beds.

StatLink https://stat.link/cdlez5

In response to this pressure on hospitals, and particularly on ICU beds, many European governments have implemented policies to boost surge capacity. For example, in Estonia, France, Hungary, Italy, Romania, Slovenia and Spain the military helped create field hospitals. Most European countries converted general purpose and other clinical wards into ICU wards. In addition, many countries postponed elective surgery to free up a maximum amount of hospital beds to deal with the pandemic.

Such policies have significantly boosted surge capacity in several countries. For example, Belgium created an additional 759 ICU beds (i.e. an extra 6.6 per 100 000 population) since the start of the COVID-19 crisis, Ireland a further 399 ICU beds (i.e. an extra 8.1 per 100 000 population). In the Lombardy region of Italy, turning wards into ICUs increased ICU capacity by 376 beds. There have also been encouraging examples of inter-country support. For example, some patients in overburdened hospitals in the East of France were transferred by train to Austria, Germany, Luxembourg and Switzerland (see Annex Table 1.A.2 in Annex 1.A for further information by country). A persistent challenge, though, has been how to adequately staff additional ICUs, with the consequent effect of underutilised ICU beds.

In general, the four broad policy interventions aimed to maximise ICU capacity during the crisis have been:

- The systematic transformation of other clinical wards into ICUs (at least 24 of 31 countries);
- The creation of field hospitals (at least 14 of 31 countries);
- The transfer of patients to localities with spare capacity (at least 8 of 31 countries);
- Partnerships with private hospitals (at least 11 of 31 countries).

Table 1.5 summarises which countries have adopted each of these policy levers.

At the same time, primary health care services were rapidly adapted in some European countries to improve the triage of patients with potential COVID-19. One innovative solution was to establish COVID-19 community care facilities, as implemented in France, Iceland, Luxembourg, Slovenia and the United Kingdom. The overarching objective was to improve co-ordination between hospitals and multi-disciplinary primary care practices to maintain adequate health services. While primary health care providers continued to be responsible for managing patients with chronic diseases, efforts also consisted of screening suspected COVID-19 cases, coordinating patient's follow-up after hospital discharges and managing frail patients in the community (Julia et al., 2020[47]).

In France, triage and prioritisation criteria for patients without COVID-19 were specifically developed to ensure usual care of chronically ill patients to avoid further delays in follow-up visits. In the United Kingdom and Luxembourg, COVID-19 community centres were established to manage both patients experiencing COVID-19 symptoms and patients having acute or chronic conditions requiring primary care treatment. Such community care facilities were made available to reach underserved people and make sure that everyone in the community had access to the right health and social support during the crisis (see the later section on maintaining access to high quality care for non-COVID-19 patients).

Obtaining the necessary equipment, supplies and medicines has proven challenging, particularly early in the crisis

Alongside beds (both general, acute and ICU beds), hospitals and other health facilities require sufficient medical equipment, supplies and medicines. Personal Protective Equipment (PPE), ventilators, infusion pumps, monitoring and laboratory equipment, and certain medicines (notably anaesthetics, antibiotics, muscle relaxants, resuscitation medicines and anti-diuretics; as well as medical oxygen) are some critical items needed to treat COVID-19 patients.

However, purchasing and distributing such items under conditions of extreme urgency and uncertainty is challenging – with risks of shortfalls in supply or poor quality products due to disruptions in the global supply chain. Even before the onset of the pandemic, countries have reported increased shortages of critical medical supplies and products. For example, across a sample of 14 OECD countries, the number of notifications of expected or actual medicine shortages grew by more than 60% between 2017 and 2019 (OECD, forthcoming[48]).

Table 1.5. **ICU capacity – overview of policies to boost surge capacity response to COVID-19, during the first wave of the pandemic**

Country	Transformation of wards into ICUs	Creation of field hospitals	Transfer of patients to localities with spare capacity	Partnerships with private hospitals
Austria	✓			
Belgium	✓			✓
Bulgaria		✓		✓
Croatia	✓	✓		
Cyprus		✓		
Czech Republic	✓			
Denmark	✓			✓
Estonia	✓	✓	✓	
Finland	✓			
France	✓	✓	✓	✓
Germany	✓	✓		
Greece	✓	✓		✓
Hungary	✓	✓		
Iceland	✓			
Ireland	✓		✓	✓
Italy	✓	✓	✓	
Latvia	✓			✓
Lithuania			✓	
Luxembourg	✓	✓		
Malta	✓			
Netherlands			✓	
Norway	✓			
Poland	✓			
Portugal	✓	✓		✓
Romania	✓	✓		
Slovak Republic				
Slovenia		✓		
Spain		✓	✓	✓
Sweden	✓	✓	✓	✓
Switzerland	✓		✓	✓
United Kingdom	✓	✓		✓

Source: OECD health system policy tracker, European Observatory Health System Response Monitor.

Effective public procurement, supply chain management, strategic stockpiling and trade policies are all important tools to enable health providers to receive essential items in a timely manner. In terms of procurement, most European countries used emergency contracting rules so that public buyers could act more quickly – for example, by not requiring a minimum number of contractors to be consulted, lighter checks on firms' track record and other simplifications to tender procedures (see OECD (2020[49]) for an in-depth analysis during the COVID-19 crisis). While emergency contracting speeds up procurement, the challenge is to also keep purchasing transparent and accountable.

Central price and supplier tracking and digitalisation of procedures can help identify red flags. For example, in Italy the central purchasing body *Consip* only uses verified suppliers. In Lithuania, the Public Procurement Office has made data on COVID-19 related contracts publicly available.[10]

Centralised purchasing can make procurement rapid, efficient and well-coordinated. Increased centralisation has been adopted in the Czech Republic, Latvia, Germany, Estonia, Italy, Lithuania, Poland, Spain, Switzerland and the Slovak Republic as a direct response to COVID-19. In Germany, Italy and other decentralised countries, centralised purchasing has been implemented in close partnership with sub-national governments. There have also been joint procurement efforts at supranational level (see Box 1.4 for further details on this and other European level initiatives).

Managing risks in the supply chain, notably through supply network mapping, limits over-reliance on single suppliers. A temporary clearing house set up by the European Commission has identified available supplies and potential risks to the supply chain (see Box 1.4). Strategic stockpiling can also help, although this requires careful monitoring to avoid excessive buffers in some countries and shortages in others. While many countries had stockpiles prior to the crisis, Finland was one of the few countries whose stockpile was sufficiently well maintained to meet needs for medical supplies (OECD, 2020[50]). At the EU level, *RescEU* was set up in March 2020 as a strategic reserve of essential medical equipment, with the European Commission financing most of the stockpiling costs and managing distribution.

Several governments have also enacted temporary trade measures in order to restrict exports and/or liberalise imports of certain medical products (OECD, 2020[51]; OECD, 2020[52]). On a national level, as of 8 October 2020, export restrictions on medical goods such as PPE and medicines were put in place across at least 19 European countries (Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, France, Germany, Greece, Hungary, Iceland, Latvia, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Switzerland, the United Kingdom). Most measures have been described as temporary, and at least 11 countries have already waived some of these restrictions. These measures imposed by countries during the pandemic include *export bans* (i.e. entirely prohibiting exports) and *new licencing requirements* (i.e. regulating new requirements for obtaining export licenses).

Such measures can actually increase scarcity in international markets, put existing contracts at risk, and raise prices and lower availability in non-producing countries. No country is self-sufficient in the production of all the necessary medicines, including those to combat the COVID-19 pandemic, and trade is an essential tool to increase availability internationally. In terms of liberalising imports, at least three countries (Norway, Switzerland, the United Kingdom) enacted measures to reduce tariffs on medical equipment and PPE.

At the European Union level, various co-ordinated responses have been taken on trade. These include an EU-wide regulation on export authorisations on PPE, with most member states subsequently lifting their national export restrictions on these products; the temporary waiving of custom duties and VAT; and guidance on exemptions to labelling and packaging requirements for medical imports – see Box 1.4 for further details on these policies.

Many governments have also sought innovative production solutions through the private sector. In the United Kingdom, for example, over 5 000 companies responded to the government-launched “Ventilator Challenge”, producing an estimated 14 000 ventilators[11]. In Italy, the government subsidised companies to produce PPE. In the Czech Republic, the Programme “Czech Rise Up” provided government subsidies to expand production capacities of essential items including PPE, respirators and ventilators. Bulgaria, Estonia, France, Greece, Italy, Norway, Poland and Spain have also incentivised domestic manufacturers to increase the production of core items such as PPE and ventilators.

Box 1.4. **EU-level actions to support the availability of critical medical equipment, supplies and medicines**

A number of collaborative EU-level initiatives have helped alleviate supply constraints and support a more co-ordinated response across countries. Notable actions include:

- **Joint procurement**. The European Commission has launched several voluntary Joint Procurement procedures since February 2020. These are based on Article 5 of Decision 1082/2013 on cross-border health threats, as well as on the Joint Procurement Agreement (JPA) with participation open to all EU and EEA Member States (plus the United Kingdom, six Candidate and Potential Candidate countries)[1]. Seven international tenders were launched to address or prevent shortages of medical countermeasures relevant for COVID-19. The European Commission helped countries identify and select suppliers, and negotiate contracts, enabling them to purchase essential products under the same (and more favourable) conditions. Between April and May 2020, countries placed orders for millions of masks, goggles and coveralls, +100 000 ventilators, and 30 lots of different laboratory equipment through these contracts. Over EUR 3.2 billion worth of orders can be placed by the 20-26 countries participating in these contracts.
- **Clearing house**. The European Commission set up a temporary clearing house to facilitate matching supply and demand between manufacturers and member states. Risk factors that may impact supply chain lead times are also analysed. It uses a centralised platform that pools data on trade flows, production capacity in third countries, and logistical, technical and regulatory bottlenecks.
- **Enhanced monitoring**. The European Medicines Agency, together with the pharmaceutical industry and EU Member States, launched a fast-track monitoring system to help anticipate drug shortages. This reinforced a single contact point for national medicines agencies (SPOC) and the launch of an industry single point of contact (i-SPOC).
- **Strategic stockpiling**. RescEU, a common reserve of medical equipment managed autonomously by the European Commission, was established in March 2020. The European Commission finances most of the stockpiling costs, and manages the distribution of equipment to member countries. At the same time, the European Commission provided guidelines and urged member states to lift export bans and restrictions on medicines and to avoid national stockpiling of medicines.
- **Manufacturing capacity**. The European Commission's new pharmaceutical strategy emphasises policies to increase the manufacturing capacity for certain critical medicines, active pharmaceutical ingredients and raw materials within Europe.
- **Trade policies: regulating exports**. A temporary EU-wide export authorisation scheme for PPE set out conditions for their export. This ran from 15 March to 26 May, to help safeguard supplies whilst also maintaining open trade flows. Indeed, over 13 million protective masks and about 1 million protective garments were exported from the EU since 26 April.
- **Trade policies: liberalising imports**. In April 2020, customs duties and VAT were temporarily waived on imported medical devices and PPE from non-EU countries. Moreover, the European Medicines Agency published guidance on regulatory expectations and flexibility during COVID-19, where member states may "grant full or partial exemption to certain labelling and packaging requirements" for crucial medicines used for COVID-19 (Article 63(3) of Directive 2001/83/EC). This includes accepting that product information may not be translated into the official language in the event of severe availability problems, and that national specific information may not appear or the presentation may differ from those authorised in the member state.
- **Anti-fraud measures**. The European Anti-Fraud Office (OLAF) has launched investigations into imports of fake health and hygienic products linked to COVID-19, such as masks, testing kits and disinfectant.
- **Simplifying standards**. To speed up market entry for essential medical items, the European Commission adopted revised harmonised standards for medical devices, with simpler processes for manufacturers of medical devices. Guidance documents for other items, such as PPE and testing materials, were also produced to assist manufacturers.

Box 1.4. **EU-level actions to support the availability of critical medical equipment, supplies and medicines *(cont.)***

- **Vaccines**. The EU Vaccine Strategy outlines how the European Commission intends to accelerate the development and availability of a COVID-19 vaccine. Its main objectives are to secure the production of vaccines within the EU; to ensure their future availability for its member states through Advance Purchase Agreements with vaccine producers; and to adapt EU rules to accelerate the development, authorisation and availability of vaccines while maintaining safety standards. A significant part of the EUR 2.7 billion Euro Emergency Support Instrument will be dedicated to fund implementation of this strategy.

1. *https://ec.europa.eu/health/preparedness_response/joint_procurement_en*.

Source: Information in this box is drawn largely from Box 6 of the EC's report on Health Systems' Resilience (2020[5]), "Assessing The Resilience of Health Systems in Europe: An Overview of the Theory, Current Practice and Strategies for Improvement", *https://ec.europa.eu/health/sites/health/files/systems_performance_assessment/docs/2020_resilience_en.pdf*, OECD (2020[50]), "The face mask global value chain in the COVID-19 outbreak: Evidence and policy lessons", *http://www.oecd.org/coronavirus/policy-responses/the-face-mask-global-value-chain-in-the-covid-19-outbreak-evidence-and-policy-lessons-a4df866* and OECD health system policy tracker.

What has been done to protect older people and other vulnerable populations from COVID-19?

Almost all reported COVID-19 deaths have been amongst those aged 60 and above, with recipients of long-term care particularly at risk

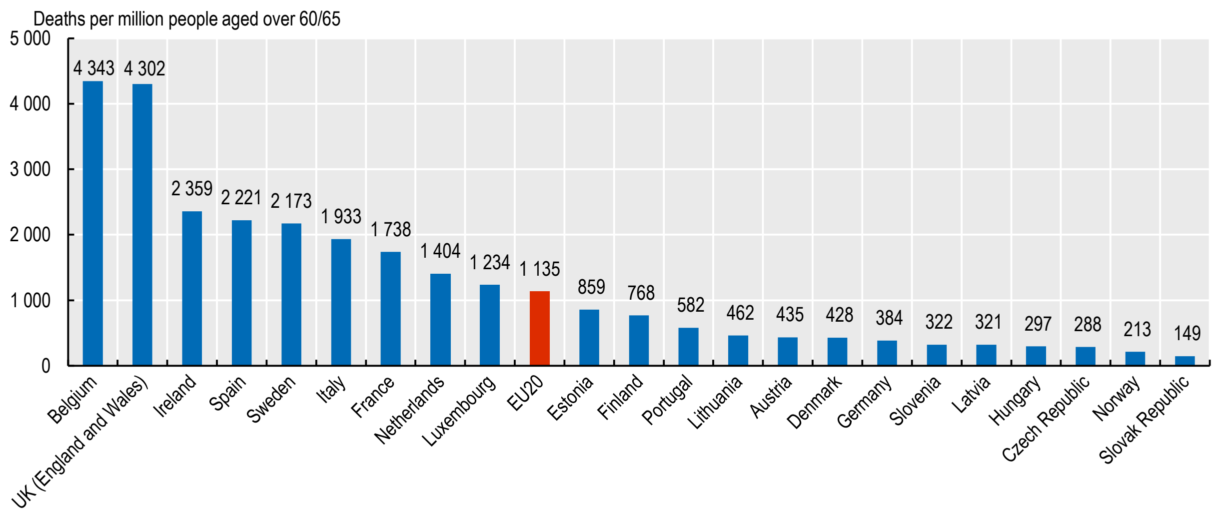
While COVID-19 has claimed the lives of many people across all age groups, people with comorbidities (e.g. obesity, cardiovascular diseases) and in particular older populations face an elevated risk of dying from COVID-19. Among 22 European countries with data available by age group, reported COVID-19 deaths per million people aged 60/65 and over were on average 3.7 times higher than amongst the population as a whole. In nearly all of these countries, 90% or more of reported COVID-19 deaths were amongst people aged 60/65 and over; with people aged 80 and over accounting for around half of all COVID-19 deaths.

The United Kingdom, Italy, Spain and France all reported more than 17 000 deaths amongst those aged 60 and over (as of mid-September). Adjusting for population size, reported COVID-19 mortality rates amongst people aged 60/65 and over were more than 3 000 deaths per million people in this age group in the United Kingdom (England and Wales) and Belgium, and over 1 000 deaths per million people in Ireland, Sweden, Italy, Spain, France and the Netherlands (Figure 1.17). Mortality rates were even higher amongst those aged 80/85 and over, reaching over 10 000 reported deaths per million people in this age group in the United Kingdom (England and Wales), Belgium and Ireland.

Recipients of care, including those resident in long-term care (LTC) facilities, often have compromised immune systems or chronic conditions that place them at high risk of infection – especially, but not only, during the COVID-19 crisis. Home care workers and carers in institutions are also at high risk of being infected and of infecting an elderly person, given their direct contact with them, typically heavy workload, and that they often work across several facilities. Discharged hospital patients who are transferred back to nursing homes can also spread the virus.

Across 13 European countries with available data, there were over 75 000 deaths amongst residents in LTC institutions (as of early October 2020). Absolute numbers of reported deaths were particularly high in the United Kingdom (25 466 deaths), Spain (20 649 deaths) and France (14 955 deaths), all countries that suffered heavily from COVID-19. Adjusting for population size, deaths among residents in LTC institutions were equivalent to over 5 000 deaths per million people aged 80 and over in Belgium, the United Kingdom, Spain, Ireland and Sweden (Figure 1.18). Such deaths among LTC residents reached over half of all reported COVID-19 deaths in Spain, Belgium, Ireland and Norway.

Figure 1.17. **Reported COVID-19 deaths per million people aged over 60/65, up to early October 2020 (or latest data available)**

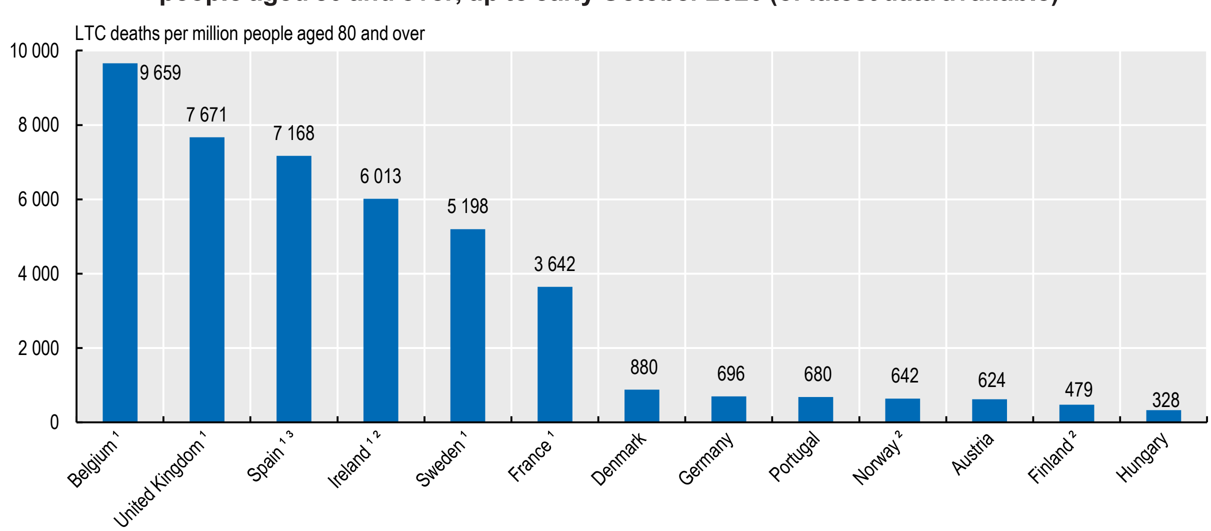


Note: Data on cumulative deaths up to mid-September/early October 2020, except for Portugal (August), Ireland and Luxembourg (July) and Spain (May). Data are not fully comparable due to different testing, reporting and coding procedures. In Belgium and Ireland, data include confirmed and suspected COVID-19 deaths. Data refer to people aged 60 and over in Denmark, France, Germany, Italy, Hungary, Netherlands, Norway, Portugal, Spain and Sweden. In France and Spain, as data disaggregated by age excluded deaths in long-term care (LTC) facilities, data on deaths in LTC facilities were added to the count of deaths.

Source: Institut National d'Etudes Démographiques, *https://dc-covid.site.ined.fr*, Eurostat Database, national epidemiological summaries and European Centre for Disease Prevention and Control (ECDC).

StatLink *https://stat.link/uh1g9o*

Figure 1.18. **Reported COVID-19 deaths among residents of long-term care institutions, per million people aged 80 and over, up to early October 2020 (or latest data available)**



Note: Data on cumulative deaths up to early October 2020, except for the United Kingdom (September), Hungary (August), Ireland (July), Italy and Portugal (May). Data are not fully comparable due to different testing, reporting and coding procedures. Unless otherwise stated, deaths refer to confirmed deaths of LTC residents, including deaths that occurred in LTC facilities and elsewhere (e.g. hospitals, homes).

1. Includes confirmed and suspected deaths. 2. Only includes deaths occurring in LTC facilities. 3. Data come from regional governments using different methodologies, some including suspected deaths.

Source: Comas-Herrera, Ashcroft and Lorenz-Dant (2020[53]), "International examples of measures to prevent and manage COVID-19 outbreaks in residential care and nursing home settings", *https://ltccovid.org*.

StatLink *https://stat.link/szvxip*

These data exclude deaths of LTC recipients receiving home-based care, thus underestimating total deaths amongst people receiving long-term care, particularly for countries where home-based care is more common. The under-reporting of COVID-19 cases in the LTC sector (due to a lack of testing, especially early on in the pandemic) also underestimate the true death toll, particularly in those countries that only include confirmed cases.

Containment strategies limited the spread of the virus among long-term care recipients, but had important repercussions for continuity of care

Countries have taken steps to mitigate the impact of COVID-19, both on the recipients of LTC and on LTC workers (OECD, 2020[54]). This includes measures to protect people from contracting the virus, but also efforts to maintain continuity of care during the crisis.

Table 1.6 summarises the main measures taken across European countries. However, it should be noted that policy responses in the LTC sector could have been quicker, with countries often focusing first and foremost on hospitals. For example, in France, Italy, Spain and the United Kingdom (England and Wales), there was an at least two-month lag between the first reported COVID-19 cases and the issuance of guidelines on preventing infection in LTC institutions.

Some countries increased funding for LTC to cover increased costs caused by the pandemic response. For example, in Austria a special endowment of EUR 100 million was transferred to the Länder for additional expenditure in LTC facilities, including bonus payments for nursing staff. France also announced support in the form of bonuses for workers and compensating institutions for some of the increased costs caused by COVID-19. In Germany, additional financial support for LTC included funding an increase in minimum wages in the sector and bonuses for LTC workers. Austria, Hungary, Ireland, Italy, Latvia, the Netherlands, Slovenia, Spain and the United Kingdom boosted staff numbers for LTC through increased funding or redeployment of military staff. Psychological support to care home staff has also been offered.

In terms of limiting the spread of infections, at least 17 of 31 European countries implemented restrictions in the form of isolation measures and restricted visits to residents in LTC institutions. For example, Austria, Hungary, Italy and Slovenia had a complete ban on all visits; Ireland and Portugal suspended all visits other than special permissions to visit individuals in end-of-life care. Some nursing homes also limited group activities, for example in France and Spain, although such restrictions were relaxed at a later stage. Day care activities and home-based care were also often more restricted than prior to the pandemic. Efforts were widely made to isolate residents infected by the virus, to the extent possible given the challenges of isolating residents living in collective dwellings with limited spare capacity. In the Czech Republic, for example, LTC facilities were required to reserve 10% of their capacity to accommodate suspected or infected cases.

However, such restrictions were not always implemented in a timely manner. For example, as compared to when countries implemented the closure of public spaces, there was over a four-week delay in introducing restrictions for LTC in the Slovak Republic and the United Kingdom (Table 1.7).

The LTC sector was not typically prioritised for testing across Europe in the early days of the pandemic. As national testing capacity increased (see earlier section on containment and mitigation policies), only 12 countries prioritised testing in care homes. Likewise, it took time for countries to improve access to PPE in LTC facilities. As countries managed to alleviate the initial shortages, most countries did secure access to PPE for social care workers through additional funds or direct distribution to points of need. In France, for example, the government sent masks directly to LTC workers. In Germany, many states facilitated the distribution of PPE for care providers.

Maintaining continuity of care has also proven challenging. Closures of day care, reduced availability of home care, and absence of some LTC staff have all disrupted care. In the United Kingdom, for example, amongst older people needing support with two or more activities of daily living, one-in-ten reported receiving less help than prior to the pandemic (Evandrou et al., 2020[55]). Together, these factors placed an additional burden on informal carers.

Table 1.6. **Overview of policies implemented to protect LTC recipients and workers from COVID-19, and to maintain continuity of elderly care during the first wave of the pandemic**

Country	Improve access to PPE (funding or direct distribution)	Prioritised testing of care home residents and staff	Restrictions within facilities (restricted visits, isolation measures)	Boosting staff numbers (funding or staff redeployment)	Expanded telehealth services
Austria		✓	✓	✓	✓
Belgium	✓	✓	✓		✓
Bulgaria					
Croatia					
Cyprus					
Czech Republic	✓		✓		✓
Denmark	✓	✓	✓		
Estonia					✓
Finland			✓		✓
France	✓	✓	✓	✓	✓
Germany	✓	✓	✓	✓	
Greece	✓		✓		✓
Hungary	✓		✓	✓	
Iceland					
Ireland	✓		✓	✓	✓
Italy			✓	✓	
Latvia	✓			✓	
Lithuania	✓	✓	✓		
Luxembourg	✓	✓	✓	✓	✓
Malta					
Netherlands		✓	✓	✓	
Norway	✓	✓	✓	✓	
Poland	✓		✓		✓
Portugal		✓	✓	✓	✓
Romania					
Slovak Republic		✓	✓		✓
Slovenia	✓	✓	✓	✓	
Spain	✓		✓	✓	
Sweden	✓	✓	✓	✓	
Switzerland	✓	✓	✓		✓
United Kingdom	✓	✓	✓	✓	✓

Note: For countries with all columns empty, this may reflect insufficient information from the sources used below.
Source: OECD health system policy tracker; European Observatory Health System Response Monitor; Comas-Herrera, Ashcroft and Lorenz-Dant (2020[53]), "International examples of measures to prevent and manage COVID-19 outbreaks in residential care and nursing home settings", *https://ltccovid.org*.

Measures to contain the virus have also made LTC recipients even more socially isolated, with potentially significant repercussions for their mental health. Still, there are some examples of countries having used digital technologies to maintain essential clinical and social care, as well as to limit social isolation by facilitating virtual contact with families. For instance, in England social care and health care workers can connect using dedicated digital tools, and residents in LTC facilities have the option of teleconsultations. Germany, Austria and Italy have also promoted the provision of care remotely through digital means (Comas-Herrera, Ashcroft and Lorenz-Dant, 2020[53]). Although telehealth cannot replace all needed care, telemedicine and smartphone-based assessments appear to have helped with remote monitoring and care for people with dementia or other cognitive impairments (Cuffaro et al., 2020[56]). In terms of palliative care, Austria, France, Italy and Spain provided guidelines on symptom management in a time of more limited capacity, and ways to help patients maintain virtual contact with families.

Table 1.7. **Timing of implementation of LTC restrictions (amongst countries introducing restrictions)**

Country	Date restrictions introduced for long-term care	Introduced before, after, or same day as closure of public spaces?	Difference (days)
Austria	21 March	After	5
Belgium	11 March	Before	-2
Czech Republic	18 March	After	2
Denmark	18 March	Same day	0
France	11 March	Before	-5
Germany	2 April	After	17
Hungary	6 April	After	24
Ireland	6 March	After	5
Italy	6 March	Before	-4
Luxembourg	15 March	Before	-1
Netherlands	19 March	After	7
Norway	6 March	Before	-6
Portugal	13 March	Same day	0
Slovak Republic	7 May	After	52
Slovenia	9 April	After	25
Spain	24 March	After	10
Sweden	30 March	(no closure of public spaces)	NA
Switzerland	20 March	After	4
United Kingdom	15 April	After	30

Source: OECD health system policy tracker, European Observatory Health System Response Monitor, Comas-Herrera, Ashcroft and Lorenz-Dant (2020[53]), “International examples of measures to prevent and manage COVID-19 outbreaks in residential care and nursing home settings”, *https://ltccovid.org*.

COVID-19 exacerbated existing social health inequalities

Poorer people, those living in deprived areas and ethnic minorities have all been more likely to be affected by COVID-19

COVID-19 has disproportionately hit the poor, those living in deprived areas and ethnic minorities. This is because individuals from disadvantaged socio-economic backgrounds face an accumulation of risk factors that place them at higher risk of complications and death from COVID-19. They more often are in poor health, have higher exposure to risk factors such as obesity, and may have more limited access to the health system (OECD, 2019[57]). Insufficient information on COVID-19 and related health services in minority languages may also make it harder for some ethnic minorities to navigate the health system.

Discrimination and poverty increase the risk of ethnic minorities, other socially disadvantaged groups and those who cannot telework, to have higher-risk jobs (such as retail grocery workers, public transit employees, or health and social workers), and live in overcrowded or insecure housing – all of which increase their exposure to the virus. They also face higher exposure to air pollution (European Environment Agency, 2018[58]); see Chapter 2 for a further discussion on air pollution in European countries).

Emerging evidence clearly shows that COVID-19 has exacerbated existing social health inequalities. In the United Kingdom (England), the risk of dying among people diagnosed with COVID-19 was more than double for people living in the most deprived areas compared to those living in the least deprived areas. Further, after accounting for age, sex, deprivation and region, ethnic minorities had a higher risk of death compared to people of white ethnicity, among people diagnosed with COVID-19 (Public Health England, 2020[59]). The increased prevalence of pre-existing health conditions such as obesity among minority ethnic groups, which increases the risk of severe infection from COVID-19, is likely to explain the higher risk of mortality.

In France, alongside disparities by income, immigrants were also disproportionately affected: all-cause mortality rates for immigrants increased by 48% in March-April 2020 as compared with a year earlier – much higher than the 22% increase observed for individuals born in France (Papon and Robert-Bobée, 2020[60]). Similar findings were observed in Sweden, Spain and Norway. In Sweden, men in the lowest income tercile had an 80% higher risk of dying from COVID-19 than men in the highest income tercile. Immigrants from low- and middle-income countries were more than twice as likely to die as compared with individuals born in Sweden (Drefahl et al., 2020[61]). In Spain (Barcelona), people in poorer neighbourhoods were six to seven times more likely to contract the virus than those in wealthy areas (Mogi, Kato and Annaka, 2020[62]). In Norway, some minority communities had infection rates more than ten times above the national average (Yaya et al., 2020[63]).

Targeted health and social interventions can help address the disproportionate impacts of the COVID-19 pandemic on ethnic minorities and poorer people

Universal health coverage is a key pre-requisite in improving access to care for vulnerable groups. Whilst most European countries provide universal coverage, population coverage for core services remains below 95% in seven EU/EFTA countries, and is below 90% in Cyprus, Romania and Bulgaria (see Chapter 7). In Ireland, although health care coverage is universal, less than half of the population is covered for the cost of GP visits. But in the case of COVID-19 treatment, the Irish Government did extend coverage for GP visits to the entire population. Similarly, in Poland, the costs of health services related to COVID-19 for both uninsured and insured persons are fully covered from public funds. In Portugal, all foreigners were treated as permanent residents until at least 1 July, to ensure migrants had access to health and other public services (OHCHR, 2020[64]). In Spain, the government provided medicine and sanitary products to the Roma population to minimise the adverse health consequences of COVID-19.

Although expanding health coverage is a necessary step to alleviate the socio-economic gradient in mortality due to COVID-19, it is not sufficient by itself. More targeted social policies are required to address the core reasons why disadvantaged groups are at a higher risk of dying from COVID-19 in the first place. In this regard, providing better targeted health information and health services for minorities is one core policy. Promising examples can be found in Austria, France, Greece, Sweden and Norway. In Seine-Saint-Denis, France (the poorest region in mainland France), 20 ambulatory health care facilities were created to improve access in deprived areas. In addition, 377 information and testing missions were undertaken, targeting homeless and migrant populations (Rousseau, Bevort and Ginot, 2020[65]; ARS, 2020[66]). In Rennes Nord/Ouest, multi-professional primary care practices in deprived areas worked with community leaders to provide information about COVID-19 in several languages (Avenir Santé Villejean Beauregard, 2020[67]). Sweden and Norway published COVID-19 advice in multiple minority languages, and spread this information in partnership with relevant community leaders. Austria published informational material in multiple minority languages to address vulnerable settings and immigrants. Greece ensured the provision of adequate information to the Roma communities to address the spread of COVID-19 (OHCHR, 2020[64]).

Other targeted policies go beyond the provision of COVID-19 related services. Maintaining continuity of care for non-COVID-19 health care needs (as discussed in the earlier section on maintaining access to high quality care for non-COVID-19 patients) is particularly relevant for socially disadvantaged groups, as they are more likely to suffer from chronic illnesses and be in worse health (OECD, 2019[57]). Mobile health clinics are one important mechanism to provide targeted support for COVID-19 and non-COVID-19 needs, such as preventive care, mental health or dental care (OECD, 2020[68]).

Policies beyond the health sector are also important. Some countries have introduced measures to tackle the socio-economic impact of COVID-19 on minorities (OHCHR, 2020[64]). In Spain, for example, financial assistance has been provided to settlements with high numbers of Roma population. In Switzerland, an aid project was introduced to provide advice, support, and financial assistance for self-employed ethnic minorities to cover their daily living expenses.

How did countries try to maintain access to high quality care for non-COVID-19 patients during the first wave of the pandemic?

COVID-19 has adversely affected patients with other health care needs

COVID-19 has had a major indirect health impact on patients who did not contract the virus. Acute and chronic care patients have faced disruptions to essential care, in terms of delayed diagnoses, foregone care and impeded continuity of care. This contributes to worse health outcomes for many people, now and in the future. A dual-track approach is therefore needed to maintain high quality care for non-COVID-19 acute and chronic care, alongside boosting surge capacity to combat the virus.

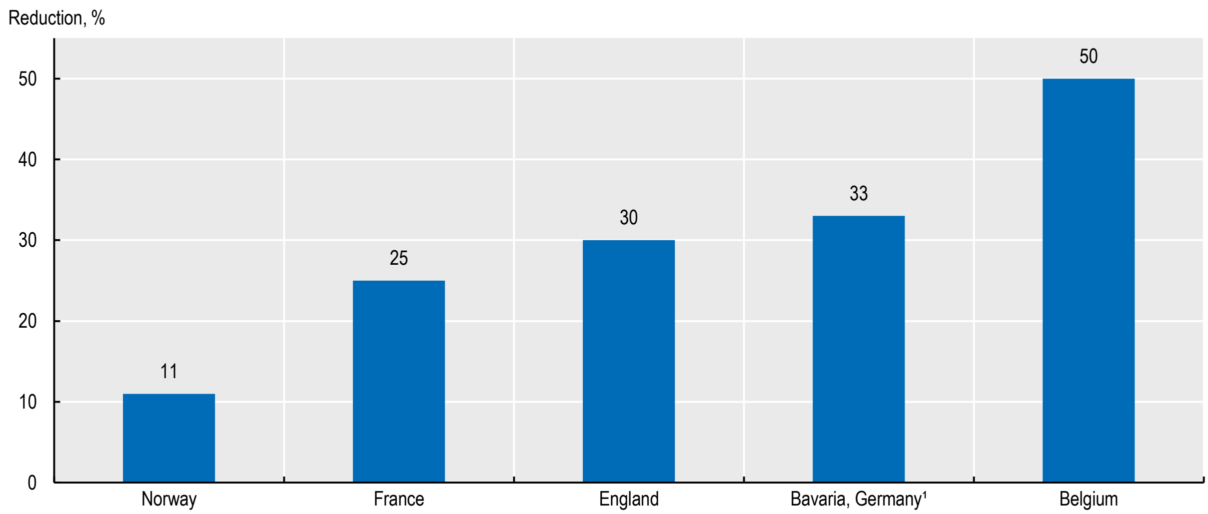
COVID-19 has led to postponed elective surgeries, fewer visits to emergency departments and less use of outpatient services, affecting both acute and chronic care patients

In response to the COVID-19 crisis, many countries postponed elective surgery to free up human resources and hospital beds. This was the case, for example, in Germany and Portugal for all non-urgent elective surgeries (OECD, 2020[69]). In France, the *Académies de médecine et de chirurgie* estimated around 1.1 million non-urgent surgical acts were postponed during the pandemic (Santi and Pineau, 2020[70]).

There have also been fewer visits to emergency departments. In the United Kingdom, for example, emergency department visits in March 2020 were 29% lower than in March 2019 (Appleby, 2020[71]). In France, fewer emergency visits were observed early in the crisis for people requiring urgent care for cardio- and neuro-vascular pathologies (Santé Publique France, 2020[72]). Moreover, a study in Paris found that the incidence of out-of-hospital cardiac arrest doubled during 16 March to 26 April, as compared to the equivalent time period in previous years (Marijon et al., 2020[73]). In Germany, the COVID-19 pandemic was associated with a significant decrease in all-cause admissions (30% lower than for the same period in 2019) and admissions due to cardiovascular events in the emergency department (41% lower) (Schwarz et al., 2020[74]). In Italy, paediatric emergency department visits were down by 73-88% in March 2020 as compared with March 2019 and 2018 (Lazzerini et al., 2020[75]).

Beyond acute care, large reductions in the use of outpatient services have been reported in some countries, including Belgium, France, Germany (Bavaria), Norway and the United Kingdom (England) (Figure 1.19), though the number of teleconsultations has increased substantially. France also reported fewer specialist care appointments.

Figure 1.19. **Reduction in the volume of primary care consultations during the first wave of COVID-19**



Note: Estimates are based on different tools and are not directly comparable. In Belgium and France, data on consultations compare April 2020 with April 2019; in Germany (Bavaria) March 2020 is compared to March 2019. In Norway and the United Kingdom (England), reductions uniquely during March 2020 are analysed. In Germany (Bavaria), data are calculated based on billing data. In France, Norway and the United Kingdom (England) estimates are based on the number of consultations.

1. Germany data refer to Bavaria only.

Source: Norway (the Norwegian Control and Payment of Health Reimbursement), France (Santé Publique France), the United Kingdom (NHS Digital, 2020[76]) and Germany (Bavaria), information from *https://www.aerzteblatt.de*).

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Delays in cancer diagnoses and treatments are likely to increase cancer deaths

Disruptions to cancer care have also been evident. In the Netherlands, data from the Cancer Registry show a notable decrease in cancer diagnoses as compared to before the COVID-19 outbreak (Dinmohamed et al., 2020[77]). In the United Kingdom, urgent referrals from primary care for people with suspected cancers decreased by 76% and chemotherapy appointments for cancer patients by 60%, in comparison to levels before the COVID-19 crisis (Lai et al., 2020[78]). In France, the number of cancer diagnoses decreased by 35-50% in April 2020, as compared to April 2019 (Santi and Pineau, 2020[70]).

In Italy, an estimated 1.4 million fewer screening exams were performed during the first five months of 2020 compared to the same period in 2019, leading to fewer cancer diagnoses (Italian National Oncology Association, 2020[79]). In Spain (Madrid), outpatient visits in oncology departments decreased by 23% between 9 March and 13 April 2020, as compared with the same period in 2019. New oncology referrals and the number of patients enrolled in clinical trials also fell, suggesting treatment delays (Manso, De Velasco and Paz-Ares, 2020[80]).

Studies are starting to show how much delayed cancer diagnoses and treatments will impact patient’s survival rates. In England, delays in diagnosis have been estimated to increase cancer deaths by about 16% for colorectal cancer, 9% for breast cancer, 6% for oesophageal cancer, and 5% for lung cancer over the next five years (Maringe, Spicer and Morris, 2020[81]). In France, delayed diagnoses could lead to an excess mortality of 10-15% per month of delay (Santi and Pineau, 2020[70]).

Strengthened primary care systems are key to maintaining continuity of care for non-COVID-19 patients

The emerging evidence described above points to the risks of not giving sufficient weight to non-COVID-19 health care needs, resulting in urgent health problems remaining undiagnosed and exacerbated chronic illnesses. Maintaining primary health care practices, establishing community care facilities, extending home-based programmes, expanding the role of primary health care workers and increasing telemedicine consultations are key to minimise delays and forgone care for all patients.

Primary health care practices, community care facilities and home-based programmes help maintain access to routine care

Primary health care practices, which house multiple professionals, enable better care co-ordination and are proactively engaged in preventive care and management of chronic diseases. Before the crisis, primary health care practices based on teams or networks of providers were reported by 17 OECD countries (OECD, 2020[68]). However, during the COVID-19 pandemic, very few countries have relied on these multi-disciplinary team practices to maintain continuity of care for non-COVID-19 patients. Iceland and Slovenia are two exceptions. In Iceland, primary health care practices have continued to work with patients to manage chronic diseases and maintain essential services. At the same time, they were also responsible for identifying high-risk patients, testing patients, and providing patient education on COVID-19. In Slovenia, health promotion centres (established within primary health care practices), have maintained care continuity for chronically ill people.

Primary health care services also rapidly adapted in some European countries. One innovative response was the establishment of COVID-19 community care facilities, as developed in France, Iceland, Slovenia and the United Kingdom. These were designed to improve triage of patients with potential COVID-19, but also maintain essential services for non-COVID-19 patients.

Expanded home-based programmes have also been used to maintain access to care for non-COVID-19 patients. Before the crisis, many European countries were already using home-based programmes to provide post-discharge care or nursing care at home. During the COVID-19 pandemic, home-based programmes have helped keep people out of hospitals by maintaining access. In Heidelberg (Germany), mobile primary health care teams visited patients at home, equipped with testing and monitoring material for patients with underlying conditions. In the United Kingdom, some primary health care services pivoted rapidly to providing home-based services (Care Quality Commission, 2020[82]).

Mobilising community pharmacists helps ensure patients continue to get needed medicines

Before the crisis, many European countries focused on ensuring a right skills mix for the primary health care workforce. The scope of practice of nurses in Estonia, Ireland, Latvia, Sweden and the United Kingdom had already been expanded. Community pharmacists have also been taking a greater role in health promotion and prevention, notably in remote and underserved areas, in Belgium, the United Kingdom (England), Finland, Italy and Switzerland (OECD, 2020[68]).

During the pandemic, the implementation of such policies has accelerated. For instance, the scope of practice of community pharmacists has rapidly been expanded to allow for greater continuity of care for non-COVID-19 patients (OECD, 2020[68]). In Austria, France, Ireland, Portugal and Spain, pharmacists can now prescribe chronic medications and have been allowed to extend prescriptions beyond what they were previously allowed to do (PGEU, 2020[39]). In the United Kingdom (Scotland), extension of the Minor Ailment Service (MAS) has empowered community pharmacists to support more patients by allowing them to give certain medicines without GP prescriptions.

Some countries have also enhanced the role of community health workers (Ballard et al., 2020[83]). For example, the United Kingdom proposed training community health workers to manage long-term conditions and review medicines use for elderly people and those with underlying health conditions (Haines et al., 2020[84]).

Telemedicine has helped preserve continuity of care while containing the spread

The adoption of telehealth and telemedicine[12] was limited in Europe before the pandemic, with providers and patients facing barriers to wider use (Oliveira Hashiguchi, 2020[85]). However, with rising cases and lockdowns limiting face-to-face care, countries have moved at speed and at scale to allow a range of services to be delivered remotely through digital means. Countries such as Austria, Belgium, Estonia and the Czech Republic that did not have a national legislation, strategy or policy on the use of telemedicine, and did not define jurisdiction, liability or reimbursement of services like telehealth, have since allowed provider payment for some telehealth consultations and clarified regulations.

Countries where telemedicine was already allowed before the pandemic, like France, Luxembourg and Poland, have made it easier for providers and patients to use remote consultations by relaxing restrictions or by creating new platforms. In Poland, new COVID-19 platforms combined with existing digital services such as the Patient's Online Account Platform made it possible to conduct around 80% of consultations remotely during the first wave of the pandemic. Since COVID-19, Belgium, Estonia, Greece and Ireland have allowed prescriptions and certificates of sick leave to be issued and accessed electronically.

The use of telemedicine has increased substantially in some countries. In France, there were close to 500 000 teleconsultations between 23-29 March, as compared to around 10 000 teleconsultations per week before March. In Germany, an estimated 19 500 teleconsultations were performed in March, compared to 1 700 teleconsultations per month in January and February. In Norway, the share of e-consultations with a GP rose from 5% between 2-8 March to almost 60% between 16-22 March.

At least 11 European countries have helplines dedicated to COVID-19, including needs triggered by the lockdown, with an emphasis on mental health and emotional support (Mental Health Europe, 2020[86]). Denmark, Portugal, Spain, the United Kingdom and WHO/Europe among others have also used AI-powered interactive chatbots to deal with the surge in service demand as well as to collect information on symptoms, to triage patients, and to combat misinformation. Finally, even before the crisis, many European countries were already using telemonitoring for chronic patients, and these programmes have acquired a new impetus, with many patients unable to attend face-to-face routine appointments.

As countries ease lockdown restrictions, and health care facilities open their doors again to patients, the number of teleconsultations is likely to decrease, as is happening in the United States (Commonwealth Fund, 2020[87]). While the pandemic has shown that countries can move very fast to break down barriers to telehealth (and other digital tools), some barriers are structural and less amenable to short term regulatory changes. Access to broadband, medical liability across jurisdictions, cybersecurity and data protection, are just a few examples.

While it is unclear how much medical care can be done remotely through digital means, telehealth is unlikely to be a substitute for the majority of health care services. Still, it can play an important and increasing role. For example, a recent US study estimated that 20% of all Medicare spending could be virtualised (McKinsey, 2020[88]). What is clear is that the pandemic has led to an unprecedented adoption and use of telehealth that would not have otherwise happened so quickly.

Countries maintained access to mental health services under difficult circumstances, and are starting to respond to emerging mental health needs

The COVID-19 crisis has had a marked impact on the mental health of both people with pre-existing mental health conditions and the general population. Countries have taken decisive action to preserve some access to mental health support. Many countries have also been providing well-being support to the general population, for example through online advice or phone hotlines. Nonetheless, the combination of reduced capacity in mental health services and increased demand caused by the worsening mental health status of the general population, risks putting additional strain on mental health services which were already over-stretched in many countries.

People living with mental health conditions did not always get the care they need

The COVID-19 outbreak had a significant disruptive impact on people living with mental health conditions. The unfamiliar situation of social distancing and confinement measures, health fears, and disruption to daily habits and routines may worsen existing conditions or provoke new episodes of mental disorders. Losing contact with mental health services further aggravates symptoms (Rajkumar, 2020[89]). Early indications suggest that people with existing mental health conditions, including schizophrenia, eating disorders, and attention deficit hyperactivity disorder (ADHD), reported increased symptoms (Moreno et al., 2020[90]).

Many countries saw peaks in discharges from mental health care in March and April, linked to the recommissioning of inpatient beds or staff for COVID-19 wards, as well as to the risk of COVID-19 transmission. In Madrid (Spain), in March 2020 the number of inpatient psychiatric beds was reduced by 60%, outpatient units were closed, and the number of patients attending emergency psychiatric services fell by 75% (Arango, 2020[91]). In the Italian region of Lombardy and the United Kingdom (England), discharges from psychiatric inpatient care increased in March and April (NHSProviders, 2020[92]; WHO Europe, 2020[93]).

Multiple reports from OECD countries also suggest significant reductions in the number of referrals to mental health services, mental health services contacts, and active community caseloads during the peak of the spring COVID-19 outbreak. In the Netherlands, for example, the impact has already been significant: the number of referrals to mental health care fell by 25-80% after the outbreak; demand for treatment dropped by 10-40%; billable hours decreased by 5-20%; and bed occupancy dropped by 9% (House of Representatives, 2020[94]). In the United Kingdom psychiatrists reported, as of May 2020, a fall in requests for routine appointments, at the same time as a marked increase in urgent and emergency cases.

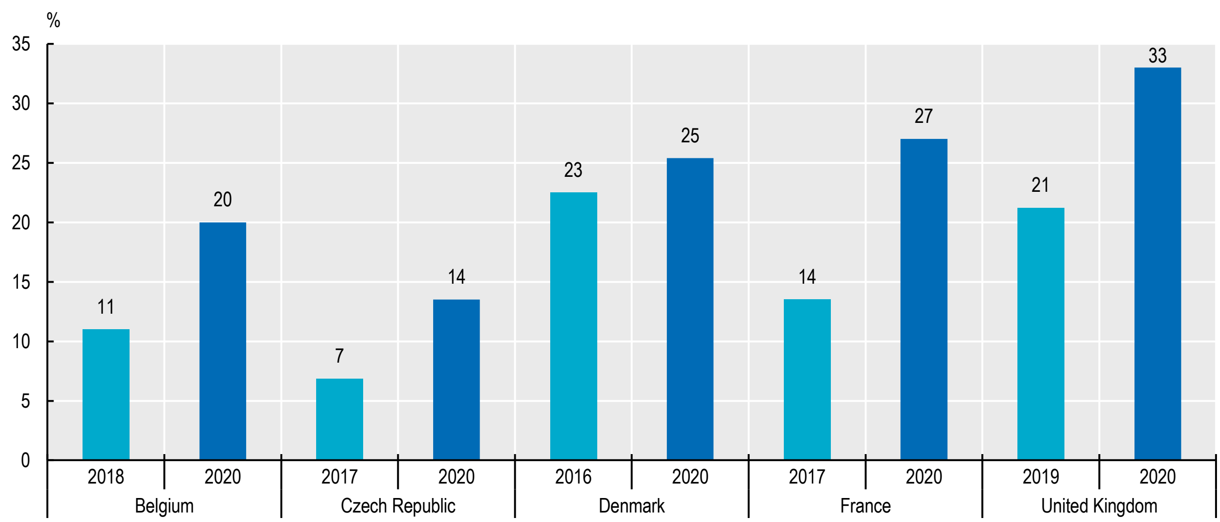
Some of these trends appear to be driven by reduced demand. For example, a common pathway into mental health services is through a referral from a General Practitioner or through schools (NHSProviders, 2020[92]). With many populations being discouraged from "non-urgent" medical visits, and widespread school closures during the first half of 2020, these referral pathways were disrupted. People may have also been less likely to seek help themselves, out of concern that they could be infected, or because they did not wish to "burden" the health system (Rethink Mental Illness, 2020[95]).

Emerging needs – the COVID-19 crisis has increased levels of mental distress

COVID-19 has had a significant negative impact on the mental health of populations. As a novel infectious disease outbreak, it is an understandable source of anxiety and fear. Furthermore, populations have been asked to significantly change their habits in a way that may negatively affect their mental health. Social distancing or living under confinement conditions include shifting away from behaviours which can promote positive mental health, such as participation in the workplace, social connection and physical exercise. Some people have faced the additional strain of illness or even loss of friends or family members (Gunnell et al., 2020[96]; Brooks et al., 2020[12]; WHO, 2020[97]; Holmes et al., 2020[98]).

Adverse impacts can already be seen for the general population. For example, population surveys from Belgium, the Czech Republic, Denmark, France and the United Kingdom all point to increased levels of overall anxiety in the weeks since the start of the major outbreak and confinement measures (Figure 1.20). Effects have been particularly pronounced among people with lower socio-economic status, young people, frontline workers, especially health and care workers, and for people with existing mental health conditions (Banks and Xu, 2020[99]; Sciensano, 2020[100]). Conversely, people who were able to continue working during confinement or to telework were also less likely to report depression and anxiety.

Figure 1.20. **Share of population experiencing anxiety, March-April 2020 compared to pre-COVID-19**



Note: The survey instruments used to measure anxiety differ between countries, and therefore may not be directly comparable. Differences in the openness of populations to discussing their mental state also hampers cross-country comparability. In Belgium, the surveys record 'Percentage of people with an 'anxiety disorder'. In the Czech Republic, the surveys record prevalence of anxiety disorders in the adult population using the Mini International Neuropsychiatric Interview (MINI). In Denmark, the surveys record 'Percentage of population with scores <50 on the WHO-5 well-being scale'. In France, the surveys record prevalence of anxiety in the population using the Hospital Anxiety and Depression scale (HADS). In the United Kingdom, the surveys record 'Percentage of the population experiencing 'high anxiety''. All 2020 surveys were undertaken at time points in the period March-April 2020.

Source: Sønderskov et al. (2020[101]), "The depressive state of Denmark during the COVID-19 pandemic", *http://dx.doi.org/10.1017/neu.2020.15*; Sciensano (2020[100]), "Enquête de santé COVID-19: quelques résultats préliminaires", *https://www.sciensano.be/en/biblio/troisieme-enquete-de-sante-covid-19-resultats-preliminaires*; ONS (2020[102]), "Coronavirus and anxiety, Great Britain: 3 April 2020 to 10 May 2020", *https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/coronavirusandanxietygreatbritain/3april2020to10may2020*; ONS (2020[103]), "Coronavirus and the social impacts on Great Britain - Office for National Statistics", *https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandthesocialimpactsongreatbritain/7may2020*; Chan-Chee et al. (2020[104]), "The Mental Health of the French facing the COVID-19 crisis: prevalence, evolution and determinants of anxiety disorders during the first two weeks of lockdown", *https://www.santepubliquefrance.fr/content/download/260547/2644064*; Winkler et al. (2020[105]), "Sharp Increase in Prevalence of Current Mental Disorders in the Context of COVID-19: Analysis of Repeated Nationwide Cross-Sectional Surveys", *http://dx.doi.org/10.2139/ssrn.3622402*.

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Innovative policies have helped protect population mental well-being

Some OECD countries are already taking steps to implement policies to protect mental well-being and provide mental health support. Informational resources have been made available online by WHO-Euro and national governments (WHO, 2020[106]; IASC, 2020[107]; NAMI, 2020[108]). Materials include advice on steps to protect mental well-being. In addition, most EU countries have introduced phone support lines for people experiencing mental distress during the COVID-19 crisis. At least 23 countries have helplines where people can seek psychological support, and in at least some countries – including Austria, Belgium, the Czech Republic, Denmark, France, Germany, Luxembourg, Portugal, Spain and Sweden – dedicated COVID-19 psychological support lines were set up (Mental Health Europe, 2020[86]).

It is not yet clear what the impact of reduced confinement measures after the first outbreak on mental well-being has been, nor whether the economic and employment fall out from the crisis will lead to sustained or increased levels of mental distress. Belgium, Germany, France, and the United Kingdom have multi-wave surveys that have been tracking population mental well-being at regular intervals since early March 2020, and should bring new insights into changing mental well-being levels, post-confinement.

Going forward, some stakeholders have called for a need for a broader increase in the availability of mental health support services in anticipation of a potential significant peak in demand (Douglas et al., 2020[109]; Torjesen, 2020[110]; Roca, Vicens and Gili, 2020[111]). It will also be important to include mental health support as part of rehabilitation efforts for people who have suffered from COVID-19, especially for persons who have spent extended periods in hospital, as these people may be at greater risk of mental health problems including Post Traumatic Stress Disorder, anxiety, and depression.

Countries have sought to protect access to care for people with mental health conditions, including inpatient care where necessary

Across Europe, the capacity of mental health services to rapidly adapt to different ways of delivering care during the COVID-19 crisis has been impressive. Mental health services, including in areas where the outbreak was most acute, were adapted to introduce new safety measures for staff and patients, to maintain essential services for the most severe cases, and to move a significant volume of services to phone or online services.

As the crisis has continued, Ministries of Health and professional associations have been issuing guidance on managing COVID-19 risk for mental health services, especially in inpatient settings. For example, in the United Kingdom the Royal College of Nursing issued guidance on mental health care delivery and the COVID-19 risk. This guidance includes reviewing safety for inpatient activities based on infection risk and therapeutic benefit, screening visitors, and preparing for an eventual COVID-19 positive patient (Nursing, 2020[112]). Multiple countries and regions, including France, Italy and Spain, set up dedicated wards for COVID-19-positive mental health patients.

Most countries sought to maintain access to a maximum of acute mental health services, including in-person care where necessary. In Italy, where the Regional Health Authorities recognised mental health as a priority service, inpatient and community mental health care was maintained, with the introduction of new sanitary safeguards such as pre-scheduled appointment times for visits, limits to interventions in service users' homes, and reduction in activities involving families or carers (Percudani et al., 2020[113]). At the same time, remote contacts were set up with an estimated 75% of cases (Carpiniello et al., 2020[114]). In Spain, the Society of Psychiatry made a series of recommendations promoting the use of mobile phones, digital resources such as apps, and other forms of telemedicine (Vieta, Pérez and Arango, 2020[115]). Some of the broader steps taken to maintain access to health care should also benefit mental health services, such as allowing pharmacists to renew repeat prescriptions as well as enhanced technical and legislative capacity around telemedicine.

Countries have also been taking further steps to ensure or even increase access to mental health support. Greece is providing psychiatric assistance in cooperation with NGOs and a large number of volunteer psychologists, while Austria has facilitated teleconsultation in psychotherapy and covered this service under social health insurance (OECD, 2020[116]). In Madrid (Spain), three new psychiatric liaison services were set up to take care of medical staff on COVID-19 wards, to support families of COVID-19 patients, and to support families of a relative at the point of death and following the death of their loved one (Arango, 2020[91]).

Some of the experiences of mental health services during the first wave of the COVID-19 pandemic may lead to positive changes going forward, notably increased use of telemedicine. In other respects, as the COVID-19 crisis continues all countries will need to take steps to ensure that good access to mental health services continue, and that mental health services have the resources – such as PPE and timely testing – that they need to maintain access.

How can policy makers improve the resilience of health systems to the ongoing pandemic and future health crises? Emerging insights

COVID-19 has had a huge and lasting impact in Europe and worldwide, testing the resilience of health systems and placing immense pressure on health workers. The virus spread rapidly across Europe, leading to many deaths and stringent containment policies by a large number of countries in an attempt to contain the outbreak.

Providing an overall assessment of country responses is difficult, given that the pandemic is far from over. Nevertheless, over the first ten months of 2020, data from reported COVID-19 and excess mortality rates suggest Belgium, Italy, Spain and the United Kingdom were the most severely affected, followed by France, the Netherlands and Sweden. In contrast, most countries in Central and Eastern and South-eastern Europe, as well as most Nordic countries, have been less adversely affected by the first wave of the pandemic. Still, many Central and Eastern European countries have been more adversely affected since August.

The health crisis has also led to a major economic crisis, with countries hardest hit by COVID-19 typically experiencing the largest economic contractions. All 31 European countries in this report experienced negative economic growth in the second quarter of 2020. Still, a few countries have managed to limit both the adverse health and economic impacts over the first ten months of 2020 – notably Estonia, Finland and Norway. These countries had the advantage of having amongst the lowest population density in Europe. Relatively high levels of trust in government have also increased compliance with government containment and mitigation strategies. However, no European country has done as well in handling the pandemic as several countries in the Asia-Pacific region, such as Korea and New Zealand.

It is important to note, though, that some countries have been more susceptible to COVID-19 due to inherent factors that go beyond policy makers' responses to the virus – such as countries with older populations, a higher prevalence of certain risk factors such as obesity, more inbound and outbound tourism and international travel, and higher population density. Further, countries first hit by the pandemic like Italy had necessarily less time to implement comprehensive policy responses.

As the situation evolves, further analysis will be needed to assess which policy interventions have worked and which have not. Still, the country experiences analysed here, predominantly from the first wave of the pandemic, offer emerging insights. These can help health systems become more resilient to the ongoing pandemic and future crises. These are grouped into five priority policy areas, focusing on lessons learned for future resilience.

If countries are prepared and are able to act quickly, they may be able to avoid costly containment and mitigation measures

Most European countries struggled to scale up their testing capacity. This limited the effectiveness of test, track and trace efforts, leaving countries with fewer measures at their disposal to contain the spread of the virus, and necessitating full lockdowns. Many countries also lacked masks and other PPE early in the outbreak. Looking forward, countries can address these shortcomings at relatively low cost – if they are well prepared and act quickly as new outbreaks emerge.

For testing, rapid scale-up of testing capacities, effective public health messages and population screening policies are key. Outside Europe, these factors largely explain Korea's excellent results in the early stages of the outbreak with relatively few tests, based on a swift and targeted approach that included innovative policies such as drive-through and phone booth testing centres, and strong public private partnerships. New Zealand has been another successful example. Within Europe, Denmark reported the highest number of daily tests in the early stages of the pandemic. Iceland was also able to rapidly scale-up testing, its success built on voluntary self-referrals and effective public information to encourage people to come forward.

For subsequent tracking and tracing, mobile technologies (digital contact-tracing apps) may hold some potential to improve early detection, but better use of routine health data is a more proven way to obtain real-time surveillance, including environmental surveillance. Standardised electronic health records (EHRs) can be used to quickly extract high quality routine data. Finland and Iceland both have national EHR systems with patient portals and, as a result, could offer integrated tools for people to report symptoms and triage patients to appropriate services. Yet OECD research prior to the COVID-19 crisis found that most European countries did not have sufficient technical and operational capabilities to generate information from EHRs.

Concerning the supply of PPE and other essential medical supplies, better procurement, supply chain management, stockpiling and trade policies can improve the availability of these items. EU-level actions have helped to strengthen health systems resilience by coordinating supplies and reducing bottlenecks.

Adaptive surge capacity can help treat COVID-19 patients in an effective manner, but countries will also need to invest more in their health workforce

Looking beyond containment, health systems need to adapt and evolve so they can better respond to surges in demand. This requires reconsidering health workforce and hospital bed capacities. For hospital beds (of which ICU beds are particularly important for combatting COVID-19), permanent increases will be costly. Yet the success of many European countries in rapidly creating surge capacity – such as by creating temporary field hospitals, converting regular beds to intensive care beds or transferring patients to hospitals with spare capacity – shows that more flexible solutions which adapt to needs can work.

Adaptive policies can also help mobilise additional staff to respond to surges in demand. France, for example, already had a "reserve list" ("*Réserve Sanitaire*"), which was mobilised and expanded during the COVID-19 outbreak. Belgium, Iceland and Ireland quickly set up new "reserve lists" to deal with the outbreak and reallocate staff across localities. Still, a lack of health personnel has been more of a binding constraint than hospital beds, reflecting the fact that training skilled health workers is more time-consuming than creating temporary facilities. Staff have also faced extreme pressures in many countries. These factors suggest that countries will need to invest more in their health workforce.

Strong primary health care and mental health services are needed for COVID-19 patients and to maintain high quality care for non-COVID-19 patients

Whilst the spotlight has largely fallen on hospitals, primary health care and mental health services are critical in times of crisis and to foster longer-term resilience. Again, adaptability is key to policy effectiveness. Much wider adoption of telehealth has helped preserve continuity of care for non-COVID-19 patients and contained the spread of the virus. Community care facilities and expanded home-based programmes have improved access to care for non-COVID-19 patients during the crisis, as well as alleviated pressure on hospitals.

Innovations in the roles and responsibilities of primary care health professionals also has lasting potential. Alongside increasing the scope of practice for nurses, enhanced roles for pharmacists and community health workers offer practical ways to maintain continuity of care when people are less able to access doctors. For example, in Austria, France, Ireland, Portugal and Spain, pharmacists had greater scope on extending prescriptions and prescribing chronic medications – thereby helping ensure patients continue to get necessary medicines during the crisis.

Mental health policies are also critical, particularly given increased social isolation following stringent containment policies. Better online advice and phone support lines for people experiencing mental distress have helped. Going forward, a broader increase in the availability of mental health support services should be planned for in anticipation of a potential significant increase in demand.

Vulnerable populations need much more support in the health system and beyond

COVID-19 has disproportionately hit vulnerable populations. Older populations face an elevated risk, and policy responses in the LTC sector could have been quicker, with countries often focusing first on hospitals. Here, timely availability of PPE and testing in LTC facilities can better protect workers and recipients of LTC.

The social gradient of deaths from COVID-19 shows that the social determinants of health need greater attention. Universal health coverage principles are a key pre-requisite in improving access to care for vulnerable groups. Yet policies also need to address more directly the reasons why disadvantaged groups are at higher risk of dying – because they more often have chronic illnesses and are in worse health, have higher-risk jobs, and live in overcrowded or insecure housing. Tackling this means more investment in prevention, but more importantly it calls for interventions beyond the health system, addressing the root causes of inequalities through better social and economic policies.

Health resilience is a multi-system challenge that requires close international cooperation

This report has focused on health system resilience, yet the COVID-19 crisis has also highlighted that broader health resilience is a multi-system challenge (OECD, 2020[4]). It relies upon interactions across different sectors of interconnected economies and between governments. International collaboration is key to strengthening resilience. In Europe, joint procurement and other EU-level actions have helped reduce strains on global supply chains. The transfer of patients from overburdened hospitals in the East of France to Austria, Germany, Luxembourg and Switzerland showed the benefits of inter-country support. Yet lasting solutions, including R&D into vaccines and effective treatments, will need close and continued international collaboration in the future.

Notes

1. The official name for the virus responsible for COVID-19 is “severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)” and for the disease it causes is “coronavirus disease (COVID-19)”. In this chapter, “COVID-19” refers to both the virus and the disease it causes.
2. Containment strategies aim to minimise the risk of transmission from infected to non-infected individuals in order to stop the outbreak. Mitigation strategies aim to slow the disease, and, where the disease has occurred, to lessen its impact or to reduce the peak in health care demand. In practice, containment and mitigation actions largely overlap and are often implemented concurrently. In fact, containment and mitigation policies may even be considered as a continuum with gradual increments of the same strategy.
3. In August 2020 Norway temporarily recommended wearing masks regionally in public transport during rush hours.
4. This threshold was used to reflect the moment when countries are likely to face an active chain of transmission on their territory (as opposed to sporadic or imported cases).
5. *https://www.rivm.nl/en/COVID-19/sewage*.

6. See *https://privacyinternational.org/examples/apps-and-COVID-19* for more details and for other country examples.
7. *https://www.adalovelaceinstitute.org/our-work/identities-liberties/COVID-19-digital-contact-tracing-tracker/*.
8. Some research papers have started to estimate the effects of social distancing and other interventions on the pandemic, using econometric models. For example, Flaxman et al. (2020[117]) found, using data from serological studies to estimate the true number of infections, that non-pharmaceutical interventions including national 'lockdowns' could have averted about 3.1 million COVID-19 deaths across 11 European countries.
9. The data for France cover the period from 1 March to end of June 2020, while the data for Italy and Spain go up until the end of August 2020.
10. *https://vpt.lrv.lt/sudarytos-sutartys-kovai-su-COVID-19*.
11. *https://www.gov.uk/government/news/ventilator-challenge-hailed-a-success-as-uk-production-finishes*.
12. Telehealth is the use of information and communication technologies to promote health at a distance, including non-clinical services and education, while telemedicine is restricted to clinical services.

References

[10] Anderson, R. et al. (2020), "How will country-based mitigation measures influence the course of the COVID-19 epidemic?", *The Lancet*, Vol. 2019/20, pp. 1-4, http://dx.doi.org/*10.1016/S0140-6736(20)30567-5*.

[71] Appleby, J. (2020), "What is happening to non-covid deaths?", *BMJ*, p. m1607, http://dx.doi.org/*10.1136/bmj.m1607*.

[91] Arango, C. (2020), "Lessons Learned From the Coronavirus Health Crisis in Madrid, Spain: How COVID-19 Has Changed Our Lives in the Last 2 Weeks", *Biological Psychiatry*, Vol. 0/0, http://dx.doi.org/*10.1016/j.biopsych.2020.04.003*.

[32] Arroyo Marioli, F. et al. (2020), "Tracking R of COVID-19: A New Real-Time Estimation Using the Kalman Filter", *medRxiv*, p. 2020.04.19.20071886, http://dx.doi.org/*10.1101/2020.04.19.20071886*.

[66] ARS (2020), *Covid19 : Ouverture de centres de consultations ambulatoires*, *https://www.iledefrance.ars.sante.fr/covid19-ouverture-de-centres-de-consultations-ambulatoires*.

[15] Asadi, S. et al. (2020), "Efficacy of masks and face coverings in controlling outward aerosol particle emission from expiratory activities", *Scientific Reports*, Vol. 10/1, pp. 1-13, http://dx.doi.org/*10.1038/s41598-020-72798-7*.

[67] Avenir Santé Villejean Beauregard (2020), *Avenir Santé Villejean Beauregard- MSP Rennes Nord/Ouest*, *https://asvb-msp-rennesnordouest.fr/*.

[33] Baker, M., N. Wilson and A. Anglemyer (2020), "Successful Elimination of Covid-19 Transmission in New Zealand", *New England Journal of Medicine*, p. e56, http://dx.doi.org/*10.1056/nejmc2025203*.

[83] Ballard, M. et al. (2020), "Prioritising the role of community health workers in the COVID-19 response", *BMJ Global Health*, Vol. 5/e002550, http://dx.doi.org/*10.1136/bmjgh-2020-002550*.

[99] Banks, J. and X. Xu (2020), "The mental health effects of the first two months of lockdown and social distancing during the Covid-19 pandemic in the UK", *IFS Working Paper W20/16*.

[37] BMA (2020), *Covid-19 Survey Results for hospital doctors, BMA Covid-19 tracker Survey*, *https://www.bma.org.uk/media/3451/bma-covid-19-survey-results-for-hospital-doctors-oct-2020.pdf*.

[11] Boddy, J., A. Young and P. O'Leary (2020), *'Cabin fever': Australia must prepare for the social and psychological impacts of a coronavirus lockdown*, The Conversation, *https://theconversation.com/cabin-fever-australia-must-prepare-for-the-social-and-psychological-impacts-of-a-coronavirus-lockdown-133353*.

[12] Brooks, S. et al. (2020), "The psychological impact of quarantine and how to reduce it: rapid review of the evidence", *The Lancet*, Vol. 395/10227, pp. 912-920, http://dx.doi.org/*10.1016/S0140-6736(20)30460-8*.

[13] Canini, L. et al. (2010), "Surgical mask to prevent influenza transmission in households: A cluster randomized trial", *PLoS ONE*, Vol. 5/11, http://dx.doi.org/*10.1371/journal.pone.0013998*.

[82] Care Quality Commission (2020), *Innovation and inspiration: examples of how providers are responding to coronavirus*, *https://www.cqc.org.uk/publications/innovation-inspiration-examples-how-providers-are-responding-coronavirus-covid-19*.

[114] Carpiniello, B. et al. (2020), "Psychiatry during the Covid-19 Pandemic: a survey on Mental Health Departments in Italy", http://dx.doi.org/*10.21203/rs.3.rs-30357/v1*.

[104] Chan-Chee, C. et al. (2020), *The Mental Health of the French facing the COVID-19 crisis: prevalence, evolution and determinants of anxiety disorders during the first two weeks of lockdown*, Santé Publique France - Rapid Communication, *https://www.santepubliquefrance.fr/content/download/260547/2644064*.

[25] Colombo, F., J. Oderkirk and L. Slawomirski (2020), "Health Information Systems, Electronic Medical Records, and Big Data in Global Healthcare: Progress and Challenges in OECD Countries", in *Handbook of Global Health*, Springer International Publishing, http://dx.doi.org/*10.1007/978-3-030-05325-3_71-1*.

[53] Comas-Herrera, A., E. Ashcroft and K. Lorenz-Dant (2020), *International examples of measures to prevent and manage COVID-19 outbreaks in residential care and nursing home settings*, . Report in LTCcovid.org, International Long-Term Care Policy Network, CPEC-LSE, *https://ltccovid.org*.

[87] Commonwealth Fund (2020), *The Impact of the COVID-19 Pandemic on Outpatient Visits: Practices Are Adapting to the New Normal*, *https://www.commonwealthfund.org/publications/2020/jun/impact-covid-19-pandemic-outpatient-visits-practices-adapting-new-normal*.

[56] Cuffaro, L. et al. (2020), "Dementia care and COVID-19 pandemic: a necessary digital revolution", *Neurological Sciences*, p. 1, http://dx.doi.org/*10.1007/s10072-020-04512-4*.

[21] Daughton, C. (2020), *Wastewater surveillance for population-wide Covid-19: The present and future*, Elsevier B.V., http://dx.doi.org/*10.1016/j.scitotenv.2020.139631*.

[77] Dinmohamed, A. et al. (2020), "Fewer cancer diagnoses during the COVID-19 epidemic in the Netherlands", *The Lancet Oncology*, http://dx.doi.org/*10.1016/S1470-2045(20)30265-5*.

[109] Douglas, M. et al. (2020), "Mitigating the wider health effects of covid-19 pandemic response", *The BMJ*, Vol. 369, http://dx.doi.org/*10.1136/bmj.m1557*.

[61] Drefahl, S. et al. (2020), "Socio-demographic risk factors of COVID-19 deaths in Sweden: A nationwide register study", *Stockholm Research Reports in Demography. Preprint*, http://dx.doi.org/*10.17045/sthlmuni.12420347.v3*.

[22] ECDC (2020), *Mobile applications in support of contact tracing for COVID-19. A guidance for EU/EEA Member States*.

[5] EU Expert Group on HSPA (2020), *Assessing The Resilience of Health Systems in Europe: An Overview of the Theory, Current Practice and Strategies for Improvement*, *https://ec.europa.eu/health/sites/health/files/systems_performance_assessment/docs/2020_resilience_en.pdf*.

[2] European Commission (2020), *Short-term EU health preparedness for COVID-19 outbreaks. Communication from the Commission to the European parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*, *https://ec.europa.eu/info/sites/info/files/communication_-_short-term_eu_health_preparedness.pdf*.

[3] European Commission (2014), *Communication from the Commission on effective, accessible and resilient health systems*, *https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0215&from=en*.

[58] European Environment Agency (2018), *EEA Report No 22/2018 - Unequal exposure and unequal impacts: social vulnerability to air pollution, noise and extreme temperatures in Europe*, *https://www.eea.europa.eu/publications/unequal-exposure-and-unequal-impacts*.

[1] Eurostat (2020), "GDP down by 11.8% and employment down by 2.9% in the euro area", *News release euro indicators*, Vol. 133.

[55] Evandrou, M. et al. (2020), "Older and 'staying at home' during lockdown: informal care receipt during the COVID-19 pandemic amongst people aged 70 and over in the UK".

[117] Flaxman, S. et al. (2020), "Estimating the effects of non-pharmaceutical interventions on COVID-19 in Europe", *Nature*, pp. 1-5, http://dx.doi.org/*10.1038/s41586-020-2405-7*.

[28] Google LLC (2020), *Google COVID-19 Community Mobility Reports*, *https://www.google.com/covid19/mobility*.

[23] Guardsquare (2020), *Most Government-Sponsored COVID-19 Contact Tracing Apps Are Insecure and Risk Exposing Users' Privacy and Data*.

[96] Gunnell, D. et al. (2020), "Suicide risk and prevention during the COVID-19 pandemic", *The Lancet Psychiatry*, http://dx.doi.org/*10.1016/S2215-0366(20)30171-1*.

[84] Haines, A. et al. (2020), "National UK programme of community health workers for COVID-19 response", *The Lancet*, Vol. 395, *https://doi.org/10.1016/S0140-6736(20)30735-2*.

[98] Holmes, E. et al. (2020), "Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science.", *The lancet. Psychiatry*, http://dx.doi.org/*10.1016/S2215-0366(20)30168-1*.

[94] House of Representatives (2020), *Parliamentary Consultation on Cornonavirus [Kamer vraagt organisaties naar gevolgen coronamaatregelen, 149 openbare reacties]*, *https://www.tweedekamer.nl/nieuws/kamernieuws/kamer-vraagt-organisaties-naar-gevolgen-coronamaatregelen-149-openbare-reacties*.

[107] IASC (2020), *Briefing note on addressing mental health and psychosocial aspects of COVID-19 Outbreak-Version 1.1*, *https://interagencystandingcommittee.org/system/files/2020-03/MHPSS%20COVID19%20Briefing%20Note%202%20March%202020-English.pdf*.

[31] Inglesby, T. (2020), *Public Health Measures and the Reproduction Number of SARS-CoV-2*, American Medical Association, http://dx.doi.org/*10.1001/jama.2020.7878*.

[41] Istituto Superiore di Sanità, I. (2020), *COVID-19 integrated surveillance data in Italy*, *https://www.epicentro.iss.it/en/coronavirus/sars-cov-2-dashboard*.

[79] Italian National Oncology Association (2020), "Tumori: "Un milone e 400 mila screening in meno nei primi 5 mesi del 2020. Rischio diagnosi piu avanzate, servono risorse per la telemedicina"", *ESMO conference*.

[47] Julia, C. et al. (2020), *Organising community primary care in the age of COVID-19: challenges in disadvantaged areas*, Elsevier Ltd, http://dx.doi.org/*10.1016/S2468-2667(20)30115-8*.

[78] Lai, A. et al. (2020), "Estimating excess mortality in people with cancer and multimorbidity in the COVID-19 emergency", *Journal on Pre-proof*, http://dx.doi.org/*10.13140/RG.2.2.34254.82242*.

[16] Lau, J. et al. (2004), "SARS Transmission, Risk Factors, and Prevention in Hong Kong", *Emerging Infectious Diseases*, Vol. 10/4, pp. 587-592, http://dx.doi.org/*10.3201/eid1004.030628*.

[75] Lazzerini, M. et al. (2020), *Delayed access or provision of care in Italy resulting from fear of COVID-19*, Elsevier B.V., http://dx.doi.org/*10.1016/S2352-4642(20)30108-5*.

[45] Luceño-Moreno, L. et al. (2020), "Symptoms of posttraumatic stress, anxiety, depression, levels of resilience and burnout in spanish health personnel during the COVID-19 pandemic", *International Journal of Environmental Research and Public Health*, Vol. 17/15, pp. 1-29, http://dx.doi.org/*10.3390/ijerph17155514*.

[14] MacIntyre, C. et al. (2016), "Cluster randomised controlled trial to examine medical mask use as source control for people with respiratory illness", *BMJ Open*, Vol. 6/12, p. e012330, http://dx.doi.org/*10.1136/bmjopen-2016-012330*.

[80] Manso, L., G. De Velasco and L. Paz-Ares (2020), *Impact of the COVID-19 outbreak on cancer patient flow and management: experience from a large university hospital in Spain*, NLM (Medline), http://dx.doi.org/*10.1136/esmoopen-2020-000828*.

[73] Marijon, E. et al. (2020), "Out-of-hospital cardiac arrest during the COVID-19 pandemic in Paris, France: a population-based, observational study", *The Lancet Public Health*, http://dx.doi.org/*10.1016/S2468-2667(20)30117-1*.

[81] Maringe, C., J. Spicer and M. Morris (2020), "The impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study", *The Lancet Oncology*, *https://doi.org/10.1016/S1470-2045(20)30388-0*.

[88] McKinsey (2020), *Telehealth: A quarter-trillion-dollar post-COVID-19 reality?*, *https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/telehealth-a-quarter-trillion-dollar-post-covid-19-reality#*.

[86] Mental Health Europe (2020), *Mental health helplines and services during COVID-19*, *https://www.mhe-sme.org/library/helplines/*.

[7] Meyerowitz-Katz, G. and L. Merone (2020), "A systematic review and meta-analysis of published research data on COVID-19 infection-fatality rates", *International Journal of Infectious Diseases*, Vol. 0/0, http://dx.doi.org/*10.1016/j.ijid.2020.09.1464*.

[42] Ministerio de Sanidad, S. (2020), *Actualización nº 194. Enfermedad por el coronavirus (COVID-19). 27.08.2020*, p. 11, *https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/Actualizacion_194_COVID-19.pdf*.

[62] Mogi, R., G. Kato and S. Annaka (2020), "Socioeconomic inequality and COVID-19 prevalence across municipalities in Catalonia, Spain", http://dx.doi.org/*10.31235/osf.io/5jgzy*.

[90] Moreno, C. et al. (2020), "How mental health care should change as a consequence of the COVID-19 pandemic", *The Lancet Psychiatry*, Vol. 7/9, pp. 813-824, http://dx.doi.org/*10.1016/s2215-0366(20)30307-2*.

[8] Morgan, D. et al. (2020), "Excess mortality: Measuring the direct and indirect impact of COVID-19", *OECD Health Working Papers*, Vol. 122, http://dx.doi.org/*10.1787/c5dc0c50-en*.

[108] NAMI (2020), *COVID-19: information and ressources*, *https://www.nami.org/getattachment/Press-Media/Press-Releases/2020/COVID-19-and-Mental-Illness-NAMI-Releases-Importan/COVID-19-Updated-Guide-1.pdf?lang=en-US*.

[76] NHS Digital (2020), *Appointments in General Practice – March 2020*, *https://digital.nhs.uk*.

[92] NHSProviders (2020), *Spotlight on... The impact of COVID-19 on mental health trusts in the NHS*.

[112] Nursing, R. (2020), *COVID-19 guidance on mental healthcare delivery*, *https://www.rcn.org.uk/clinical-topics/mental-health/covid-19-guidance-on-mental-healthcare-delivery*.

[26] Oderkirk, J. (2017), *Readiness of Electronic Health Record Systems to Contribute to National Information and Research, Health Working Paper 99, OECD Publishing, Paris*.

[4] OECD (2020), “A systemic resilience approach to dealing with Covid-19 and future shocks.”*, OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, *http://www.oecd.org/coronavirus/policy-responses/a-systemic-resilience-approach-to-dealing-with-covid-19-and-future-shocks-36a5bdfb/*.

[69] OECD (2020), *Country Policy Tracker*, OECD, Paris, *https://www.oecd.org/coronavirus/country-policy-tracker/*.

[51] OECD (2020), “COVID-19 and international trade: Issues and actions”*, OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, *http://www.oecd.org/coronavirus/policy-responses/covid-19-and-international-trade-issues-and-actions-494da2fa/*.

[9] OECD (2020), “Flattening the COVID-19 peak: Containment and mitigation policies”*, OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, *http://www.oecd.org/coronavirus/policy-responses/flattening-the-covid-19-peak-containment-and-mitigation-policies-e96a4226/*.

[49] OECD (2020), “Public procurement and infrastructure governance: Initial policy responses to the coronavirus (Covid-19) crisis”*, OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, *http://www.oecd.org/coronavirus/policy-responses/public-procurement-and-infrastructure-governance-initial-policy-responses-to-the-coronavirus-covid-19-crisis-c0ab0a96/*.

[68] OECD (2020), *Realising the Potential of Primary Health Care*, OECD, Paris, *https://doi.org/10.1787/a92adee4-en.*

[116] OECD (2020), “Tackling the coronavirus (COVID-19) crisis together: OECD policy contributions for co-ordinated action”*, Beyond containment: Health systems responses to COVID-19 in the OECD*, OECD Publishing, Paris, *https://www.oecd.org/coronavirus/policy-responses/beyond-containment-health-systems-responses-to-covid-19-in-the-oecd-6ab740c0/*.

[18] OECD (2020), “Testing for COVID-19: A way to lift confinement restrictions”*, OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, *http://www.oecd.org/coronavirus/policy-responses/testing-for-covid-19-a-way-to-lift-confinement-restrictions-89756248/*.

[50] OECD (2020), “The face mask global value chain in the COVID-19 outbreak: Evidence and policy lessons”*, OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, *http://www.oecd.org/coronavirus/policy-responses/the-face-mask-global-value-chain-in-the-covid-19-outbreak-evidence-and-policy-lessons-a4df866*.

[24] OECD (2020), “Tracking and tracing COVID: Protecting privacy and data while using apps and biometrics”*, OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, *http://www.oecd.org/coronavirus/policy-responses/tracking-and-tracing-covid-protecting-privacy-and-data-while-using-apps-and-biometrics-8f394636/*.

[52] OECD (2020), “Trade interdependencies in Covid-19 goods”*, OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, *http://www.oecd.org/coronavirus/policy-responses/trade-interdependencies-in-covid-19-goods-79aaa1d6/*.

[54] OECD (2020), “Workforce and Safety in Long-Term Care during the COVID-19 pandemic”*, OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, *https://www.oecd.org/coronavirus/policy-responses/workforce-and-safety-in-long-term-care-during-the-covid-19-pandemic-43fc5d50/*.

[34] OECD (2019), *Government at a Glance 2019*, OECD Publishing, Paris, *https://doi.org/10.1787/8ccf5c38-en*.

[57] OECD (2019), *Health for Everyone?: Social Inequalities in Health and Health Systems*, OECD Health Policy Studies, OECD Publishing, Paris, *https://dx.doi.org/10.1787/3c8385d0-en*.

[35] OECD (forthcoming), “Adaptive Health Financing: Budgetary and Health System Actions to Combat COVID-19”*, OECD Health Working Papers*, OECD Publishing, Paris.

[48] OECD (forthcoming), “Medicine shortages in OECD countries”*, OECD Health Working Papers*, OECD Publishing, Paris.

[64] OHCHR (2020), “Covid-19 and Minority Rights: Overview and Promising Practices”, *https://www.ohchr.org/Documents/Issues/Minorities/OHCHRGuidance_COVID19_MinoritiesRights.pdf*.

[85] Oliveira Hashiguchi, T. (2020), “Bringing health care to the patient: An overview of the use of telemedicine in OECD countries”*, OECD Health Working Papers*, No. 116, OECD Publishing, Paris, *https://dx.doi.org/10.1787/8e56ede7-en*.

[102] ONS (2020), *Coronavirus and anxiety, Great Britain: 3 April 2020 to 10 May 2020*, *https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/coronavirusandanxietygreatbritain/3april2020to10may2020*.

[103] ONS (2020), *Coronavirus and the social impacts on Great Britain - Office for National Statistics*, *https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandthesocialimpactsongreatbritain/7may2020*.

[29] Pan, A. et al. (2020), “Association of Public Health Interventions With the Epidemiology of the COVID-19 Outbreak in Wuhan, China”, *JAMA*, Vol. 323/19, p. 1915, http://dx.doi.org/*10.1001/jama.2020.6130*.

[60] Papon, S. and I. Robert-Bobée (2020), *Une hausse des décès deux fois plus forte pour les personnes nées à l’étranger que pour celles nées en France en mars-avril 2020. INSEE 198*.

[113] Percudani, M. et al. (2020), “Mental Health Services in Lombardy during COVID-19 outbreak”, *Psychiatry Research*, Vol. 288, http://dx.doi.org/*10.1016/j.psychres.2020.112980*.

[39] PGEU (2020), *PGEU overview of the expansion of community pharmacy services/activities in relation to COVID-19*, PGEU.

[59] Public Health England (2020), “Disparities in the risk and outcomes of COVID-19”, *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/892085/disparities_review.pdf*.

[89] Rajkumar, R. (2020), “COVID-19 and mental health: A review of the existing literature”, *Asian Journal of Psychiatry*, Vol. 52, p. 102066, http://dx.doi.org/*10.1016/j.ajp.2020.102066*.

[46] Remuzzi, A. and G. Remuzzi (2020), *COVID-19 and Italy: what next?*, Lancet Publishing Group, http://dx.doi.org/*10.1016/S0140-6736(20)30627-9*.

[95] Rethink Mental Illness (2020), *80% of people living with mental illness say current crisis has made their mental health worse*, *https://www.rethink.org/news-and-stories/news/2020/04/80-of-people-living-with-mental-illness-say-current-crisis-has-made-their-mental-health-worse/*.

[43] Robert Koch Institute (2020), *Coronavirus Disease 2019 (Covid-19) – Daily Situation Report of the Robert Koch Institute. Updated satus for Germany*.

[111] Roca, M., C. Vicens and M. Gili (2020), *Covid-19 and the future of mental health in primary care.*, British Medical Journal Publishing Group, http://dx.doi.org/*10.1136/bmj.m2520*.

[20] Roser, M. et al. (2020), *Coronavirus Pandemic (COVID-19)*, *https://ourworldindata.org/coronavirus*.

[44] Rossi, R. et al. (2020), “Mental Health Outcomes Among Frontline and Second-Line Health Care Workers During the Coronavirus Disease 2019 (COVID-19) Pandemic in Italy”, *JAMA network open*, Vol. 3/5, p. e2010185, http://dx.doi.org/*10.1001/jamanetworkopen.2020.10185*.

[65] Rousseau, A., H. Bevort and L. Ginot (2020), “La santé publique au risque de la COVID19 : du premier retour d’expérience à la formulation de nouvelles exigences collectives”, *Santé Publique*, Vol. 32/2, p. 183, http://dx.doi.org/*10.3917/spub.202.0183*.

[72] Santé Publique France (2020), *Covid-19 et continuité des soins Continuer de se soigner, un impératif de santé publique*, Santé Publique France.

[40] Santé Publique France (2020), *Recensement national des cas de COVID-19 chez les professionnels en établissements de santé*, *https://www.santepubliquefrance.fr*.

[70] Santi, P. and E. Pineau (2020), *Les inquiétants effets sanitaires collatéraux du coronavirus*, Le Monde, *https://www.lemonde.fr/sciences/article/2020/07/13/diagnostics-prise-en-charge-traitements-le-coronavirus-a-des-effets-sanitaires-collateraux-tres-larges_6046098_1650684.html*.

[74] Schwarz, V. et al. (2020), “Decline of emergency admissions for cardiovascular and cerebrovascular events after the outbreak of COVID-19”, *Clinical Research in Cardiology*, pp. 1-7, http://dx.doi.org/*10.1007/s00392-020-01688-9*.

[100] Sciensano (2020), *Enquête de santé COVID-19: quelques résultats préliminaires*, Sciensano, Brussels, *https://www.sciensano.be/en/biblio/troisieme-enquete-de-sante-covid-19-resultats-preliminaires*.

[38] Service Public France (2020), *Prime exceptionnelle aux soignants hospitaliers et heures supplémentaires majorées, Direction de l’information légale et administrative.*, *https://www.service-public.fr*.

[101] Sønderskov, K. et al. (2020), “The depressive state of Denmark during the COVID-19 pandemic”, *Acta Neuropsychiatrica*, p. 1, http://dx.doi.org/*10.1017/neu.2020.15*.

[6] Spiteri, G. et al. (2020), *First cases of coronavirus disease 2019 (COVID-19) in the WHO European Region, 24 January to 21 February 2020*, European Centre for Disease Prevention and Control (ECDC), http://dx.doi.org/*10.2807/1560-7917.ES.2020.25.9.2000178*.

[110] Torjesen, I. (2020), "Covid-19: Mental health services must be boosted to deal with "tsunami" of cases after lockdown", *BMJ (Clinical research ed.)*, Vol. 369, p. m1994, http://dx.doi.org/*10.1136/bmj.m1994*.

[115] Vieta, E., V. Pérez and C. Arango (2020), "Psychiatry in the aftermath of COVID-19", *Revista de Psiquiatria y Salud Mental*, Vol. 13/2, pp. 105-110, http://dx.doi.org/*10.1016/j.rpsm.2020.04.004*.

[36] Walloon Government (2020), "Coronavirus : le Gouvernement de Wallonie prend des mesures de soutien supplémentaires", *https://borsus.wallonie.be/home/presse--actualites/publications/coronavirus--le-gouvernement-de-wallonie-prend-des-mesures-de-soutien-supplementaires.publicationfull.html*.

[17] WHO (2020), *Advice on the use of masks in the context of COVID-19*, *https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak*.

[106] WHO (2020), *Coping with stress during the 2019-nCoV outbreak*, WHO, Geneva, *https://www.who.int/docs/default-source/coronaviruse/coping-with-stress.pdf?sfvrsn=9845bc3a_2*.

[19] WHO (2020), *Coronavirus*, *https://www.who.int/health-topics/coronavirus*.

[97] WHO (2020), *Mental Health Considerations during COVID-19 Outbreak*, WHO, Geneva, *https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf?sfvrsn=6d3578af_2*.

[93] WHO Europe (2020), "Essential mental health service delivery during the COVID-19 outbreak and response: lessons learned from Italy and Spain", *Expert seminar in April 2020*.

[27] Williamson, E. et al. (2020), "OpenSAFELY: factors associated with COVID-19 death in 17 million patients", *Nature*, http://dx.doi.org/*10.1038/s41586-020-2521-4*.

[105] Winkler, P. et al. (2020), "Sharp Increase in Prevalence of Current Mental Disorders in the Context of COVID-19: Analysis of Repeated Nationwide Cross-Sectional Surveys", *SSRN Electronic Journal*, http://dx.doi.org/*10.2139/ssrn.3622402*.

[30] Xiao, Y. et al. (2020), "Linking key intervention timing to rapid decline of the COVID-19 effective reproductive number to quantify lessons from mainland China", *International Journal of Infectious Diseases*, Vol. 97, pp. 296-298, http://dx.doi.org/*10.1016/j.ijid.2020.06.030*.

[63] Yaya, S. et al. (2020), "Ethnic and racial disparities in COVID-19-related deaths: counting the trees, hiding the forest", *BMJ Global Health*, Vol. 5/6, p. e002913, http://dx.doi.org/*10.1136/bmjgh-2020-002913*.

ANNEX 1.A

Annex tables

Annex Table 1.A.1. **Health workforce – policies to boost surge capacity response to COVID-19 during the first wave of the pandemic in 2020**

Country	Selected policy examples (e.g. mobilising health care students, retired and non-practicing health care workers, foreign health care workers, existence of official reserve list, transfer of staff to localities with greater needs)
Austria	Young civil servants mobilised to support long-term care workers as paramedics – the government estimates about 14 600 additional workers can be mobilised this way. Other policies included allowing foreign health care workers from Central and Eastern European countries to enter Austria and the involvement of medical students.
Belgium	Medical students, nursing students and physicians in training mobilised to mitigate possible shortage of health care professionals. At the level of federated entities, lists of reserves were also organised to provide assistance in health services.
Bulgaria	A call was launched to mobilise medical students and retired health professionals to combat COVID-19.
Croatia	Information not available.
Cyprus	Workforce from private sector mobilised to support public hospitals. Final-year medical and nursing students employed on a voluntary basis.
Czech Republic	Non-EU medical staff without fully validated degrees allowed to work in hospitals (but was also the case before the pandemic). About 3 800 students engaged, mostly as nurses, auxiliaries or at Public Health Authorities call centres (with almost 5 500 students registered to combat COVID-19 by mid-April). Graduate nurses not working in health care applied to help and worked in health facilities during the pandemic.
Denmark	Students in medical, nursing and other health education programmes and retired health workers invited to join the workforce through the establishment of a 'job bank'. Fast track re-training of health professionals has also been set-up to facilitate work in ICU facilities. Nurses from surgical departments have been redeployed depending on needs.
Estonia	The Army sent a medical team of 18 members and a support team of 20 members to help set up a field hospital. As of 5 April, 11 voluntary doctors and nurses from Estonian hospitals, ambulances and the private sector were also mobilised to staff the field hospital. In addition, medical and nursing students mobilised to work in primary care practices, while hospital staff were reassigned when needed.
Finland	Some health workers retrained and/or reassigned to different positions. Medical students have been recruited to do contact tracing as testing capacity increases. From 26 March to 13 April, people working in both public and private health care facilities were required to work during the crisis if needed.
France	About 3 000 health professionals were registered in the sanitary reserve before the crisis. An additional 40 000 expressed their interest to be registered by April 2020 (although not all of them were registered and the number who were deployed is unknown).
Germany	Over 20 000 medical students registered to combat COVID-19 (as of 26 March). Potential pool of about 14 000 foreign-trained physicians waiting for recognition of their diplomas.
Greece	New legislation allowed for the employment of private physicians in public hospitals. Since 4 March, 4 200 job placements have been approved (medical, nursing and support staff) and 2 000 have been completed. Since 23 March, over 8 000 volunteers (doctors, nurses, paramedics, psychologists, medical students, and retirees) have applied through the digital platform to combat COVID-19.
Hungary	Over 900 volunteers registered at the NHS website to combat COVID-19 (students, health professionals from the private sector, retired health workers).
Iceland	The Ministry of Health established a health care service reserve which includes doctors, nurses, auxiliaries, retired health workers and medical and nursing students. 1 000 health professionals registered to this reserve.
Ireland	A total of 4 858 workers recruited in the public health care sector. Of which, mobilisation of 1 399 nursing, midwifery and science students, 992 medical interns and 156 retired health care workers. Nationwide recruitment campaign 'Be on Call for Ireland' launched in mid-March (197 applicants employed) and creation of a reserve list. In addition, 2 114 health care workers recruited through usual channels. Redeployment of 558 health care workers to areas where they were most needed.
Italy	The NHS hired 29 433 additional health professionals since March 2020 to combat COVID-19 (across all contract types and facilities), including 6 330 doctors (of which 22% in the Lombardy Region and 11% in Emilia-Romagna) and 13 607 nurses (of which 14% in the Lombardy Region and 17% in Emilia-Romagna).
Latvia	Many volunteer students from several Latvian universities responded to the call to combat COVID-19. In addition, the quota of overtime hours increased for medical practitioners and epidemiologists.
Lithuania	Health workers were reassigned depending on needs. Health professionals, medical students, residents and retired doctors can be pooled if needed. On 19 March, the National Centre for Public Health issued a call for volunteers.
Luxembourg	On 23 March, a national platform was launched to recruit volunteers. It targeted health workers, students, retired health workers and people on leave without pay. In addition, GPs, nurses and medical students have been trained to support hospital staff during the COVID-19 crisis.
Malta	Some health professionals and medical students retrained to be able to work in A&E or ICU units, while other volunteers have been trained to support helplines. A public call was also issued for doctors, dentists, nurses and allied health professionals to combat COVID-19.
Netherlands	Additional workforce mobilised in hospitals by reactivating former health professionals (retired workers or other people no longer working in hospitals). Other measures included removing obligations for re-registration, allowing workers whose official registration had expired to work and mobilising additional workforce from the military service.
Norway	Hospitals staff have been reassigned, after receiving necessary training. The Directorate of Health advised the municipalities to hire medical and nursing students and retired health workers. An official call was made on 24 March for all health professionals to register. As of 18 May, 6 492 health personnel had registered in the national preparedness registry, including 1 453 nurses and 754 physicians.

Annex Table 1.A.1. **Health workforce – policies to boost surge capacity response to COVID-19 during the first wave of the pandemic in 2020** *(cont.)*

Country	Selected policy examples (e.g. mobilising health care students, retired and non-practicing health care workers, foreign health care workers, existence of official reserve list, transfer of staff to localities with greater needs)
Poland	Some medical doctors have been reassigned to other facilities depending on needs. Final-year students in medicine, pharmacy, medical analytics, nursing and emergency allowed to perform support roles in hospitals and nursing homes. Legislation has been passed to facilitate the hiring of retired health workers and non-practicing nurses in hospital.
Portugal	The Ministry of Health implemented a series of measures, including: redeploying health workers; suspending overtime quota; training for GPs; and simplified contractual arrangements for hiring students, retired health care workers or nurses. As of 15 May, 2 628 health workers had been hired by the NHS under these new rules (including 118 doctors and 855 nurses).
Romania	About 2 000 temporary jobs created (1 000 jobs at district public health authorities and 1 000 jobs for district emergency ambulance services). A legislative basis was also introduced to allow the compulsory redeployment of doctors, nurses, and students.
Slovak Republic	Information not available.
Slovenia	Medical students and interns mobilised to increase the availability of health workers. A call targeting nursing professionals who had previously worked in ICUs was made to help bridge the workforce gaps in ICU units.
Spain	The Ministry of Health implemented a series of measures, including: hiring of retired health workers, resident doctors, nursing or other health workers; and relocating health workers to facilities and regions with greater needs.
Sweden	A call was launched to mobilise students, retired health workers and staff from other sectors with a health education to combat COVID-19. The Region of Stockholm requested SALAR to activate an emergency agreement to temporarily increase working hours and transfer staff between various wards, departments within regions, and between two regions.
Switzerland	The cantons and hospitals put out calls for health care volunteers (including medical students). As of June 2020, the army had mobilised 8 000 persons to support various civilian services.
United Kingdom	The UK Regulatory Bodies for all health care professions facilitated rapid re-registration of retired clinicians and over 50 000 of these made an initial offer to return to support the NHS. Along with medical, nursing and AHP students, over 60 000 extra personnel became available to work and many thousands were employed in front line and remote services. In addition, a call for volunteers to support NHS services resulted in more than 750 000 applications.

Source: OECD health system policy tracker, European Observatory Health System Response Monitor and reports from national governments.

Annex Table 1.A.2. **Policies to boost surge capacity response to COVID-19, during the first wave of the pandemic in 2020**

Country	Selected policy examples (e.g. turning wards into ICUs, creating field hospitals, transfer of patients to localities with spare capacity, partnerships with private hospitals)
Austria	About 7 500 additional beds from facilities other than hospitals (such as rehabilitation facilities) and another 1 735 regular beds have been made available for COVID-19 treatment (as of 8 April).
Belgium	An additional 759 intensive care beds created since the start of the COVID-19 crisis (as of 22 March). Redistribution of patients from the provinces of Limburg and Hainaut toward Anvers.
Bulgaria	Private hospitals provided equipment and capacity. Armed forces prepared camp beds and mobile facilities for COVID-19 treatment.
Croatia	Hospitals converted to COVID-19 respiratory centres with support from mobile medical facilities. Some non-medical facilities (e.g. student campuses, sports halls) repurposed with hospital beds to treat patients with non-severe COVID-19 symptoms. Other non-medical facilities converted to quarantine facilities.
Cyprus	Creation of a new ICU at the General Hospital of Nicosia with a capacity of 28 beds.
Czech Republic	Transformation of standard beds into ICU beds. As of 16 April 2020, 4 197 ICU beds (beds in anaesthesiology and resuscitation departments and ICUs for adults) were made available during the COVID-19 pandemic.
Denmark	Pre-existing intensive care capacity increased by 75%. Flexible adjustments in local capacity allowed for rapid re-location of equipment. Private hospitals were required to make their facilities available to treat COVID-19 patients.
Estonia	Creation of Defence Forces field hospital to support the Kuressaare hospital, with 20 additional intensive care beds and 40 general ward beds (on 2 April). Possible transfer of patients to non-medical facilities such as spas and hotels to boost hospital capacity. Restructuring of post-surgery wakeup rooms and day surgery rooms into ICUs equipped with ventilators.
Finland	Conversion of operation wards and recovery areas into ICUs. Helsinki University Central Hospital dedicated one of its buildings to COVID-19 patients.
France	The resuscitation bed capacity increased from 5 000 to 8 000 beds (as of 24 March). Hospitals and private clinics increased their intensive care capacity across the country. A Military Field Hospital also created to boost capacity. 644 patients from overburdened hospitals transferred by train to less affected regions and other EU countries (Austria, Germany, Luxembourg and Switzerland).
Germany	In many hospitals, capacities shifted from planned and elective procedures to increase general and ICU bed capacity. Non-medical facilities (e.g. rehabilitation facilities, hotels, public halls) transformed into ICUs. Overall, the number of ICU beds increased by about 12 000.
Greece	The total number of ICU beds increased by 305 (as of 31 March). This included 85 new ICU beds in public hospitals, the provision of 30 ICU beds by military hospitals, and the provision of 137 ICU beds by private clinics. Public hospital of Athens transformed into a COVID-19 hospital, along with a private hospital in the Attiki region. In selected general hospitals, ICU units also dedicated to COVID-19 patients.
Hungary	Construction of emergency hospital and 4 major hospitals outside of Budapest dedicated to COVID-19 patients. A 330-bed capacity temporary facility created in Budapest in the exhibition buildings of Hungexpo (by 16 March). A military camp hospital was also built (by 24 March).
Iceland	Landspitali University Hospital and Akureyri hospital dedicated to COVID-19, including a specialised COVID-19 ambulatory care unit at Lanspitali. Transformation of wards into intensive care units. Reserve beds prepared in other health care institutions in the Capital Region to admit patients from Landspitali hospital in case of need.
Ireland	Opening additional beds in existing critical care units, transforming wards and other spaces such as theatre into ICUs and transferring patients to units with spare capacity or with additional expertise (10-15% of COVID patients transferred). Private hospitals operated as public hospitals under Section 38 of the Health Act for the duration of the Emergency (31 March-30 June). Overall, increased capacity of ICU beds reached 8.1 beds per 100 000 population (399 additional intensive care beds), as of 1 May 2020.
Italy	In Lombardy the ICU capacity increased by 376 beds by turning wards into ICUs (by 16 March). The city of Milan converted existing industrial spaces into hospitals. In some regions, the Department of Civil Protection set-up military camp hospitals with additional ICU beds and lower intensity care beds. Patients in need of intensive care in affected regions transferred to other regions by air.
Latvia	Measures to boost capacity included re-orienting hospital ward into ICUs to manage COVID-19 patients and using medical equipment from the private sector. As of 28 March, approximately 1 000 hospital beds were available in Latvia for the placement of COVID-19 patients.
Lithuania	Reallocating some non-COVID-19 patients into other facilities to create more inpatient beds for COVID-19 patients. Secondary care was reorganised into a network of hospitals to manage the treatment of COVID-19 patients on a regional basis.
Luxembourg	Inter-country support (some patients in overburdened hospitals in the east of France transferred to Luxembourg), creation of military field hospital, increased bed capacity in ICU and non-ICU hospital facilities, increased number of ventilation equipment and CT scans.
Malta	An additional 600 beds were made available for COVID-19 patients from acute hospitals, private medical facilities and other state-owned health facilities. In addition, the number of Intensive Therapy Unit (ITU) beds increased five-fold (from 20 to over 100).
Netherlands	Redistribution of patients in need of ICU care to hospitals with spare capacity. For instance, in the Groningen hospitals (north of the country) 32 of the 34 COVID-19 patients came from the provinces of Noord-Brabant and Limburg (the south of the country).
Norway	Plan to increase ICU capacity to 1 200 beds by 15 April.
Poland	22 hospitals transformed into single-infection hospitals. Non-COVID-19 patients moved to alternative facilities nearby. The Ministry of Health estimates approximately 10 000 beds were available in these designated single-infection hospitals.

Annex Table 1.A.2. **Policies to boost surge capacity response to COVID-19, during the first wave of the pandemic in 2020** *(cont.)*

Country	Selected policy examples (e.g. turning wards into ICUs, creating field hospitals, transfer of patients to localities with spare capacity, partnerships with private hospitals)
Portugal	Measures to increase hospital capacity included reorganisation of the hospital network with one hospital fully dedicated to the treatment of COVID-19 patients, turning hospital wards into ICUs (the NHS had further increased general level 3 ICU beds for adults by 25%), increasing patient discharges, contracting out with the private sector, and creation of field hospitals.
Romania	Re-deployment of hospital beds into ICU beds. The army also deployed a mobile hospital near Bucharest, and a second one bought from the Netherlands was located near Constanta. Many other modular hospitals built and 5 intensive care mobile units bought with the support of local authorities, NGOs and other donors.
Slovak Republic	Information not available.
Slovenia	The first mobile hospital created by the military base Edvard Peperk in Ljubljana to host up to 120 patients in ICUs.
Spain	16 additional temporary hospitals created with the help of the Armed Forces. All ICU beds from private hospitals made available to treat COVID-19 patients. Three speed trains converted to transfer 24 critical patients to ICUs.
Sweden	Additional 524 ICU beds gradually created during the crisis, which doubled the capacity of ICU beds (normal capacity is around 500 beds).
Switzerland	Transfer of patients from the Canton of Ticino to the German-speaking part of Switzerland. Some hospitals were converted to treat exclusively COVID-19 patients, others transforming general hospital wards into ICUs. Private hospitals and clinics also mobilised to treat COVID-19.
United Kingdom	New temporary hospitals built in seven locations to provide additional intensive care unit capacity (for example 500 beds in the London Nightingale hospital). New hospital discharge criteria introduced that freed up around 33 000 beds (England).

Source: OECD health system policy tracker, European Observatory Health System Response Monitor and reports from national governments.

Health at a Glance: Europe 2020
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PART I

Chapter 2

Air pollution and its impact on health in Europe: Why it matters and how the health sector can reduce its burden

This chapter reviews the health and welfare impacts of air pollution in Europe. Although air pollution has decreased in most European countries over the past two decades, it remains above WHO guidelines in most countries, particularly in some large Central and Eastern European cities. This has serious consequences on people's health and mortality: in the EU, estimates attribute between 168 000 and 346 000 deaths to air pollution from fine particles ($PM_{2.5}$) alone in 2018. The welfare losses from air pollution are substantial. A conservative estimate of the welfare impact of $PM_{2.5}$ and ozone shows that this amounts to an annual loss of 4.9% of GDP in the EU. This welfare loss is mainly attributable to the impact of these pollutants on mortality, along with lower quality of life, lower labour productivity and higher spending on health.

Efforts to reduce air pollution need to focus on the main sources of emissions. These include the use of fossil fuels in energy production, transportation and the residential sector, as well as industrial and agricultural activities. The EU recovery plan from the COVID-19 crisis provides a unique opportunity to promote a green economic recovery by integrating environmental considerations in decision-making processes, thereby supporting the achievement of the 2030 EU national emission reduction targets. The health sector itself can contribute to achieving this objective by implementing various measures to minimise its own environmental footprint. Through multi-sectoral approaches, public health authorities can also contribute to environmentally friendly urban and transport policies, which may also promote greater physical activity.

Introduction

Air pollution is the main environmental risk factor for health in Europe and around the world. It has substantial health, economic and welfare consequences, including ill-health and greater premature mortality, increased health care costs, as well as reduced labour productivity and economic output in some sectors (e.g. agriculture and forestry sectors). The main sources of air pollution arise from the burning of fossil fuels in energy production, transport and households, and from some industrial and agricultural activities.

Depending on the methods of estimation, between 168 000 and 346 000 premature deaths across all EU member states in 2018 can be attributed to exposure to outdoor air pollution in the form of fine particles ($PM_{2.5}$) alone (Institute for Health Metrics and Evaluation, 2020[1]; European Environment Agency, 2020[2]). This represented 4% to 7% of all deaths in 2018. In addition, hundreds of thousands of people develop various illnesses associated with air pollution, leading to a loss of about 3.9 million disability-adjusted life years (DALYs) annually in the European Union (Institute for Health Metrics and Evaluation, 2020[1]).

While most European countries have substantially reduced their emissions of various air pollutants since 2005, most EU member states are still at risk of failing to fulfill their 2030 national emission reduction commitments unless additional measures are taken (European Commission, 2020[3]). A key element of the European Green Deal, announced in December 2019, is the zero-pollution ambition for a toxic-free environment. A proposed zero-pollution action plan for air, water and soil will be announced for 2021 (European Commission, 2019[4]). The EU recovery plan from the COVID-19 crisis, approved by the European Council in July 2020, aims to promote a green recovery by integrating environmental considerations into the recovery process (European Council, 2020[5]). This plan should also promote the achievement of national emission reduction commitments.

This chapter first reviews the evidence of the health effects of air pollution in Europe and offers estimates of the welfare losses associated with its considerable impact on morbidity and mortality. It then reviews some of the main EU policy goals and actions to achieve good air quality and to promote steady reductions in air pollution, including progress in the implementation of the 2016 National Emission reduction Commitments (NEC) Directive (European Commission, 2016[6]). This chapter ends with a discussion of the potential contribution of the health sector to efforts to reducing air pollution, including through decreasing its ecological footprint and encouraging lifestyle and environmental changes that both promote better health and benefit the environment.

The health and economic burden of air pollution in Europe

Air pollution causes different health problems, particularly respiratory and cardiovascular diseases. Different air pollutants can affect different parts of the body (Box 2.1). The greatest health damage from air pollution is caused by chronic exposure to particulate matter, in particular to fine particulate matter ($PM_{2.5}$) which increases the risk of heart diseases, stroke, lung cancer and many respiratory diseases including asthma, bronchitis, chronic obstructive pulmonary disease (COPD) and respiratory infections. This explains why this chapter focuses primarily on the health and welfare consequences of exposure to $PM_{2.5}$.

Box 2.1. **Main air pollutants with adverse effects on health**

Particulate matter (including PM_{10} and $PM_{2.5}$) are particles that are suspended in the air. Primary PM emissions result from the combustion of fuels, such as for power generation, domestic heating and in vehicle engines. Chronic exposure to particles contributes to the risk of developing cardiovascular and respiratory diseases, irritates eyes, nose and throat, causes disorders in the reproductive and central nervous systems, as well as increases the risk of lung cancer. Small particulates of less than 10 microns in diameter (PM_{10}) are capable of penetrating deep into the respiratory tract and causing significant health damage. Fine particulates smaller than 2.5 microns in diameter ($PM_{2.5}$) cause even more severe health effects because they penetrate deeper into the respiratory tract and are potentially more toxic.

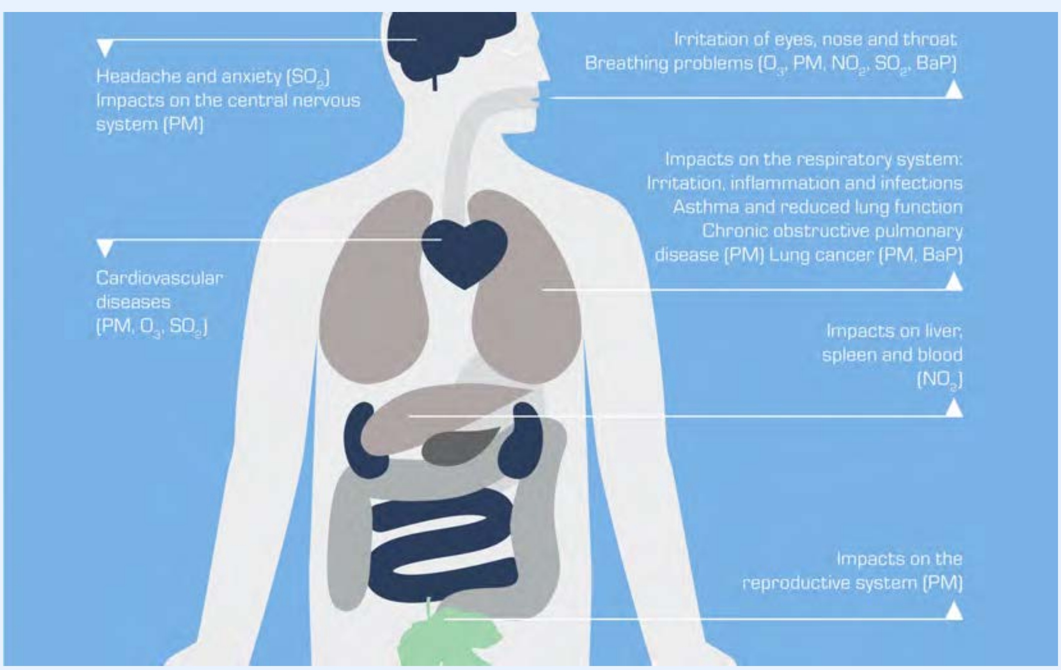
Nitrogen dioxide (NO_2) is formed primarily from vehicle exhausts, especially from diesel vehicles, power plants and combustion in industry. In addition to being a primary pollutant, it contributes to the formation of particulate matter and ozone. NO_2 can cause bronchitis and asthma, lead to irritations of eyes, nose and throat, cause respiratory infections and reduced lung function, and impact on liver, spleen and blood.

Ozone (O_3) at ground level, is formed by chemical reactions (triggered by sunlight) involving pollutants emitted into the air, including those by transport, natural gas extraction, landfills and household chemicals. Excessive ozone in the air can cause cardiovascular diseases as well as lead to breathing problems, irritations of eyes, nose and throat, trigger asthma and reduce lung function.

Sulphur dioxide (SO_2) is emitted mainly from the burning of fossil fuels such as coal and oil, and the smelting of mineral ores that contain sulphur. Sulphur dioxide can affect the respiratory system, central nervous system and lung function, and can cause headaches, anxiety and eye irritation. It can also aggravate bronchitis and asthma, and be a cause of cardiovascular diseases.

Benzo(a)pyrene (BaP) originates from incomplete combustion of fuels. Main sources include wood and waste burning, coke and steel production and vehicle engines. BaP can affect the respiratory system, and irritates eyes, nose and throat.

Infographic 2.1. **Potential health impacts of major sources of air pollution**



Source: European Environment Agency, *https://www.eea.europa.eu/signals/signals-2013/infographics/health-impacts-of-air-pollution/view*.

Exposure to air pollutants can take place both in outdoor (ambient) and indoor (household) environments. In Europe, the impact on population health from exposure to outdoor air pollutants is much greater compared to that from indoor air pollutants (see Figure 2.7 below).

Due to its impact on respiratory and cardiovascular diseases, emerging evidence suggests that increased long-term exposure to air pollution (notably $PM_{2.5}$) increases the risk of severe COVID-19 complications (Box 2.2). In general, having pre-existing conditions linked to exposure to air pollutants appears to make people more vulnerable to the effects of COVID-19 (OECD, 2020[9]).

Box 2.2. **Air pollution and COVID-19**

As widely illustrated in this chapter, exposure to air pollution is a risk factor for many chronic diseases, including chronic respiratory and cardiovascular diseases. There is wide recognition that people with such conditions are at increased vulnerability from COVID-19, and may thus be prone to a more severe course of the disease (Clark et al., 2020[10]). The World Health Organization and a number of national public health authorities have also issued warnings for citizens with these pre-existing conditions of greater risks of complications from COVID-19 (WHO, 2020[11]). It has been estimated that long-term exposure to air pollution from $PM_{2.5}$ contributed to about 19% of COVID-19 mortality in Europe through its effect in increasing respiratory and cardiovascular diseases, but the confidence intervals around this estimate are wide (8-41%), reflecting high levels of uncertainties (Pozzer et al., 2020[12]).

In addition, some studies suggest that air pollution ($PM_{2.5}$ in particular) may increase the risk of infection by acting as a vehicle spreading the virus (Copat et al., 2020[13]). While there are some concerns that air pollution could carry the virus over longer distances, at this stage it is not known whether the virus remains viable on pollution particles (European Environment Agency, 2020[7]). Further research is needed to verify this hypothesis.

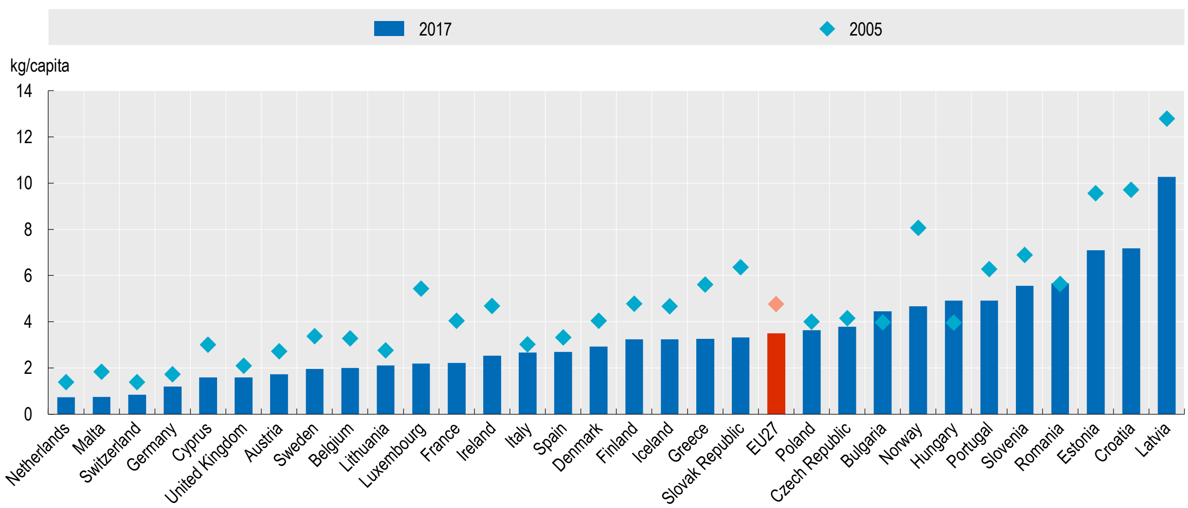
On the other hand, the confinement measures that have been put in place to reduce the spread of the coronavirus have led to at least a temporary reduction in air pollution. Reductions in economic and social activities led to significant decreases in certain types of pollution, notably in nitrogen dioxide (NO_2), largely due to reduced traffic and other activities, especially in major cities. The extent of reductions varied considerably, with the largest reductions of up to 70% observed in urban centres in those countries like Spain, Italy and France that were most affected by COVID-19 in the spring of 2020. Concentrations of particulate matter (PM_{10}) also fell across Europe, although to a lesser extent than NO_2. However, these reductions were short lived, with levels of air pollution rebounding as lockdowns were eased and vehicular transport resumed across Europe (European Environment Agency, 2020[7]).

Air quality is improving in Europe, but exposure to various air pollutants remains very high

Since 2005, most European countries have made progress in reducing air pollution and notably $PM_{2.5}$ emissions (Figure 2.1), following the provisions included in the 2008 Ambient Air Quality Directive and the more recent adoption of the EU Directive on National Emission reduction Commitments (NEC) of certain air pollutants in 2016. On average across EU countries, emissions of $PM_{2.5}$ have reduced by over 25% between 2005 and 2017. These reductions reflect mainly improvements in combustion processes in both industry and residential heating, a decrease in the use of coal in the energy mix, and lower emissions from transport and to a lesser degree from agriculture. However, this progress is not reflected in public opinion polls that show that most people believe that air quality has deteriorated (see Box 2.3).

Reductions in emissions have led to reductions in (population-weighted) concentrations and, therefore, reductions in population exposure to $PM_{2.5}$ in most EU countries. Nonetheless, in 21 out of 31 European countries, the annual concentrations of $PM_{2.5}$ exceeded the 10 microgrammes/m^3 values recommended by the WHO Air Quality Guidelines in 2018. This is particularly the case in many Central and Eastern European countries, mainly because of greater reliance on fossil fuels and other dirty energy sources for heating and other purposes. Northern European countries have the lowest levels of population exposure, generally well below the WHO guideline value for $PM_{2.5}$ (Figure 2.3).

Figure 2.1. **Emissions of fine particulate matters ($PM_{2.5}$) per capita have fallen in the vast majority of European countries between 2005 and 2017**



Note: The EU average is unweighted.

Source: OECD Environment Database - Emissions of air pollutants, 2020. For non-OECD countries, the source is the Convention on Long-Range Transboundary Air Pollution, UNECE-EMEP emissions database.

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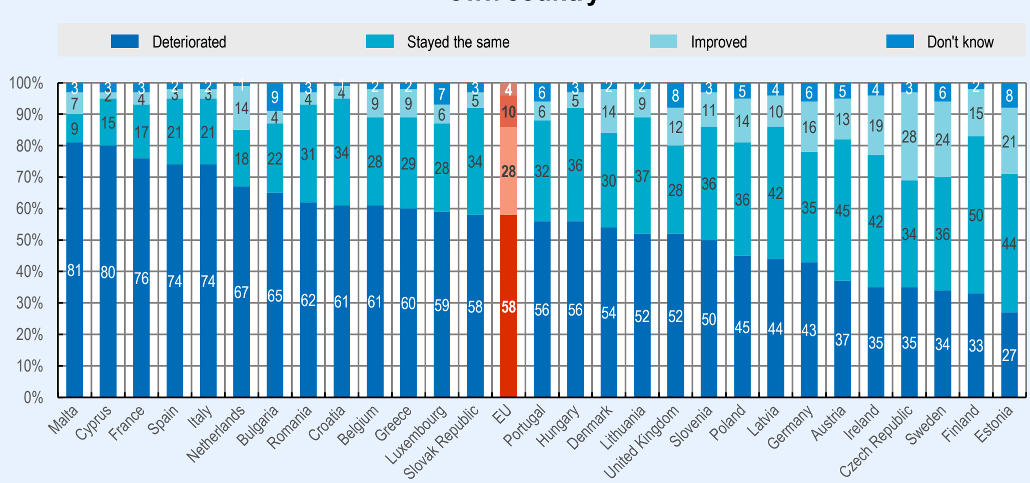
Box 2.3. **Why do most Europeans think that air quality has deteriorated when the evidence shows the contrary?**

Despite evidence that significant progress has been achieved over the past decade in improving air quality in most European countries, there is a widespread perception among Europeans that air quality has generally deteriorated. According to a 2019 Eurobarometer survey conducted across all EU member states, 58% of respondents reported they thought that air quality had deteriorated over the past decade, another 28% thought that it had stayed the same, while only 10% believed that it had improved (Figure 2.2). The proportion of respondents who thought that air quality had deteriorated increased by more than 10 percentage points compared with the previous survey in 2017.

Figure 2.2. **People's perception of changes in air quality over the last 10 years in their own country**



Source: European Commission, (2019[15]), "Attitudes of Europeans towards Air Quality. Special Eurobarometer 497".

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Box 2.3. **Why do most Europeans think that air quality has deteriorated when the evidence shows the contrary?** *(cont.)*

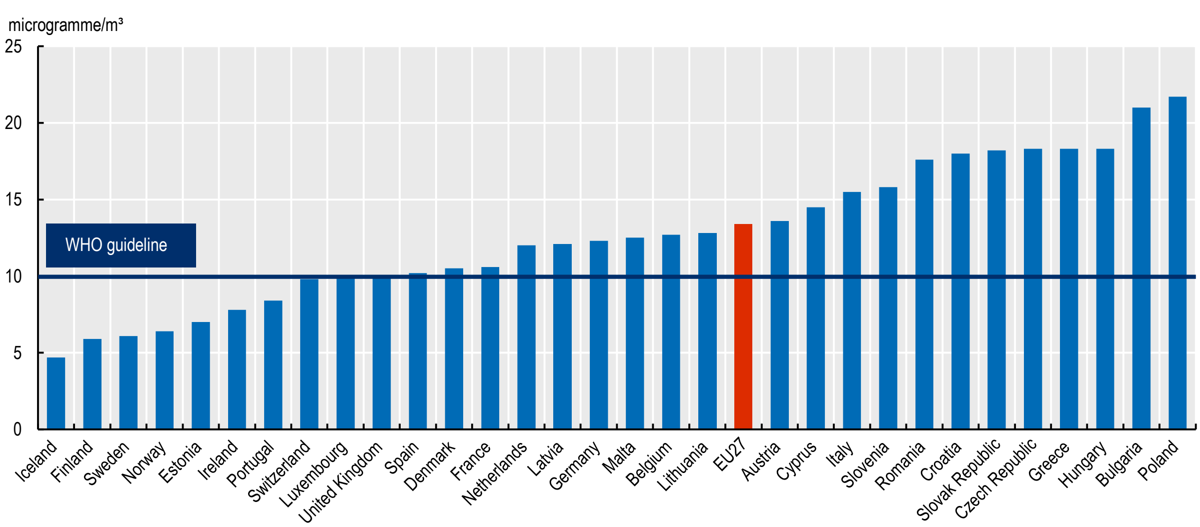
In a minority of countries such as Bulgaria, Hungary and Romania, the public perception is in line with the objectively measured situation, as levels of air pollution measured in terms of $PM_{2.5}$ emissions have in fact increased. However, this is not the case in the vast majority of European countries.

One possible explanation for the apparent inconsistency between objective indicators and subjective perceptions of air quality trends is that, given the close relationship between air pollution and climate change, a growing awareness among the public of the contribution of pollution to climate change may have led citizens to assess that air quality must have also worsened.

Increasing media attention on the subject of air pollution itself, as well as the growing public awareness of the health impact of exposure to air pollutants may have also played a role in shaping the perception that air quality is deteriorating. At the same time, most respondents in the 2019 Eurobarometer survey did not feel well-informed about air quality in their country. Interestingly, those respondents who reported that they were well-informed were less likely to believe that air quality had deteriorated. For example in Finland, where more than 80% of the population believed that they were well-informed about air quality, only a third of respondents thought that the quality of air had deteriorated.

Various initiatives have been taken to better inform people about air quality, for example through the EU Ambient Air Quality directives. At the local level, a growing number of municipalities are issuing alerts when air pollution levels exceed some thresholds, possibly contributing to the perception that air pollution levels are getting worse. Both at national and European levels, key measurements on air pollution are regularly collected and reported at various levels of aggregation, allowing people to monitor the situation on a day-to-day basis and progress over time. The EEA Air Quality Index is a good example of the effort to widely disseminate information about air quality in real time at the EU level (European Environment Agency, 2020[2]).

Figure 2.3. **In 2018, annual country-level mean concentrations of $PM_{2.5}$ in the atmosphere exceeded the WHO guideline in most European countries**



Note: Country values are population-weighted concentrations. The EU average is unweighted.
Source: European Environment Agency (2020[2]), *Air quality in Europe – 2020 Report*.

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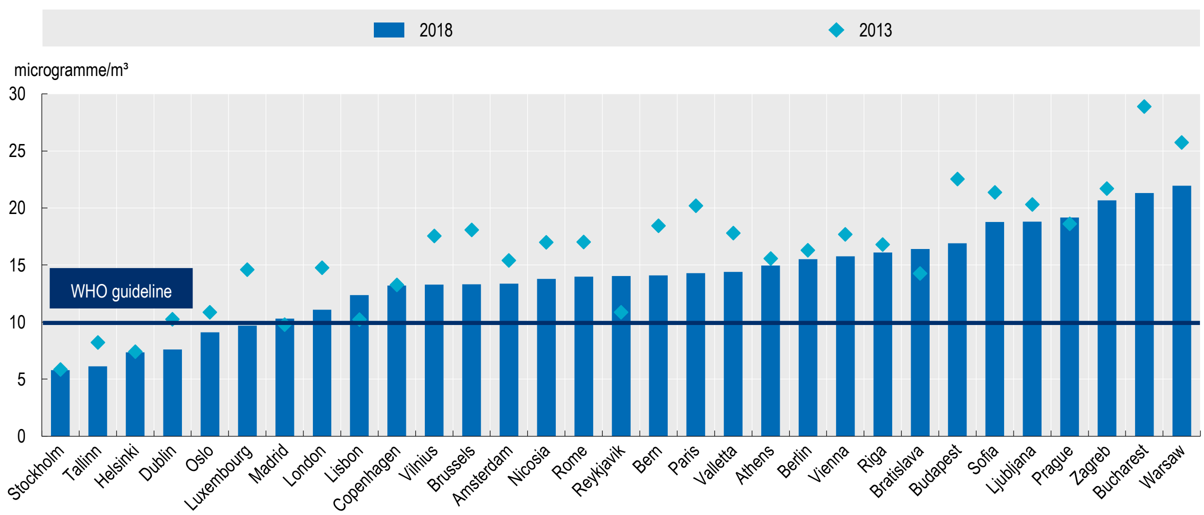
Some countries have a relatively high level of $PM_{2.5}$ emissions per capita (Figure 2.1) but a relatively low level of population-weighted concentration of such air pollutants (Figure 2.3). This is the case, for example, in Finland and Estonia. This may be partly explained by the fact that emissions of $PM_{2.5}$ largely occur in areas outside national capitals and other large cities where most people live.

While some progress has been achieved in reducing exposure to $PM_{2.5}$ in many European capital cities between 2013 and 2018, the annual mean concentrations of $PM_{2.5}$ still exceed the WHO guideline by a wide margin in almost all European capitals (Figure 2.4). This is especially the case in Warsaw, Bucharest, Zagreb, Prague, Ljubljana and Sofia, where the average $PM_{2.5}$ levels in 2018 were about twice as high as the WHO guideline. On the other hand, $PM_{2.5}$ concentrations were below the WHO guideline in several Northern European capitals – Stockholm, Tallinn, Helsinki and Oslo – and in Dublin.

Figure 2.4. **The annual mean concentration of $PM_{2.5}$ in the atmosphere has declined in most European capital cities, but remains above the WHO guideline in most of them**



Note: For Valletta, only data from the neighbouring city of Msida was available. For Lisbon, initial data are from 2014 (not 2013). For Bratislava and Bucharest, initial data are from 2016.

Source: European Environment Agency Air Quality Statistics database, 2020 *https://www.eea.europa.eu/data-and-maps/dashboards/air-quality-statistics-expert-viewer*. City-level data were estimated by averaging the station-level data in 2013 and 2018. As much as possible, the data from the same stations were used in both years for each city.

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Beyond differences in $PM_{2.5}$ concentrations between capital cities and the rest of the country, there can also be significant variations across different regions in each country. For example, $PM_{2.5}$ pollution levels are much greater in the north of Italy than in the south. In Poland, $PM_{2.5}$ levels are particularly high in the central and southern parts of the country (European Environment Agency, 2020[2]).

Some population groups are particularly vulnerable to the effects of air pollution. Older people, children, those with chronic diseases and those experiencing material deprivation are typically more vulnerable to the effects of air pollution than the general population. Lower-income households are more vulnerable to the health effects of air pollution, either because of greater exposure or greater susceptibility to serious health consequences when they are exposed (Box 2.4). Improvements to air quality may therefore particularly benefit lower-income households and ultimately contribute to reducing health inequalities.

Box 2.4. **Unequal exposure and unequal impacts of air pollution**

People's ability to avoid or cope with the health impacts of air pollution is influenced by their socio-economic status (i.e. income level and employment status). Lower-income households are generally more vulnerable to the health effects of air pollution, both because of potentially greater exposure, and because of increased susceptibility to its negative health consequences. This might be because they are in poorer health to start with, have limited access to high quality health care, are more exposed to other risk factors (like smoking) and have limited ability to invest in protective measures such as air filtration systems and better housing quality (Mackie and Haščič, 2019[16]).

Socioeconomically disadvantaged groups may be more exposed to indoor air pollution because they lack access to cleaner energy sources for heating. In addition, people in lower socio-professional categories may be exposed to higher levels of pollution in workplaces. Having said that, socio-economic disadvantage does not always correlates with air pollution exposure in the expected direction, as in some cases wealthier households may prefer to live in more central and more polluted parts of cities (Cournane et al., 2017[17]; European Environment Agency, 2018[18]).

Between 168 000 and 346 000 deaths each year in EU countries can be attributed to outdoor air pollution

Between 168 000 and 346 000 people across all EU countries died prematurely in 2018 from diseases attributable to outdoor air pollution ($PM_{2.5}$), according to the most recent estimates from the Global Burden of Disease study (Institute for Health Metrics and Evaluation, 2020[1]) and the European Environment Agency (European Environment Agency, 2020[2]), respectively.[1] Box 2.5 provides information about differences in sources and methods that result in different estimates of the mortality attributed to air pollution.

Box 2.5. **Estimating the mortality burden of air pollution**

All estimates of the impact of air pollution on mortality are based on some models and assumptions about the links between exposure to different types of air pollution and mortality from various diseases, which are subject to a certain degree of uncertainty. The models also often use different data inputs. Hence, it is not surprising to see that the use of different data sources based on different estimation methods provide different results.

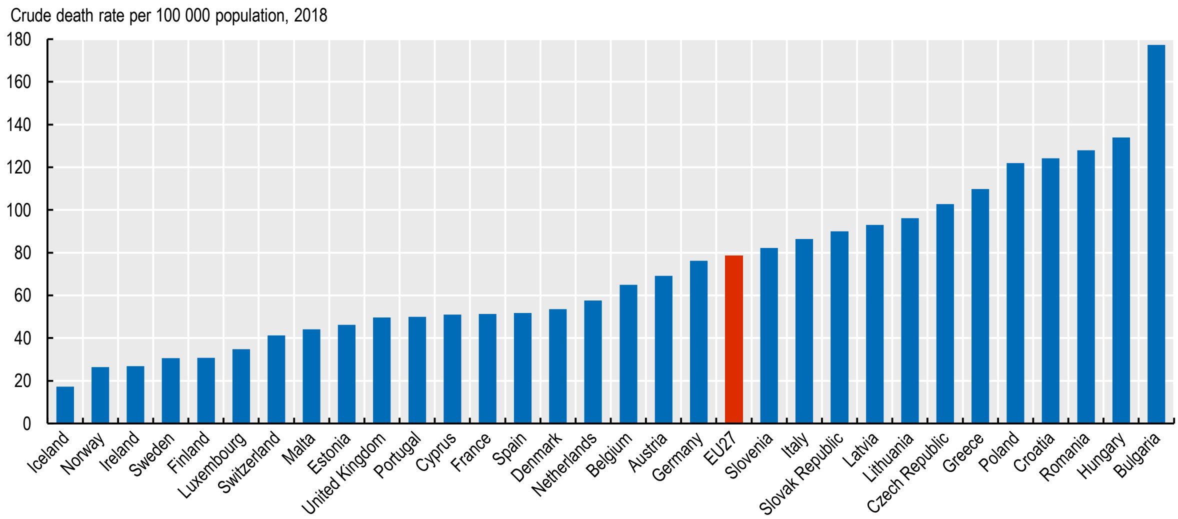
The European Environment Agency provides higher estimates of the number of premature deaths attributable to the effect of outdoor air pollution from $PM_{2.5}$ (346 000 in 2018 across the current 27 EU member states) compared with IHME estimates (168 000 in 2018) and WHO estimates (204 000 in 2016). At least three methodological reasons can explain these different results.

First, the EEA, following the WHO's recommendations (WHO Europe, 2013[19]), takes a broader approach in estimating the excess mortality due to $PM_{2.5}$ emissions that takes into account all possible related causes of premature death. By comparison, the IHME estimates take into account mortality from five main causes (cardiovascular diseases, diabetes, chronic respiratory diseases, respiratory infections and tuberculosis, and some cancers), while the WHO estimates focus on mortality from three main causes (ischemic heart disease, stroke and respiratory diseases). A second reason for the differences is that the EEA estimates are based on more granular, location-based air pollution exposure data, while both the IHME and WHO estimates are based on average country-level exposure to $PM_{2.5.}$ Thirdly, the EEA assumes that the counterfactual minimum exposure level for $PM_{2.5}$ equals zero, which is lower than in the other two cases. Although WHO and IHME estimates rely on a similar "population attributable fraction"-based methodology that estimates the fraction of deaths potentially linked to air pollution levels, some differences in their final estimates arise due, for example, to differences in the assumed minimum exposure levels or in the underlying data sources.

All the available model-based estimates are subject to considerable uncertainty. In the case of EEA, the uncertainty (or confidence) intervals of the number of estimated premature deaths from $PM_{2.5}$ across all EU member states range approximately between 218 000 and 462 000 (European Environment Agency, 2020[2]). When it comes to the 2016 WHO estimates, the uncertainty (or confidence) intervals range from 155 000 to 264 000 (WHO, 2018[20]), while the range for the 2018 IHME estimates is between 128 000 and 211 000 (Institute for Health Metrics and Evaluation, 2020[1]).

Premature death rates attributable to air pollution ($PM_{2.5}$) were the highest in 2018 in Central and Eastern European countries, reaching up to between 120-180 deaths per 100 000 population in Bulgaria, Hungary, Poland, Romania and Croatia. Deaths were the lowest in Nordic countries, with rates about six times lower at 20-30 deaths per 100 000 population (Figure 2.5).

Figure 2.5. **Premature death rates attributable to outdoor air pollution ($PM_{2.5}$) are generally the highest in Central and Eastern Europe, and lowest in Northern Europe**



Note: The EU average is weighted.
Source: Based on European Environment Agency (2020[2]), *Air quality in Europe – 2020 report*.

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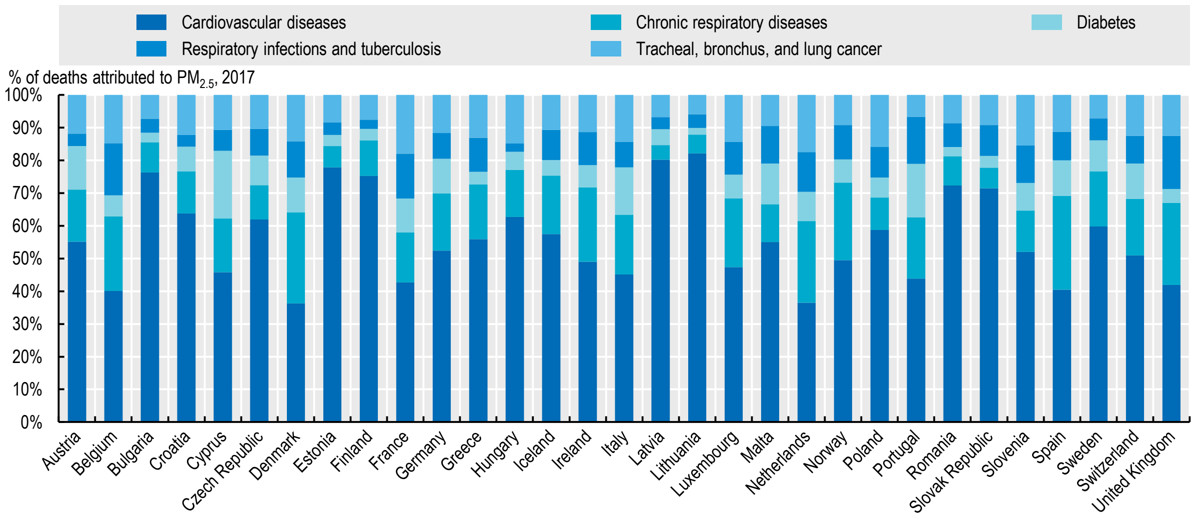
Based on IHME estimates, the two main causes of premature deaths attributable to air pollution ($PM_{2.5}$) are cardiovascular and chronic respiratory diseases. The proportion of mortality from cardiovascular diseases attributed to $PM_{2.5}$ exposure accounted for the largest share of premature deaths associated with air pollution in all countries in 2017 (Figure 2.6).

While outdoor air pollution accounts for a much larger proportion of deaths than indoor air pollution in all European countries, exposure to indoor $PM_{2.5}$ also contributes to a sizeable number of deaths, particularly in some Central and Eastern European countries like Estonia, Romania, Hungary and Bulgaria (Figure 2.7). This is mainly due to the still prevalent use of solid fuels for cooking and heating inside houses. Several countries have taken measures to improve indoor air quality, including for example financial support for the phasing out of high emission boilers and stoves in Latvia (Asikainen et al., 2016[21]).

Figure 2.6. **Deaths attributable to air pollution ($PM_{2.5}$) relate mainly to cardiovascular and respiratory diseases**



Note: This figure shows estimates of the proportion of these causes of death that are attributed to air pollution.
Source: IHME (2018), "GBD Results Tool", *http://ghdx.healthdata.org/gbd-results-tool*.

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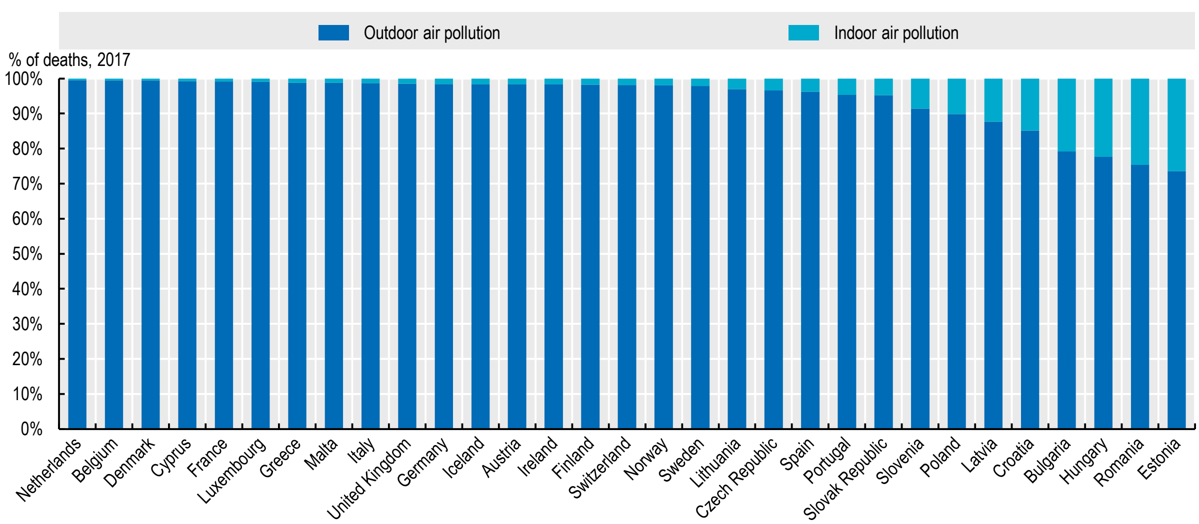
Figure 2.7. **A relatively high proportion of premature deaths from $PM_{2.5}$ exposure in Central and Eastern Europe are due to indoor air pollution**



Note: The data on indoor air pollution refers to the indoor use of solid fuels for cooking.
Source: IHME (2018), "GBD Results Tool", *http://ghdx.healthdata.org/gbd-results-tool*.

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Air pollution causes about EUR 600 billion in welfare losses each year across EU countries

The serious health consequences of air pollution result in large welfare losses because of greater mortality and morbidity (lower quality of life due to ill-health), greater health spending care costs to treat related conditions, and reduced labour productivity arising from greater absences from work due to illness. Box 2.6 describes the methodology that is used to estimate the different welfare losses related to air pollution, which is based on previous OECD work (OECD, 2016[22]). The estimates have been updated to 2017 based on the assumption that the share of each cost category has remained constant in recent years. The estimates relate to the impact of $PM_{2.5}$ (both outdoor and indoor) and ground-level ozone.

Box 2.6. **Methodology used to estimate the welfare losses from air pollution**

The methodology used in this chapter to estimate the welfare losses from air pollution is based on previous work by the OECD as described in the publication *The Economic Consequences of Outdoor Air Pollution* (OECD, 2016[22]). Table 2.1 below summarises the different categories of welfare losses considered in this analysis.

Table 2.1. **Non-market and market consequences considered in assessing the welfare losses of air pollution**

Health impacts	Non-market consequences	Market consequences
Mortality from cardiovascular and respiratory diseases, lung cancer and other diseases due to high concentrations of $PM_{2.5}$ and ozone	Premature deaths	[see note below]
Morbidity from cardiovascular and respiratory diseases, lung cancer and other diseases due to high concentrations of $PM_{2.5}$ and ozone	Quality of life losses due to ill-health (e.g. pain and suffering)	Higher health expenditure Lower labour productivity (due to absence from work)

Note: Premature deaths also have market consequences as it involves a loss of potential workers for premature mortality related to the working-age population and a loss of potential consumers for mortality at all ages, but these losses are not taken into account in this analysis.
Source: OECD (2016[22]), *The Economic Consequences of Outdoor Air Pollution*, *http://dx.doi.org/ 10.1787/9789264257474-en*.

The first and main welfare loss from air pollution is related to its impact on premature death. These welfare losses are calculated based on the value of a statistical life (VSL) approach, a standard economic method to measure the cost of premature mortality. The VSL method is based on assumptions about how much people would be willing to pay to reduce their risk of death, or how much additional money they would require to accept an additional risk, based on information from stated preference surveys. For example, on average, people may be willing to pay USD 30 (EUR 24) to reduce their risk of dying from diseases associated with air pollution by 1 per 100 000 people each year. If 100 000 people are willing to pay on average USD 30, the value of statistical life is then equal to USD 3 million (EUR 2.4 million) per life saved.

Using information from such surveys, previous OECD work has estimated that one statistical year of life was approximately equivalent to USD 3 million (EUR 2.4 million) on average across OECD countries (OECD, 2012[23]). Country-specific estimations are adjusted to take into account differences in national income and standards of living. These estimations, adjusted for purchasing power parity (PPP), range from USD 2.5 million in Greece (EUR 2 million) to USD 7.3 million (EUR 5.8 million) in Luxembourg in 2017. This monetary value is then multiplied by the number of premature deaths to calculate the total statistical value of life lost due to air pollution. The number of premature deaths is based on IHME estimates, which are at the lower end of the range considered in this chapter, so estimates of these welfare losses can be considered to be conservative.

The second category of welfare losses relates to the lower quality of life for people who are falling ill because of air pollution. These values are estimated based on stated preference surveys and willingness to pay values from earlier work (Holland, 2014[24]). For each of the morbidity impacts, the results are multiplied by an estimated value to calculate the welfare costs related to the quality of life losses (or disutility) from different illnesses (e.g. respiratory diseases). The third and fourth categories relate to market costs that are more directly measurable. These include the additional health care costs for people requiring care for respiratory, cardiovascular and other diseases that are attributed to air pollution, as well as lower labour productivity as measured by lost working days due to these illnesses among the working-age population (OECD, 2016[22]).

Table 2.2 shows that premature mortality due to air pollution from $PM_{2.5}$ and ozone resulted in the loss of an estimated EUR 527 billion across EU countries in 2017. Such costs account for about 88% of total welfare losses from air pollution (OECD, 2016[22]).

Welfare losses related to the lower quality of life of people living with illnesses that can be attributed to air pollution accounted for about 8% of total welfare losses, which is equivalent to about

Table 2.2. **Estimated welfare losses from air pollution ($PM_{2.5}$ and ground-level ozone), 2017**

	Total cost		Premature mortality		Quality of life losses		Health care cost		Productivity losses	
	bn EUR	**% GDP**	bn EUR	% GDP	bn EUR	% GDP	bn EUR	% GDP	bn EUR	% GDP
EU27 total	**601.45**	**4.92**	527.2	4.32	48.26	0.40	14.85	0.12	11.14	0.09
Austria	**14.98**	**4.35**	13.1	3.81	1.20	0.35	0.37	0.11	0.28	0.08
Belgium	**20.15**	**4.84**	17.7	4.24	1.62	0.39	0.50	0.12	0.37	0.09
Bulgaria	**6.01**	**13.16**	5.3	11.54	0.48	1.06	0.15	0.32	0.11	0.24
Croatia	**4.21**	**9.44**	3.7	8.27	0.34	0.76	0.10	0.23	0.08	0.17
Cyprus	**0.94**	**5.28**	0.8	4.63	0.08	0.42	0.02	0.13	0.02	0.10
Czech Republic	**11.87**	**7.05**	10.4	6.18	0.95	0.57	0.29	0.17	0.22	0.13
Denmark	**12.45**	**4.56**	10.9	4.00	1.00	0.37	0.31	0.11	0.23	0.08
Estonia	**0.86**	**4.16**	0.8	3.65	0.07	0.33	0.02	0.10	0.02	0.08
Finland	**4.79**	**2.26**	4.2	1.99	0.38	0.18	0.12	0.06	0.09	0.04
France	**71.86**	**3.27**	63.0	2.87	5.77	0.26	1.77	0.08	1.33	0.06
Germany	**168.15**	**5.55**	147.4	4.86	13.49	0.45	4.15	0.14	3.11	0.10
Greece	**13.68**	**7.72**	12.0	6.76	1.10	0.62	0.34	0.19	0.25	0.14
Hungary	**11.08**	**9.88**	9.7	8.66	0.89	0.79	0.27	0.24	0.21	0.18
Ireland	**6.11**	**2.33**	5.4	2.04	0.49	0.19	0.15	0.06	0.11	0.04
Italy	**95.14**	**5.75**	83.4	5.04	7.63	0.46	2.35	0.14	1.76	0.11
Latvia	**2.24**	**9.18**	2.0	8.04	0.18	0.74	0.06	0.23	0.04	0.17
Lithuania	**3.17**	**8.49**	2.8	7.44	0.25	0.68	0.08	0.21	0.06	0.16
Luxembourg	**1.44**	**2.76**	1.3	2.42	0.12	0.22	0.04	0.07	0.03	0.05
Malta	**0.54**	**5.61**	0.5	4.92	0.04	0.45	0.01	0.14	0.01	0.10
Netherlands	**29.18**	**4.23**	25.6	3.71	2.34	0.34	0.72	0.10	0.54	0.08
Poland	**33.61**	**7.81**	29.5	6.85	2.70	0.63	0.83	0.19	0.62	0.14
Portugal	**9.04**	**5.03**	7.9	4.41	0.73	0.40	0.22	0.12	0.17	0.09
Romania	**14.89**	**9.29**	13.0	8.14	1.19	0.75	0.37	0.23	0.28	0.17
Slovak Republic	**5.42**	**6.79**	4.7	5.96	0.43	0.55	0.13	0.17	0.10	0.13
Slovenia	**1.98**	**5.09**	1.7	4.46	0.16	0.41	0.05	0.13	0.04	0.09
Spain	**46.46**	**4.31**	40.7	3.78	3.73	0.35	1.15	0.11	0.86	0.08
Sweden	**11.20**	**2.46**	9.8	2.16	0.90	0.20	0.28	0.06	0.21	0.05
Iceland	**0.29**	**1.85**	0.25	1.62	0.02	0.15	0.01	0.05	0.01	0.03
Norway	**7.82**	**2.25**	6.9	1.97	0.63	0.18	0.19	0.06	0.14	0.04
Switzerland	**17.77**	**2.90**	15.6	2.54	1.43	0.23	0.44	0.07	0.33	0.05
United Kingdom	**109.61**	**4.15**	96.1	3.64	8.80	0.33	2.71	0.10	2.03	0.08

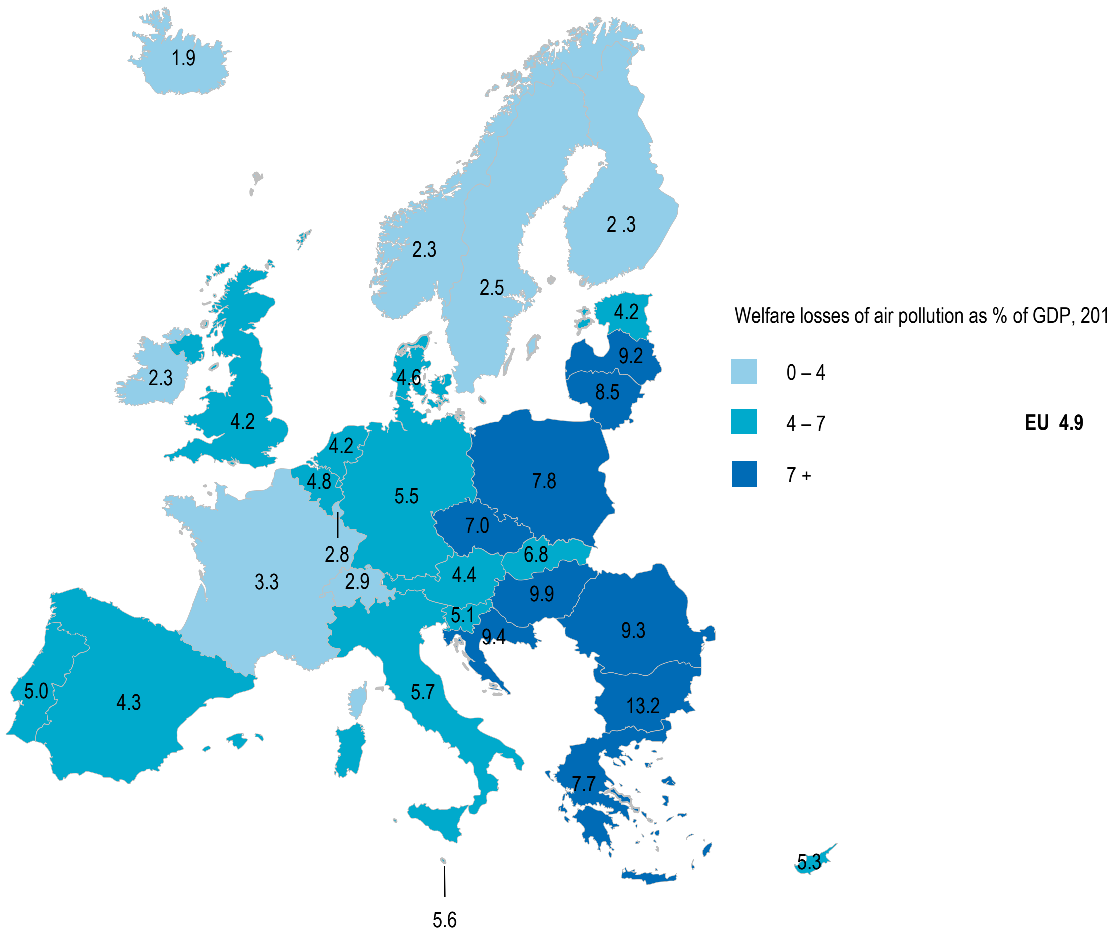
Source: OECD calculations, based on methodology described in Box 2.6 and OECD (2016[22]), *The Economic Consequences of Outdoor Air Pollution*, *http://dx.doi.org/ 10.1787/9789264257474-en*, using data from 2017.

EUR 48 billion across all EU countries. Greater health care costs related to air pollution represented about 2.5% of total welfare losses, equivalent to about EUR 15 billion across EU countries. Finally, the labour productivity losses from lost working days due to illnesses related to air pollution accounted for the remaining 2% of welfare losses, equivalent to about EUR 11 billion across EU countries.[2]

Taken together, the overall welfare losses of these air pollutants amounted to about EUR 600 billion in 2017, equivalent to 4.9% of the EU GDP. As a share of GDP, the estimated welfare losses related to air pollution were highest in Central and Eastern European countries (reaching over 9% of GDP in Bulgaria, Croatia, Hungary, Latvia and Romania), and lowest in Nordic countries (except Denmark), Ireland and Luxembourg (less than 3% of GDP) (Figure 2.8). These variations mainly reflect differences in the burden of premature mortality due to air pollution, the main driver of welfare loss estimates.

The main challenges to reducing the heavy impact of air pollution on people's health and welfare consist of further reducing the emissions of air pollutants at all levels (local, regional, national),

Figure 2.8. **Estimated welfare losses due to air pollution ($PM_{2.5}$ and ozone) as share of GDP, 2017**



Source: OECD calculations, based on methodology described in Box 2.6 and OECD (2016[22]), *The Economic Consequences of Outdoor Air Pollution*, *http://dx.doi.org/ 10.1787/9789264257474-en*.

StatLink *https://stat.link/9eb5q8*

achieving a strong decoupling of emissions from economic growth, and limiting people's degree of exposure to air pollutants. This implies implementing effective pollution prevention and control policies, sustainable transport and mobility policies, stimulating investment in cleaner technologies, promoting more sustainable agricultural methods, energy efficiency and the substitution of dirty energy sources with cleaner ones (OECD, 2020[8]).

EU countries have set ambitious goals to reduce air pollution by 2030

Since the 1970s, the EU has been working with its member states and international organisations to improve air quality by controlling the emissions of air pollutants and integrating environmental protection requirements into the energy, transport, industrial and agricultural sectors. In the international context, EU member states have worked since 1979 with other countries in and outside Europe to control international air pollution under the UNECE Convention on Long-Range Transboundary Air Pollution (the Air Convention), recognising that air pollution does not respect national borders. Reducing the negative impacts of air pollution is also part of the 2030 Global Agenda for Sustainable Development Goals (SDG), notably under Goal 3 (Good health and well-being) that calls for substantial reductions in the number of deaths from air pollution, under Goal 11 (Sustainable cities and communities) that aims to reduce the negative environmental impact of cities, and under Goal 13 (Combat climate change) that calls for urgent actions to combat climate change.

At the EU level, most of the provisions under the current Ambient Air Quality Directive (2008/50/EC) and the Directive on heavy metals and polycyclic aromatic hydrocarbons in ambient air (2004/107/EC) were originally established in the Air Quality Framework Directive in 1996 or in one of the four Daughter Directives adopted between 1999 and 2004. The two current directives are driving improvements in ambient air quality in Europe. They have set the basic principles for assessing and managing air quality and pollutant concentration thresholds that should not be exceeded (Box 2.7).

Box 2.7. **EU air quality standards and WHO guidelines**

The EU's air quality directives (2008/50/EC Directive on Ambient Air Quality and Cleaner Air for Europe and 2004/107/EC Directive on heavy metals and polycyclic aromatic hydrocarbons in ambient air) set pollutant concentrations thresholds that shall not be exceeded in a given period of time. If the limit or target values are exceeded, competent authorities are required to implement measures to improve air quality.

Selected EU air quality standards and WHO guidelines are summarised in Table 2.3 below. The WHO guidelines are set for health protection and are generally stricter than the current EU standards. Some European countries have chosen to apply these more stringent WHO guidelines. Under the European Green Deal, the European Commission is expected to propose to revise the air quality standards to align them more closely with the WHO guidelines (European Commission, 2019[15]).

Table 2.3. **Current EU Air Quality Directive and WHO guidelines for selected air pollutants**

Pollutant	Time period	EU Air Quality Directive	WHO guidelines
$PM_{2,5}$	Calendar year	Limit value, 25 microgrammes/m^3	10 microgrammes/m^3
PM_{10}	Calendar year	Limit value, 40 microgrammes/m^3	20 microgrammes/m^3
0_3	Maximum daily 8-hour mean	Target value, 120 microgrammes/m^3 (1)	100 microgrammes/m^3
NO_2	Calendar year	Limit value, 40 microgrammes/m^3	40 microgrammes/m^3

1. Not to be exceeded on more than 25 days per year, averaged over three years.

Source: European Environment Agency, "Air quality standards", *https://www.eea.europa.eu/themes/air/air-quality-concentrations/air-quality-standards*.

The 2013 Clean Air Programme for Europe reconfirmed the objective to achieve full compliance with existing air quality standards across the EU as soon as possible and set objectives for 2020 and 2030. A new EU Directive (2016/2284) on national emission reduction commitments (NEC) of certain air pollutants came into force at the end of 2016 (repealing the previous Directive 2001/81/EC), and is the main legislative instrument to achieve the 2030 objectives of the Clean Air Programme. This Directive sets national emission reduction commitments for each EU member state for the period 2020 to 2029 and more ambitious ones from 2030 onwards. It targets five pollutants responsible for serious health and environmental damages: sulphur dioxide, nitrogen oxide, volatile organic compounds, ammonia and fine particulate matter ($PM_{2.5}$). The aim of the Clean Air Programme is to reduce the health impact of air pollution by half by 2030 compared with 2005.

Emissions standards have also been set for key sources of pollution. These standards are set out at EU level in legislation targeting industrial emissions, emissions from power plants, vehicles and transport fuels, as well as the energy performance of products (European Commission, 2018[25]).

The effective implementation of this clean air legislation forms an essential contribution to the zero-pollution ambition for a toxic-free environment announced by the European Commission in

December 2019 under the European Green Deal. The European Green Deal proposes to adopt a "Zero-Pollution Action Plan" by 2021 (European Commission, 2019[15]).

According to the first European Commission report assessing the implementation of the 2016 NEC Directive released at the end of June 2020, 10 member states projected that they will be able to fulfill all of their 2020 emission reduction commitments under current measures, while the number falls to four only when it comes to the 2030 commitments. Regarding primary $PM_{2.5}$ emissions specifically, 23 EU countries projected that they will be able to meet their 2020 emission reduction commitments, but the number falls to 13 when it comes to the 2030 commitments (Table 2.4). Other member states will need to put in place additional measures to fulfil their emission reduction commitments (European Commission, 2020[3]).[3] Compliance with the 2020 emission reduction commitments can only be checked in 2022, when emission data for 2020 will become available.

Table 2.4. **Projected compliance as reported by EU member states in 2019 under existing policies and measures against 2020-29 and 2030-onwards national emission reduction commitments**

Member State	NO_x		NMVOCs		SO_2		NH_3		$PM_{2.5}$	
	2020	2030	2020	2030	2020	2030	2020	2030	2020	2030
Austria	✓	×	✓	✓	✓	✓	×	×	✓	×
Belgium	✓	✓	✓	✓	✓	✓	✓	×	✓	✓
Bulgaria	✓	×	×	×	✓	✓	✓	×	×	×
Croatia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cyprus	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Czech Republic	✓	×	✓	×	✓	✓	✓	×	✓	✓
Denmark	✓	✓	✓	✓	✓	×	×	×	×	×
Estonia	✓	✓	✓	✓	✓	✓	×	×	✓	✓
Finland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
France	×	×	✓	✓	✓	✓	×	×	✓	✓
Germany	✓	×	✓	✓	✓	×	×	×	✓	×
Greece	✓	×	✓	×	✓	✓	✓	✓	✓	✓
Hungary	✓	×	×	×	✓	×	×	×	×	×
Ireland	✓	×	×	×	✓	×	×	×	✓	✓
Italy	✓	×	×	×	✓	✓	✓	×	✓	×
Latvia	×	×	✓	✓	✓	✓	×	×	✓	×
Lithuania	×	×	✓	×	✓	✓	×	×	✓	×
Luxembourg	✓	×	✓	×	✓	✓	×	×	✓	×
Malta	✓	×	×	×	✓	✓	✓	×	✓	✓
Netherlands	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Poland	×	✓	×	✓	×	×	✓	×	✓	×
Portugal	✓	✓	✓	×	✓	✓	✓	✓	✓	×
Romania	×	×	×	×	✓	×	✓	✓	×	×
Slovak Republic	✓	×	✓	✓	✓	×	✓	✓	✓	✓
Slovenia	×	✓	✓	×	✓	×	✓	✓	✓	×
Spain	✓	×	✓	×	✓	×	✓	×	✓	×
Sweden	✓	×	✓	✓	✓	✓	×	×	✓	✓
United Kingdom	✓	×	✓	×	✓	×	×	×	×	×
✓	**22**	**10**	**21**	**14**	**27**	**18**	**16**	**9**	**23**	**13**
×	**6**	**18**	**7**	**14**	**1**	**10**	**12**	**19**	**5**	**15**

Note: NOx are nitrogen oxides; NMVOCs are non-methane volatiles organic compounds; SO_2 are sulphur oxides; NH_3 is ammonia; $PM_{2.5}$ are fine particles.

Source: First EC report on implementation of NEC Directive, 2020, *https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1593765728744&uri=CELEX:52020DC0266*.

Beyond enforcing the relevant EU legislation, a number of EU actions also support the implementation of the National Emission reduction Commitments (NEC) Directive and the Ambient Air Quality Directives. These actions focus on promoting the sharing of best practices and providing EU funding to support measures to improve air quality (European Commission, 2018[25]).

The European Commission has organised two European Clean Air Fora so far to facilitate the coordinated implementation of air quality legislation and policies across the EU. The first forum took place in Paris in November 2017, and the second in Bratislava in November 2019. Both events were met with strong interest from stakeholders. The Clean Air Forum 2017 focused on the themes of air quality in cities, air pollution from the agricultural sector, as well as clean air business opportunities. The Clean Air Forum 2019 followed up on the discussion on agricultural impacts of air pollution and put an emphasis on clean air and health, domestic heating, as well as funding opportunities for clean air measures (European Commission, 2020[3]).

EU funding has also been made available in recent years under various programmes and used by member states to improve air quality. This funding either directly supports clean air projects or effectively includes clean air objectives in other investments (e.g. infrastructure, rural and regional development). During the period 2014-20, an estimated EUR 46.4 billion of EU funds have been allocated to contribute to clean air objectives through these various programmes (Table 2.5).

Table 2.5. **Estimates of EU funds dedicated to clean air objectives from various programmes**

Programme	Estimated Clean Air Contribution 2014-20 (in million EUR)
Horizon 2020	4 219
EFSI (European Fund for Strategic Investments)	819
CEF (Connecting European Facility)	8 830
ERDF (European Regional and Development Fund)	20 458
CF (Cohesion Fund)	10 874
EAFRD (European Agriculture Fund for Regional Development)	1 138
LIFE (Financial Instrument for Environment)	105
Total	**46 443**

Source: First EC report on implementation of NEC Directive, 2020 (Annex 4), *https://www.eea.europa.eu/themes/air/air-pollution-sources-1/national-emission-ceilings/nec-directive-reporting-status-2019*.

How can the health sector contribute to reducing the burden of air pollution?

Most policies that aim at reducing air pollution target those human activities that are its major sources – notably energy production and consumption, transportation, and the industrial and agricultural sectors. The role and involvement of the health sector in achieving air pollution reductions has to date been more limited.

The health sector can also contribute directly or more indirectly to overall efforts to reduce air pollution in at least two ways:

1. the health sector can reduce its own “ecological footprint” by improving its energy efficiency and reducing its use of various products that contribute to air pollutant emissions;
2. public health authorities and health professionals can also encourage a transition to less polluting and more active modes of transportation through behavioural changes and promoting urban and transport policies that are more supportive of health and environmental protection.

The health sector can reduce its ecological footprint

The health sector accounts for more than 8% of GDP on average across EU countries, and its wide range of activities contribute to air pollution and climate change in various ways. The approximately 13 000 hospitals across the EU have a high demand for heating and also use a large amount of energy for their day-to-day operations and activities. Health systems also consume a lot of medical goods and equipment that can contribute to air pollution during the production and disposal process (Health Care Without Harm Europe, 2016[26]). It has been estimated that the health sector is responsible for 3% to 8% of the total greenhouse gas emissions in EU countries through energy consumption and the industrial production of pharmaceuticals and other medical goods (WHO, 2015[27]).

Under the project “Health Care Without Harm”, more than 43 000 hospitals and health centres in 72 countries around the world (including in all EU countries) have already committed to reduce their environmental footprint and promote both human and environmental health through improving their supply chain through the Global Green and Healthy Hospitals initiative. Many hospitals started a long time ago to leverage their significant purchasing power to become more environmental-friendly. For example, in Vienna, public hospitals and all other public institutions are expected to consider the environmental impact of their purchasing decisions. This has led to phasing-out the use of toxic and potentially carcinogenic chemicals in disinfectants, surfaces and instruments, from four tonnes annually in 1997 to almost zero in 2014 (Health Care Without Harm Europe, 2016[26]).

There is also great potential for hospitals and other health care facilities to achieve energy efficiency gains and reduce their reliance on fossil fuels and other dirty energy sources. In Germany, energy savings in hospitals are stimulated by the award of an “Energy Saving Hospital” quality label (*Bund Für Umwelt Und Naturschutz Deutschland*). In Sweden, the region of Skåne has set an ambitious goal to eliminate the use of fossil fuels in all public buildings managed by the region, including hospitals. The region was already 86% fossil fuel-free in 2016 (Health Care Without Harm Europe, 2016[26]).

The health sector can also reduce its environmental footprint by reducing its use and waste of polluting materials and products. In many cases, the disposal of such waste involves incineration, with the potential to generate harmful emissions, ashes, nitrogen oxides, particulate matter and various volatile substances. Some hospitals in France and other countries have started to implement a comprehensive waste management policy to minimise the quantities of materials going to landfill or incineration (Health Care Without Harm Europe, 2016[26]).

Large amounts of food are wasted in hospitals and other health care facilities, contributing to food overproduction, additional strains on available natural resources and air pollution (OECD, 2017[28]). Estimates of food wasted in European hospitals range from 6% to 65% of all the food served (Williams and Walton, 2011[29]). France has set a national objective to reduce food waste in hospitals and other collective establishments by 50% by 2025 compared with 2015, in order to reduce greenhouse gas and other emissions and avoid the unnecessary use of natural resources while reducing costs (Ministère de la transition écologique, 2020[30])

More broadly, public health authorities can work with other government, environmental, agricultural and industrial stakeholders to identify more effective ways to encourage both a healthy diet and more sustainable food production for the population as a whole. Results from such collaborations can be used to update nutritional guidelines to help the population make healthy choices. At the European level, the new “Farm to Fork” strategy provides a good example of a strategy designed to make food production and consumption more healthy and environment-friendly, with the aim of reducing the emission of greenhouse gases and air pollutants (Box 2.8).

Box 2.8. **The EU Farm to Fork Strategy**

Linked to the *European Green Deal*, the new EU Farm to Fork Strategy, announced in May 2020, is designed to make food systems more sustainable, fair, healthy and environmentally friendly. The Strategy sets out various initiatives, both regulatory and non-regulatory, to achieve several key changes to the food systems in Europe. The main goals of the Strategy are to:

- Ensure that food systems will have at least a neutral or preferably positive environmental impact;
- Help everyone achieve access to safe, nutritious and sustainable food;
- Address simultaneous challenges of ensuring food affordability, generating fair economic returns, fostering competitiveness of the EU supply sector and promoting fair trade;
- Help to mitigate climate change and adapt to its impacts;
- Reverse the loss of biodiversity;
- Make sure that trade policies and international cooperation instruments support global transition to sustainable agri-food systems.

Source: European Commission, (2020[31]), "Farm to Fork Strategy: For a fair, healthy and environmentally friendly food system", *https://ec.europa.eu/food/farm2fork_en*.

Public health authorities can promote a transition to greener urban policies and more active transportation

A substantial part of PM emissions and other air pollutants are due to the use of cars and other motor vehicles, which also contributes to physical inactivity, another important cause of morbidity and mortality. Public health authorities can work with other partners to encourage a transition to cleaner and more active modes of transportation, such as cycling, walking or using public transport, with benefits including less air pollution, fewer car accidents and greater physical activity (Infographic 2.2).

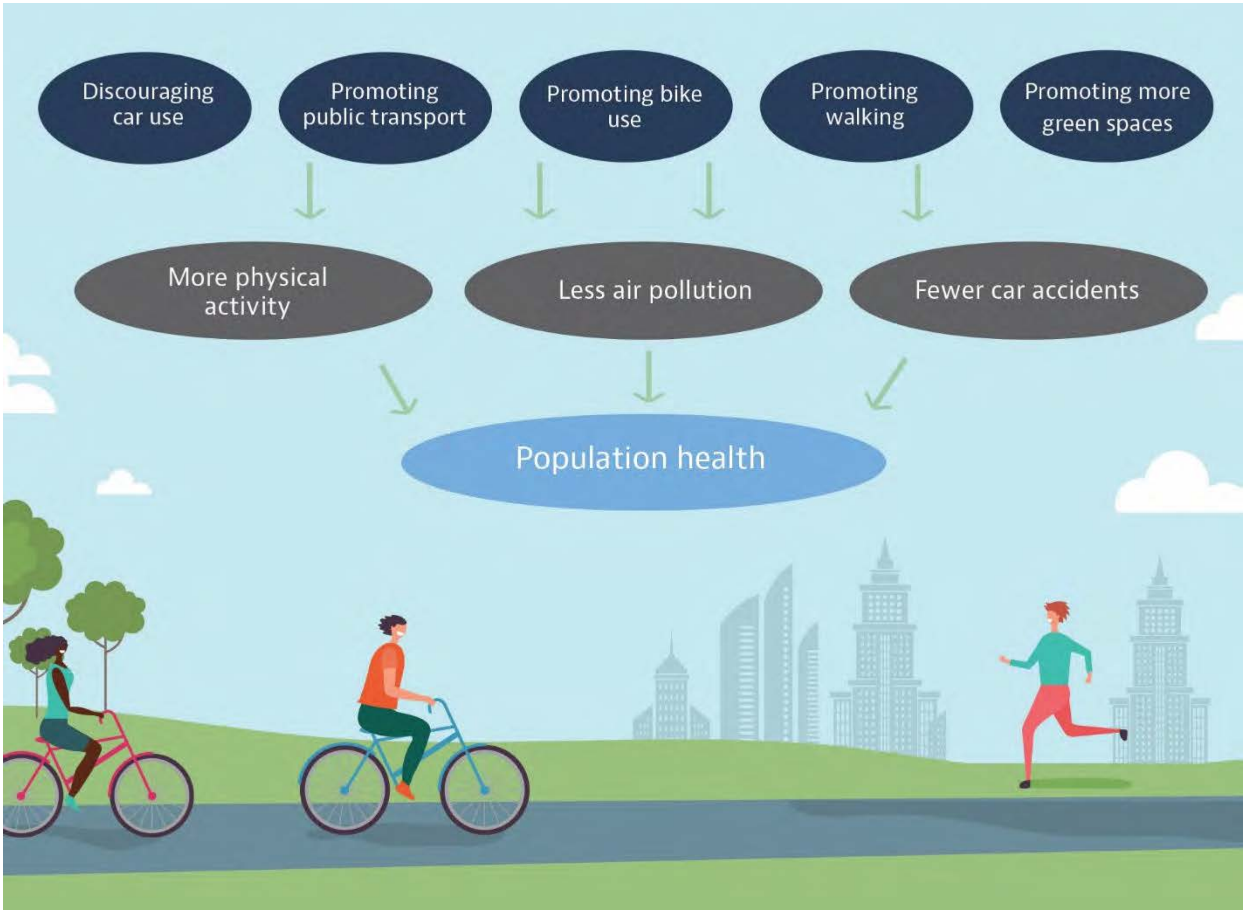
Health care systems can directly contribute to achieving these health and environment benefits by making adjustments to their transportation services for patients, staff and supplies. For example, over the past five years the network of public hospitals in Paris (APHP) has put in place a number of green mobility options for its staff (Health Care Without Harm Europe, 2016[26]; European Commission, 2020[33]).

Doctors and other health workers can also play an important role in promoting changes in people's behaviours, by discussing with their patients the benefits of greater physical activity for transportation and other purposes. Evidence shows that GP prescriptions of physical activity for people at risk of developing chronic diseases may increase their physical activity by about one hour of moderate-level exercise per week – more than one third of the 150 minutes per week of moderate exercise recommended by the WHO (Goryakin, Suhlrie and Cecchini, 2018[34]). To the extent that such increases in physical activity reduce the use of motor vehicles, this may have the added benefit of reducing air pollution.

Public health authorities can also contribute to the roll-out of mass media campaigns to encourage greater levels of physical activity among the population in general, thereby also possibly contributing to the use of less polluting modes of transportation. Such campaigns can be implemented through both traditional media (television, radio, newspaper) and new media (online marketing, social networks), and be implemented at the national or local levels. Evidence shows that well-designed mass media campaigns can increase the proportion of people who are at least moderately active by more than one-third (OECD, 2019[35]).

Since 2002, the European Mobility Week campaign has sought to improve public health and quality of life by promoting clean and sustainable urban transport. Actions during this week typically include a Car-free Day, where participating towns and cities set aside one or several areas solely for

Infographic 2.2. **Encouraging less polluting and more active modes of transportation can lead to multiple health and environmental benefits**



Source: Adapted from © ONYXprj/Shutterstock and Figure 1 in Rojas-Rueda et al. (2016[32]), "Health Impacts of Active Transportation in Europe", *http://dx.doi.org/10.1371/journal.pone.0149990*.

pedestrians, cyclists and public transport. Over 2 700 towns and cities across Europe participated in the European Mobility week in September 2020 under the theme of promoting zero-emission for all.

Population behaviour and the quality of air in cities are also influenced by urban design and infrastructures. Most obviously, urban sprawl encourages the use of motor vehicles and discourages more active modes of travelling (Stone et al., 2007[36]). While urban and transport policies are beyond the usual responsibilities of public health authorities, a greater public health perspective can be brought in these policies to improve both air quality and population health. Such policies can promote a greater availability of public transportations, facilitate the use of more active modes of transportation and increase the number of green spaces.

For example, Luxembourg has implemented a nation-wide free-of-charge public transportation policy since the end of February 2020 (Luxembourg.public.lu, 2020[37]). The development of public transportation systems generally increases the amount of walking, on average by about 30 minutes per person per week (Xiao, Goryakin and Cecchini, 2019[38]), which is a fifth of the time that people should spend on physical activity as recommended by WHO. The importance of public transportation for air quality was highlighted, for example, during public transit strikes in five large German cities between 2000 and 2011. During these strikes, PM_{10} levels in these cities increased by 14%, while hospital admissions for respiratory diseases among young children increased by 11%

(Bauernschuster, Hener and Rainer, 2017[39]). In Barcelona, nitrogen oxide emissions increased by 8% during public transit strikes between 2005 and 2016 (Basagaña et al., 2018[40]).

The introduction or expansion of bicycle lanes and bike-sharing schemes increases the use of bicycles and can help improve air quality. For example, in Barcelona, bike-sharing was estimated to reduce yearly CO_2 emissions by about 9 000 tonnes per year (Rojas-Rueda et al., 2011[41]). In Warsaw, a study estimated that CO_2 emissions could be reduced by up to 26 000 tonnes per year if cycling accounted for 35% of all trips (Rojas-Rueda et al., 2016[32]). Another study, simulating the impact of investment in cycling infrastructure in London and Antwerp, estimated that if the cycling share of all trips increased by 23%, there would be a reduction of annual emissions of NO_x by up to 27% in London and of PM_{10} by up to 19% in Antwerp (Hitchcock and Vedrenne, 2014[42]). While it is possible that for individual bike users, exposure to air pollution can sometimes increase because they may spend more time on the roads, the evidence indicates that benefits from physical activity at the individual level far outweigh this risk (Rojas-Rueda et al., 2016[32]).

Several European countries have also introduced various financial incentives to encourage a switch from cars to more active modes of transportation. These include greater parking fees in urban centres, and subsidies for bike purchases in countries like Belgium, France, Luxembourg and Italy (European Commission, 2020[33]).

Other urban and transport policies are also beneficial both to air quality and population health, including the introduction of low emission zones, speed limits and congestion charges (Box 2.9). Low-emission zones are areas within a city where vehicles with certain emission ratings cannot enter or are charged a fee for entering. These zones have been implemented in over 200 cities in 10 European countries with the aim to meet EU Air Quality Standards (Holman, Harrison and Querol, 2015[43]). In Germany and the Netherlands, these low emission zones have contributed to a reduction in various air pollutants (Boogaard et al., 2012[44]; Holman, Harrison and Querol, 2015[43]). The implementation of low-emission zones may also provide an opportunity to take stock of available transportation choices in a city and to develop more environmental-friendly options such as public transportation, bicycle and pedestrian-friendly infrastructure.

Box 2.9. **Examples of good practices in transportation policies with the potential to reduce air pollution and improve population health**

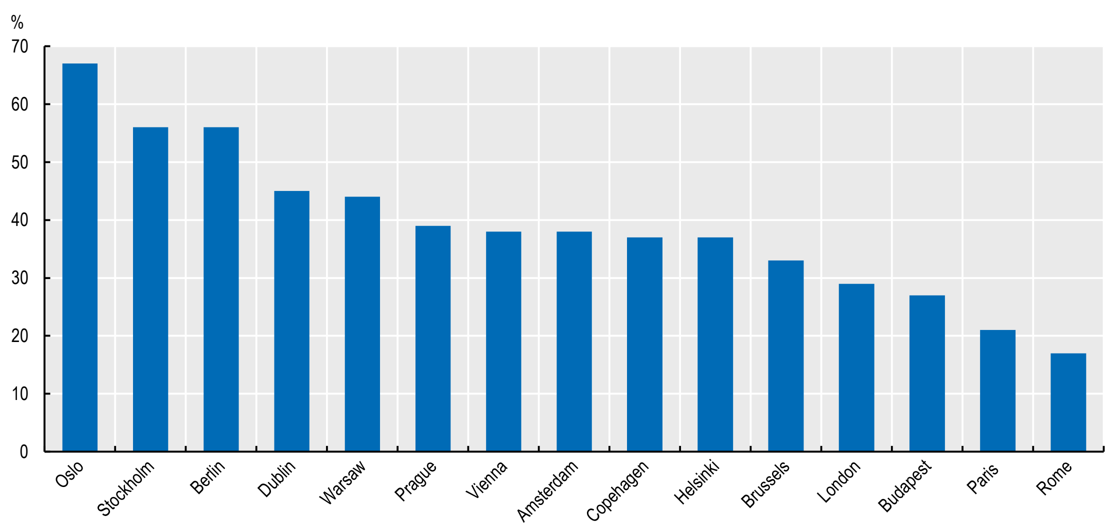
- In Stockholm, it was estimated that the Congestion Charges, introduced on a pilot basis in 2006 and on a more permanent basis in 2007, resulted in a 15% drop in vehicle miles travelled, leading to emissions reductions of 8.5% for nitrogen oxides, and 13% for PM_{10} (Johansson, Burman and Forsberg, 2009[45]).
- In Berlin, a speed limit of 30 km/h was imposed in several areas with particularly high air pollution levels in 2018, with the aim of decreasing both the number of road accidents and air pollution. According to one evaluation, a speed limit of 30 km/h in Berlin has resulted in the reduction of NO_2 pollution levels by 10 to 15% (Berlin.de, 2018[46]).
- In Paris, the municipal authorities have announced the intention to phase out the use of diesel cars by 2024 and petrol cars by 2030, with only electric cars being allowed. In 2019, all diesel vehicles aged 13 years or over were banned from streets in the city centre. Likewise, the region of Brussels has decided to ban diesel cars from 2030, and all petrol cars (although not trucks nor vans) from 2035.
- Low emission zones are implemented in a number of European cities. For example, in Belgium, to enter parts of Antwerp, Brussels or Ghent, drivers have to check in advance whether their vehicles meet the emission level thresholds, and in certain cases register their vehicles on relevant websites.

Public health authorities and other public health stakeholders can also advocate for a greater number of green spaces and parks that can help reduce particulate matter levels, while also helping to promote greater physical activity, more active lifestyles and lead to other benefits such as noise reduction. This can be achieved by rehabilitating sites previously used for industrial or other purposes to create new parks, playgrounds and recreational areas. Some of these interventions explicitly aim to improve air quality, such as through the installation of green vegetated screens along main and heavy traffic roads. Other projects may have other primary goals in mind, but nevertheless may lead to better air quality as a by-product. For example, a project to facilitate everyday walks in Stavanger, Norway, provides access to green trail system to 98% of its population within 500 metres of their home. In Stuttgart, a former stone quarry was transformed into a green nature reserve, while also promoting more active lifestyles. Another interesting example is the conversion of an old train track into a bike and pedestrian path in central Copenhagen (WHO Europe, 2013[19]).

A study covering 245 cities worldwide found that investing USD 4 per resident to increase the number of trees in a city can reduce particulate matter-related mortality by 2.7% to 8.7% (McDonald, 2016[47]). In general, such returns on investment were found to be higher in cities with higher population density like Paris or Madrid. In Paris, it was estimated that 2.3 million people could potentially benefit from a reduction in $PM_{2.5}$ by at least 1 µg/m³, at a cost of about USD 10 million per year.

The availability of green spaces varies significantly between European cities (Figure 2.9). This suggests significant potential for improvement especially in cities where this proportion is low.

Figure 2.9. **Percentage of population living in areas with green spaces (forests, gardens and parks) in selected European cities (2014)**



Source: Joint Research Centre, "Urban Centres database", *https://ghsl.jrc.ec.europa.eu/ucdb2018visual.php#*.

StatLink *https://stat.link/0fs8ep*

At a global level, the C40 network of cities around the world, encompassing more than 650 million people, represents a good example of how changes in the urban environment may promote a more active lifestyle and a reduction of air pollution (Box 2.10).

At the EU level, a new Green City Accord has been launched in October 2020 to make cities greener, cleaner and healthier, and accelerate the implementation of relevant EU environmental directives and laws. By signing the Accord, cities will commit to tackling the most urgent environmental challenges they are facing. With respect to air pollution, mayors who will join the Accord will agree to step up their efforts to significantly improve air quality by moving closer to respecting the WHO

Box 2.10. **The world's largest cities collaborate to take action on climate change and air pollution while supporting active lifestyles**

The C40 Cities Climate Leadership Group was established in 2005 to promote sustainable urban development through knowledge and best practice sharing. Originally, the network was composed of 40 large cities of at least 3 million people on all continents, but gradually opened up to smaller cities committed to sustainable development.

The network shares good practices to help tackle climate change and reduce urban air pollution. Many of these practices promote active travelling and active lifestyle, as well as the use of less polluting modes of transportation. For example, the Transport Authority of Milan plans to convert the local public transport network to electric power by 2030, which is expected to lead to CO_2 emission reductions by almost 75 000 tons/year and the reduction of emissions of PM and several other air pollutants (C40, 2019[48]). In Warsaw, there are plans to make 25% of the bus fleet electric by 2030 (C40, 2017[49]).

In 2018, the city of Venice signed an agreement to test the supply of fuel with 15% reusable content (with one source being oil wastes supplied by local residents) for its public boat fleet, at the same cost as the more polluting diesel fuel. The initial agreement was for seven months, but the programme is still in operation. It is expected to help reduce pollutants like nitrogen oxides and primary and secondary particulate matters (C40, 2020[50]).

guidelines and ending exceedances of EU air quality standards as soon as possible (European Commission, 2020[51]).

Conclusion

Although air pollution has decreased in most European countries over the past two decades, it still exceeds the WHO guideline in most countries, particularly in large cities. In almost all European capital cities, population exposure to air pollutants like $PM_{2.5}$ exceeds the WHO guideline, and by up to twice in several Central and Eastern European capitals.

The impact of air pollution on health and mortality is considerable. Across all EU member states, estimates of the number of premature deaths attributable to outdoor air pollution from $PM_{2.5}$ alone range from 168 000 to 346 000 deaths in 2018. The mortality attributed to air pollution is particularly high in Central and Eastern European countries mainly because of greater use of fossil fuels and other dirty energy sources for heating and other purposes. Premature death rates from air pollution reach between 120-180 per 100 000 population in Bulgaria, Hungary, Romania, Poland and Croatia. This is six times higher than in most Nordic countries.

The welfare losses associated with air pollution are enormous. Taking into account the impact on mortality, lower quality of life for people falling sick because of air pollution, lower labour productivity and higher health spending, the total welfare losses from air pollution from $PM_{2.5}$ and ozone across all EU countries was estimated to reach EUR 600 billion in 2017, which is equivalent to 4.9% of the total EU GDP.

Three EU Directives are driving improvements in air quality across Europe: the 2008 Ambient Air Quality Directive, the 2004 Directive on heavy metals and polycyclic aromatic hydrocarbons in ambient air, and the 2016 Directive on National Emission reduction Commitments (NEC) of certain air pollutants. This latter Directive has set emission reduction commitments for each member state for the period 2020-29 and more ambitious ones from 2030 onwards, targeting five pollutants that have serious negative health and environmental consequences. The first EC report assessing the implementation of the 2016 NEC Directive released at the end of June 2020 concluded that most EU member states were not on track to meet all of their 2030 emission reduction commitments under current measures, hence additional measures will be required in these countries (European Commission, 2020[3]). Work is also done for cooperation on these issues beyond the EU within the framework of the UNECE Air Convention.

Efforts to reduce air pollution have usually focused, first and foremost, on those sectors and human activities that are the main sources of air pollutants (including energy production and consumption, transport, industry and agriculture). Even though the direct role the health sector can play in reducing air pollution is limited, it can nonetheless contribute to the overall effort. The health sector can reduce its own environmental footprint by decreasing its reliance on fossil fuels in electricity generation and achieving greater energy efficiency, as well as reduce its use and waste of toxic and polluting products. Public health authorities can also work with other relevant agencies and stakeholders to promote more healthy and clean urban planning and a transition from the use of cars and other motor vehicles to less polluting and more active modes of transportation. During consultations, doctors and other health professionals can encourage people to change their behaviours and become more physically active, contributing to a reduction in air pollution to the extent that this decreases the use of motor vehicles. Such behavioural changes will be easier to achieve if accompanied by changes in the urban environment and infrastructures that are more conducive to promoting more active modes of transportation, like cycling, walking or taking public transportations.

As European countries start implementing recovery plans from the COVID-19 crisis, there is a great opportunity for governments, businesses and citizens to promote a green recovery to avoid the looming health, economic and welfare consequences of environmental degradation, including climate change, biodiversity collapse and air pollution. While the economic crisis following the COVID-19 pandemic has led to at least a temporary reduction in various air pollutants in many countries, whether these reductions will become more permanent depends on the policy actions that will be put in place to support the economic recovery. A green recovery will require a systematic integration of environmental considerations. The EU recovery plan that was adopted by the European Council in July 2020 is designed to support the economic recovery from the COVID-19 pandemic and investments in the green and digital transitions of EU economies (European Council, 2020[5]).

Strengthening efforts in the short and longer-term to protect the environment and improve air quality are key to reducing the huge health and mortality burden of air pollution in Europe and around the world.

Notes

1. In addition to deaths related to $PM_{2.5}$, the EEA estimates that about 48 000 people died in 2018 from exposure to nitrogen dioxide (NO_2) and about 18 000 from exposure to ozone (O_3) across all EU countries (European Environment Agency, 2020[2]). These numbers cannot be added with premature mortality from $PM_{2.5}$ due to potential double counting.
2. These estimates of labour productivity losses can also be considered to be conservative. Another recent OECD study of the economic cost of air pollution in Europe, using other data sources and methods, found that a 1 microgramme/m^3 increase in $PM_{2.5}$ concentration (or a 10% increase at the sample mean) led to a 0.8% reduction in GDP, with most of the impact due to reductions in labour productivity from greater absence from work. These results suggest that policies to reduce air pollution may contribute to economic growth (Dechezleprêtre, Rivers and Stadler, 2019[52]).
3. Alongside this first implementation report, at the end of June 2020 the European Commission also released an analysis of the risk of non-compliance with national emission reduction commitments based on the National Air Pollution Control Programme and the quality of projections. Over half of the countries assessed (12 out of 20) were identified as facing medium to high risks of not meeting their 2020 national emission reduction commitments of $PM_{2.5}$ and three-quarters (15 out of 20) of not meeting their 2030 national emission reductions (European Commission, 2020[3]).

References

[21] Asikainen, A. et al. (2016), “Reducing burden of disease from residential indoor air exposures in Europe (HEALTHVENT project)”, *Environmental Health*, Vol. 15/S1, http://dx.doi.org/*10.1186/s12940-016-0101-8*.

[40] Basagaña, X. et al. (2018), “Effect of public transport strikes on air pollution levels in Barcelona (Spain)”, *Science of The Total Environment*, Vol. 610-611, pp. 1076-1082, http://dx.doi.org/*10.1016/j.scitotenv.2017.07.263*.

[39] Bauernschuster, S., T. Hener and H. Rainer (2017), “When Labor Disputes Bring Cities to a Standstill: The Impact of Public Transit Strikes on Traffic, Accidents, Air Pollution, and Health”, *American Economic Journal: Economic Policy*, Vol. 9/1, pp. 1-37, http://dx.doi.org/*10.1257/pol.20150414*.

[46] Berlin.de (2018), *30 km/h speed limit*, *https://www.berlin.de/hauptstadtluft/en/improving-air-quality/30 km-h-speed-limit/artikel.773484.en.php*.

[44] Boogaard, H. et al. (2012), “Impact of low emission zones and local traffic policies on ambient air pollution concentrations”, *Science of The Total Environment*, Vol. 435-436, pp. 132-140, http://dx.doi.org/*10.1016/j.scitotenv.2012.06.089*.

[50] C40 (2020), *The Circular Economy in Venice: Green Fuel For the City’s Boat Fleet*, *https://www.c40.org/case_studies/the-circular-economy-in-venice-green-fuel-for-the-city-s-boat-fleet*.

[48] C40 (2019), *Milan’s Network of Public Transport Going Full Electric by 2030*, *https://www.c40.org/case_studies/milan-s-network-of-public-transport-going-full-electric-by 2030*.

[49] C40 (2017), *Cities100: Warsaw – Electrification of the Bus Fleet*, *https://www.c40.org/case_studies/cities100 warsaw-electrification-of-the-bus-fleet*.

[10] Clark, A. et al. (2020), “Global, regional, and national estimates of the population at increased risk of severe COVID-19 due to underlying health conditions in 2020: a modelling study”, *The Lancet Global Health*, Vol. 8/8, pp. e1003-e1017, *http://dx.doi.org/10.1016/s2214-109x(20)30264-3*.

[13] Copat, C. et al. (2020), “The role of air pollution (PM and NO2) in COVID-19 spread and lethality: A systematic review”, *Environmental Research*, Vol. 191, p. 110129, http://dx.doi.org/*10.1016/j.envres.2020.110129*.

[17] Cournane, S. et al. (2017), “High Risk Subgroups Sensitive to Air Pollution Levels Following an Emergency Medical Admission”, *Toxics*, Vol. 5/4, p. 27, http://dx.doi.org/*10.3390/toxics5040027*.

[52] Dechezleprêtre, A., N. Rivers and B. Stadler (2019), “The economic cost of air pollution: Evidence from Europe”*, OECD Economics Department Working Papers*, No. 1584, OECD Publishing, Paris, *https://dx.doi.org/10.1787/56119490-en*.

[32] Ebi, K. (ed.) (2016), “Health Impacts of Active Transportation in Europe”, *PLOS ONE*, Vol. 11/3, p. e0149990, http://dx.doi.org/*10.1371/journal.pone.0149990*.

[31] European Commission (2020), *Farm to Fork Strategy: For a fair, healty and environmentally-friendly food system*, *https://ec.europa.eu/food/farm2fork_en*.

[51] European Commission (2020), *Green City Accord*, *https://ec.europa.eu/environment/urban/green_city_accord.htm*.

[33] European Commission (2020), *Health Promotion and Disease Prevention Knowledge Gateway*, *https://ec.europa.eu/jrc/en/health-knowledge-gateway*.

[3] European Commission (2020), *Report from the Commission to the European Parliament and the Council on the progress made on the implementation of Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants, COM/2020/266 final*, *https://ec.europa.eu/environment/air/pdf/reduction_napcp/1_EN_ACT_part1_v7.pdf*.

[15] European Commission (2019), *Attitudes of Europeans towards Air Quality. Special Eurobarometer 497*, *https://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/88560*.

[4] European Commission (2019), *The European Green Deal: COM(2019) 640 final*, *https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf*.

[25] European Commission (2018), *A Europe that protects: Clean air for all: COM(2018) 330 final*, *https://ec.europa.eu/environment/air/pdf/clean_air_for_all.pdf*.

[6] European Commission (2016), *European Commission (2016), Directive on the reduction of national emissions of certain atmospheric pollutants*, *https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016L2284&from=EN*.

[5] European Council (2020), *Special meeting of the European Council (17, 18, 19, 20 and 21 July 2020) – Conclusions*, *https://www.consilium.europa.eu/media/45109/210720-euco-final-conclusions-en.pdf*.

[2] European Environment Agency (2020), *Air quality in Europe – 2020 report*, *https://www.eea.europa.eu/publications/air-quality-in-europe-2020*.

[7] European Environment Agency (2020), *Healthy environment, healthy lives: how the environment influences health and well-being in Europe*, *https://www.eea.europa.eu/publications/healthy-environment-healthy-lives*.

[18] European Environment Agency (2018), *Unequal exposure and unequal impacts: social vulnerability to air pollution, noise and extreme temperatures in Europe*, *https://doi.org/10.2800/324183*.

[34] Goryakin, Y., L. Suhlrie and M. Cecchini (2018), "Impact of primary care-initiated interventions promoting physical activity on body mass index: systematic review and meta-analysis", *Obesity Reviews*, Vol. 19/4, pp. 518-528, http://dx.doi.org/*10.1111/obr.12654*.

[26] Health Care Without Harm Europe (2016), *Reducing Healthcare's Climate Footprint: Opportunities for European Hospitals & Health Systems*, *https://noharm-europe.org/sites/default/files/documents-files/4746/HCWHEurope_Climate_Report_Dec2016.pdf*.

[42] Hitchcock, G. and M. Vedrenne (2014), *Cycling and urban air quality – a study of european experiences*, European Cyclists' Federation, *https://ecf.com/files/150119-Cycling-and-Urban-Air-Quality-A-study-of-European-Experiences_web.pdf*.

[24] Holland, M. (2014), *Cost-benefit Analysis of Final Policy Scenarios for the EU Clean Air Package*, *https://ec.europa.eu/environment/air/pdf/TSAP%20CBA.pdf*.

[43] Holman, C., R. Harrison and X. Querol (2015), "Review of the efficacy of low emission zones to improve urban air quality in European cities", *Atmospheric Environment*, Vol. 111, pp. 161-169, http://dx.doi.org/*10.1016/j.atmosenv.2015.04.009*.

[1] Institute for Health Metrics and Evaluation (2020), *Global Burden of Disease Study 2019 (GBD 2019) Results*, *http://ghdx.healthdata.org/gbd-results-tool*.

[45] Johansson, C., L. Burman and B. Forsberg (2009), "The effects of congestions tax on air quality and health", *Atmospheric Environment*, Vol. 43/31, pp. 4843-4854, http://dx.doi.org/*10.1016/j.atmosenv.2008.09.015*.

[37] Luxembourg.public.lu (2020), *The Grand Duchy Shifts To Free Public Transport*, *https://luxembourg.public.lu/en/living/mobility/transport-gratuit.html*.

[16] Mackie, A. and I. Haščič (2019), *The distributional aspects of environmental quality and environmental policies*, OECD, Paris, *https://www.oecd.org/greengrowth/GGSD_2018_Households_WEB.pdf*.

[47] McDonald, R. (2016), *Planting Healthy Air*, *https://www.nature.org/en-us/what-we-do/our-insights/perspectives/how-urban-trees-can-save-lives/.*

[30] Ministère de la transition écologique (2020), *Gaspillage alimentaire*, *https://www.ecologie.gouv.fr/gaspillage-alimentaire-0#*.

[8] OECD (2020), *Environment at a Glance 2020*, OECD Publishing, Paris, *https://dx.doi.org/10.1787/4ea7d35f-en*.

[9] OECD (2020), "Environmental health and strengthening resilience to pandemics"*, OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, *http://www.oecd.org/coronavirus/policy-responses/environmental-health-and-strengthening-resilience-to-pandemics-73784e04/*.

[14] OECD (2019), "Air and climate: Air emissions by source (Edition 2019)", *OECD Environment Statistics* (database), *https://dx.doi.org/10.1787/0ed9ad0d-en*.

[35] OECD (2019), *The Heavy Burden of Obesity: The Economics of Prevention*, OECD Health Policy Studies, OECD Publishing, Paris, *https://dx.doi.org/10.1787/67450d67-en*.

[28] OECD (2017), *Healthy people, healthy planet*, OECD, Paris, *https://www.oecd.org/health/health-systems/Healthy-people-healthy-planet.pdf*.

[22] OECD (2016), *The Economic Consequences of Outdoor Air Pollution*, OECD Publishing, Paris, *https://dx.doi.org/10.1787/9789264257474-en*.

[23] OECD (2012), *Mortality Risk Valuation in Environment, Health and Transport Policies*, OECD Publishing, Paris, *https://dx.doi.org/10.1787/9789264130807-en*.

[12] Pozzer, A. et al. (2020), "Regional and global contributions of air pollution to risk of death from COVID-19", *Cardiovascular Research* cvaa288, http://dx.doi.org/*10.1093/cvr/cvaa288*.

[41] Rojas-Rueda, D. et al. (2011), "The health risks and benefits of cycling in urban environments compared with car use: health impact assessment study", *BMJ*, Vol. 343/aug04 2, pp. d4521-d4521, http://dx.doi.org/*10.1136/bmj.d4521*.

[36] Stone, B. et al. (2007), "Is Compact Growth Good for Air Quality?", *Journal of the American Planning Association*, Vol. 73/4, pp. 404-418, http://dx.doi.org/*10.1080/01944360708978521*.

[11] WHO (2020), *COVID 19 and NCDs: information note*, *https://www.who.int/publications/m/item/covid-19-and-ncds*.

[20] WHO (2018), *Global Health Observatory data repository*, *https://apps.who.int/gho/data/node.main.BODAMBIENTAIRDTHS?lang=en*.

[53] WHO (2016), *Ambient Air Pollution: A global assessment of exposure and burden of diseases*, *https://www.who.int/phe/publications/air-pollution-global-assessment/en/*.

[27] WHO (2015), *Climate and Health Country Profiles – 2015: France. Climate and Health Country Profile – 2015.*, *https://apps.who.int/iris/rest/bitstreams/1031230/retrieve*.

[19] WHO Europe (2013), *Health risks of air pollution in Europe – HRAPIE project*, *https://apps.who.int/iris/handle/10665/153692*.

[29] Williams, P. and K. Walton (2011), "Plate waste in hospitals and strategies for change", *e-SPEN, the European e-Journal of Clinical Nutrition and Metabolism*, Vol. 6/6, pp. e235-e241, http://dx.doi.org/*10.1016/j.eclnm.2011.09.006*.

[38] Xiao, C., Y. Goryakin and M. Cecchini (2019), "Physical Activity Levels and New Public Transit: A Systematic Review and Meta-analysis", *American Journal of Preventive Medicine*, Vol. 56/3, pp. 464-473, http://dx.doi.org/*10.1016/j.amepre.2018.10.022*.

Part II

Overview of health indicators

Health at a Glance: Europe 2020
State of Health in the EU Cycle

PART II

Chapter 3

Health status

This chapter describes the health status of EU citizens, including trends in life expectancy, the main causes of death, health inequalities, the occurrence of communicable and chronic diseases, and mental health issues. Life expectancy now reaches 81 years in the EU as a whole, but the gains have slowed markedly in several Western European countries in recent years due to severe flu seasons and a slowdown in reductions in cardiovascular mortality. The COVID-19 pandemic will result in a further stagnation or even reduction in life expectancy in 2020 in those countries that have been most impacted. The main causes of deaths across EU countries remain cardiovascular diseases (over 1 700 000 deaths in 2017) and cancers (1 200 000 deaths), which together account for over 60% of all deaths. Large inequalities in life expectancy persist by gender and socio-economic status. On average across EU countries, 30-year-old men with a low education level can expect to live about seven years less than those with a university degree or the equivalent. This education gap among women is smaller, at about three years. At age 65, men and women across EU countries could expect to live over 75% of their remaining years of life free of disability in 2018. Nearly 40% of people aged 65 and over report having at least two chronic conditions, although this does not necessarily impede them from leading a normal life. About 30% of people aged 65 and over report at least one limitation in (instrumental) activities of daily living that may require some long-term care assistance.

Life expectancy has increased in EU countries over the past decades, but progress has slowed down in recent years in many countries. The COVID-19 pandemic will result in a further stagnation or possible decline in life expectancy in 2020 in those countries that have been most impacted.

In the EU as a whole, life expectancy at birth reached 81 years in 2018. Spain and Italy had the highest life expectancy among EU countries, with life expectancy reaching over 83 years in 2018. Life expectancy at birth exceeds 80 years in almost two-thirds of EU countries, but still remains at only around 75 years in Bulgaria, Latvia and Romania (Figure 3.1).

Women continue to live longer than men in all EU countries – on average almost 6 years longer – although this gap has narrowed by about one year since 2000 as men's life expectancy increased more rapidly than women's in most countries. The gender gap in life expectancy is particularly large in Latvia and Lithuania, where women live almost 10 years longer than men, and is also quite large in Estonia (nearly 9 years). These gender differences in life expectancy 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. Men are also more likely to die from violent deaths, such as suicide and accidents.

Until recently, life expectancy was rising fairly rapidly and steadily across EU countries, increasing by about 2.5 years per decade on average. While some countries have registered fairly large gains in life expectancy during the last decade (notably Baltic countries like Estonia), gains in life expectancy have slowed down markedly in some Western European countries like Spain, France and Germany even before the COVID-19 pandemic. The gains in life expectancy at birth in these countries have been limited to only about half a year between 2011 and 2018. The slowdown has been particularly marked among older people (Figure 3.2).

The severe flu seasons of 2014/15, 2016/17 and 2017/18 have contributed to substantial excess mortality in those years, especially among older people. A slowdown in the reduction in death rates from circulatory diseases, which was previously the main factor driving life expectancy gains, also contributed to the recent slowdown in many EU countries (OECD/The King's Fund, 2020).

The COVID-19 pandemic will further contribute to the stagnation in life expectancy in 2020 – and even possible reduction – in those European countries severely hit, such as Belgium, France, Italy, Spain, Sweden and the United Kingdom. The impact of COVID-19 on mortality and life expectancy will depend on both infection rates and fatality rates of people infected during the year. According to some estimations at the beginning of the pandemic, COVID-19 might lead to a reduction in life expectancy in all the countries where life expectancy was already high and where the infection rate will exceed 1% or 2% of the population (IIASA, 2020). In France, preliminary estimates based on the number of COVID-19 deaths until the end of June 2020 indicate that life expectancy may fall by 0.2 year for men and 0.1 year for women in 2020, if the number of deaths were to stabilise at that level (The Conversation, 2020). In addition to direct deaths related to COVID-19, the number of indirect deaths may increase due to disruptions to patients' care for other conditions, or may decrease due to lower mortality from other causes such as road accidents.

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 be, on average, higher than life expectancy calculated with current death rates.

References

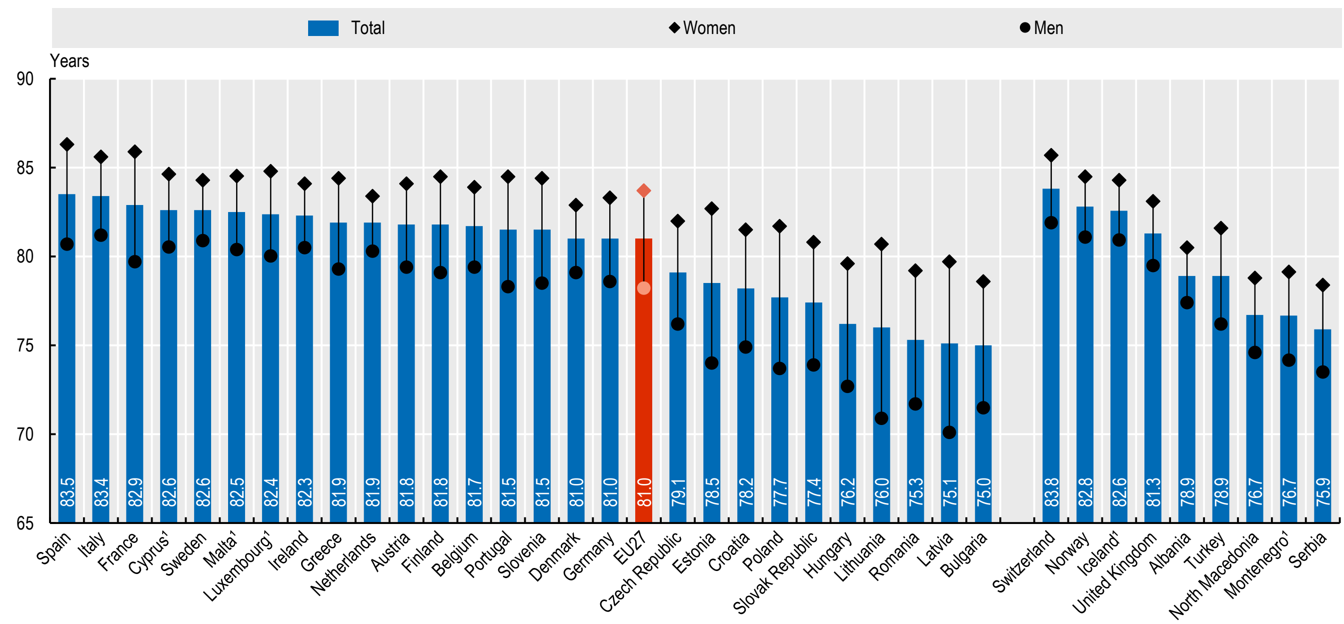
IIASA (2020), "Assessing the potential impact of COVID-19 on life expectancy", Working Paper, WP-20-005, May 2020.

Raleigh, V. (2019), "Trends in life expectancy in EU and other OECD countries: Why are improvements slowing?" *OECD Health Working Papers*, No. 108, OECD Publishing, Paris, *https://doi.org/10.1787/223159ab-en*.

OECD/The King's Fund (2020), *Is Cardiovascular Disease Slowing Improvements in Life Expectancy?: OECD and The King's Fund Workshop Proceedings*, OECD Publishing, Paris, *https://doi.org/10.1787/47a04a11-en*.

The Conversation (2020), "COVID-19 epidemic: what impact on life expectancy in France?" [Épidémie de COVID-19: quel impact sur l'espérance de vie en France?], June 2020.

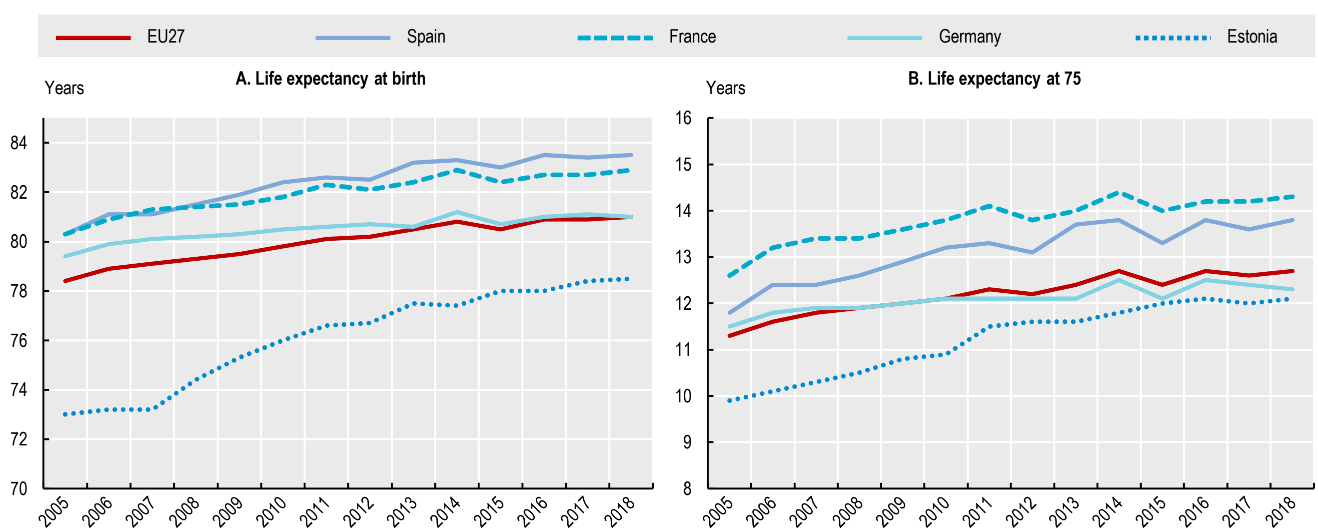
Figure 3.1. **Life expectancy at birth, by gender, 2018**



Note: The EU average is weighted. 1. Three-year average (2016-18).
Source: Eurostat Database.

StatLink https://stat.link/042196

Figure 3.2. **Trends in life expectancy, 2005-18**



Note: The EU average is weighted.
Source: Eurostat Database.

StatLink https://stat.link/gsb2oa

Large inequalities in life expectancy exist not only by gender, but also by socio-economic status, no matter how they are measured – by education level, income or occupational group. This section focuses on inequalities by education level since this is the socio-economic indicator with the most widely available data, although the data coverage still remains limited to only about half of EU countries.

Inequalities in life expectancy by education level are generally larger among men than among women, and are particularly large in Central and Eastern Europe. On average across 14 EU countries for which data are available, 30-year-old men with less than an upper secondary education can expect to live about seven years less than those with a tertiary education (a university degree or the equivalent) in 2017 (Figure 3.3). In the Slovak Republic, Poland and Hungary, 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.

The education gap among women is smaller, at about three years on average across the 14 EU countries. In the Slovak Republic and Estonia, 30-year-old women with a low level of education can expect to live over five 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. The gap in mortality rate between low-educated and high-educated prime-age men (the 25-64 year-olds) is particularly large. 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 this 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 suicide). An important gap in mortality rates by education level also exists among older men and women, also driven mainly by higher death rates from circulatory diseases and cancer (Murtin et al., 2017).

Many factors contribute to the education gap in mortality and life expectancy. These include lower income and standard of living for people with lower educational attainment, higher smoking rates and obesity rates, and less healthy nutritional habits (see indicators in Chapter 4 for more information on disparities in risk factors by socio-economic group). If the prevalence of smoking among the least educated was identical to that of the most educated, life expectancy between ages 35 to 80 could increase by one year among men and six months among women on average across 12 EU countries (Figure 3.4). Similarly, reducing the prevalence of high bodyweight among the least educated could contribute to a four-month increase of life expectancy between ages 35 to 80 among men and women. Wider determinants of health matter too, notably income. Reducing the share of the least educated people living on low incomes could also further increase life expectancy, especially among men in Central and Eastern European countries (Mackenbach et al., 2019).

Reducing socio-economic inequalities in life expectancy requires inter-sectoral actions involving not only health ministries but also other ministries responsible for education, employment, social protection, housing and environment (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 2011 0-2). The highest education level refers to people who have completed a tertiary education (ISCED 2011 5-8). Data on life expectancy by education level have been extracted from the Eurostat database for most countries, with the exception of the Netherlands where the data come from Statistics Netherlands.

References

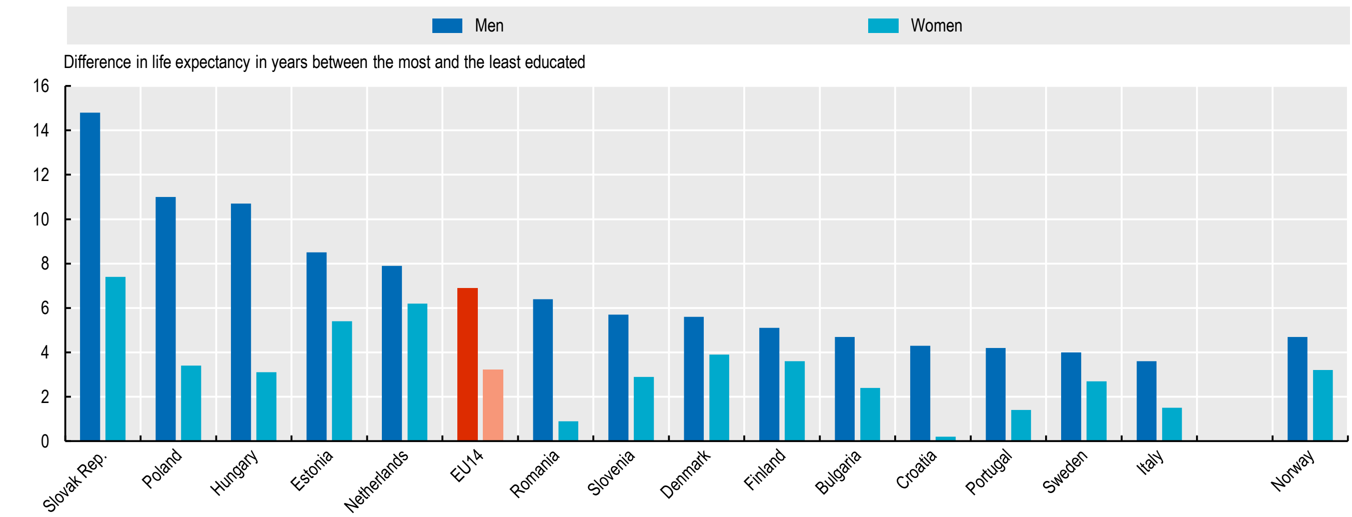
INSEE (2018), “L’espérance de vie par niveau de vie” [Life expectancy by living standards], *Insee Première,* No. 1687, February 2018.

James, C. et al. (2017), “Inclusive growth and health”, *OECD Health Working Papers*, No. 103, OECD Publishing, Paris, *http://dx.doi.org/10.1787/93d52bcd-en*.

Mackenbach, J. et al. (2019), “Determinants of inequalities in life expectancy: an international comparative study of eight risk factors”, *The Lancet Public Health*, Vol. 4/10, pp. e529-e537, *https://doi.org/10.1016/S2468-2667(19)30147-1*.

Murtin, F. et al. (2017). “Inequalities in longevity by education in OECD countries: Insights from new OECD estimates”, *OECD Statistics Working Papers*, 2017/02, OECD Publishing, Paris, *http://dx.doi.org/10.1787/6b64d9cf-en*.

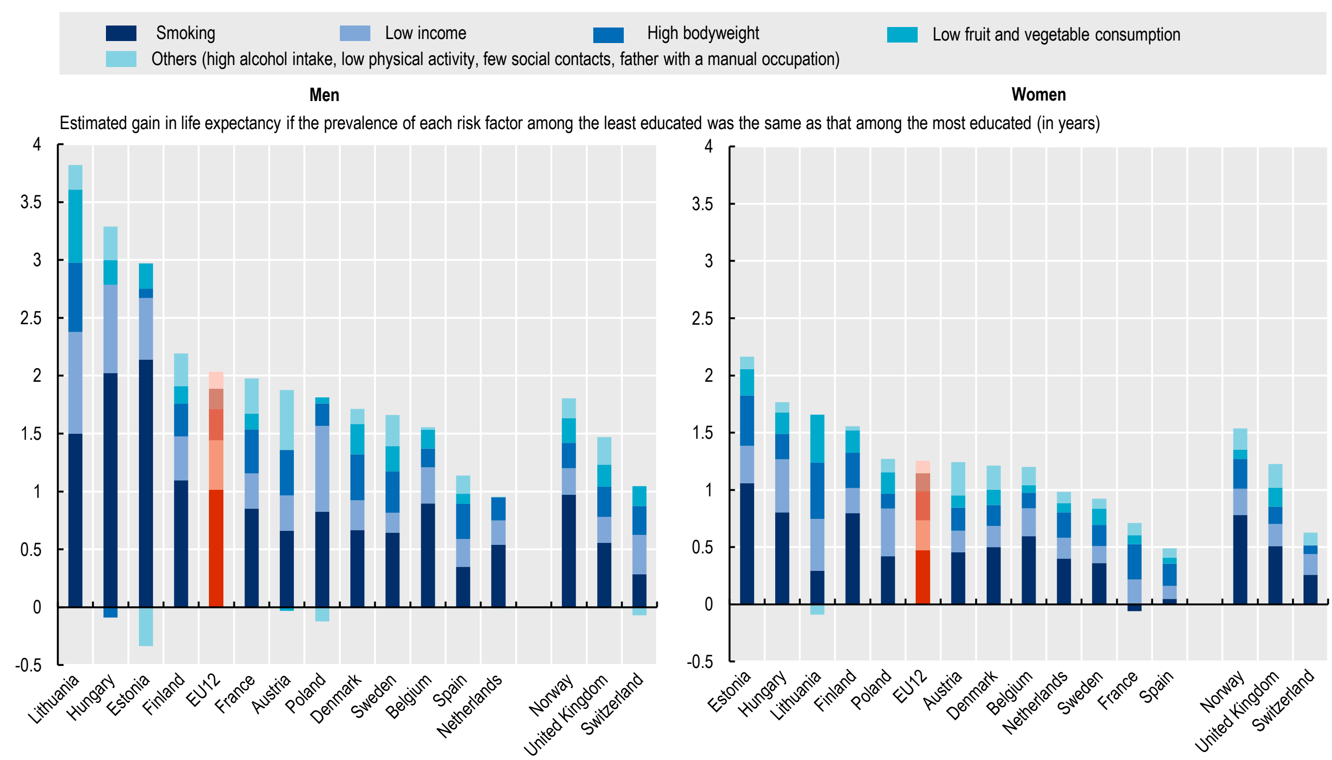
Figure 3.3. **Gap in life expectancy at age 30 between people with the highest and lowest level of education, 2017 (or nearest year)**



Note: The EU average is unweighted.
Source: Eurostat Database, complemented with data from Statistics Netherlands for the Netherlands.

StatLink https://stat.link/hkr4bj

Figure 3.4. **Contribution of risk factors to inequalities in life expectancy by education level, around 2010-14**



Note: The United Kingdom refers to England and Wales. The EU average is unweighted. Life expectancy is for people aged 35 to 80.
Source: Mackenbach et al., 2019.

StatLink https://stat.link/79k483

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

The main indicator of healthy life years used in the EU 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, men could expect to live 81% of their lives free of disability in 2018, while this proportion was only 77% among women (Figure 3.5). The lower share of healthy life years among women is due to the fact that they generally report more activity limitations due to health problems at any given age and also because they live longer. Whereas the gender gap in life expectancy at birth is almost six years on average across EU countries, it is only half a year in healthy life expectancy (64.2 years for women compared with 63.7 years for men). In the Netherlands, Denmark, Portugal, Slovenia, Sweden and Finland, the number of healthy life years is lower for women than men because they report more disabilities.

In 2018, 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 about 85% of their life expectancy free of disability, while this share reaches around 90% for men. Latvia and Estonia had the lowest healthy life expectancy among both women and men, reflecting both a relatively low life expectancy and a substantial share of people's life lived with some disabilities.

As people get older, the share of the remaining years of life that they can expect to live free of disability falls. This is particularly the case among women. While women across EU countries can expect to live almost another 22 years when they reach the age of 65, only ten of these years can be expected to be free of activity limitations. For men, the remaining life expectancy at age 65 is almost four years shorter across EU countries (18 years), but they can also expect to live only about ten years free of disability (Figure 3.6).

Inequalities in healthy life years by socio-economic status are even greater than inequalities in life expectancy, because women and men with lower education or income are also more likely to report some activity limitations throughout their lives than those with higher level of education or income. In the Netherlands, the gap in life expectancy at age 25 between the most and the least educated people was around six years in 2011, but this gap was over seven years when it comes to healthy life expectancy (Gheorghe et al., 2016).

A range of policies can contribute to increasing healthy life expectancy while reducing health inequalities, including greater efforts to prevent health problems starting early in life, promoting equal access to care for the whole population, and better managing 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, based on the EU-SILC survey.

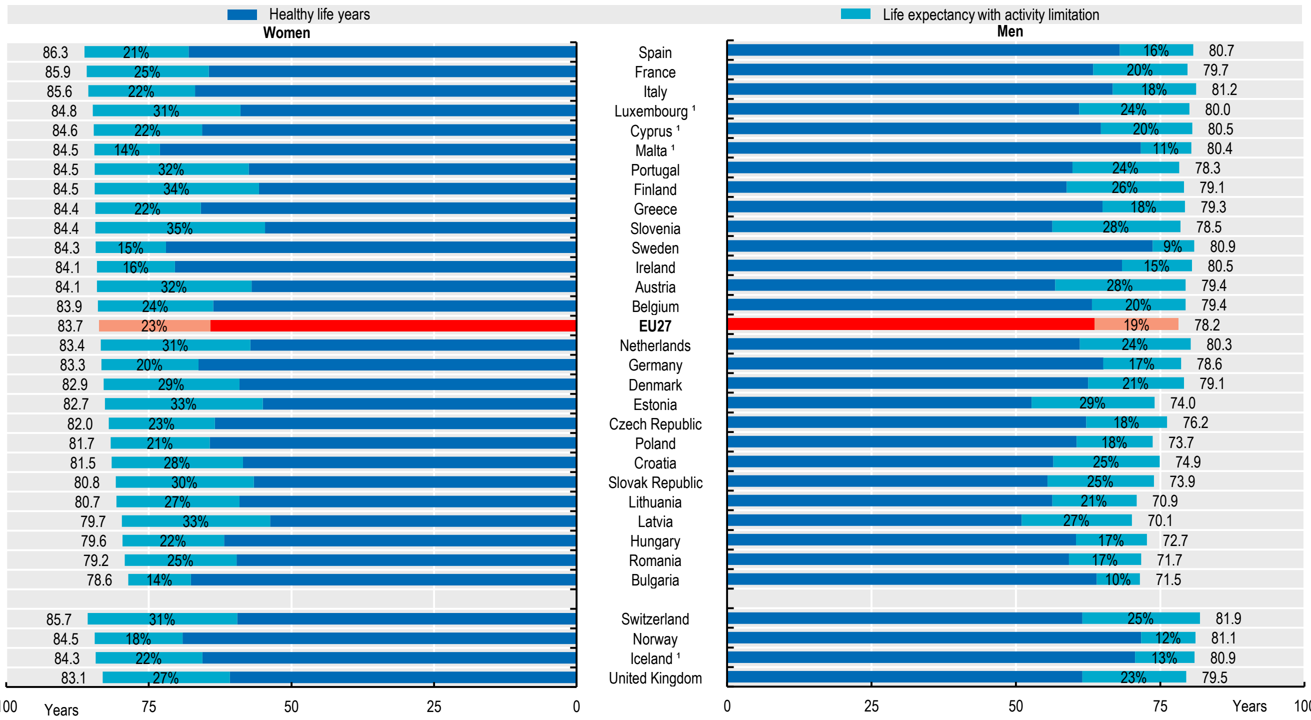
The comparability of data on healthy life years is limited by the fact that the indicator is derived from self-reported data which can be affected by people's subjective assessment of their activity limitation (disability) and by social and cultural factors. There are also differences across countries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

References

Gheorghe, M. et al. (2016), "Health inequalities in the Netherlands: trends in quality-adjusted life expectancy by educational level", *European Journal of Public Health*, Vol. 26/5, pp. 794-799.

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

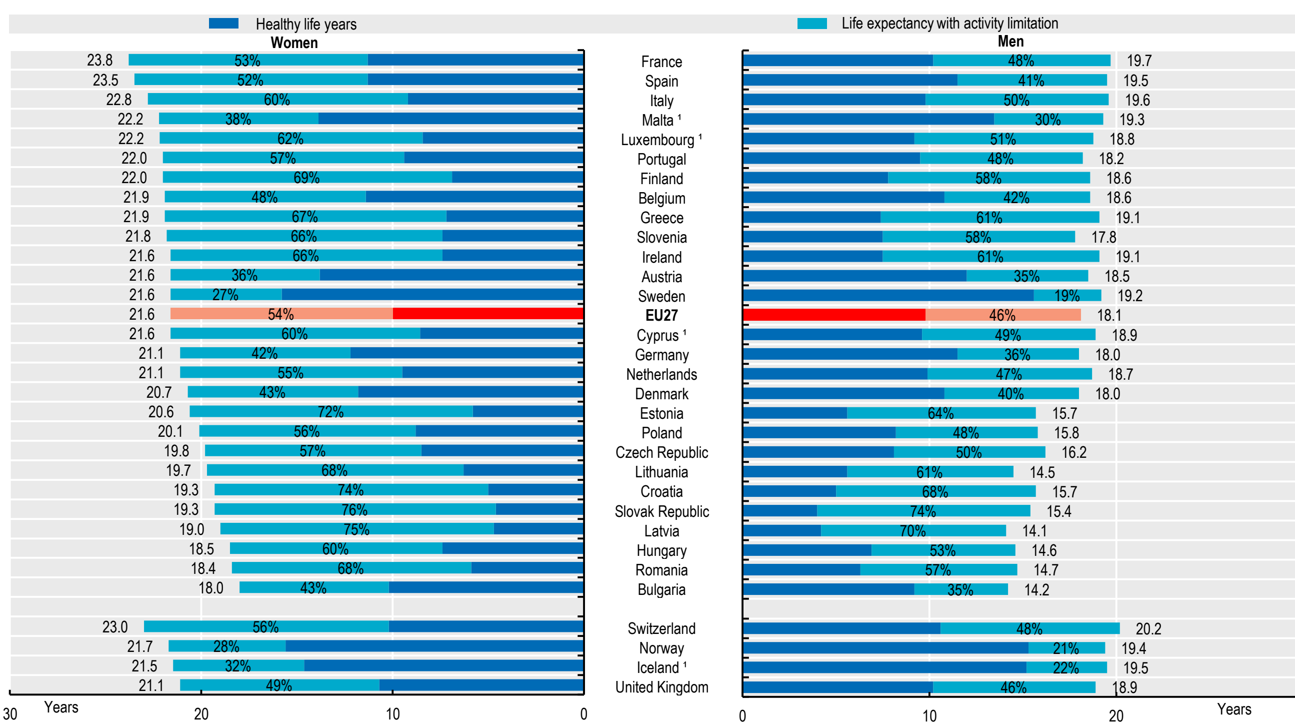
Figure 3.5. **Life expectancy and healthy life years at birth, by gender, 2018 (or nearest year)**



Note: The EU average is weighted. Data comparability is limited because of cultural factors and different formulations of question in EU-SILC. 1. Three-year average.
Source: Eurostat Database.

StatLink https://stat.link/nrt5a7

Figure 3.6. **Life expectancy and healthy life years at 65, by gender, 2018 (or nearest year)**



Note: The EU average is weighted. Data comparability is limited because of cultural factors and different formulations of question in EU-SILC. 1. Three-year average.
Source: Eurostat Database.

StatLink https://stat.link/tyhncw

Over 4.6 million people died in EU countries in 2017 (Figure 3.7). 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 about 1.7 million deaths in 2017 or 37% of all deaths. Ischaemic heart diseases (including heart attack and other diseases) and stroke are the most common causes of cardiovascular mortality (see indicator "Mortality from circulatory diseases"). Mortality rates from circulatory diseases are much higher among men than women (about 40% higher).

Some 1.2 million people in EU countries died of cancer in 2017, accounting for 26% of all deaths (25% among women and 28% 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 "Cancer incidence and mortality").

After circulatory diseases and cancer, respiratory diseases are the third leading cause of death in EU countries, causing some 366 000 deaths in 2017 or 8% of all deaths. The vast majority of these deaths occur among people aged over 65. Respiratory diseases accounted for 7% of all deaths among women and 9% among men. Chronic obstructive pulmonary disease (COPD) is the most common cause of mortality among respiratory diseases, followed by pneumonia.

External causes of death, including accidents, suicides, homicides and other violent causes of death, were responsible for 4% of all deaths among women and 5% of deaths among men across EU countries in 2017. The most important causes of violent deaths are suicides (48 000 deaths in 2017) and transport accidents (about 27 000 deaths). Transport accidents are a particularly important cause of death among young people (aged 18-25), whereas suicide rates generally increase with age (see indicator "Adult mental health").

Looking at other specific causes, Alzheimer's and other dementias accounted for 5% of all deaths in 2017, and were a cause of death more important among women. Diabetes represented 2% of all deaths across EU countries.

The main causes of death differ between socio-economic groups, explaining the gap in life expectancy. Social disparities are generally larger for the most avoidable causes of death (Mackenbach et al., 2015).

Overall mortality rates (age-standardised) ranged in 2017 from less than 900 deaths per 100 000 population in France, Spain and Italy (which is about 15% lower than the EU average) to over 1 400 deaths per 100 000 population in Bulgaria, Romania, Latvia, Hungary and Lithuania (over 40% higher than the EU average) (Figure 3.8). The main reason for the much higher mortality rates in this latter group of countries is higher mortality rates from circulatory diseases, the leading cause of death. In Hungary, higher mortality rates from cancer also explain a large part of the difference with the EU average (Eurostat, 2020).

Definition and comparability

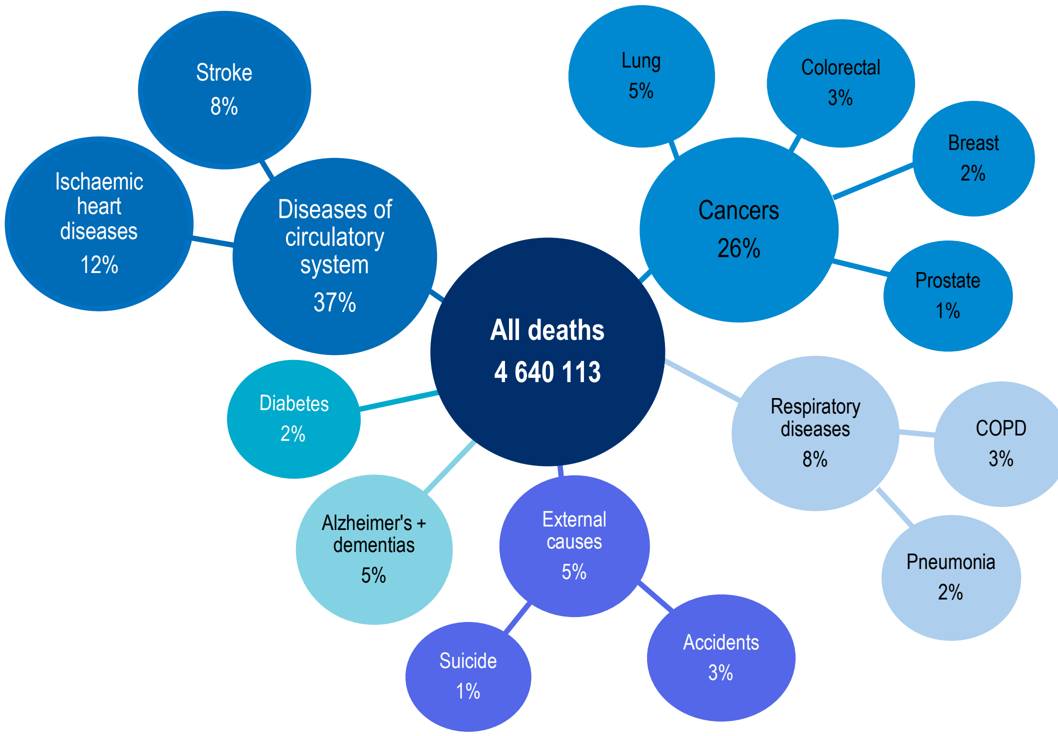
Deaths from all causes are classified to ICD-10, Codes A00-Y89, excluding S00-T98. The grouping Alzheimer's disease and other dementias include G30 (Alzheimer) and F01-F03 (other dementias). Mortality rates are based on the number of deaths registered in a country in a year divided by the population. 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.

References

Eurostat (2020), *Causes of death statistics*, Statistics Explained, September 2020.

Mackenbach, J. et al. (2015), "Variations in the relation between education and cause-specific mortality in 19 European populations: A test of the 'fundamental causes' theory of social inequalities in health", *Social Science and Medicine*, Vol. 127, pp. 51-62.

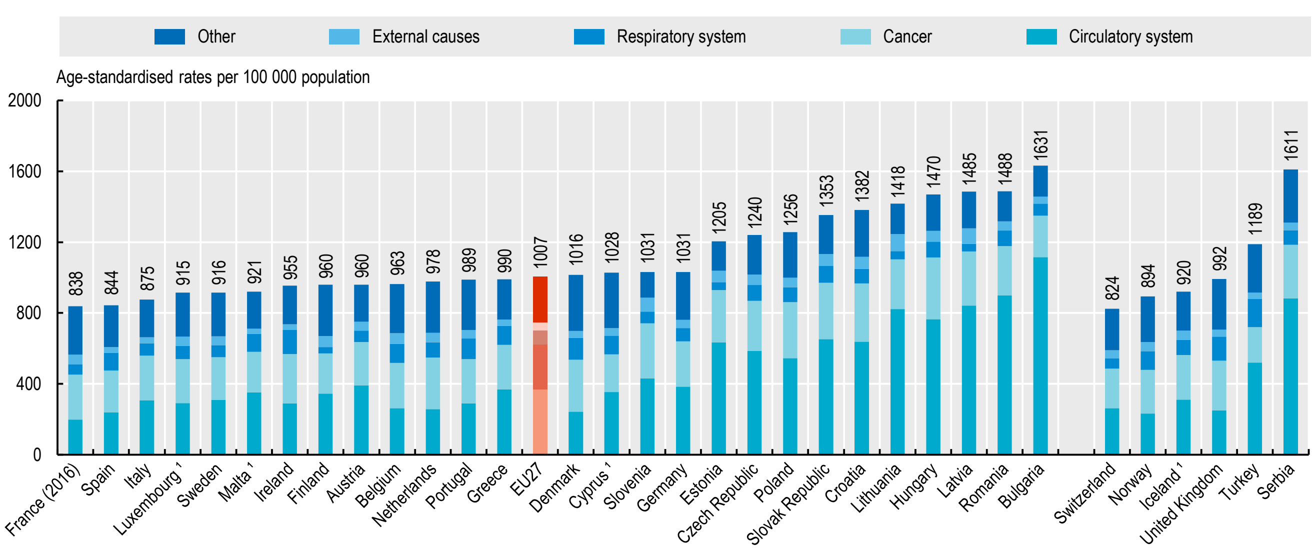
Figure 3.7. **Main causes of mortality in EU countries, 2017**



Note: Data refer to 2016 for France.
Source: Eurostat Database.

StatLink https://stat.link/fyc0lq

Figure 3.8. **Main causes of mortality by country, 2017**



Note: External causes of death include accidents, suicides, homicides and other causes. The EU average is weighted (using imputed estimates for France for 2017). Data for France refer to 2016. 1. Three-year average.
Source: Eurostat Database.

StatLink https://stat.link/jktro3

Circulatory (or cardiovascular) diseases remain the main cause of mortality in nearly all EU member states, accounting for some 1.7 million deaths and 37% of all deaths across EU countries in 2017. The morbidity and mortality related to circulatory diseases has major economic costs as well as human costs for Europe. The cost of circulatory diseases to the EU economy was estimated at EUR 210 billion in 2015, of which slightly more than half was due to direct health care costs, a quarter to productivity losses and a fifth to the informal care of people with cardiovascular diseases (Wilkins et al., 2017). This estimate does not take into account the welfare losses associated with premature mortality related to these diseases.

The two main causes of death from circulatory diseases are ischaemic heart diseases (notably heart attacks) and cerebrovascular diseases (strokes). These two causes of death alone account for over half of all deaths from circulatory diseases, and more than one-fifth of all deaths in EU member states in 2017.

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. Some 550 000 deaths were attributed to IHD across EU countries in 2017, accounting for 12% of all deaths. 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, Hungary, the Slovak Republic and Latvia, with age-standardised rates three to four 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 half the EU average (Figure 3.9).

Cerebrovascular diseases (or strokes) were responsible for some 375 000 deaths across the EU in 2017, 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 around three to four times higher than the EU average in Bulgaria, Romania and Latvia. They are the lowest in France, Luxembourg and Spain, with death rates about half the EU average (Figure 3.10).

Steady and substantial reductions in mortality rates from IHD, strokes and other circulatory diseases were the main driver of increases in life expectancy in previous decades, but these reductions have slowed down over the past five to ten years in several Western European countries (e.g. France, Germany and the United Kingdom). This has contributed to the slowdown in life expectancy improvements (OECD/The King's Fund, 2020).

There are wide socio-economic inequalities in mortality from circulatory diseases in most European countries, reflecting socio-economic differences in major risk factors. Many of these deaths can be prevented, but trends in several risk factors are going in the wrong direction. While smoking rates overall have fallen, cholesterol, blood pressure, low physical activity, obesity and diabetes are on the rise in many EU countries (OECD/The King's Fund, 2020).

A number of public health measures can be implemented to counter the slowdown in reducing mortality rates from circulatory diseases. Fiscal and regulatory measures can promote healthy lifestyles and help reduce the burden of cardiovascular diseases, as well as also ease pressures on health care systems.

Definition and comparability

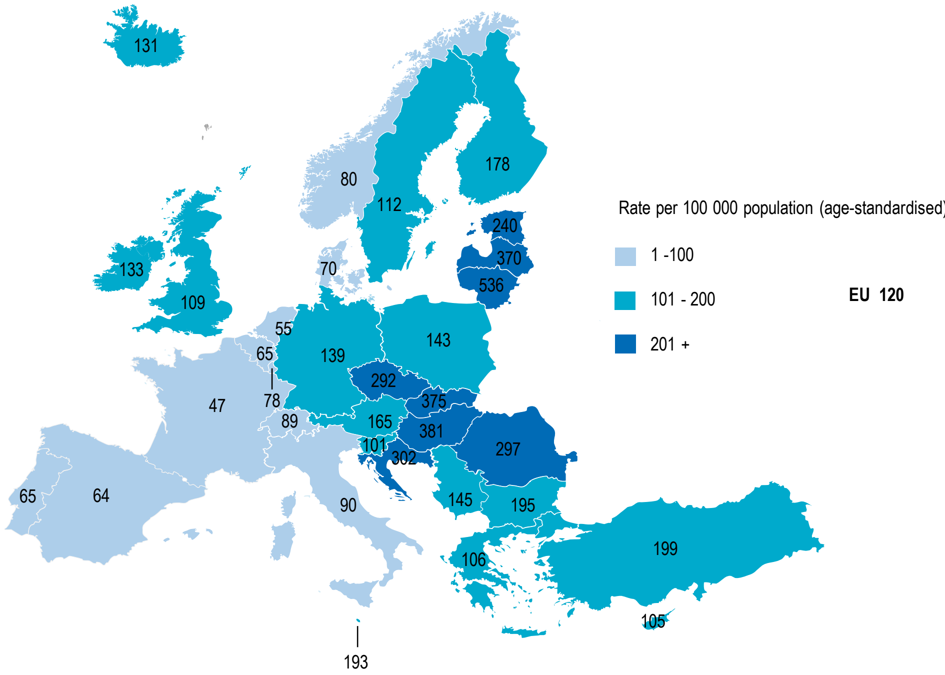
Mortality rates are based on the number of deaths registered in a country in a year divided by the population. The rates have been age-standardised to the revised European standard population adopted by Eurostat in 2012 to remove variations arising from differences in age structures across countries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

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

Reference

OECD/The King's Fund (2020), *Is Cardiovascular Disease Slowing Improvements in Life Expectancy?*: *OECD and The King's Fund Workshop Proceedings*, OECD Publishing, Paris, *https://doi.org/10.1787/47a04a11-en*.

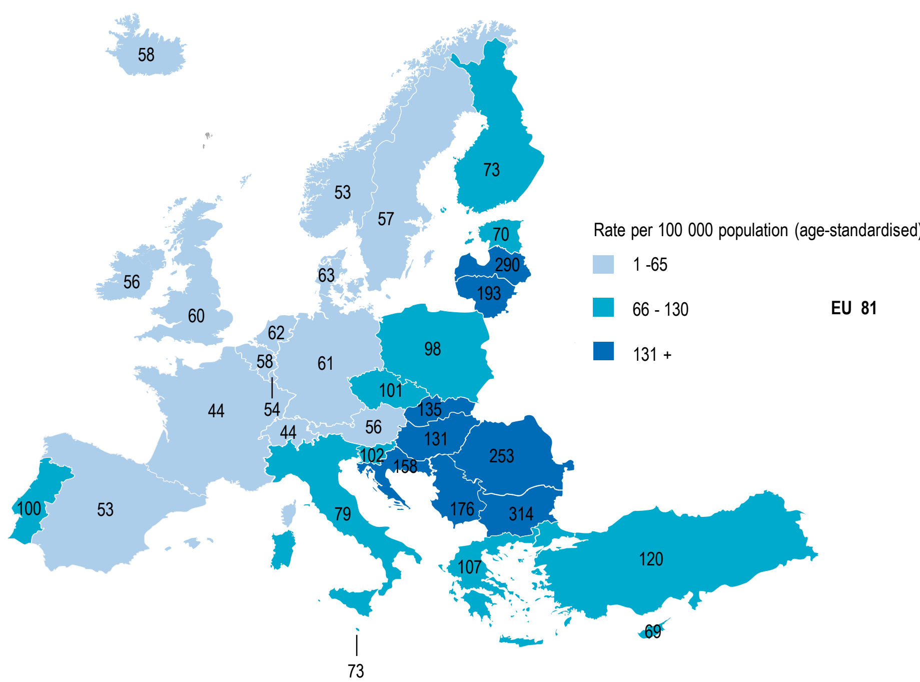
Figure 3.9. **Ischaemic heart disease mortality, 2017**



Note: The EU average is weighted (using imputed estimates for France for 2017). Three-year average (2015-17) for Cyprus, Iceland, Luxembourg, and Malta. Data refer to 2016 for France.
Source: Eurostat Database.

StatLink https://stat.link/2dwhpc

Figure 3.10. **Stroke mortality, 2017**



Note: The EU average is weighted (using imputed estimates for France for 2017). Three-year average (2015-17) for Cyprus, Iceland, Luxembourg, and Malta. Data refer to 2016 for France.
Source: Eurostat Database.

StatLink https://stat.link/t2m3wn

In 2020, about 2.7 million people in the 27 EU countries are expected to be diagnosed with cancer, and nearly 1.3 million to die from it (Joint Research Centre, 2020). Over 40% of cancer cases are preventable, and mortality can also be reduced through earlier diagnosis and the provision of more timely and effective treatments. The Europe's Beating Cancer Plan aims to reduce the cancer burden for patients, their families and health systems, and address cancer-related inequalities between and within countries, with actions to support, coordinate and complement the efforts of Member States (EC, 2020).

More men than women are expected to be diagnosed with cancer in 2020 across EU countries (54% men and 46% women). Among men, the main cancer sites are prostate cancer, which is expected to account for 23% of all new cancers diagnosed in 2020, followed by lung cancer (14%) and colorectal cancer (13%). Among women, breast cancer is the main cancer site, expected to account for 29% of all new cancer cases, followed by colorectal cancer (12%) and lung cancer (9%) (Figure 3.11).

Ireland, Denmark, the Netherlands and Belgium are expected to have the highest incidence rate of all cancers combined in 2020, with age-standardised rates more than 10% higher than the EU average (Figure 3.12). These variations 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 well as differences in the quality of cancer surveillance and reporting.

Cancer is the second leading cause of mortality in the EU after cardiovascular diseases. Reflecting mainly higher incidence, mortality from cancer is greater among men than women. Overall across EU countries, about 706 000 men and 555 000 women are expected to die from cancer in 2020 (JRC, 2020).

Mortality rates from cancer are lowest in Finland, Malta, Spain, Luxembourg, and Sweden, with rates at least 15% lower than the EU average. They are highest in the Slovak Republic, Poland, Cyprus, and Hungary, with rates more than 20% higher than the EU average (Figure 3.12).

Lung cancer remains by far the most common cause of death from cancer among men and the second most common among women (after breast cancer). Over 257 000 people are expected to die from lung cancer across EU countries in 2020 (JRC, 2020). The main risk factors for lung cancer are tobacco smoking and environmental factors such as air pollution (see Chapter 2 on the impact of air pollution on health and mortality). While the survival rate after a diagnosis for lung cancer has increased over the past decade, it still remains fairly low (see indicator "Incidence, survival and mortality from lung cancer" in Chapter 6).

Colorectal cancer is the second most common cause of cancer death, with about 156 000 people expected to die from colorectal cancer in EU countries in 2020. 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 age, including a diet high in fat and low in fibre, alcohol consumption, smoking and obesity. Earlier detection and better treatment have led to higher survival rates after diagnosis (see indicator "Screening, survival and mortality from colorectal cancer" in Chapter 6).

Breast cancer is the leading cause of cancer death among women, expected to cause about 95 000 deaths in 2020 and accounting for 17% of all female cancer deaths. While incidence rates of breast cancer have increased over the past decade, death rates have declined or stabilised, reflecting increases in survival rates due also to earlier diagnosis and better treatment (see indicator "Screening, survival and mortality for breast cancer" in Chapter 6).

The estimates of cancer incidence and mortality reported here do not reflect any effect that the COVID-19 pandemic might have on the burden of cancer as they are based on trends from previous years. At the time of writing this report, it is not clear yet what effect the COVID-19 outbreak might have on cancer incidence, mortality or survival in each country and in the EU as a whole. However, many EU countries faced significant challenges during the peak of the epidemic in maintaining cancer screening and treatment, impacting the quality of care for cancer patients and possibly also survival rates.

Definition and comparability

The 2020 cancer incidence and mortality estimates have been computed using the European Cancer Information System (ECIS) which is used for reporting the cancer burden in Europe. These estimates are the outcome of a collaborative project between the Joint Research Centre (JRC) and the European Network of Cancer Registries (ENCR), together with the International Agency for Research on Cancer (IARC). The estimates are based on the cancer registries historical data on incidence and mortality. Rates have been age-standardised based on the new European Standard Population to remove variations arising from differences in age structures across countries. The estimates for 2020 may differ from national estimates due to differences in methods.

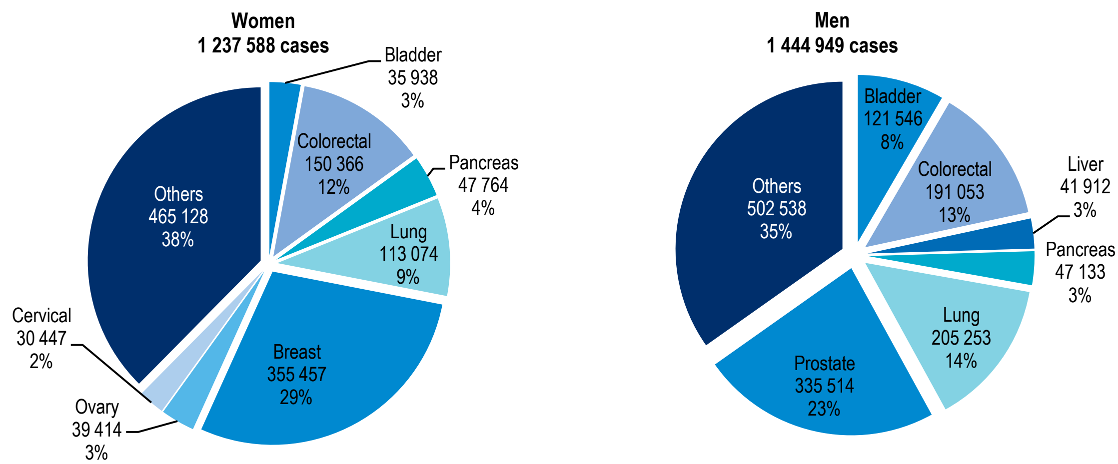
The incidence and mortality from all cancers relate to ICD-10 codes C00-C97 (excluding non-melanoma skin cancer C44).

References

EC (2020), *EU Policy on Cancer*, *https://ec.europa.eu/health/non_communicable_diseases/cancer_en*.

Joint Research Centre (2020), *ECIS – European Cancer Information System*, *https://ecis.jrc.ec.europa.eu*.

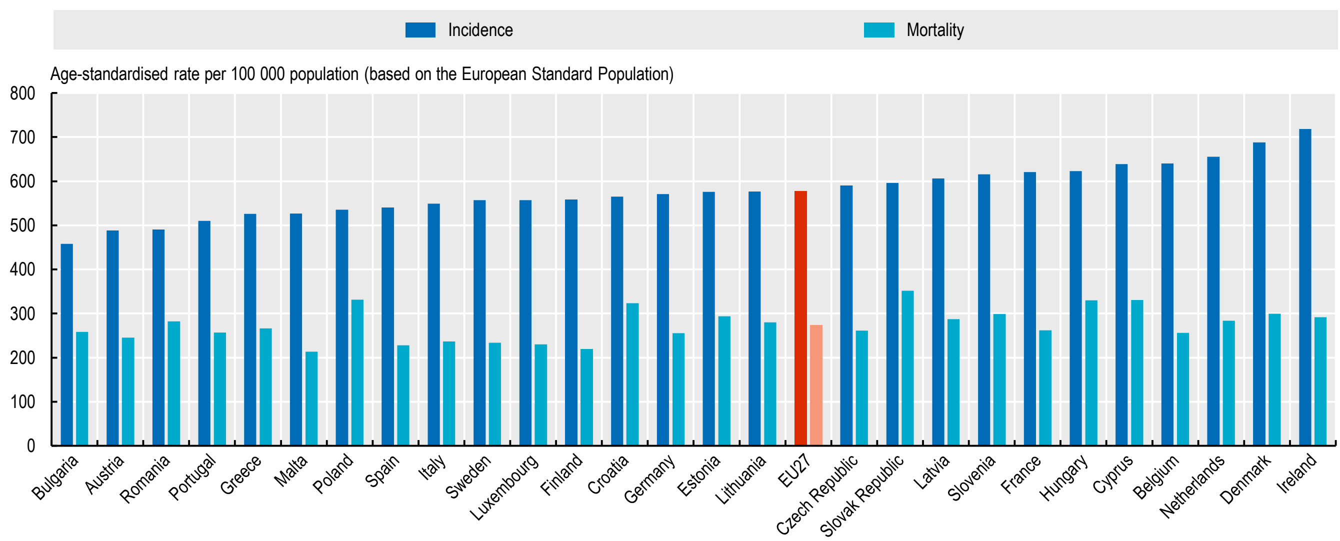
Figure 3.11. **Expected cancer incidence by gender and main causes in EU countries, 2020**



Note: Data include all cancer sites except non-melanoma skin cancer.
Source: ECIS – European Cancer Information System.

StatLink https://stat.link/lwjsmz

Figure 3.12. **Expected cancer incidence and mortality in EU countries, 2020**



Note: The EU average is weighted. Data include all cancer sites except non-melanoma skin cancer.
Source: ECIS – European Cancer Information System.

StatLink https://stat.link/ys3jcg

Poor living conditions and other socio-economic factors affect the health of mothers and newborns, but the quality of health care can greatly reduce the number of infant deaths, particularly by addressing life-threatening issues during the neonatal period (i.e. the first month of life). The main causes of death during the first month are congenital anomalies, prematurity and other conditions arising during pregnancy. For deaths beyond the first month (post neonatal mortality), there tends to be a greater range of causes, with the most common being sudden unexpected death in infancy (Euro-Peristat, 2018).

Infant mortality rates are low in most EU countries, with an average of less than 3.5 deaths per 1 000 live births across EU countries in 2018 (Figure 3.13). However, a small group of countries – Malta, Romania, Bulgaria and the Slovak Republic – still have infant mortality rates of 5 deaths per 1 000 live births or more. In Malta, infant mortality rates are 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.

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 3.4 deaths in 2018. Reductions in infant mortality rates have been particularly rapid in Bulgaria and Romania, converging towards the EU average (Figure 3.14).

Across EU countries, 1 in 15 babies (6.6%) weighed less than 2 500 grammes at birth in 2018 (Figure 3.15). Low birthweight can occur as a result of restricted foetal growth or from pre-term birth. Low birthweight 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 birthweight 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 higher maternal age.

The percentage of low birthweight is more than two-times greater in some EU countries than in others. There is a marked geographical variation that may reflect physiological differences in mothers and babies. The Baltic countries (Estonia, Latvia and Lithuania) and Nordic countries (Finland, Sweden and Denmark) have the lowest proportion of low birthweight babies, whereas some countries in Southern and Eastern Europe (Cyprus, Greece, Bulgaria and Portugal) have the highest proportion.

Between 2010 and 2018, some countries like Austria and the Czech Republic registered substantial reductions in the percentage of low birthweight babies, whereas this share remained fairly stable in most other countries.

Definition and comparability

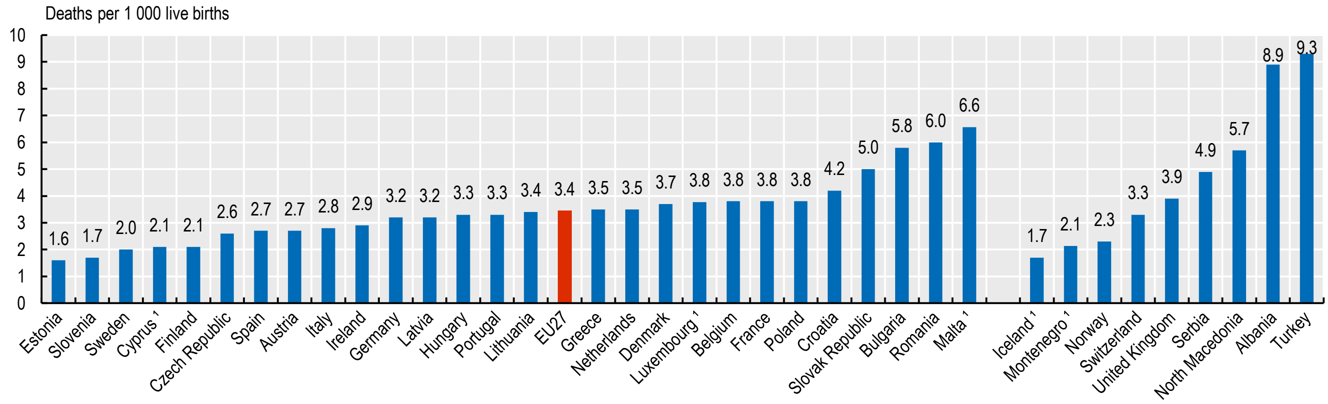
Infant mortality rate is the number of deaths of children under one year of age per 1 000 live births. Some of the international variation in infant and neonatal mortality rates may be due to variations among countries in registering practices of premature infants. While some countries have no gestational age or weight limits for mortality registration, several countries apply a minimum gestational age of 22 weeks (or a birth weight threshold of 500 grammes) for babies to be registered as live births (Euro-Peristat, 2018).

Low birth weight is defined by the World Health Organization as the weight of an infant at birth of less than 2 500 grammes (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 grammes 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, 2018). The number of low weight births is expressed as a percentage of total live births.

Reference

Euro-Peristat (2018), *European Perinatal Health Report: Core indicators of the health and care of pregnant women and babies in Europe in 2015*, November 2018.

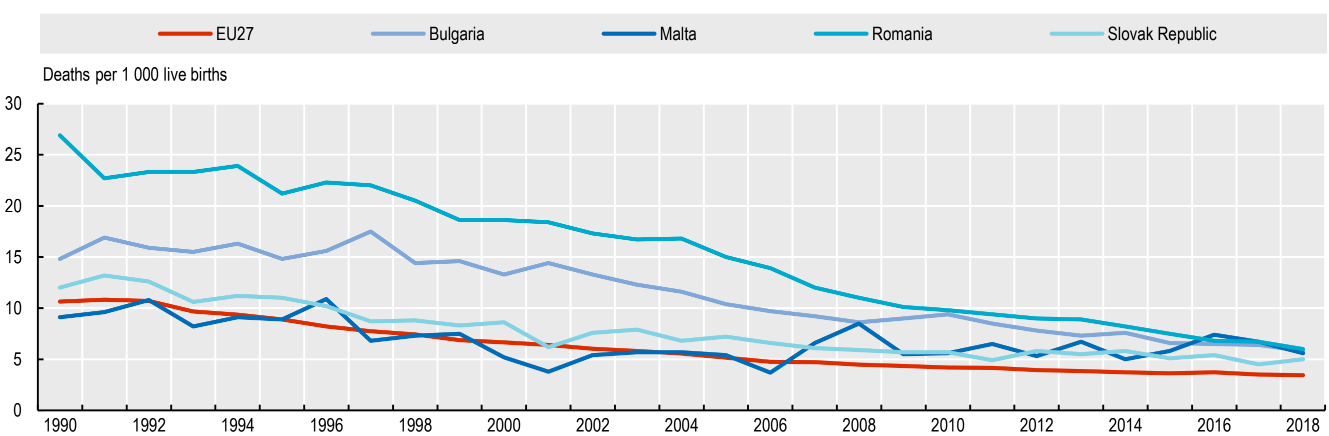
Figure 3.13. **Infant mortality, 2018**



1. Three-year average (2016-18).
Source: Eurostat Database.

StatLink https://stat.link/zrvopy

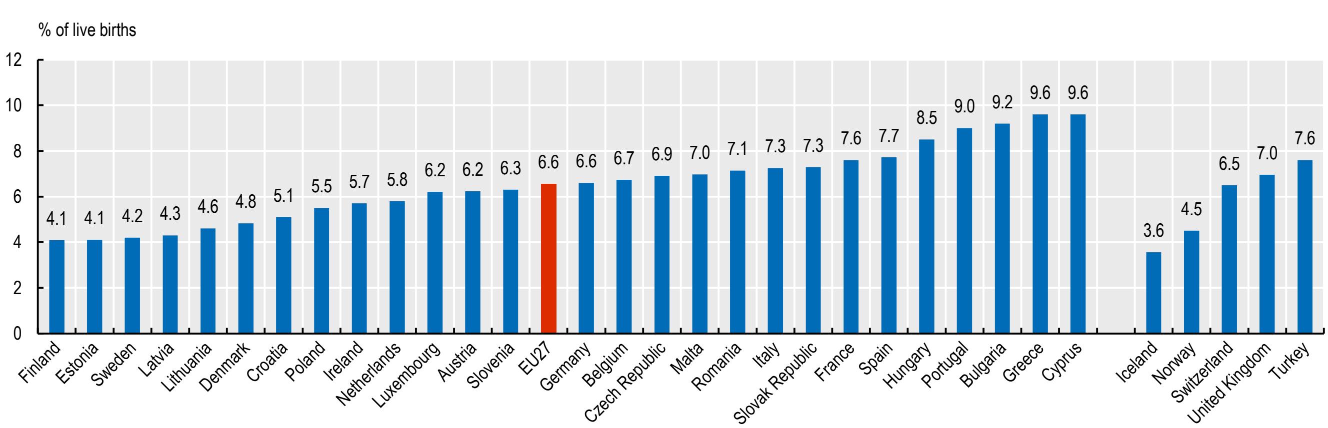
Figure 3.14. **Trends in infant mortality, 1990-2018**



Source: Eurostat Database.

StatLink https://stat.link/rylfi5

Figure 3.15. **Low birthweight, 2018 (or nearest year)**



Source: OECD Health Statistics 2020, Eurostat Database and national sources for Croatia and Cyprus.

StatLink https://stat.link/2yt8db

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 (EC, 2018).

Measles is a highly infectious disease of the respiratory system, caused by a virus, which can lead to severe complications, including pneumonia, encephalitis, diarrhoea and blindness. All EU Member States and other countries around the world have adopted the goal to eliminate measles. In the 12-month period preceding the COVID-19 outbreak (between March 2019 and February 2020), 11 576 cases of measles were reported to the European Surveillance System by the 27 EU countries, Iceland, Norway, Switzerland and the United Kingdom. Following the COVID-19 pandemic and the confinement measures, there has been a sharp decrease in the reporting of measles cases with the number falling to 692 in the six-month period from March to August 2020 in the same group of countries (ECDC, 2020).

The average rate across EU countries in 2019 was 3.9 cases per 100 000 population, but with wide variations (Figure 3.16). Lithuania reported the highest number of new cases and highest rate (29.8 cases per 100 000 population), followed by Bulgaria with a rate of 17.6 per 100 000 population. An outbreak of measles started in 2019 in Lithuania, most notably in the cities of Kaunas and Vilnius. The authorities responded with a large vaccination campaign to contain the outbreak and prevent any future epidemic. Vaccination against measles is very effective, and the vast majority of newly diagnosed people in Europe were not vaccinated. While most measles cases are among infants under one year old as they are often still too young to have received the first dose of vaccine, about 45% of cases occur among adults.

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. About 24 500 hepatitis B cases were reported in EU countries, Iceland, Norway, Switzerland and the United Kingdom in 2018, nearly 10% down from 26 900 cases in 2017 (ECDC, 2020b). Latvia had the highest notification rates, with 1.5 cases per 100 000 population (Figure 3.17). The rates were also high in the Slovak Republic, Malta, Germany, and Spain, the United Kingdom and Turkey.

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. 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 hepatitis B, the data for five countries (France, Greece, Hungary, Lithuania and Spain) only include acute cases, not chronic cases, resulting in a large under-estimation. Variation between countries also likely reflects differences in testing as well as differences in immunisation and screening programmes.

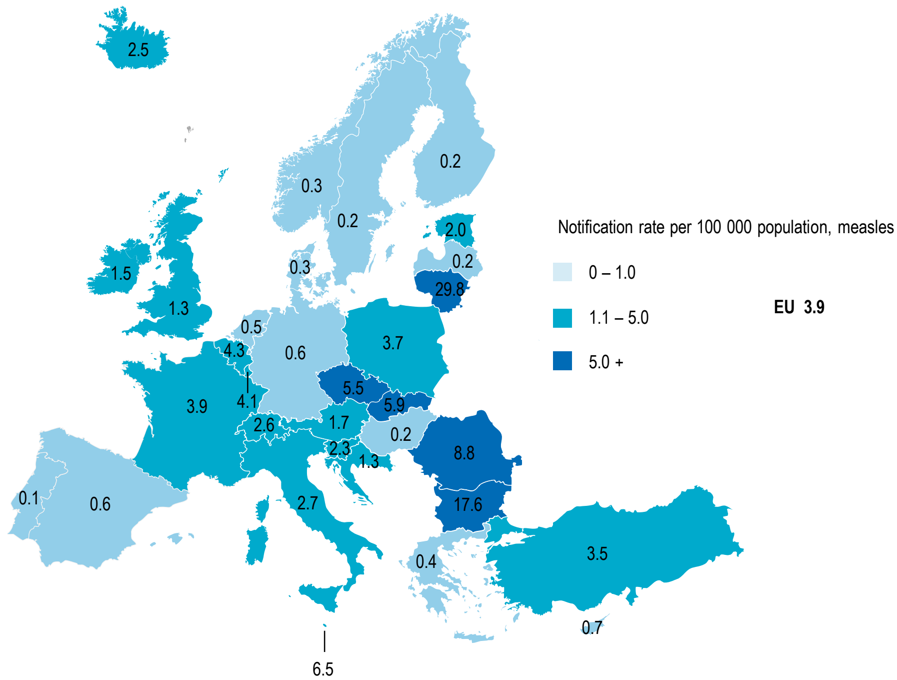
References

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

ECDC (2020a), Communicable Disease Threats Report on Measles, Stockholm.

ECDC (2020b), *Hepatitis B – Annual epidemiological report for 2018*, Stockholm.

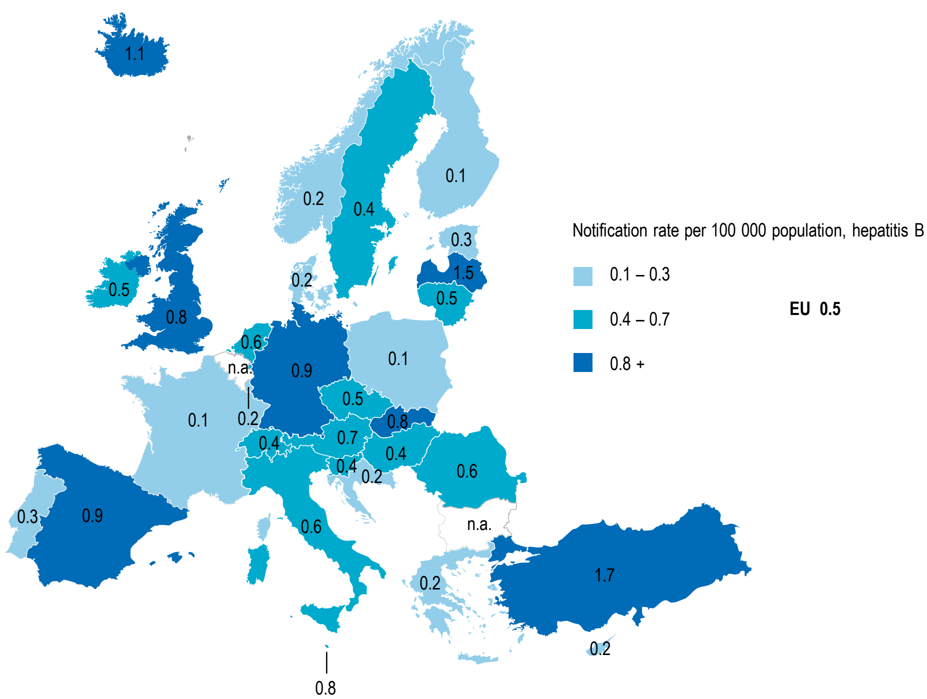
Figure 3.16. **Notification rate of measles, 2019**



Source: ECDC Surveillance Atlas of Infectious Diseases.

StatLink https://stat.link/e3f0ah

Figure 3.17. **Notification rate of hepatitis B, 2018 (or nearest year)**



Note: Data for France, Greece, Hungary, Lithuania and Spain only include acute cases, not chronic cases, resulting in a large under-estimation.
Source: ECDC Surveillance Atlas of Infectious Diseases.

StatLink https://stat.link/xd1o8y

Childhood and adolescence are fundamental phases in human development, when young people develop knowledge and skills to deal with critical aspects of their health, and are also the period during which many mental health problems first emerge. The COVID-19 crisis has significantly disrupted children and adolescents' daily lives, and makes attention to young peoples' health all the more critical (see Chapter 1 on resilience to the COVID-19 pandemic).

Across EU countries in 2018, about one in three 11-year-old girls and less than one in three 11-year-old boys experienced multiple health complaints, such as feeling "low" or irritable, or experiencing headaches, stomach aches or backaches, or having difficulties falling asleep (Figure 3.18). Some of the physical health complaints that adolescents experience, such as stomach ache or headache, can also be signs of psychological distress. In contrast, over one in two 15-year-old girls reported multiple health complaints, a difference of over 20 percentage points compared to 11-year-old girls. The rates of 11-year-olds and 15-year-olds reporting multiple health complaints are highest among boys and girls in Italy, Bulgaria and Malta.

Mental health problems can be associated with major risk factors, such as heavy episodic drinking, tobacco or illicit drug use, unhealthy nutrition and lack of physical activity (see Chapter 4). Behavioural risk factors such as excessive drinking or drug use can both worsen adolescents' mental health, and be used as a coping mechanism in the absence of more effective mental health support, as well as contributing to lasting effects on physical health across the life course (e.g. circulatory diseases and some cancers).

Mental health problems and psychological distress are one important driver of suicide among adolescents. Over 1 000 15-19 year-olds died of suicide across EU countries in 2017, and most of these deaths were among boys. Despite the relatively low absolute number of suicides among adolescents, suicide is one of the leading causes of death in this age group. Young people are more likely to attempt suicide if they have a family history of alcohol and drug abuse disorders, have access to firearms, and experience difficult life events at school or at home (McLoughlin, Gould and Malone, 2015). The number of death by suicide among teenagers has decreased by over one-third on average across EU countries between 2000 and 2017.

In recent years (2015-17), the suicide rate among teenagers was highest in Lithuania and Estonia, with rates of over 11 deaths per 100 000 15-19 year-olds, a rate more than 2.5 times higher than the EU average. The lowest rates are reported in Southern European countries (Greece, Portugal, Cyprus, Italy and Spain). Suicide rates among boys was 2.5 times higher than among girls on average across EU countries (Figure 3.19).

Countries have taken steps to support vulnerable adolescents with mental health problems (McDaid et al., 2017; OECD, 2015). Inter-sectoral strategies encompassing health, education and welfare policies can promote and protect the health and wellbeing of adolescents. School-based mental health programmes have been introduced in many countries and can improve social and educational outcomes. For example, the Youth Aware of Mental Health (YAM) programme is in place in ten European countries and is associated with a 55% reduction in suicide attempts and 50% fewer cases of suicidal ideation after 12 months (Wasserman et al., 2015).

Definition and comparability

The indicator on multiple health complaints is based on the following symptoms experienced in the last six months: headache; stomach ache; backache; feeling low; feeling irritable or bad tempered; feeling nervous; difficulties in getting to sleep; and feeling dizzy. Differences across countries may reflect a different understanding and interpretation of the questions.

Data on multiple health complaints come from the Health Behaviour in School-aged Children (HBSC) study. The HBSC surveys have been undertaken every four years since 1993-94 and now include all EU countries except Cyprus. Data are drawn from school-based samples of 1 500 children in three age groups (11-, 13- and 15-year-olds) in most countries, ensuring that the sample is representative of each age group.

Data on suicide rates come from the Eurostat Database. The registration of suicide is a complex procedure, affected by factors such as how intent is ascertained, responsibility for completing the death certificate, and cultural dimensions including stigma. Caution is therefore needed when comparing suicide rates.

References

Inchley J et al. (2020), *Spotlight on adolescent health and well-being. Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada. International report*, Vol. 2, Key data, Copenhagen: WHO Regional Office for Europe.

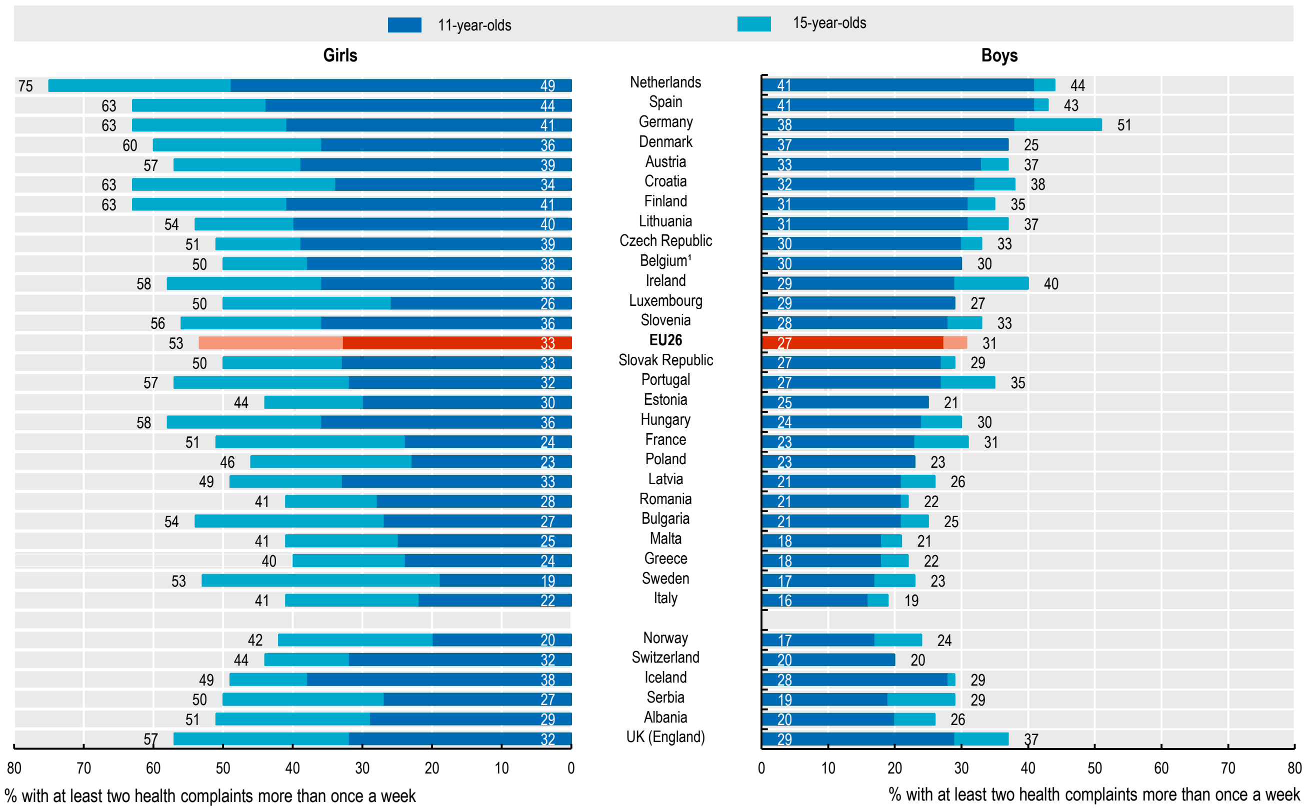
McDaid, D., E. Hewlett and A. Park (2017), "Understanding effective approaches to promoting mental health and preventing mental illness", *OECD Health Working Papers*, No. 97, OECD Publishing, Paris, *https://doi.org/10.1787/bc364fb2-en*.

McLoughlin, A., M. Gould and K. Malone (2015), "Global trends in teenage suicide: 2003-14", *QJM*, Vol. 108/10, *http://dx.doi.org/10.1093/qjmed/hcv026*.

OECD (2015), *Fit Mind, Fit Job: From Evidence to Practice in Mental Health and Work*, Mental Health and Work, OECD Publishing, Paris, *https://doi.org/10.1787/9789264228283-en*.

Wasserman, D et al. (2015), "School-based suicide prevention programmes: The Seyle cluster-randomised, controlled trial", *The Lancet*, Vol. 9/977, pp. 385.

Figure 3.18. **Share of 11- and 15-year-olds reporting multiple health complaints, 2018**

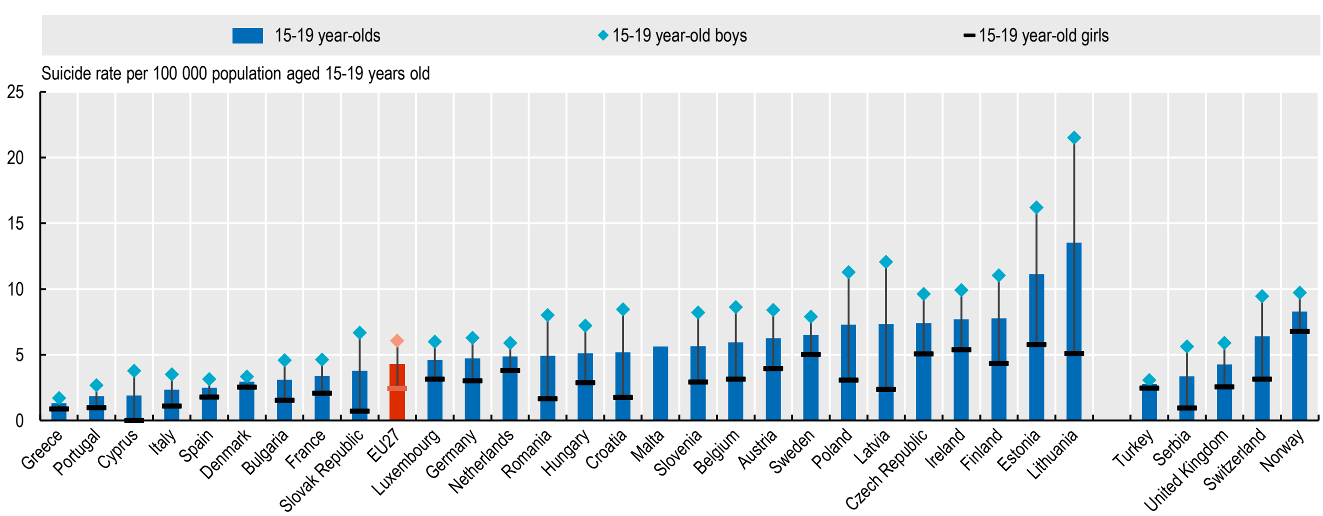


Note: Differences across countries, and especially in Italy, may reflect a different understanding and interpretation of the questions. The EU average is unweighted. The rate for 11-year-old boys is higher than the rate for the 15-year-olds in Romania, Austria and Lithuania. 1. Belgium is the unweighted average of the Flanders region and the French region.

Source: HBSC data from Inchley et al. (2020).

StatLink https://stat.link/ubmvzg

Figure 3.19. **Suicide rate among the 15-19 year-olds, 3-year average, 2015-17 (or nearest years)**



Note: Differences across countries may reflect, at least in part, differences in recording practices. The EU average is weighted. Data refer to a 3-year average (2015-17), except in Cyprus (2015), France (2014-16) and Luxembourg (2014 and 2016 due to missing data in 2015 and 2017).

Source: Eurostat Database.

StatLink https://stat.link/h8mvys

Good mental health is vital for people to be able to lead healthy and productive lives. Living with a mental health problem can have a significant impact on daily life, contributing to worse educational outcomes, higher rates of unemployment, and poorer physical health. As of 2020, the COVID-19 crisis is also having a negative impact on mental wellbeing, especially amongst young people and people with lower socio-economic status (see Chapter 1).

In 2018, one in nine adults (11%) on average across EU countries had symptoms of psychological distress (Figure 3.20). Prevalence ranged from about 5% in Ireland, Poland, Estonia, the Slovak Republic and Finland, to about 20% or over in Croatia and Portugal. While these rates suggest that psychological distress is common in all EU countries, they do not reflect a clinical diagnosis. Self-reported data can be influenced by cultural differences, and different levels of stigma and literacy around mental health.

Without effective treatment and support, mental health problems can have a devastating effect on people's lives, and significantly increase the risk of dying from suicide (OECD/EU, 2018). In 2017, over 48 000 people died of suicide across EU countries. The most frequent number of suicides were amongst men aged 45 and over (Figure 3.21). Gender differences in suicidal behaviour are significant; men represent over three-quarters of suicides in EU countries, though the gender gap is narrower amongst older age groups. In Lithuania, the suicide rate among men was more than five times higher than that for women.

On average, there were 11 deaths by suicide per 100 000 population across EU countries in 2017 (Figure 3.22). Suicide rates were lowest in Cyprus, Greece, Italy and Malta, where there were fewer than six suicides per 100 000 population in 2017. Lithuania and Slovenia had the highest suicide rate, with 26 and 20 deaths per 100 000 population, respectively.

Suicide rates have decreased in almost all EU countries, falling by 50% between 2000 and 2017. In some countries, the declines have been significant, including in Hungary, the Slovak Republic and Bulgaria, where deaths by suicide have fallen by more than 50%.

Effective approaches to reducing death by suicide include good access to support and mental health care; suicide prevention training for gatekeepers such as health workers and community leaders; reducing access to lethal means such as firearms and pharmaceuticals; responsible media reporting around suicide; and awareness and anti-stigma campaigns. Some EU countries include suicide prevention as part of their broader mental health policies, while others such as Ireland, Luxembourg, the Netherlands and Switzerland have specific suicide reduction plans.

In the Netherlands, the National Agenda for Suicide Prevention 2018-21 takes a multi-pronged approach, including suicide prevention training for General Practitioners and hospital nurses, improving aftercare following a suicide attempt, and training for persons in contact with identified high-risk groups such as agencies working with debt relief, unemployment support workers, and the police. In France, suicide prevention includes training for peer workers and General Practitioners, as well as a specific suicide reattempt prevention programme.

In Ireland, too, the National Strategy to Reduce Suicide 2015-20 focuses attention on groups at particular risk of suicide, and persons who have already presented with suicide attempts. Ireland focuses on strengthening pathways to services for people vulnerable to suicidal behaviour, and improving the capacity of community-based organisations to provide appropriate information around suicide and recognising risks.

In Switzerland, the suicide rate has decreased by 64% since 2000. While rates of 'assisted suicide' are rising, mainly in older people, since 2009 assisted suicides have been excluded from overall suicide data, explaining the sharp decline the year the reporting changed. Switzerland has taken steps to reduce deaths by suicide, including a suicide prevention action plan in 2016 that focused on providing fast access to mental health support, reducing stigma around suicide, and raising awareness of suicide risks.

Definition and comparability

The prevalence of psychological distress symptoms is based on EU survey on Statistics on Income and Living Conditions (EU-SILC). Questions are based on the module on mental health of the SF-36 questionnaire. The prevalence is calculated from responses to five items such as "Have you been very nervous over the past four weeks?" on a 5-point scale (0-4) ranging from 'at no time' to 'all of the time'. The scores can amount to a maximum score of 20, which is then multiplied by 5 to get a maximum of 100. Someone is considered with psychological distress symptoms if they scored above 50. Items refer to feeling nervous, feeling down, feeling calm, feeling down-hearted or depressed, and feeling happy. Prevalence is weighted by population size.

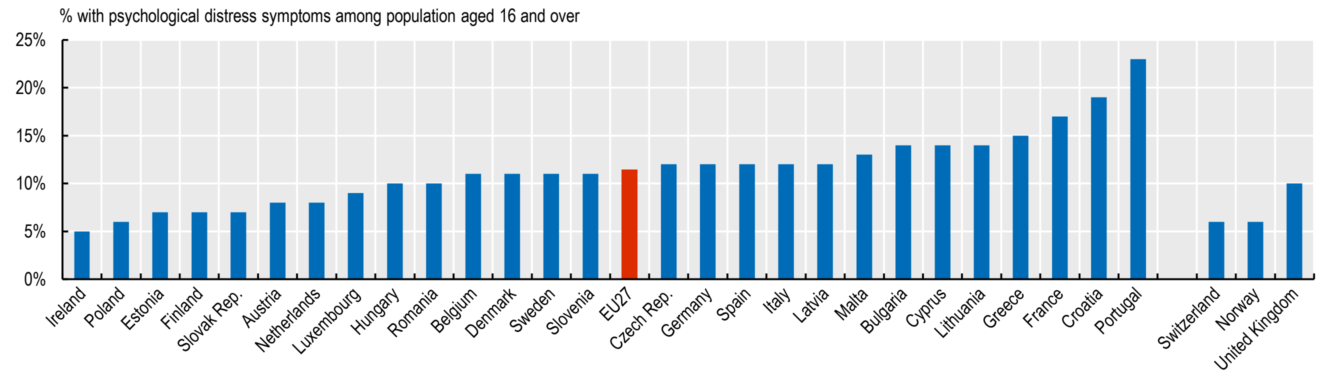
Suicide data come from the Eurostat Database. The registration of suicide is a complex procedure, affected by factors such as how intent is ascertained, who is responsible for completing the death certificate, and cultural dimensions including stigma. Caution is therefore needed when comparing rates between countries.

References

OECD (2015), *Recommendation of the Council on Integrated Mental Health, Skills and Work Policy*, *https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0420*.

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*.

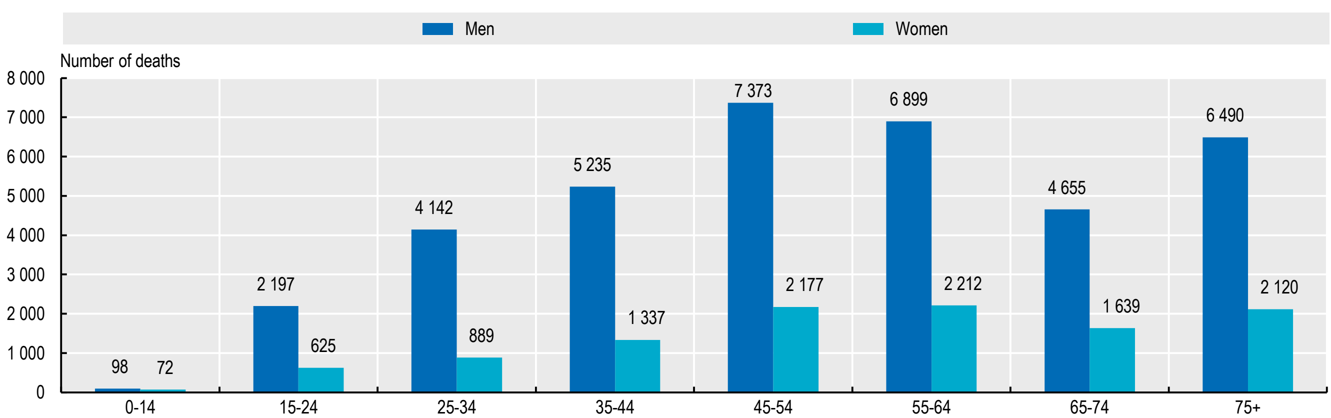
Figure 3.20. **Prevalence of psychological distress symptoms, 2018**



Note: Differences across countries may reflect in part cultural differences. Data are not based on clinical diagnosis. The EU average is unweighted.
Source: OECD calculations based on EU survey on Statistics on Income and Living Conditions (EU-SILC).

StatLink https://stat.link/pcxvjy

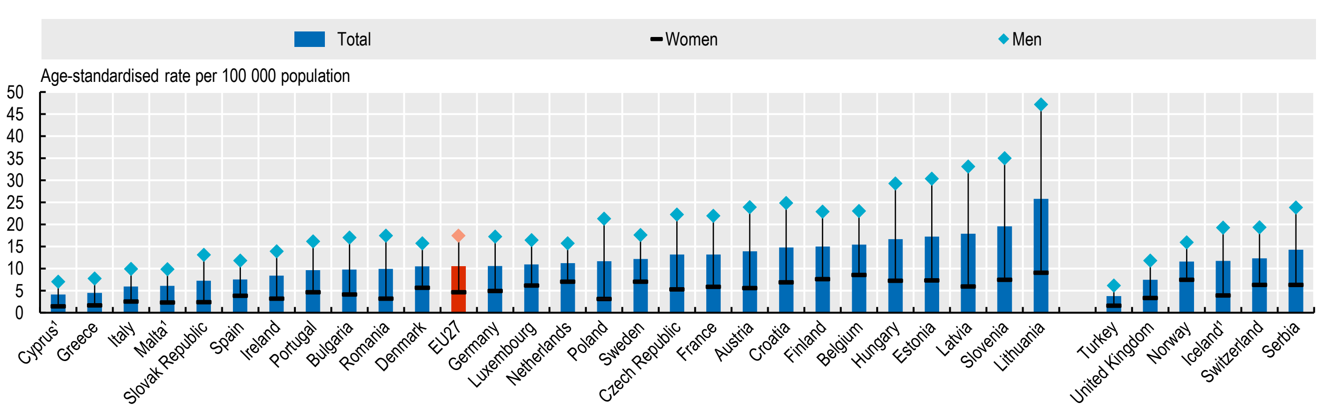
Figure 3.21. **Number of deaths by suicide by age group and gender, EU countries, 2017**



Note: Data refer to 2016 for France.
Source: Eurostat Database.

StatLink https://stat.link/r67ypb

Figure 3.22. **Suicide rates, 2017 (or nearest year)**



Note: Differences across countries may reflect, at least in part, differences in recording practices. The EU average is weighted. 1. 3-year average. Data refer to 2016 for France.
Source: Eurostat Database.

StatLink https://stat.link/9lxke3

Life expectancy has increased greatly in EU countries over the past few decades, but many years of life in old age are lived with some chronic diseases and disabilities (see the indicator Healthy life expectancy). The EU approach to addressing the challenge of chronic diseases involves an integrated response focusing on prevention across sectors, combined with efforts to strengthen health systems to improve the management of chronic conditions (EC, 2020).

Based on the latest wave of the Survey on Health, Ageing and Retirement in Europe (SHARE), about 37% of people aged 65 and over reported having at least two chronic diseases on average across EU countries in 2017 (Figure 3.23). Women report multiple chronic diseases more often than men (41% versus 32% on average). As expected, the prevalence of chronic diseases increases with age. Among people aged 80 and over, 56% of women and 47% of men report multiple chronic diseases on average across EU countries.

There are substantial disparities in the prevalence of chronic diseases by income group. On average across EU countries, 27% of people aged 65 and over in the highest income quintile reported at least two chronic diseases, compared with 46% for those in the lowest income quintile. This reflects to a large extent the cumulative effect of more difficult living and working conditions and greater exposure to various risk factors for chronic conditions earlier in life (OECD, 2017).

Living with chronic diseases does not necessarily hinder older people from carrying on their usual activities. Nonetheless, about 30% of people aged over 65 on average across EU countries reported having at least one limitation in activities of daily living (ADL, including basic activities such as eating or dressing) or instrumental activities of daily living (IADL, including activities such as cooking or doing the laundry) (Figure 3.24). Such limitations in ADLs and IADLs may require long-term care assistance.

Women report more often having at least one ADL or IADL limitation than men in all EU countries (34% of women and 24% of men on average across EU countries). This reflects mainly the fact that women report more chronic diseases with disabling effects, such as arthritis.

The prevalence of activity limitations increases greatly with age: about 45% of people aged 75 years and over report to be limited in their daily activities across EU countries. There are also large disparities in disability by income quintile: on average across EU countries, about 18% of people aged over 65 in the highest income quintile report such activity limitations compared with 43% among those in the lowest income quintile.

The provision of long-term care for people with limitations in ADL or IADL can be very costly. All EU countries have some type of social protection for people requiring long-term care, as most people would not be able to afford the full cost. In many EU countries, the access and level of support to long-term care benefits depend on people's income and asset, and in some countries, on the availability of informal carers. Older people with the most severe needs and limited assistance from informal carers are the most likely to be pushed into poverty or to have to move to LTC facilities (Oliveira Hashiguchi and Llena-Nozal, 2020).

Definition and comparability

The question used in SHARE to measure the prevalence of any chronic disease is "Has a doctor ever told you that you had any of the conditions on this card?" Data reported here include people who report Alzheimer's disease, cancer, chronic kidney diseases, chronic lung diseases, diabetes, heart attack, hip fracture, Parkinson's disease, stroke, rheumatoid arthritis and osteoarthritis.

As for limitations in daily activities, the questions is: "Do you have any difficulty with these activities because of a physical, mental, emotional or memory problem?". Activities of daily living (ADL) or instrumental activities of daily living (IADL) included here relate to limitations in: dressing, walking across the room, bathing/showering, eating, getting in/out of bed, using the toilet, preparing a hot meal, doing the groceries, making telephone calls, taking medications, doing work around the house/garden, managing money, leaving the house independently and doing the laundry. Difficulties expected to last less than three months are excluded.

The prevalence of limitations in daily activities is adjusted by the OECD to correct for the underrepresentation of the population living in LTC facilities (except in Greece and in the Netherlands, resulting in an under-estimation), while the prevalence of chronic diseases excludes those who live permanently in LTC facilities and is not adjusted.

Data are weighted by population size in each country, except in the Netherlands.

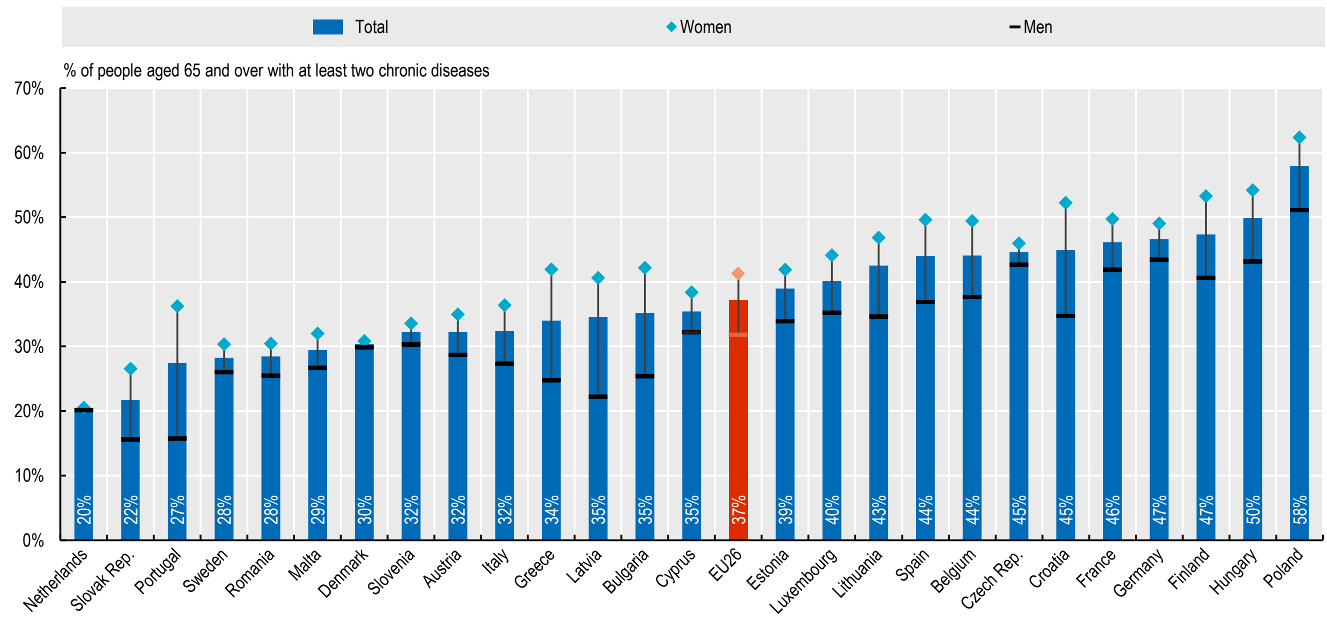
References

EC (2020), "EU integrated approach to non-communicable diseases", *https://ec.europa.eu/health/non_communicable_diseases/overview_en*.

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

Oliveira Hashiguchi, T. and Llena-Nozal, A. (2020), "The effectiveness of social protection for long-term care in old age: Is social protection reducing the risk of poverty associated with care needs?", *OECD Health Working Papers*, No. 117, OECD Publishing, Paris, *https://doi.org/10.1787/2592f06e-en*.

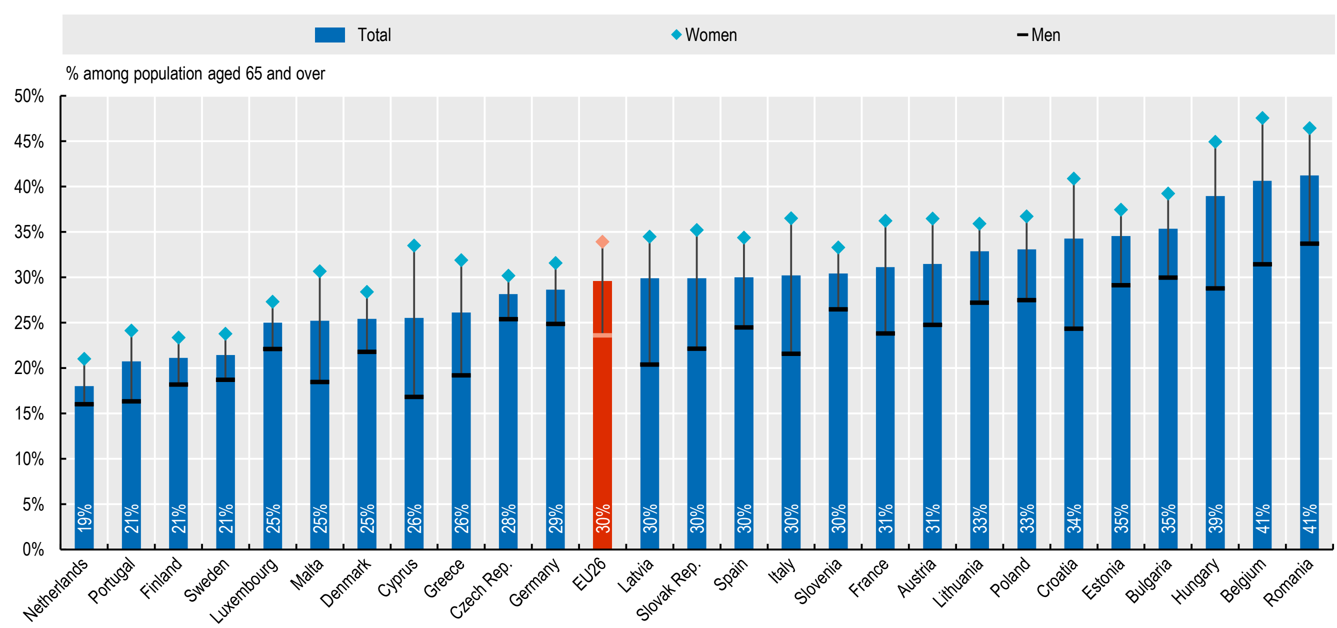
Figure 3.23. **Multiple chronic conditions among people aged 65 and over, by gender, 2017**



Note: The EU average is unweighted. Chronic diseases include Alzheimer's disease, cancer, chronic kidney diseases, chronic lung diseases, diabetes, heart attack, hip fracture, Parkinson's disease, stroke, rheumatoid arthritis and osteoarthritis.
Source: Survey of Health, Ageing and Retirement in Europe (wave 7).

StatLink https://stat.link/s4o93q

Figure 3.24. **Limitations in daily activities among people aged 65 and over, by gender, 2017**



Note: The EU average is unweighted. Prevalence is adjusted to correct for the underrepresentation of people in LTC facilities in SHARE, except in the Netherlands and Greece.
Source: Survey of Health, Ageing and Retirement in Europe (wave 7).

StatLink https://stat.link/regtlj

Diabetes is a chronic condition that occurs when the body is unable to regulate excessive glucose levels. If left undiagnosed or poorly controlled, it can result in serious complications, including blindness, kidney failure and lower limb amputation. Diabetes also increases the risks of cardiovascular diseases, and people with diabetes also have a greater risk of becoming severely ill if infected by the COVID-19 virus. Many diabetic patients also did not get proper management and control of their condition during the initial phase of the COVID-19 pandemic, possibly resulting in avoidable complications.

About 32.3 million adults were diagnosed with diabetes in the European Union in 2019, up from an estimated 16.8 million adults in 2000. An additional 24.2 million people in Europe were estimated to have diabetes but be undiagnosed in 2019 (IDF, 2019). The number of men with diagnosed diabetes has increased particularly rapidly since 2000, more than doubling from around 7.3 million in 2000 to 16.7 million in 2019. The number of women with diabetes has also gone up substantially, rising from 9.5 million in 2000 to 15.6 million in 2019, an increase of over 50% (Figure 3.25). Men are more prone to develop diabetes because of biological factors and have to gain less weight than women to develop the condition.

Diabetes is more common among older people: 19.3 million people aged 60-79 have diabetes across EU countries, compared with 11.3 million people aged 40-59 and only 1.7 million aged 20-39 (Figure 3.26). 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.

Diabetes prevalence among adults (diagnosed and age-standardised) was 6.2% on average in EU countries in 2019. The rates varied from 9% or more in Cyprus, Portugal, and Germany to less than 4% in Ireland and Lithuania (Figure 3.27). The prevalence of diabetes appears to have stabilised in many European countries in recent years, especially in Nordic countries, although they have continued to go up slightly in Southern European countries and Central and Eastern European 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 results from the 2014 European Health Interview Survey, 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. However, the prevalence of important risk factors for diabetes such as obesity is much higher among the least-educated people (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 2019 in the EU, with the average expenditure per diabetic adult estimated at about EUR 3 000 per year (IDF, 2019).

Type 2 diabetes is largely preventable. A number of risk factors, such as overweight and obesity, nutrition and physical inactivity, are modifiable through effective preventive strategies and lifestyle changes. Effective management of the growing number of people with diabetes is also a priority in many countries, usually involving a considerable amount of self-care. Therefore, proper advice and education are central to the primary care of people with diabetes (OECD, 2020).

Definition and comparability

The sources and methods used by the International Diabetes Federation are outlined in the Diabetes Atlas, 9th edition (IDF, 2019). The IDF produced estimations based on a variety of sources of which the majority was peer-reviewed articles and national health surveys. 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 WHO. The data include adults with Type 1 or Type 2 diagnosed diabetes.

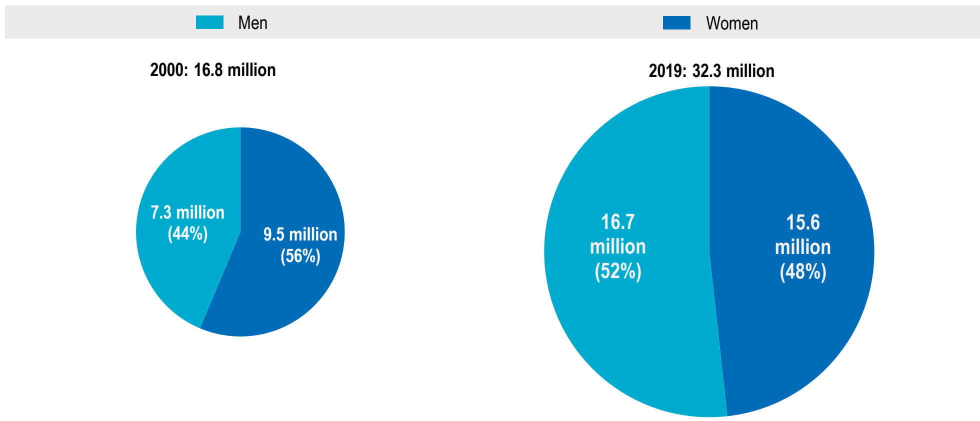
References

IDF (2019), *Diabetes Atlas, 9th 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*.

OECD (2020), *Realising the Potential of Primary Health Care*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/a92adee4-en*.

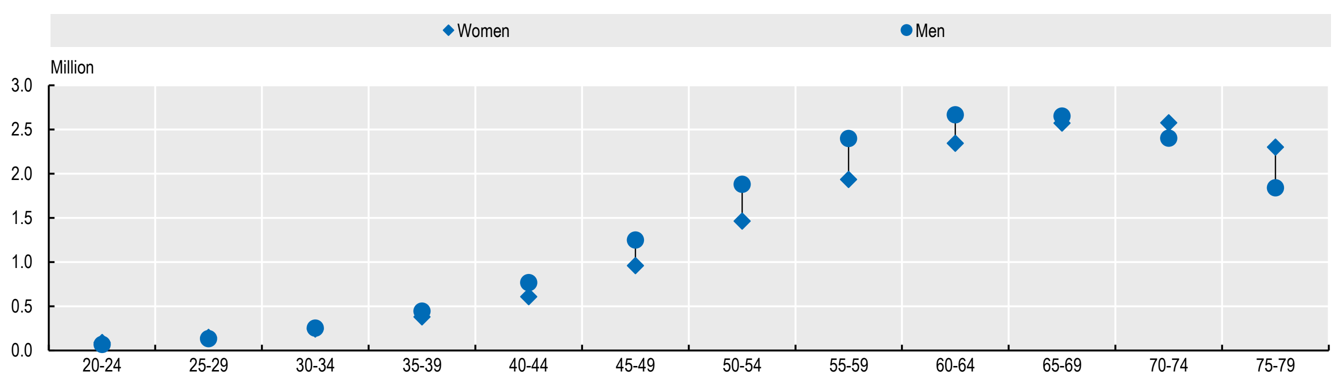
Figure 3.25. **Number of people with diabetes in EU27, 2000 and 2019**



Note: Data include people aged 20-79 with Type 1 or Type 2 diabetes. The number of people with diabetes in 2000 has been estimated for some countries due to data gaps.
Source: IDF Atlas, 9th Edition, 2019 and OECD estimates.

StatLink https://stat.link/u4i1ze

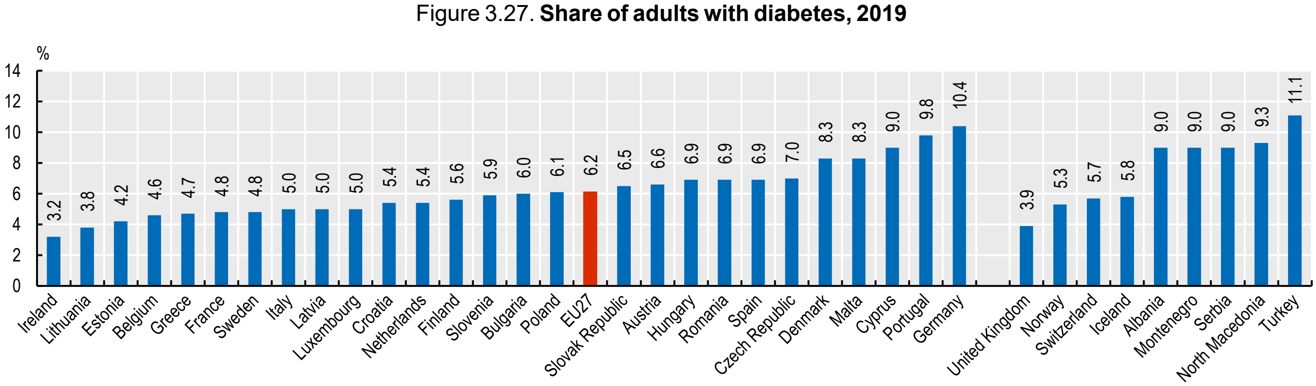
Figure 3.26. **People with diabetes in EU27, by gender and age group, 2019**



Note: Population with Type 1 or Type 2 diabetes. Data are only available up to 79 years old.
Source: IDF Atlas, 9th Edition, 2019.

StatLink https://stat.link/n1dm63

Figure 3.27. **Share of adults with diabetes, 2019**



Note: Age-standardised prevalence of population aged 20-79 with Type 1 or Type 2 diabetes. The EU average is unweighted.
Source: IDF Atlas, 9th Edition, 2019.

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Health at a Glance: Europe 2020
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PART II

Chapter 4

Risk factors

This chapter focuses on modifiable risk factors to health, including smoking, alcohol consumption, illicit drug use, unhealthy nutrition, lack of physical activity and obesity. Despite progress in reducing smoking rates over the last decades, about one-fifth of adults still smoke every day and tobacco consumption remains the largest behavioural risk factor to health, accounting for about 700 000 deaths per year across EU countries. Alcohol consumption is responsible for another 255 000 to 290 000 deaths per year across EU countries. While alcohol control policies have achieved progress in reducing overall alcohol consumption, heavy alcohol consumption remains an issue among a sizeable share of adolescents and adults: more than one in five adolescents aged 15 report having been drunk more than once in their life and one-third of adults report regular heavy drinking. The use of illicit drugs is another important public health issue in Europe: about 15% of young people aged 15 to 34 report having used cannabis in the last year. Weight problems are widespread in most EU countries, with nearly one in five adolescents overweight or obese on average across EU countries in 2018 and more than one in six adults obese. Overweight and obesity is driven by unhealthy nutrition habits and lack of physical activity. Only one in seven 15-year-olds on average across EU countries report doing at least moderate physical activity at least one hour daily, and less than half report eating at least one fruit or vegetable per day. Large socio-economic inequalities exist for most risk factors to health. For example, overweight and obesity rates among children and adolescents are 50% greater among those living in the least affluent families than those living in the most affluent.

Childhood and adolescence is a period of experimentation, sometimes linked to engagement in behaviours that are harmful for health, including tobacco consumption and the use of illicit drugs. Children and adolescents who smoke tobacco are more likely to become regular tobacco smokers in adulthood. Tobacco smoking in childhood and adolescence has both immediate and long-term health consequences, increasing the risks of respiratory diseases like asthma in the short term and the risks of cardiovascular diseases, respiratory illnesses and cancer in the long term.

While in recent years tobacco smoking among adolescents has continued to decline in most EU countries, too many adolescents still smoke. On average across EU countries, more than one in six (18%) 15-year-olds reported having smoked cigarettes at least once in the past month in 2018 (Figure 4.1). This proportion reached a high of more than one in four in Bulgaria, Lithuania and Italy. Less than one in eight reported to have smoked cigarettes in the past month in Ireland, Portugal, Malta, Sweden and Belgium. Smoking rates among 15-year-olds have decreased since 2014 in almost all EU countries, except in Spain, Bulgaria and Lithuania. The largest reductions occurred in Croatia and France, although another survey shows a smaller reduction in these two countries between 2007 and 2015 (ESPAD Group, 2016).

The gap in tobacco smoking between 15-year-old boys and girls is fairly small in most countries. On average, a slightly greater proportion of 15-year-old girls reported smoking in 2018 (19% compared with 17% for boys).

Over the last few decades, a mix of policies including increased taxes on tobacco products, smoking bans in indoor public places, restrictions on youth purchase of tobacco, advertising restrictions, plain packaging of tobacco products, and greater investment in education about the health consequences of tobacco use have contributed to reducing smoking rates among children and adolescents.

The EU Tobacco Products Directive (2014/40/EU) banned the sale of cigarettes with characterising flavours, such as menthol, starting in May 2020. Legislation stemming from this EU Directive may contribute to further reducing tobacco smoking among adolescents and young adults, since they tend to be the main target market for these products. Across EU countries, about one in ten 15-24 year-olds who smoked on a regular basis were opting for menthol cigarettes in 2017, a proportion much greater than among older population groups (European Commission, 2017).

This EU Directive also contains provisions concerning the production and sales of e-cigarettes, including maximum nicotine concentration and compulsory health warnings advising consumers that e-cigarettes also contain nicotine. In 2017, a quarter of 15-24 year-olds across EU countries reported having tried e-cigarettes at least once, although regular use tends to be fairly low (European Commission, 2017).

Smoked cannabis is by far one of the most used drugs among adolescents. Frequent and heavy cannabis use during adolescence is linked to long-term increased risk of dependence and cognitive functioning problems, including memory losses and attention deficits.

On average in EU countries, 1 in 14 (7%) 15-year-olds reported smoking cannabis at least once in the past month in 2018 (Figure 4.2). This proportion ranged from over 10% in Bulgaria, Slovenia and Italy to less than 5% in Finland, Denmark, Romania, Portugal and Sweden. Cannabis use has decreased since 2014 in about half of EU countries, whereas it increased in the other half. The largest decreases have occurred in France, Poland and Denmark, with drops of over 4 percentage points.

A greater proportion of 15-year-old boys report smoking cannabis than girls in all EU countries (9% of boys and 6% of girls on average in 2018).

EU countries use a mix of approaches to reduce cannabis consumption among adolescents, combining legal controls of drug dealers and users, education and public awareness programmes of the health risks of drug use, and treatments for young people who have developed addictions.

Definition and comparability

The data come from the Health Behaviour in School-aged Children (HBSC) study. The HBSC surveys have been undertaken every four years since 1993-94 and now include all EU countries except Cyprus. Data are drawn from school-based samples of 1 500 children in three age groups (11-, 13- and 15-year-olds) in most countries, ensuring that the sample is representative of each age group. The data relate to the proportion of adolescents reporting to have smoked a cigarette or cannabis at least once in the past month.

The data source on cannabis use in this edition of *Health at a Glance: Europe* is different from the one used in the previous edition in 2018, which was based on the European School Survey Project on Alcohol and Other Drugs (ESPAD). This explains the difference in results.

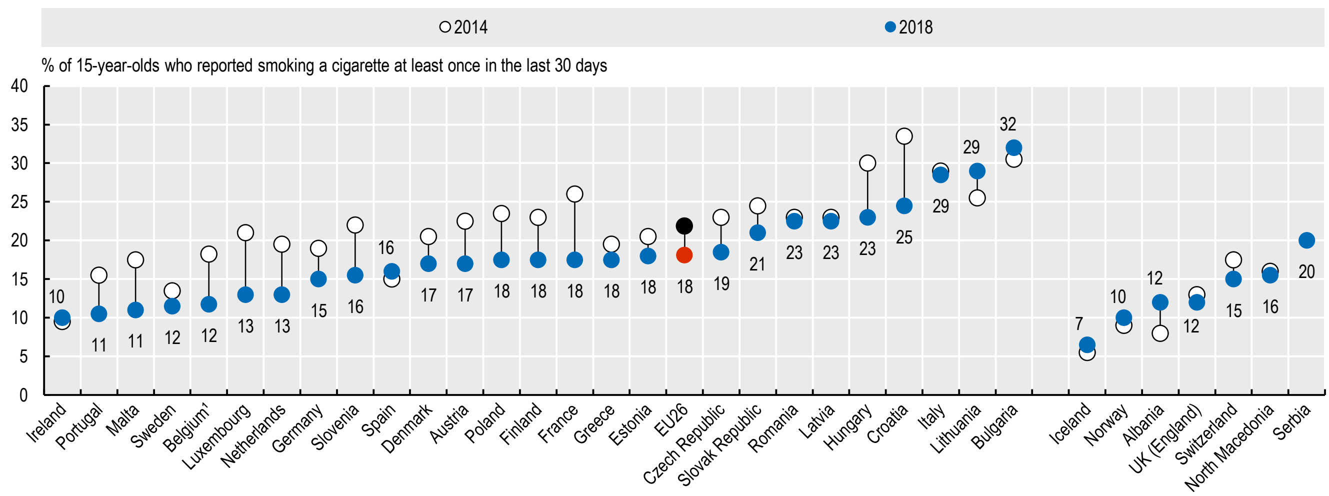
References

European Commission (2017), *Attitudes of Europeans towards tobacco and electronic cigarettes, special Eurobarometer 458*, Wave EB87.1, TNS opinion & social.

ESPAD Group (2016), *ESPAD Report 2015: Results from the European School Survey Project on Alcohol and Other Drugs*, EMCDDA and ESPAD.

Inchley, J. et al. (2020), *Spotlight on adolescent health and well-being: Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada*, International report, Vol. 2, Key data, WHO Regional Office for Europe, Copenhagen.

Figure 4.1. **Tobacco smoking rates among 15-year-olds, 2014 and 2018**



Note: The EU average is unweighted. 1. The value for Belgium is the unweighted average of the Flemish and French Communities.
Source: HBSC data from Inchley et al. (2020).

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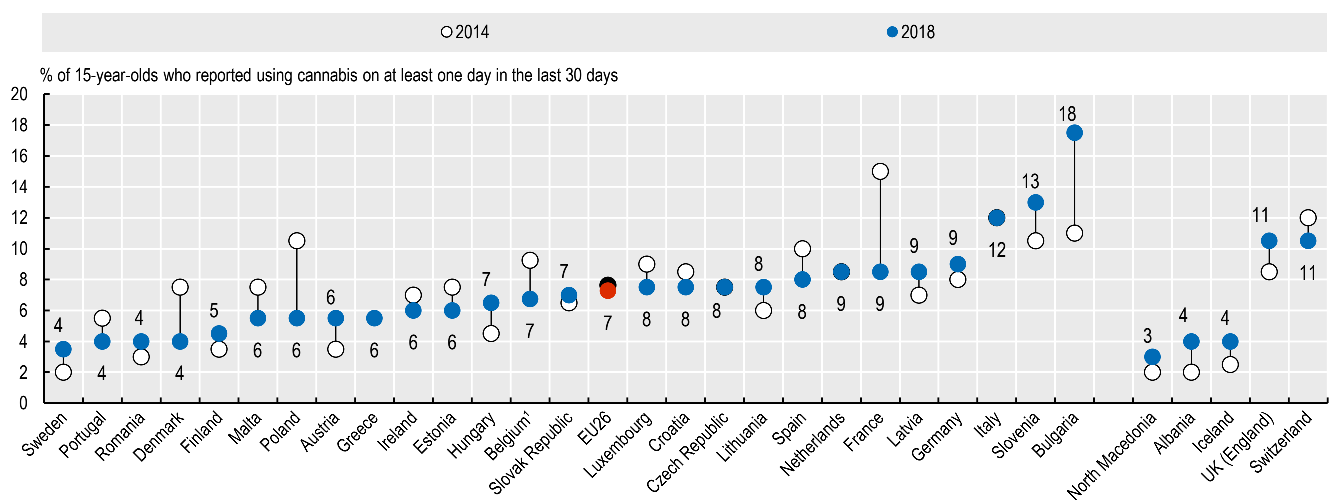
Figure 4.2. **Cannabis smoking rates among 15-year-olds, 2014 and 2018**



Note: The EU average is unweighted. 1. The value for Belgium is the unweighted average of the Flemish and French Communities.
Source: HBSC data from Inchley et al. (2020).

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Tobacco consumption is the largest avoidable behavioural risk factor to health in the European Union and the most significant cause of premature death across EU countries, accounting for about 700 000 deaths per year. Around half of smokers die prematurely, dying 14 years earlier on average (European Commission, 2020). 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 severe chronic respiratory diseases.

Despite some progress in reducing smoking rates over the last decade, more than one in five adults still smoked daily in 2018 on average across EU countries. The proportion of adults who smoke daily varies more than three-fold across countries. It is lowest in Nordic countries (Sweden, Finland, as well as Iceland and Norway) and highest in Greece, Bulgaria and Hungary (Figure 4.3). Nordic countries, the Netherlands, Ireland and Estonia have achieved the largest reductions in smoking among adults over the past decade.

Tobacco consumption remains more common among men than women in all EU countries, but there is virtually no gender gap in the United Kingdom, Norway and Iceland (Figure 4.4). About one in four men and one in six women smoke daily on average in EU countries. This gender gap is particularly large in Lithuania, Cyprus and Romania.

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

The EU Tobacco Products Directive (2014/40/EU) requires health warnings to 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). Many European countries (e.g. Belgium, France, Hungary, Ireland, Slovenia, the United Kingdom and Norway) have also adopted a plain packaging policy to reduce smoking attractiveness in recent years.

According to the tobacco control scale from the Association of European Cancer Leagues, the United Kingdom, France, Ireland, Iceland and Norway were the top five European countries with the most comprehensive tobacco control policies in 2019. Slovenia, Greece and Austria achieved the greatest progress in recent years in adopting tobacco control measures (Joossens et al., 2020). Slovenia notably introduced a plain packaging policy, advertising and display ban at sales points, permits for sale, and smoking ban in private cars when minors are present. In Austria, a smoke free legislation in public places was adopted and started to be implemented in 2019, following a decade-long debate, bringing the country's law in line with most other EU countries. In Greece, a new smoke-free legislation was also adopted in 2019 to update and expand the previous legislation from 2010, including greater fines for people and establishments violating the law.

Increasing taxes on tobacco is one of the most effective ways to reduce tobacco use and to encourage users to quit smoking (WHO, 2017). A number of EU countries recently increased taxes on tobacco products. For example, France increased taxes on a pack of 20 cigarettes by nearly EUR 1 on average in 2018, contributing to a reduction in cigarettes sales of 9% in that year. In 2019, taxes on tobacco increased further, resulting in an average retail price increase of 50-60 cents for a 20-cigarette pack. In early 2020, taxes on cigarettes in Europe were highest in Ireland, the United Kingdom, France and Finland and lowest in Bulgaria, Poland, the Slovak Republic and Romania (Tax Foundation, 2020).

Definition and comparability

The proportion of daily smokers is defined as the percentage of people 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.

References

European Commission (2020), *Tobacco*, *https://ec.europa.eu/health/tobacco/overview_en*.

European Commission (2017), *Attitudes of Europeans towards tobacco and electronic cigarettes, special Eurobarometer 458, Wave EB87.1*, TNS opinion & social.

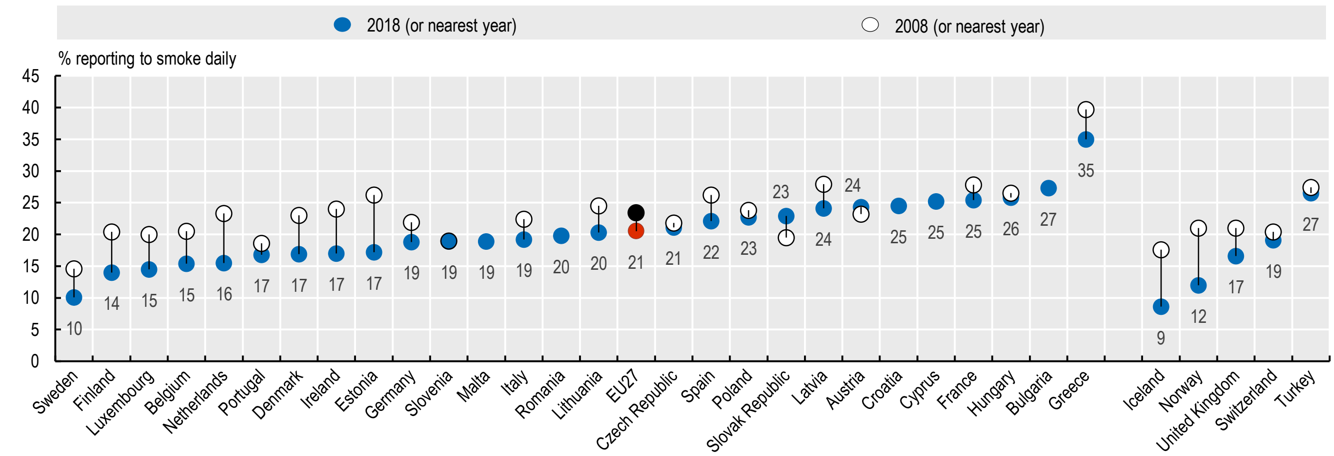
European Commission (2014), *Tobacco Products Directive, Brussels*, *http://ec.europa.eu/health/tobacco/products/index_en.htm*.

Joossens et al. (2020), *The Tobacco Control Scale 2019 in Europe. Brussels: Association of European Cancer Leagues*, Catalan Institute of Oncology.

Tax foundation (2020), *Cigarette taxes in Europe*, *https://taxfoundation.org/cigarette-taxes-in-europe-2020/*.

WHO (2017), *WHO report on the global tobacco epidemic, 2017: Monitoring tobacco use and prevention policies*, Geneva.

Figure 4.3. **Changes in daily smoking rates among adults, 2008 and 2018 (or nearest year)**



Note: The EU average is unweighted.

Source: OECD Health Statistics 2020 (based on national health interview surveys), complemented with Eurostat (EHIS 2014) for Bulgaria, Croatia, Cyprus, Malta, and Romania.

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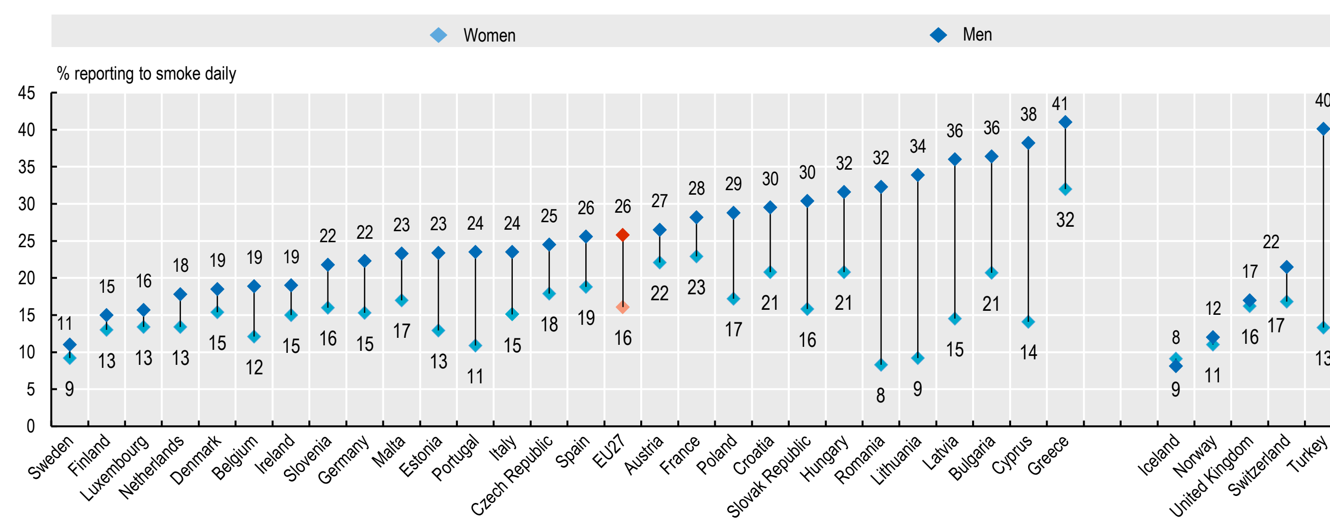
Figure 4.4. **Gender gap in daily smoking rates among adults, 2018 (or nearest year)**



Note: The EU average is unweighted.

Source: OECD Health Statistics 2020 (based on national health interview surveys) complemented with Eurostat (EHIS 2014) for Bulgaria, Croatia, Cyprus, Malta, and Romania.

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Alcohol use in adolescence continues to be very common in Europe with two in three adolescents aged 15 years old having tried alcohol at least once in their life in 2018, although the proportion of adolescents reporting to have been drunk more than once in their life has decreased in recent years (Figure 4.6).

Drinking initiation and heavy drinking in adolescence are of particular concern, since these can have severe health, education and social consequences. Despite the fact that the legal drinking age in most EU countries is 18, on average two-thirds of European adolescents report having drunk alcohol at least once in their life by age 15, and over 20% report having been drunk more than once in their life (Inchley et al, 2020). Adolescents who report early exposure to alcohol and having been drunk multiple times are more likely to develop problematic alcohol use and dependence later in life (Spear, 2015).

More than 30% of 15-year-olds in Hungary, Austria, Lithuania and Denmark reported having been drunk more than once in their life in 2018, compared with 10% or less in Romania and Luxembourg (Figure 4.5). Boys are more likely than girls to report repeated drunkenness in most EU countries (24% versus 20% on average across EU countries), with the biggest differences in Croatia, Malta and Denmark. By contrast, in Ireland, Poland, Spain and Sweden, a greater proportion of girls report having been drunk more than once.

On a positive note, the proportion of 15-year-olds reporting repeated drunkenness has declined in most EU countries over the past two decades, decreasing on average from 41% to 24% among boys, and from 29% to 20% among girls between 1998 and 2018 (Figure 4.6). Focusing on the most recent trends, between 2014 and 2018, the proportion of adolescents who reported having been drunk more than once has decreased significantly in most countries, although it has increased in Austria, Germany and Denmark.

A number of policies have proven to be effective to reduce alcohol use among adolescents, such as limiting accessibility to alcohol (e.g. through restrictions on location and hours of sales, and raising the minimum legal age for drinking), increasing prices (through taxation or minimum pricing of alcohol units), regulating advertisement in traditional and social media, and restricting industry sponsorship of sport and youth events. Taxes on alcoholic beverages exist in all EU countries. However, despite the existence of a common EU-wide legal framework, tax levels vary widely across countries and by beverage type. When it comes to advertising on social media and the internet, the most common type of regulation across EU countries relates to restrictions on the content and/or the placement of advertising, although some countries have gone further and adopted advertising bans on social media (e.g. Norway). Regarding industry sponsorship of sport and youth events, about one-third of European countries report having voluntary agreements in place, while one-quarter have no restrictions (WHO, 2019).

Definition and comparability

The data source is the Health Behaviour in School-aged Children (HBSC) survey. The HBSC survey has been collecting comparable data on alcohol use among 11-, 13- and 15-year-old students every four years since 1993-94 in nearly all EU countries with the exception of Cyprus. Repeated drunkenness is defined as having experienced drunkenness at least twice in life.

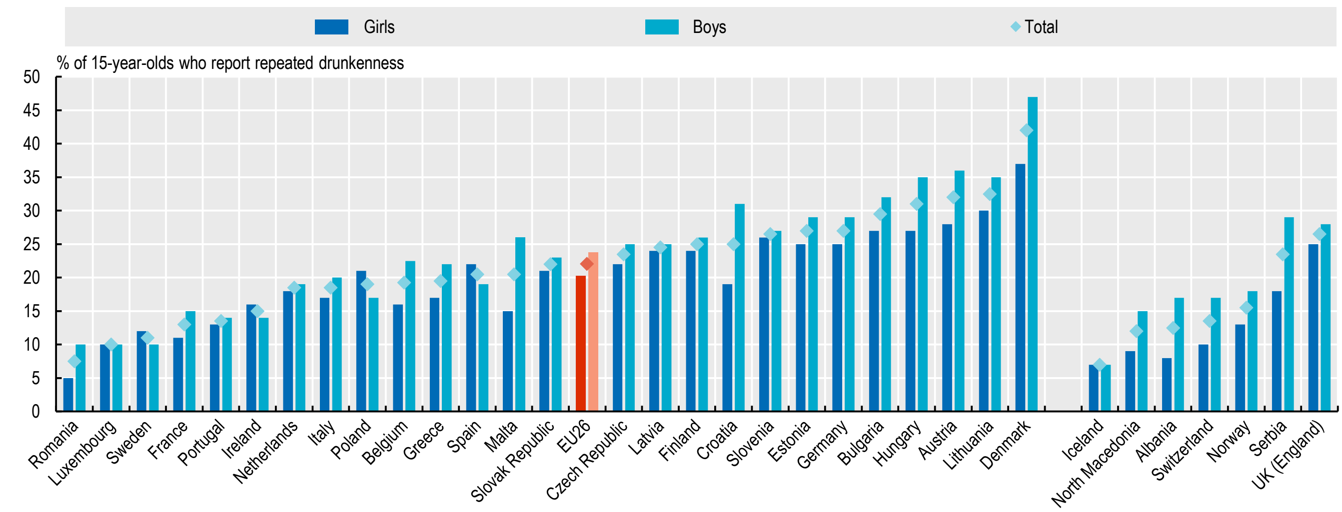
References

Inchley, J. et al. (2020), *Spotlight on adolescent health and well-being: Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada,* International report, Vol. 2, Key data, WHO Regional Office for Europe, Copenhagen.

Spear, L.P. (2015), “Adolescent alcohol exposure: are there separable vulnerable periods within adolescence?”, *Physiology & Behavior*, 148, pp. 122-130, *https://doi.org/10.1016/j.physbeh.2015.01.027*.

WHO (2019), *Status report on alcohol consumption, harm and policy responses in 30 European countries 2019*, WHO Regional Office for Europe, Copenhagen.

Figure 4.5. **Share of repeated drunkenness among 15-year-olds, 2018**



Note: The EU average is unweighted. The value for Belgium is the unweighted average of the Flemish and French Communities.
Source: HBSC data from Inchley et al. (2020).

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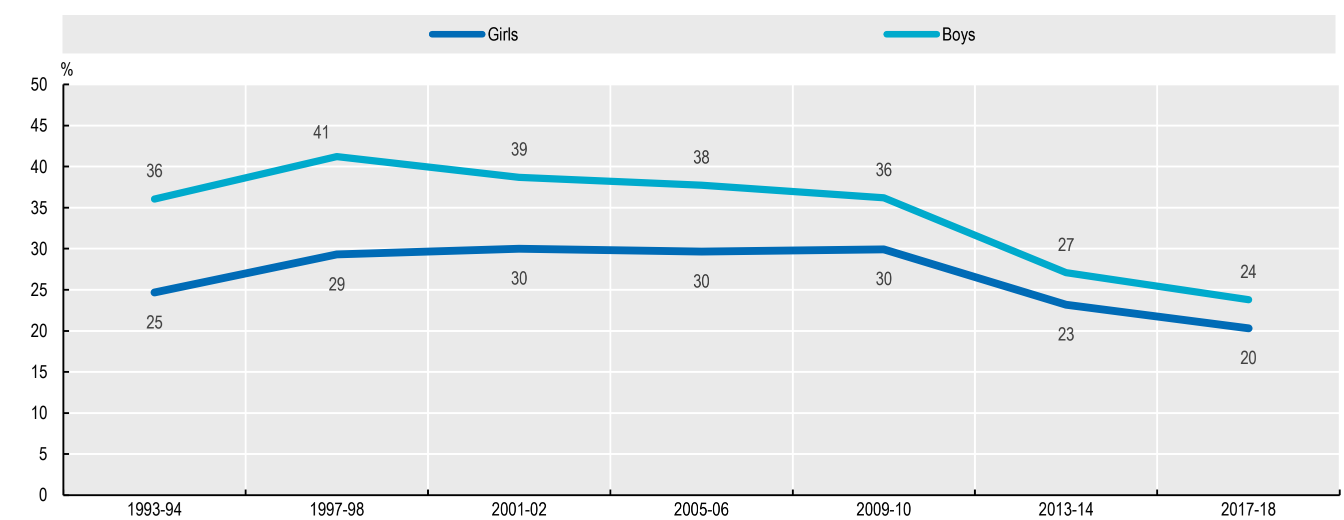
Figure 4.6. **Trends in repeated drunkenness among the 15-year-olds, EU average, 1993 to 2018**



Source: HBSC data from Inchley et al. (2020).

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Alcohol-related harm is a major public health issue in the European Union. Alcohol use is responsible for some 255 000 to 290 000 deaths each year across EU countries (WHO, 2019; IHME, 2019). High alcohol consumption is associated with increased risk of heart diseases and stroke, liver cirrhosis, certain cancers and foetal alcohol disorders, but even moderate alcohol consumption increases the long-term risk of developing such diseases. Alcohol also contributes to morbidity and mortality through accidents and injuries, violence, homicide and suicide.

Measured through sales data, overall alcohol consumption stood at 10 litres of pure alcohol per adult on average across EU countries in 2018, down from 11 litres in 2008 (Figure 4.7). Latvia and Austria have the highest level of alcohol consumption, with over 12 litres per adult, followed by the Czech Republic, France, Bulgaria, Lithuania and Luxembourg, with over 11 litres per adult. Greece, Sweden, Italy and Malta have relatively low levels of consumption, below 8 litres of pure alcohol per adult.

Over the past decade, alcohol consumption has decreased in most EU countries, with the largest reductions in Estonia, Greece and Lithuania (reductions of about 3 litres per adult). It has slightly increased in Bulgaria, Latvia and Malta, although it remains well below the EU average in Malta.

Although overall alcohol consumption per capita is a useful measure to assess long-term trends, it is also important to consider drinking patterns across population groups to identify those who drink the most and are most at risk of alcohol-related disorders. Men consume about four times more alcohol than women on average across EU countries (WHO, 2019). Beyond quantity, drinking frequency and intensity are also crucial to measure the extent of harmful consumption. In 2016, one-third (33%) of adults on average across EU countries reported having had six drinks or more on a single occasion during the last month (Figure 4.8). This proportion was three times higher among men than women (51% compared with 17%). Men and women in Lithuania, Luxembourg, Latvia, the Czech Republic and Estonia were more likely to report episodic heavy drinking, with the proportion reaching over 40%. Heavy drinking is on the rise in many countries among young adults and women especially. Men in lower socio-economic groups are also more likely to drink heavily than those in higher socio-economic groups, while it is the opposite for women (OECD, 2015).

Many European countries have implemented a range of policies to limit alcohol consumption, including taxation, restrictions on the availability of alcohol, bans on alcohol advertising, and public health campaigns (OECD, 2015). Recent innovative measures include minimum unit pricing, regulation of digital alcohol marketing, and alcohol labelling. Minimum pricing of alcohol units, introduced in Scotland in 2018, has been associated with a reduction in alcohol purchases, especially among households that bought the most alcohol (O'Donnell et al, 2019).

The confinement measures following the COVID-19 pandemic in the first half of 2020 had at least a temporary impact on people's lifestyle and drinking habits. Different population groups reported either an increase or a decrease in alcohol use. In France and Belgium, the closure of bars and restaurants during the lockdown was associated with an overall reduction in alcohol consumption, especially among young adults. At the same time, other population groups (such as people aged 35-50 and parents of young children) reported having drunk more than usual during the confinement period (Sciensano, 2020; Santé Publique France, 2020).

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 illegal 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.

The proportion of heavy episodic drinkers is defined as the share of adults aged 15 years and over who reported having had at least 60 grammes or more of pure alcohol (6 drinks or more) on at least one occasion in the past 30 days.

References

IHME (2019), GBD Results Tool, *http://ghdx.healthdata.org/gbd-results-tool*.

O'Donnell, A. et al. (2019), "Immediate impact of minimum unit pricing on alcohol purchases in Scotland: controlled interrupted time series analysis for 2015-18", *BMJ*, p. l5274, *http://dx.doi.org/10.1136/bmj.l5274*.

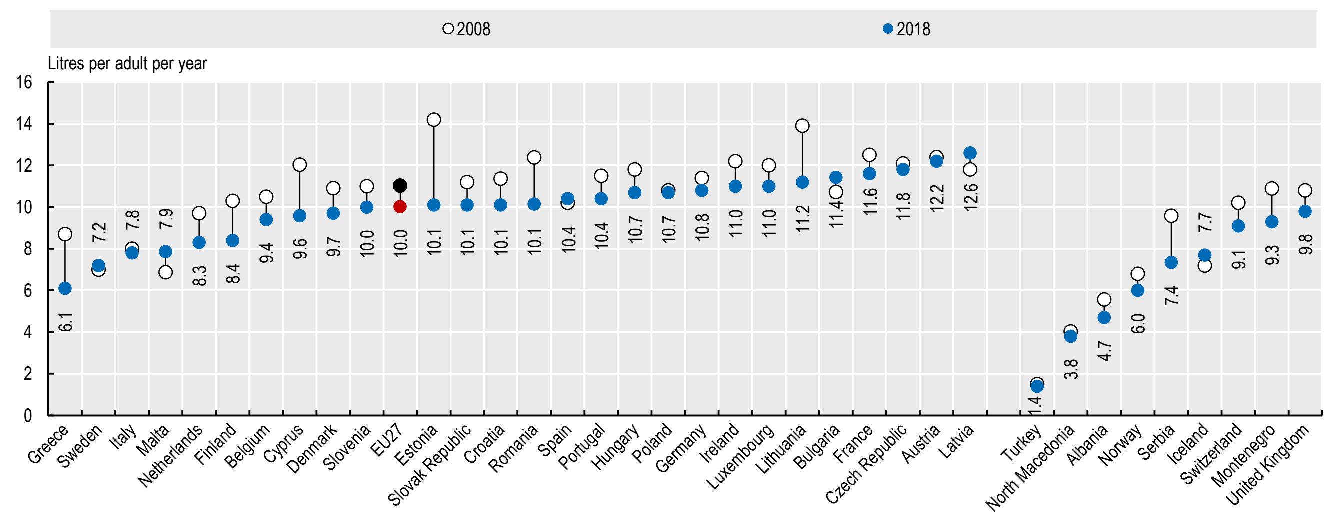
OECD (2015), *Tackling Harmful Alcohol Use: Economics and Public Health Policy*, OECD Publishing, *http://dx.doi.org/10.1787/9789264181069-en*.

Sciensano (2020), Second health survey of COVID-19: preliminary findings [*Deuxième enquête de santé COVID-19: résultats préliminaires*], Brussels.

Santé Publique France (2020), Tobacco, alcohol: what impact of confinement on consumption among French people? [*Tabac, Alcool: quel impact du confinement sur la consommation des Français?*].

WHO (2019), *Status report on alcohol consumption, harm and policy responses in 30 European countries 2019*, WHO Regional Office for Europe, Copenhagen.

Figure 4.7. **Overall alcohol consumption among adults, 2008 and 2018 (or nearest years)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020, WHO Global Information System on Alcohol and Health for Belgium, Germany, Greece, Italy, Latvia, Portugal and non-OECD countries.

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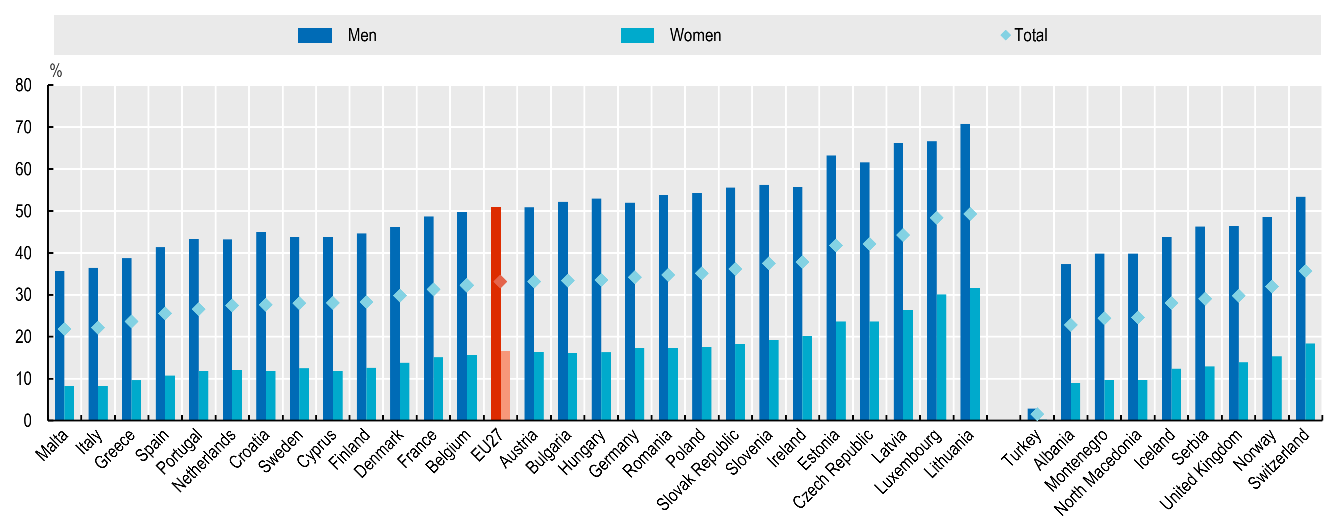
Figure 4.8. **Proportion of adults who report heavy episodic drinking in the past 30 days, 2016**



Note: The EU average is unweighted.
Source: WHO Global Information System on Alcohol and Health (GISAH), 2019.

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The use of illicit drugs remains an important public health issue in Europe. Almost a third of adults in the European Union aged 15-64, or around 97 million people, have used illicit drugs at some point in their lives, with the experience of drug use being more frequently reported by men than women. Cannabis is the most frequently used drug, but some have also used cocaine, ecstasy (MDMA), amphetamines, and other drugs (EMCDDA, 2020). The use of illicit drugs, particularly among people who use them regularly and heavily, is associated with higher risks of cardiovascular diseases, mental health problems, accidents, as well as infectious diseases such as HIV when the drug is injected. Illicit drug use is a major cause of preventable mortality among young people 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. Around 15% of people aged 15 to 34 in EU countries report having used cannabis in the last year (Figure 4.9). Cannabis use is highest in France and Italy, with 20% or more people aged 15 to 34 reporting to have consumed cannabis in the last year. It is estimated that around 1% of European adults are daily or almost daily cannabis users – that is, they have used the drug on 20 days or more in the last month. Around 58% of these are older drug users, aged 35 to 64, and around three-quarters are men. Cannabis use among young adults has remained stable over the past decade in several countries, but it has increased in some Nordic countries (Denmark and Finland). It has also increased in recent years in France and Germany.

Cocaine is the most commonly used illicit stimulant in Europe: around 2.4% of young adults reported having used cocaine in the last year (Figure 4.10). The percentage of young adults using cocaine is highest in Denmark, France, the Netherlands and the United Kingdom with 3% or more having used cocaine at least once in the last year. After years of reported decreases in cocaine use, there are now signs of increases in use in many countries (EMCDDA, 2020).

The use of ecstasy (MDMA) is slightly lower than the use of cocaine, with about 1.9% of young adults in EU countries reporting to have used ecstasy in the last year. The use of ecstasy is highest in the Netherlands, Ireland, the United Kingdom, Bulgaria and Germany. In many countries, the use of ecstasy declined after a peak in early and mid-2000s. Recent surveys, however, point to an increase in use (EMCDDA, 2020).

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 still 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 (15-64 years old) is estimated at 0.4% of the EU population, the equivalent of 1.3 million high-risk opioid users in 2018. Several countries have implemented different interventions to reduce opioid-related deaths, such as overdose reversal medications, needle and syringe programmes and medically supervised consumption centres. Research initiatives to boost innovation in pain relief and opioid use disorders treatments have also been launched (OECD, 2019).

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 reflect better the current situation. The information is based on the last survey available for each country. The study year ranges from 2014 to 2018. To obtain estimates of the overall number of users in Europe, the EU average is applied to countries without prevalence data.

Data from web surveys can provide complementary information to general population surveys and further insight into the use of drugs in Europe. While not representative of the general population, these surveys are able to reach large samples of people who use drugs. The European Web Survey on Drugs collected information about patterns of use and purchases of the most commonly used illicit drugs from 40 000 people who use drugs, recruited primarily through social media.

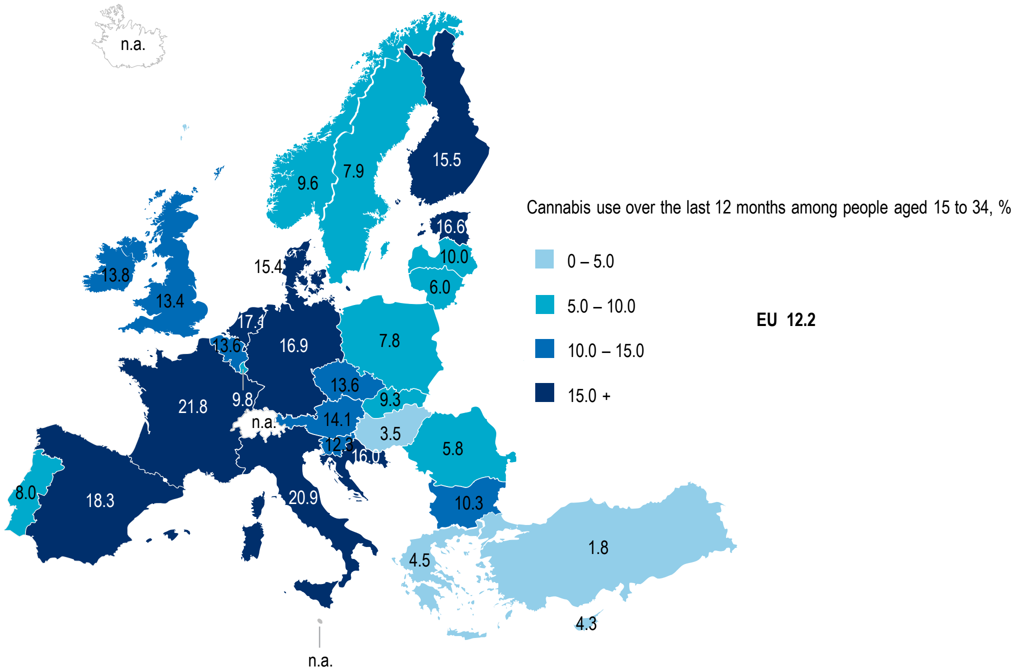
For more information, please see: *http://www.emcdda.europa.eu/data/*.

References

European Monitoring Centre for Drugs and Drug Addiction (2020), *European Drug Report 2020: Trends and Developments*, Publications Office of the European Union, Luxembourg.

OECD (2019), *Addressing Problematic Opioid Use in OECD Countries*, OECD Health Policy Studies, OECD Publishing, Paris, *https://dx.doi.org/10.1787/a18286f0-en*.

Figure 4.9. **Cannabis use over last 12 months among people aged 15 to 34, 2018 (or nearest year)**



Source: EMCDDA, 2020.

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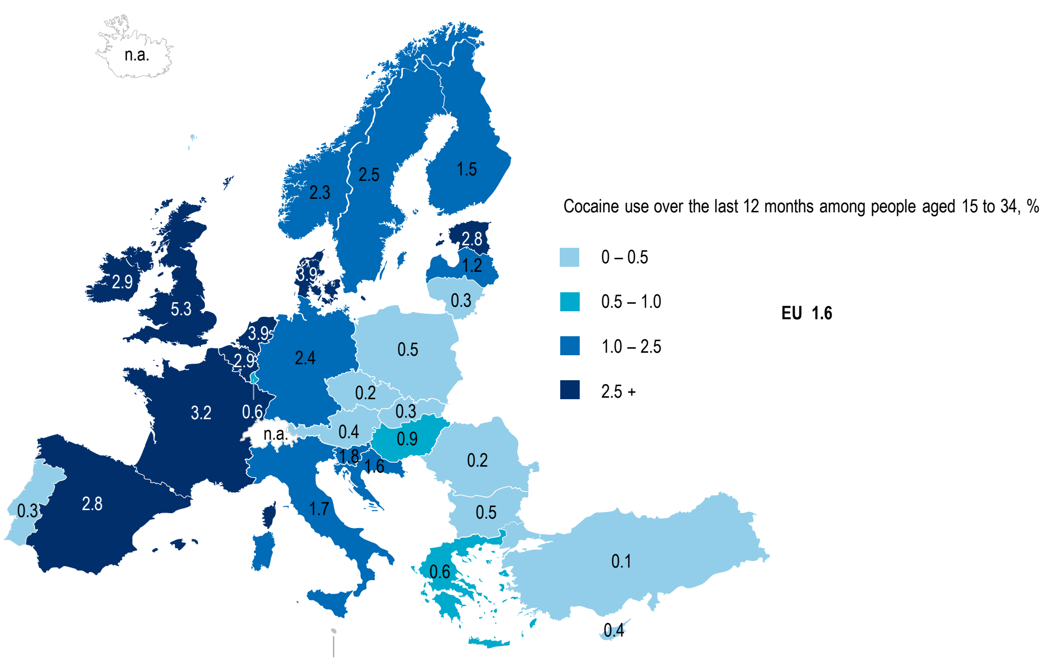
Figure 4.10. **Cocaine use over last 12 months among people aged 15 to 34, 2018 (or nearest year)**



Source: EMCDDA, 2020.

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Nutrition is fundamental for child and adolescent development and long-term health. Taking good nutrition habits at a young age, including eating fruit and vegetables regularly, can protect against many serious health problems such as obesity and diabetes.

On average across EU countries, more than half (56%) of 15-year-olds reported not eating any fruit or vegetable each day in 2018 (Figure 4.11). In Belgium, Denmark, Ireland, the Netherlands and Bulgaria, a larger share of the 15-year-olds reported eating fruit or vegetable each day, although this does not necessarily mean that they consume a greater overall quantity of fruit and vegetables each day. According to another comprehensive food consumption survey, adolescents in Belgium and the Netherlands were usually consuming a lower quantity of fruit and vegetables per day (measured in grammes) than the EU average (Sciensano, 2019). In all EU countries except Malta, boys are more likely than girls to report eating no fruit or vegetable each day.

A number of policies can promote greater fruit and vegetable consumption among young people, including health education and promotion in schools, increasing the fruit and vegetables content in food served in schools, mass media campaigns targeting both young people and parents, and regulations on advertising of unhealthy food targeting children (OECD, 2019). Most EU countries have launched national campaigns to promote greater consumption of fruit and vegetables, notably through "five a day" campaigns (e.g. in Germany, Spain, France). However, only one in nine (11%) 15-19 year-olds reported eating five portions or more of fruit and vegetables in 2014 on average across EU countries.

At the European level, the School Fruit Scheme adopted in 2008 promotes fruit and vegetable consumption among school-aged children. This programme was later combined with the school scheme on milk and other dairy products. In 2017/2018, over 20 million children in 159 000 schools across EU countries benefited from this joint scheme (European Commission, 2019). Some programme evaluation indicates that the scheme led to a short-term increase in the frequency and volume of fruit and vegetable consumption among school children (Methner et al., 2016). More recently, the 2020 EU Farm to Fork strategy has set ambitious goals to improve food quality and promote more informed consumer choices about food products, including among children and adolescents.

Across EU countries, the share of 15-year-olds who report eating at least one fruit every day increased slightly from 35% to 37% between 2014 and 2018, and the proportion of those reporting to eat at least one vegetable also increased slightly from 32% to 34%.

Promoting better nutrition at a young age also entails reducing the consumption of products high in sugars, fat and salt. On average across EU countries, about one in six (16%) 15-year-olds drank sugared soft drinks each day in 2018 (Figure 4.12). This proportion was highest in Belgium, France, Luxembourg, Malta and Bulgaria, where more than one in four 15-year-olds reported to consume soft drinks every day. Across all countries, boys were more likely to report drinking sugared soft drinks each day than girls (19% compared with 13% on average in EU countries).

The share of 15-year-olds consuming sugared soft drinks every day has decreased since 2014 in most EU countries (by 5 percentage points on average), but it has increased at least slightly in Finland, Lithuania, Slovenia, Latvia and Denmark.

A number of policy actions have been taken in many countries to reduce the consumption of sugared soft drinks, such as the reformulation of products to reduce sugar levels, smaller portion sizes, front-of-pack labels promoting low-sugared drinks, taxes based on the sugar level in products, and marketing/advertising restrictions on products highly sugared (OECD, 2019).

Definition and comparability

Dietary habits are measured in terms of the share of 15-year-olds who report not eating any fruit or vegetables every day and drinking a sugared soft drink each day. Since the survey questions on fruit and vegetable consumption do not explicitly ask respondents to exclude juices, soups or potatoes, these may be included in responses.

Data come from the Health Behaviour in School-aged Children (HBSC) study. The HBSC surveys have been undertaken every four years since 1993-94 and now include all EU countries except Cyprus. Data are drawn from school-based samples of 1 500 children in three age groups (11-, 13- and 15-year-olds) in most countries, ensuring that the sample is representative of each age group.

References

European Commission (2019), *The EU school fruit, vegetables and milk scheme*, *https://ec.europa.eu/commission/news/eu-school-fruit-vegetables-and-milk-scheme-2019-mar-27_en*.

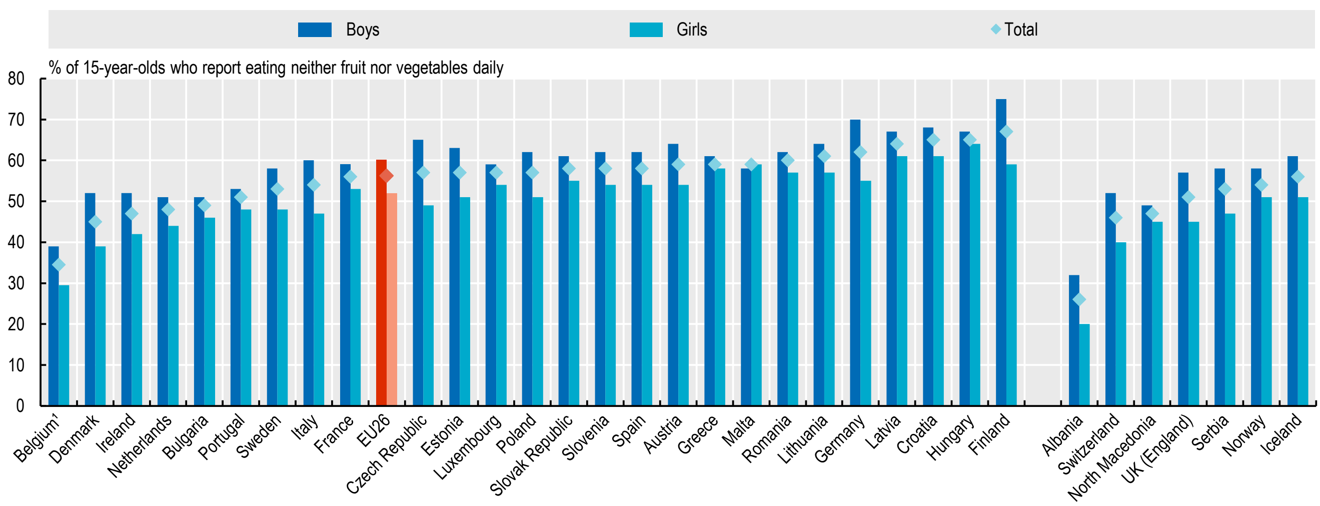
Inchley, J. et al. (2020), *Spotlight on adolescent health and well-being: Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada,* International report, Vol. 2, Key data, WHO Regional Office for Europe, Copenhagen.

Methner, S., G. Maschkowski and M. Hartmann (2016), "The European School Fruit Scheme: impact on children's fruit and vegetable consumption in North Rhine-Westphalia, Germany", *Public Health Nutrition*, Vol. 20/3, pp. 542-548, *http://dx.doi.org/10.1017/s1368980016002652*.

OECD (2019), *The Heavy Burden of Obesity: The Economics of Prevention*, OECD Health Policy Studies, OECD Publishing, *https://doi.org/10.1787/67450d67-en*.

Sciensano (2019), *Health Status Report 2019*, Brussels.

Figure 4.11. **Share of 15-year-olds not consuming any fruit or vegetable each day, 2018**



Note: The EU average is unweighted. 1. The value for Belgium is the unweighted average of the Flemish and French Communities.
Source: HBSC data from Inchley et al. (2020).

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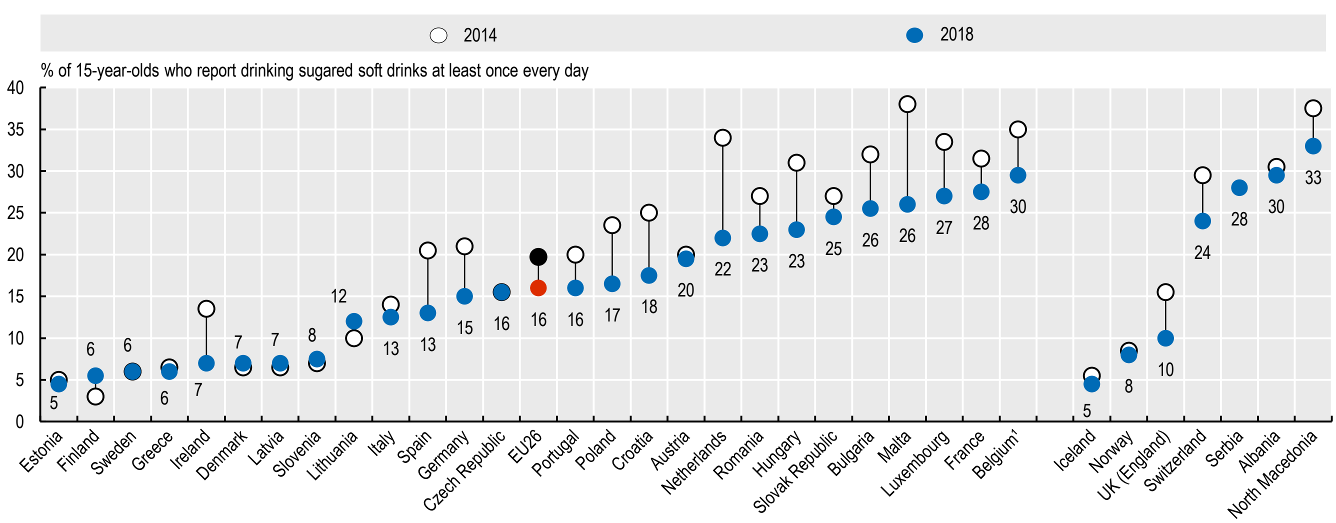
Figure 4.12. **Share of 15-year-olds consuming sugared soft drinks each day, 2014-2018**



Note: The EU average is unweighted. 1. The value for Belgium is the unweighted average of the Flemish and French Communities.
Source: HBSC data from Inchley et al. (2020).

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Physical activity is beneficial for child and adolescent development and can set good habits for adulthood, thereby influencing health outcomes later in life. WHO recommends that children do at least 60 minutes of moderate-to-vigorous physical activity daily, yet these recommendations are not met by most children and adolescents in all countries.

On average across EU countries, only around one in four 11-year-olds and only about one in seven 15-year-olds reported that they undertook moderate-to-vigorous exercise at least one hour daily in 2018 (Figure 4.13). In all countries, girls are less physically active than boys at both ages. Physical activity also falls sharply between ages 11 to 15 in most EU countries for both genders. The proportion of girls and boys doing sufficient physical activity each day is lowest in Italy, France, Portugal and Denmark. In Italy, France and Denmark, the shares were already low in 2014, while they decreased from 16% in 2014 to 11% in 2018 among the 11-, 13- and 15-year-olds in Portugal.

On average across EU countries, the proportion of children and adolescents doing moderate-to-vigorous physical activity each day has decreased slightly between 2006 and 2018 for both boys and girls, and in all age groups (Figure 4.14). For boys aged 11 years old and 13 years old, the rate decreased by 4 percentage points, narrowing the gap with the physical activity level of girls at the same age.

Some of the factors influencing the levels of physical activity undertaken by children include the availability of safe space and equipment, their school curricula and other competing pastimes, in particular screen activities. Heavy use of mobile devices and internet takes time away from other activities, including physical activity (OECD, 2019).

Physical activity can be encouraged by the promotion of physical education, such as active play or recreation as well as safe independent mobility (WHO, 2018). EU countries have taken a number of initiatives to change behaviours in children and adolescents, and more generally, in the whole population. For example, in Slovenia, the National Nutrition and Physical Activity Strategy 2015-25 aims to improve physical activity habits across all age groups to tackle growing obesity, including through school-based programmes such as the "SLOfit surveillance system" (OECD/European Observatory on Health Systems and Policies, 2019). In Finland, The National Obesity Programme 2012-18 aimed at reducing obesity rates by encouraging healthy nutrition and physical activity. This programme included objectives for the whole population, specific age groups (such as school-age children), municipalities and schools. It also offered check-lists to support implementation for schools, health professionals and municipalities. In addition, other initiatives intend to address the gender gap in physical activity, such as "This Girl Can" campaign in the United Kingdom (Owen et al. 2017; Guthold et al., 2020).

Definition and comparability

Moderate-to-vigorous physical activity refers to exercise undertaken for at least an hour each day that increases the heartbeat, and sometimes leaves the child out of breath.

Data come from the Health Behaviour in School-aged Children (HBSC) study. The HBSC surveys have been undertaken every four years since 1993-94 and now include all EU countries except Cyprus. Data are drawn from school-based samples of 1 500 children in three age groups (11-, 13- and 15-year-olds) in most countries, ensuring that the sample is representative of each age group.

References

Guthold, R. et al. (2020), "Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1·6 million participants", *The Lancet Child & Adolescent Health*, Vol. 4/1, pp. 23-35, *http://dx.doi.org/10.1016/s2352-4642(19)30323-2*.

Inchley, J. et al. (2020), *Spotlight on adolescent health and well-being: Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada,* International report, Vol. 2, Key data, WHO Regional Office for Europe, Copenhagen.

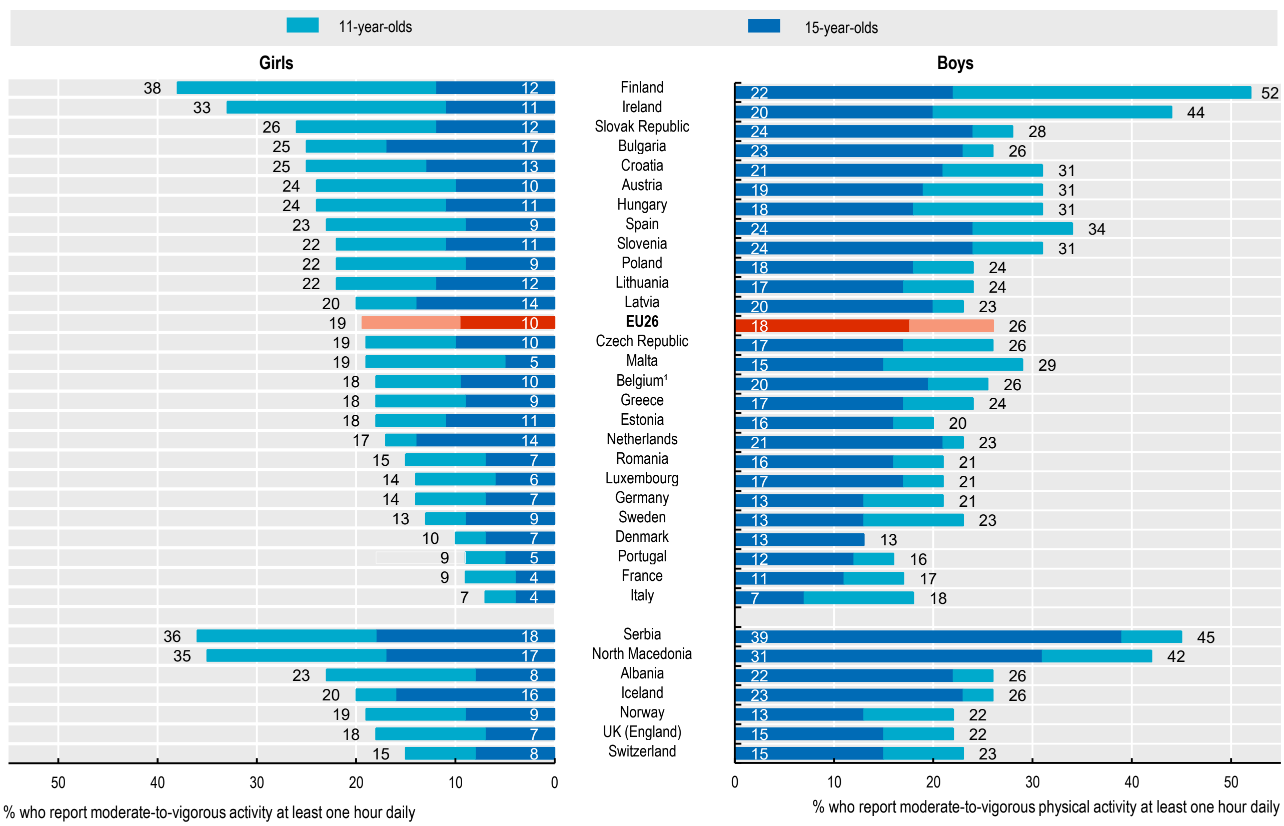
OECD (2019), *The Heavy Burden of Obesity: The Economics of Prevention*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/67450d67-en*.

OECD/European Observatory on Health Systems and Policies (2019), *Slovenia: Country Health Profile 2019*, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels, *https://doi.org/10.1787/79ba70a2-en*.

Owen, M. et al. (2017), "The effectiveness of school-based physical activity interventions for adolescent girls: A systematic review and meta-analysis", *Preventive Medicine*, Vol. 105, pp. 237-249, *http://dx.doi.org/10.1016/j.ypmed.2017.09.018*.

WHO (2018), *Physical activity factsheets for the 28 European Union member States of the WHO European region*, WHO Regional Office for Europe, Copenhagen.

Figure 4.13. **Share of 11- and 15-year-olds meeting WHO recommended daily physical activity, 2018**



Note: The EU average is unweighted. 1. The value for Belgium is the unweighted average of the Flemish and French Communities.
Source: HBSC data from Inchley et al. (2020).

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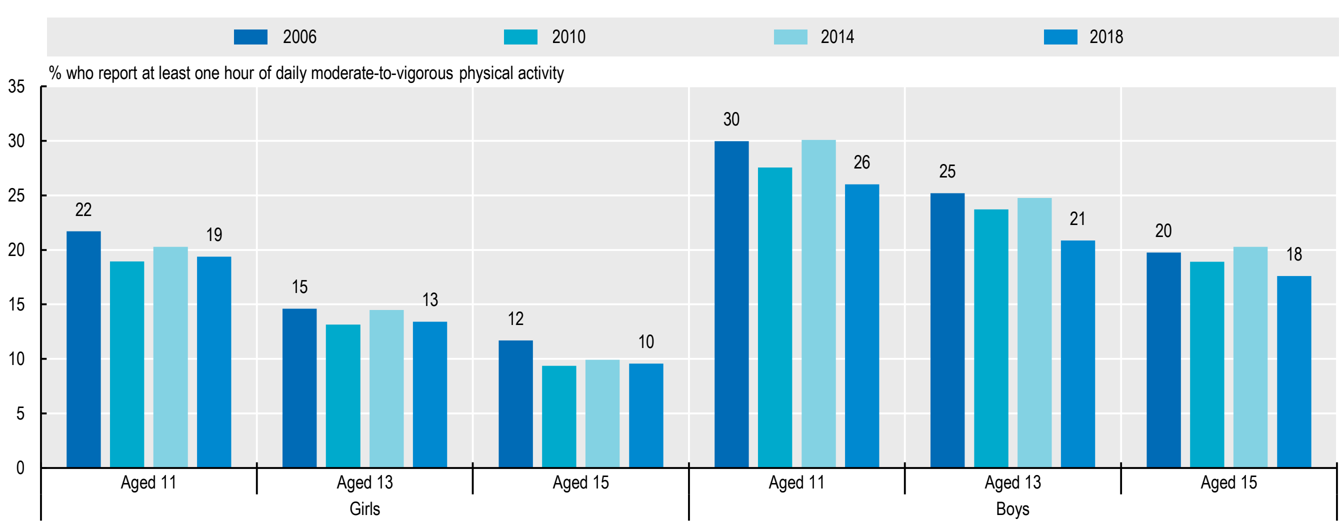
Figure 4.14. **Trends in physical activity among 11-, 13- and 15-year-olds, EU average, 2006-2018**



Note: The EU average is unweighted EU.
Source: HBSC data from Inchley et al. (2020) and previous HBSC reports.

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Overweight and obesity among children and adolescents is a major public health issue. Children and adolescents who are overweight or obese are at a greater risk of poor health, and this effect persists into adulthood. Moreover, obesity among children and adolescents is often related to psychosocial problems such as poor self-esteem, bullying and underachievement at school, which can further worsen health and economic outcomes in adulthood (OECD, 2019).

In 2018, almost one in five (19%) 15-year-olds was either overweight or obese on average across EU countries, up from one in six (16%) in 2010 (Figure 4.15). There is a three-fold variation in overweight and obesity rates among adolescents across EU countries, ranging from 12% in the Netherlands to 36% in Malta.

In all EU countries except Portugal, overweight and obesity is more prevalent in boys than girls. On average across EU countries, the prevalence in 2018 was 23% in 15-year-old boys compared to 15% in girls. This gender difference is driven by a combination of biological, social and environmental factors. In Poland, Italy and Greece, overweight and obesity among boys are more than twice as prevalent as among girls.

In all countries except Albania, children and adolescents from more affluent families are less likely to be overweight or obese than those from less affluent families (Figure 4.16). On average across EU countries, overweight and obesity among young people from less affluent families is over 50% higher than among those from more affluent families.

Many countries have implemented policies to reduce obesity specifically targeting children. These include restrictions on advertising of food and drinks to children, school-based wellness and educational programmes, reducing the availability of unhealthy food options in schools, encouraging or enabling active transport to school, and family physical activity programmes (OECD, 2019). Other policies, such as warning labels, marketing restrictions of unhealthy foods to children, pricing policies and mass media campaigns, can also help tackle childhood obesity.

The EU Action Plan on Childhood Obesity 2014-20 aims to halt the rise in obesity in children and young people in the EU by 2020. It identifies several key areas for action, such as supporting a healthy start in life, making healthier choices the easy option (e.g. food reformulation), reducing marketing to children, encouraging physical activity, and promoting healthier environments in schools (European Commission, 2014 and 2019). A mid-term evaluation from 2018 found that although many European countries were active in creating healthier school environments and improving the quality of food products through reformulation, making the healthier option the ‘easy option’ for children and restricting marketing/advertising of unhealthy foods still required further actions (Boer, 2018).

The EU Joint Action on Nutrition and Physical Activity (JANPA), which ran from 2015 to 2017, produced a web-based toolbox to help decision-makers and programme planners design and implement effective interventions on childhood obesity. Starting in 2018, the Science and Technology in childhood Obesity Policy (STOP) project, funded by Horizon 2020, brings together academic and other stakeholders from across Europe to generate evidence on the factors that contribute to childhood obesity, and the effectiveness of different actions to address this problem. In 2020, a new Joint Action was launched focusing on the promotion of food reformulation, the reduction of aggressive marketing to children of foods high in fat, salt and sugar, and the improvement of public procurement of food.

Definition and comparability

Childhood and adolescent data on overweight and obesity come from the Health Behaviour in School-aged Children (HBSC) study. This survey asked young people aged 11-, 13- and 15 years old to report their height and weight. Body mass index (BMI) was calculated from this information and cut-offs for overweight and obesity allocated based on the WHO growth reference for age.

The indicator of socio-economic status is based on the Family Affluence Scale, which asks young people about material assets in the household.

References

Boer, J. (2018), *Supporting the mid-term Evaluation EU Action Plan on Childhood Obesity: Results of the Childhood Obesity Study*, *https://ec.europa.eu/health/sites/health/files/nutrition_physical_activity/docs/ev_20180601_co03_en.pdf*.

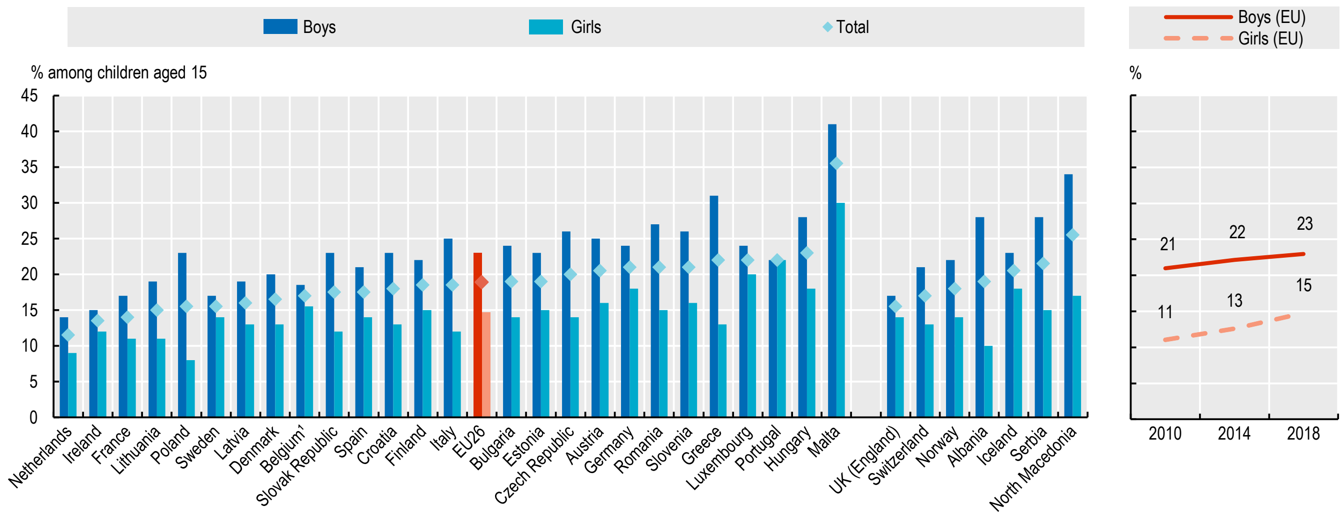
European Commission (2014), *EU Action Plan on Childhood Obesity 2014-20*, Brussels, *https://ec.europa.eu/health/sites/health/files/nutrition_physical_activity/docs/childhoodobesity_actionplan_2014_2020_en.pdf*.

European Commission (2019), *Initiatives on Nutrition and Physical Activity*, *https://ec.europa.eu/health/sites/health/files/nutrition_physical_activity/docs/2019_initiatives_npa_en.pdf*.

Inchley, J. et al. (2020), *Spotlight on adolescent health and well-being: Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada*, International report, Vol. 2, Key data, WHO Regional Office for Europe, Copenhagen.

OECD (2019), *The Heavy Burden of Obesity: The Economics of Prevention*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/67450d67-en*.

Figure 4.15. **Overweight and obesity rate among 15-year-olds, 2018 and trends since 2010**



Note: The EU average is unweighted. 1. The value for Belgium is the unweighted average of the Flemish and French Communities.
Source: HBSC data from Inchley et al. (2020).

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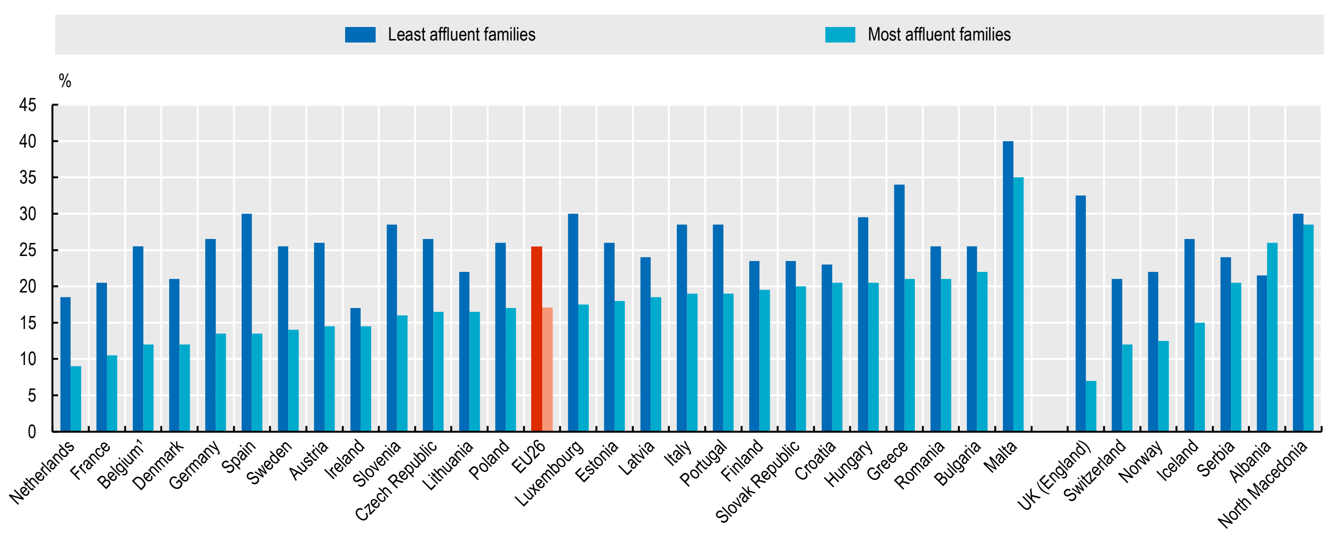
Figure 4.16. **Overweight and obesity rate among 11-, 13- and 15-year-olds by family affluence, 2018**



Note: The least and most affluent are defined as those living in the lowest and highest quintiles (20%) in each country. 1.The value for Belgium is the unweighted average of the Flemish and French Communities.
Source: HBSC data from Inchley et al. (2020).

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Obesity is a known risk factor for numerous non-communicable diseases, including hypertension, diabetes, cardiovascular diseases, and some forms of cancer. On average in the EU, overweight and obesity reduce life expectancy by nearly three years (OECD, 2019). Evidence from some countries also suggests that obesity increases the risk of developing severe COVID-19 symptoms and requiring intensive care (Caussy et al., 2020).

On average across EU countries, more than one in six adults (17%) were obese in 2018, according to self-reported data (Figure 4.17). Obesity rates among adults vary more than two-fold across EU countries, from 10% in Romania to 26% in Malta. While in most countries obesity is more prevalent in men, in the Netherlands, Lithuania, Latvia, Turkey and Iceland considerably more women than men are obese.

Obesity rates based on the actual measurement of height and weight are higher than those based on self-reported data, as many people either overestimate their height or underestimate their weight. However, these more reliable data are only available in a limited number of countries. When looking at measured data for nine EU countries, the average obesity prevalence is 24% (Figure 4.18). The highest rate is in Hungary (30%) and the lowest in France (17%).

Over the last two decades, the prevalence of obesity has increased in the EU. Among the 18 EU countries with self-reported data available since around 2000, the average obesity rate increased from 11% in 2000 to 17% in 2018 (Figure 4.19). Finland and Latvia saw particularly large increases. The COVID-19 pandemic may contribute to further increases. A Belgian survey conducted in April 2020 found that 25% of respondents gained weight during the confinement (Sciensano, 2020), although this may only be a temporary effect.

The rising prevalence of obesity is driven by a number of behavioural and environmental factors, including urbanisation, increased sedentary behaviour, and the widespread availability and marketing of energy-dense foods. Socially disadvantaged groups are particularly at risk of becoming obese, either because of less healthy nutrition habits or lack of physical activity. For example, the prevalence of low fruit and vegetable consumption is 59% higher among low-educated women in England compared to high-educated women. In Spain, the prevalence of low physical activity is approximately 50% higher in low-educated people (Graf and Cecchini, 2017).

A growing number of countries have taken actions to tackle the rise in obesity rates. A wide range of policy options exist, including food and menu labelling, public awareness campaigns, mobile apps, restrictions on food advertising targeting children, school and workplace programmes, and price policies. In general, policies to provide information and to increase the number of healthy options are common, while measures to modify the cost of health-related choices and to regulate promotion of unhealthy choices are less widely used (OECD, 2019). Among initiatives to enable people to make healthy choices, the Nutri-Score front-of-pack logo which informs about the nutritional quality of the food product in a simplified design, developed by the French institute of public health, is been increasingly used by the food industry and retailers in France and under development in other European countries (Santé Publique France, 2020).

At the EU level, a number of initiatives have been implemented to improve diets and increase physical activity. To reduce the amount of sugar in food, in 2015, the EU brokered agreements with business operators – food manufacturers, supermarkets and caterers – to reduce the amount of added sugars in their products by a minimum of 10% by 2020.

Definition and comparability

Obesity is defined as excessive weight presenting health risks because of the high proportion of body fat. The 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 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 from population-based health interview surveys, or measured estimates from health examinations. Estimates from health examinations are generally higher and more reliable than from health interviews.

References

Caussy, C. et al. (2020), "Prevalence of obesity among adult inpatients with COVID-19 in France", *The Lancet Diabetes & Endocrinology*, Vol. 8/7, pp. 562-564, *http://dx.doi.org/10.1016/s2213-8587(20)30160-1*.

European Commission (2016), *EU Platform on Diet, Physical Activity and Health, 2016 Annual Report*, Brussels.

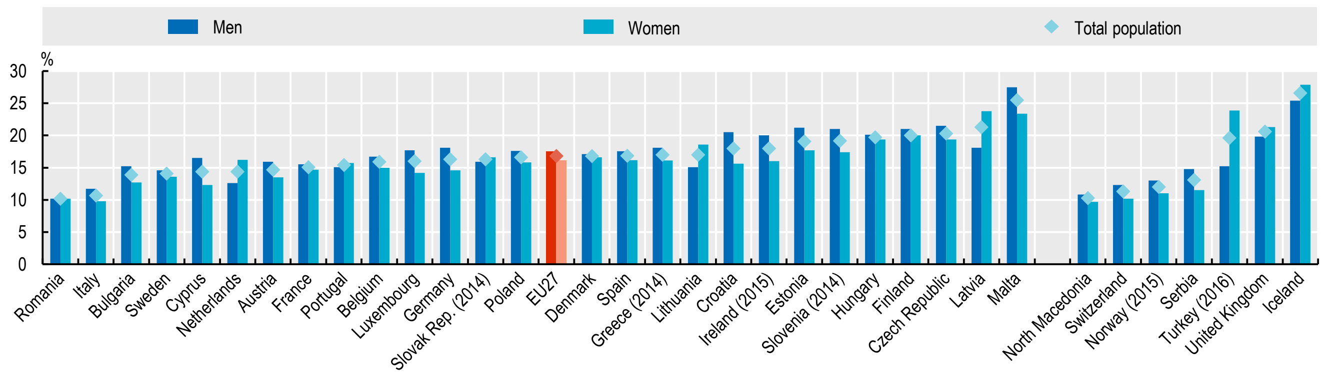
Graf, S. and Cecchini, M. (2017), Diet, physical activity and sedentary behaviours: Analysis of trends, inequalities and clustering in selected OECD countries. *OECD Health Working Papers*, No. 100. OECD Publishing, Paris, *https://doi.org/10.1787/54464f80-en*.

OECD (2019), *The Heavy Burden of Obesity: The Economics of Prevention*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/67450d67-en*.

Santé Publique France (2020), *Nutri-score*, *https://www.santepubliquefrance.fr/determinants-de-sante/nutrition-et-activite-physique/articles/nutri-score*.

Sciensano (2020), *Impact of the corona crisis on the Belgian population: Results of 2nd COVID-19 health survey*, *https://www.sciensano.be/en/node/65063*.

Figure 4.17. **Self-reported obesity rates among adults, 2018 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020 (based on EU-SILC 2017 and EHIS 2014 for several countries).

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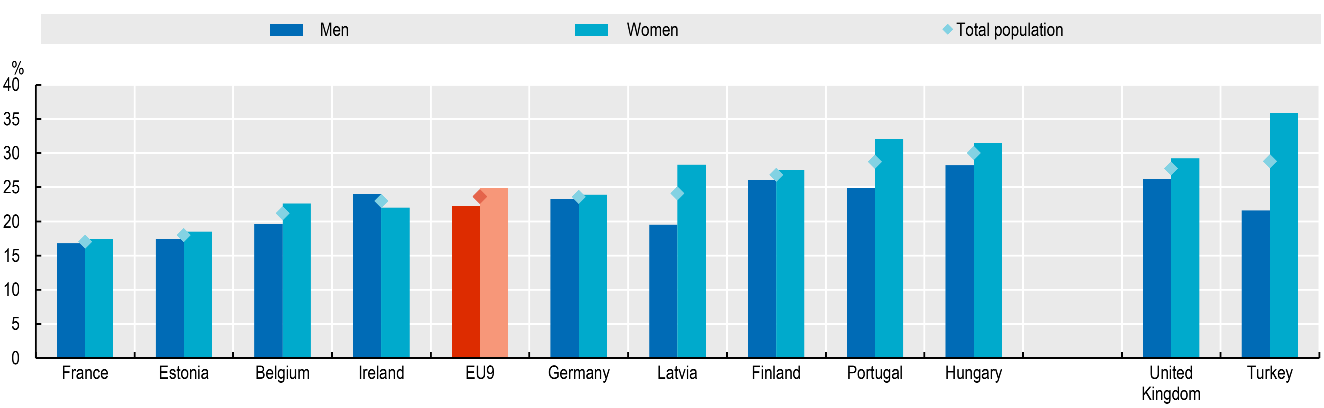
Figure 4.18. **Measured obesity rates among adults, 2018 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020.

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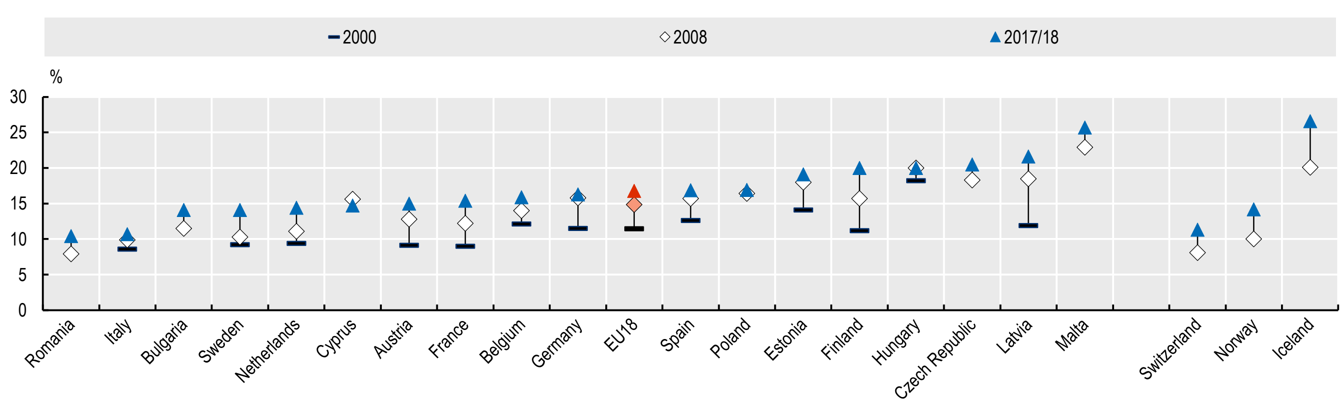
Figure 4.19. **Increase in self-reported obesity rates, 2000, 2008 and 2018 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020, complemented with EU-SILC 2017 and EHIS 2008 for several countries.

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Health at a Glance: Europe 2020
State of Health in the EU Cycle

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 by type of health service and by health care provider. A particular focus is on analysing spending on primary health care and pharmaceuticals. The chapter also analyses 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 spending.

In 2019, health spending across EU countries stood on average at 8.3% of GDP, ranging from over 11% in Germany and France to less than 6% in Luxembourg and Romania. This share remained largely unchanged from previous years as health spending grew in line with the economy but it can be expected that the COVID-19 pandemic will lead to an increase of the health spending share of GDP in many countries in 2020. On a per capita basis, there is a three-fold difference between the EU countries in Western and Northern Europe that spend the most on health (Germany, Austria, Sweden and the Netherlands) and those in Central and Eastern Europe that spend the least (Romania, Bulgaria, Latvia and Croatia).

In most countries, payments for curative and rehabilitative care services make up the bulk of health spending, while spending on pharmaceuticals also account for a large share of health expenditure particularly in some Central and Eastern European countries. Regarding the financing of health care, compulsory schemes, either government financed or through compulsory public or private health insurance, account for nearly three-quarters of overall health spending on average across EU countries. However, out-of-pocket expenditure also plays an important role in health financing in several Southern as well as Central and Eastern European countries.

The level of health spending in a country and how this changes over time is dependent on a wide range of demographic, social and economic factors, as well as the financing arrangements and organisational structure of the health system itself.

Given these factors, there are large variations in the level and growth of health spending across Europe. There is a strong correlation between income and spending on health, such that high-income European countries are typically those that spent the most on health. With spending at EUR 5 241 per person – adjusted for differences in countries' purchasing powers – Switzerland was the biggest spender in Europe followed by Norway (EUR 4 505). Among EU member states, spending levels in Germany, Austria, Sweden and the Netherlands were all at least 50% above the EU average (EUR 2 572). At the other end of the scale, Romania, Latvia, Bulgaria and Croatia were the lowest spending countries in the EU, only at around half the EU average (Figure 5.1). This means that on a per capita basis (and after adjusting for differences in price levels), there is a three-fold difference in health spending between high-income countries in Western and Northern Europe and some low spending countries in Central and Eastern Europe.

After a period of slow or even negative growth in health spending across Europe in the wake of the economic crisis in 2008, growth rates picked up again in nearly all countries. On average across EU countries, health spending per capita increased by around 3.0% each year in real terms (adjusted for inflation) between 2013 and 2019, compared with an annual growth rate of only 0.7% between 2008 and 2013. All EU countries saw positive growth in health spending between 2013 and 2019, although it remained slow in some countries (Figure 5.2).

Some Central and Eastern European member states with relatively low spending levels like Bulgaria, Romania, Latvia, Lithuania and Estonia, had some of the highest growth rates in health spending since 2013, with annual increases of around 6% or more. In Belgium, Finland, France and the Netherlands, annual per capita health spending growth over the same six-year period remained positive but at around 1% or below and the growth rates were lower than those seen during the years following the 2008 financial crisis. Both Norway and Switzerland maintained a relatively stable rate of health spending growth over the last ten years or so at around 2-2.5% per annum.

Health spending in 2020 across Europe will be significantly affected by the COVID-19 pandemic. The development of the crisis has seen the need for the rapid deployment of resources across the health sector – building up testing and diagnostic capabilities, and providing increased capacity for treatment of patients in the hospital sector. In some countries, health providers received substantial subsidies in exchange for reserving treatment capacity for COVID-19 patients. On the other hand, many countries have seen sharp reductions in many non-COVID related services, such as primary health care consultations and elective surgeries, potentially reducing health care costs for these services. Which of these two opposing trends will dominate in a country is unclear at the time of writing and will depend on many different factors. Chapter 1 provides further information on the budgetary measures that governments have taken to strengthen the health system responses to the coronavirus crisis.

Definition and comparability

Expenditure on health, as defined in the System of Health Accounts (OECD, Eurostat and WHO, 2017), measures the final consumption of health goods and services. This refers to current spending on medical services and goods, public health and prevention programmes, and overall administration of health care provision and financing irrespective of the type of financing arrangement. Subsidies paid to health care providers should also be included in the figures.

Under Commission Regulation 2015/359, all EU countries are obliged to produce health expenditure data according to the definitions of the System of Health Accounts. Data on health expenditure for 2019 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 into 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 Actual Individual Consumption (AIC) PPPs are used to compare relative expenditure on health in relation to the rest of the economy.

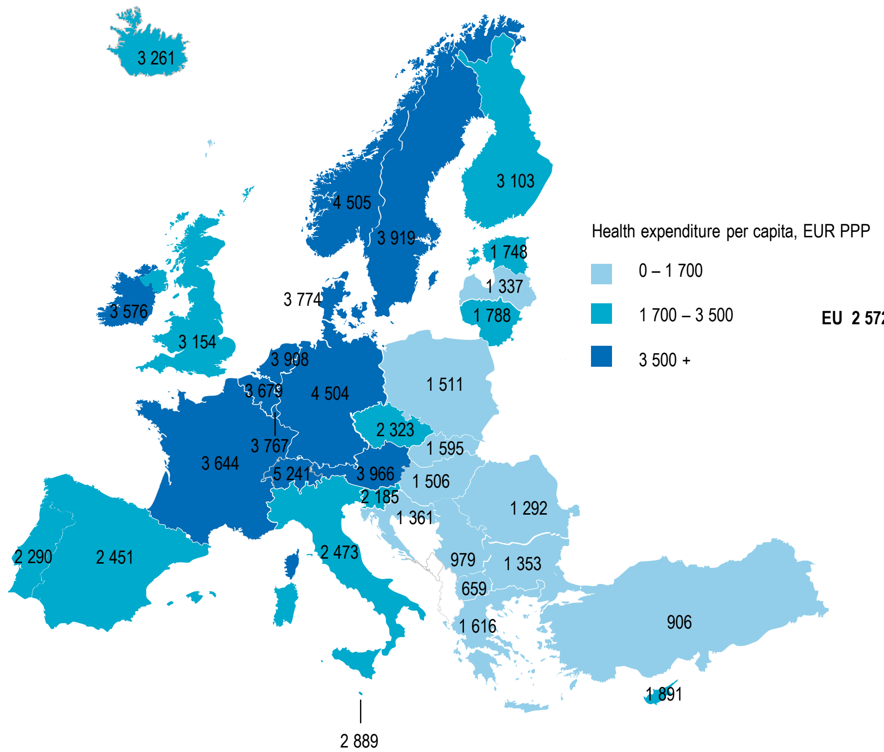
For the calculation of growth rates in real terms, economy-wide AIC deflators are used. Although some countries (e.g. France and Norway) produce their own health-specific deflators, based on national methodologies, these are not currently used due to the limited availability and comparability for all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

For countries where breaks in the time series exist, growth rates are estimated by the OECD Secretariat.

References

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

Figure 5.1. **Health expenditure per capita, 2019 (or nearest year)**



Note: The EU average is unweighted.
Sources: OECD Health Statistics 2020; Eurostat Database; WHO Global Health Expenditure Database.

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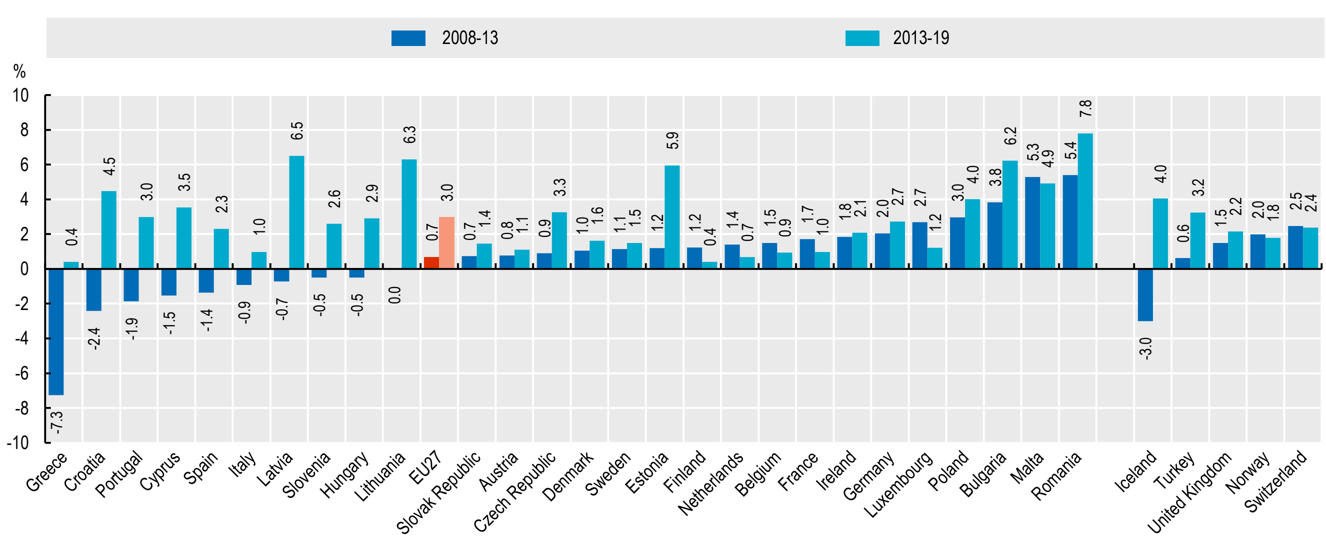
Figure 5.2. **Annual average growth rate (real terms) in per capita health spending, 2008-19 (or nearest year)**



Note: The EU average is unweighted. Growth rates and time periods may have been adjusted by the OECD Secretariat to take account of breaks in series.
Sources: OECD Health Statistics 2020; Eurostat Database.

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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 also on the size of the economy as a whole.

In 2019, it is estimated that EU countries devoted on average 8.3% of their GDP to health care (Figure 5.3). This figure has stayed largely unchanged since 2014 as growth in health spending remained broadly in line with overall economic growth. In 2019, a quarter of all EU member states spent at least 10% of their GDP on health, with Germany (11.7%) and France (11.2%) having the highest shares. The lowest shares of GDP allocated to health care were in Luxembourg (5.4%), Romania (5.7%), Poland (6.2%) and Latvia (6.3%). Across the whole of Europe, Switzerland allocated the largest share (12.1%) of its GDP to health.

When analysing countries' health expenditure dynamics, it is important to consider the health spending to GDP ratio of a country in tandem with levels of health spending per capita. Higher income countries generally tend to devote a higher proportion of their resources to health care but some countries with high levels of health expenditure per capita can have relatively low health spending to GDP ratios, and vice versa. For example, while the Czech Republic and Bulgaria spent roughly the same share of their GDP on health in 2019, per capita health spending (adjusted to EUR PPP) was 72% higher in the Czech Republic because of its higher GDP. Luxembourg provides a striking example of a country that has a high level of per capita health spending, but because of the peculiarities of its economy and working population, has the lowest share of health spending relative to GDP. Since a large proportion of its wealth is produced by non-residents and not available for domestic final consumption, relating health spending to Gross National Income may be more meaningful than looking at the health spending to GDP indicator for that country.

Over time, trends in health spending often react to changes in the broader economy, although there is typically a lag before changes in economic conditions are reflected in adjustments to health spending. When overall economic conditions rapidly deteriorated in many European countries because of the 2008 financial crisis, overall health spending was initially maintained or even continued to grow (Figure 5.4). As a result, the average health spending to GDP ratio across EU countries jumped sharply to reach 8.5% in 2009 – up from 7.8% in 2008. As countries introduced a range of measures in attempts to rein in government health spending and reduce burgeoning budgetary deficits (Morgan and Astolfi, 2014), subsequent health expenditure growth per capita was more closely aligned to economic growth in many European countries. Consequently, the ratio of health spending to GDP has been relatively stable since 2014.

As a result of this step increase in the health spending to GDP ratio ten years ago and the closer alignment with economic growth in recent years, overall growth in health expenditure per capita (in real terms) in the European Union between 2005 and 2019 has been greater than that of GDP per capita.

Looking at the trends in some individual EU countries, both France and Germany saw their health spending to GDP ratio jump sharply in 2009 but the trajectory of the indicator has diverged in recent years (Figure 5.5). While Germany continued to show a steady increase in the share of GDP allocated to health between 2015 and 2019, France has seen its ratio drop as health spending growth has remained low, both in overall terms and compared with overall economic growth. Italy and Spain also experienced a similar jump in 2009, although since then growth in health spending was more closely aligned with economic growth, resulting in the health to GDP ratio remaining stable over the last ten years.

The COVID-19 pandemic has important consequences for both GDP and health spending growth in 2020. While there remains much uncertainty at the time of writing, it is clear that GDP will substantially contract in all EU member states, even under the most optimistic scenarios. For health spending, further increases can be expected – at least in some countries. As a result, another hike in the health spending to GDP ratio is likely in 2020.

Definition and comparability

See indicator "Health expenditure per capita" for a definition of current expenditure on health.

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 needs. It includes final consumption expenditure of households, general government and non-profit institutions serving households.

Data on health expenditure for 2019 are considered preliminary, either estimated by national authorities or projected by the OECD Secretariat, and are therefore subject to revision.

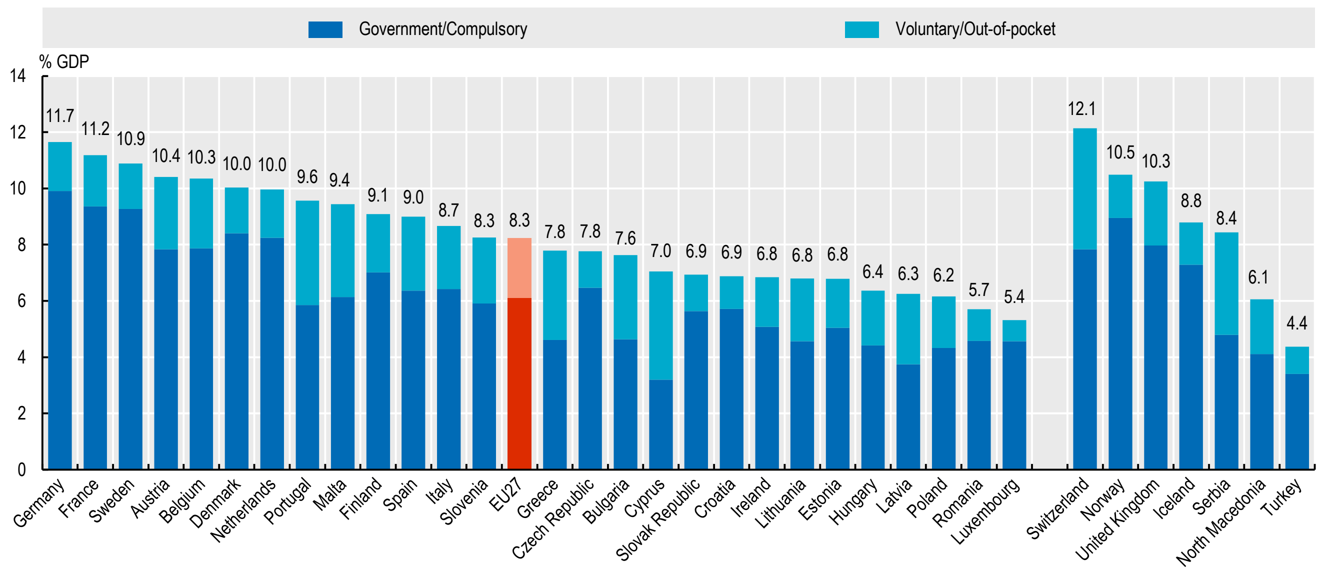
The GDP figures used to calculate the indicator health expenditure to GDP are based on official GDP data available as of mid-June 2020. Any subsequent revisions to GDP data are not reflected in the indicator.

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.

Reference

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*.

Figure 5.3. **Health expenditure as a share of GDP, 2019 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020; Eurostat Database; WHO Global Health Expenditure Database.

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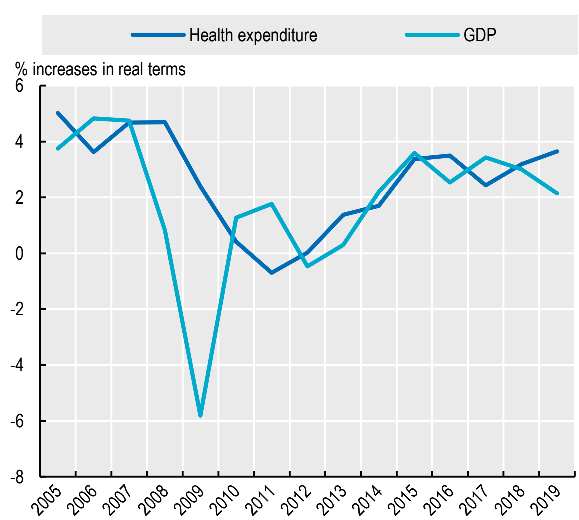
Figure 5.4. **Annual growth in per capita health expenditure and GDP, EU27, 2005-19**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020; Eurostat Database.

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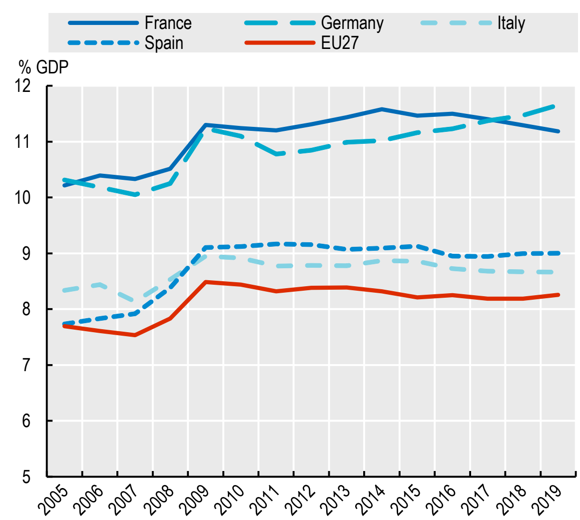
Figure 5.5. **Health expenditure as a share of GDP, EU27 and selected countries, 2005-19**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/njho4g

Health care is purchased 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 one organised through private insurers) usually covers the bulk of health expenditure. In addition, out-of-pocket payments by households 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 2018, around 73% of health spending was financed through governments and compulsory insurance on average across EU countries (Figure 5.6). In Sweden and Denmark, central, regional or local governments covered around 85% of all health spending. In Luxembourg, Croatia, Germany, France, Slovak Republic and the Netherlands, 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. The introduction of the National Health Insurance System starting in 2019 is expected to increase this share substantially.

In five EU countries – Cyprus, Latvia, Bulgaria, Greece and Malta – households' out-of-pocket payments accounted for more than one-third of health spending in 2018 (compared with an EU average of 22%), while only in Slovenia, Ireland and Cyprus did voluntary health insurance finance more than 10% of health spending (EU average: 5%).

To purchase health care goods and services, financing schemes rely on different types of revenues. In 2018, public sources (which includes government transfers and social insurance contributions) funded 73% of all health spending on average across EU countries (Figure 5.7). While this share is identical to the one seen in Figure 5.6, there are differences for some countries. For example, compulsory private health insurance is generally financed from private revenues, which explains why the share of publicly sourced health spending in Germany, France and Switzerland is substantially lower than their respective share of health spending financed from government and compulsory schemes.

Generally, the types of revenues are closely related to the system of health care financing. In Sweden and 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, in countries where social health insurance schemes exist, insurance contributions will typically be a major revenue source, but this may be complemented with governmental transfers to cover non-working population groups. Analysing the structure of financing schemes together with the types of revenues that these schemes receive shows that the government's role in funding health care is typically more than being just a simple purchaser of health services.

Public budgets (including social security schemes) finance many different services. Hence, health is competing for public funds with many other sectors such as education, defence and housing. In 2018, around 14% of total government expenditure was allocated to health on average across EU countries (Figure 5.8). In Ireland and Germany, the share of public spending dedicated to health care was around 20%, while in Hungary, Greece, Latvia and Cyprus it was below 10%. Since 2013, with the exception of Finland, the Slovak Republic and Cyprus, these shares increased (slightly) in all EU countries, most notably in Ireland (by 2.1 percentage points) and Greece (by 1.4 percentage points) reflecting that a greater share of government spending is allocated to health. In Greece, however, the share in 2018 is still below the level of 2010.

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, 2017).

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.

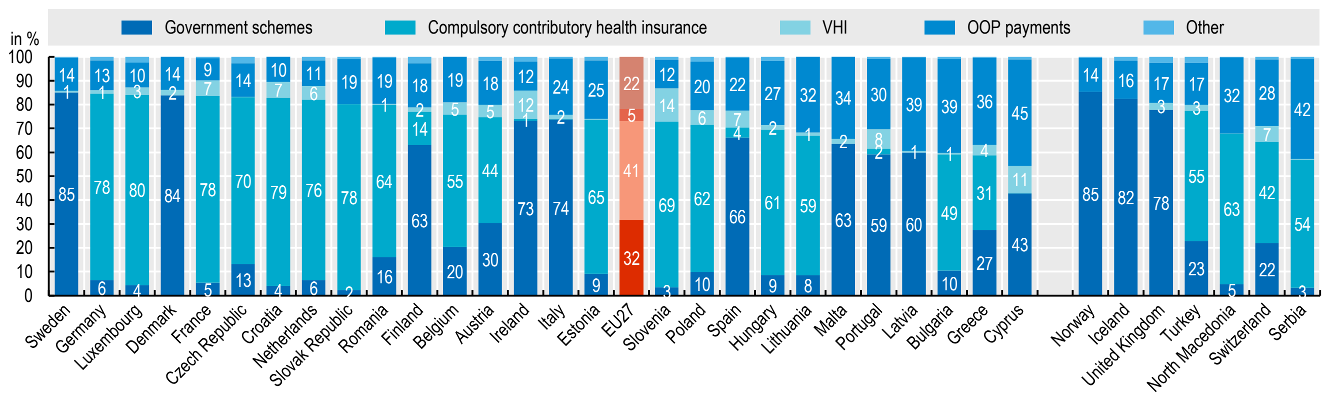
These financing schemes have to raise revenues in order to pay for health care goods and services for the population they are covering. Public revenue sources refer to transfers from the government and social insurance contributions, whereas private revenue sources comprise insurance premiums (for private voluntary or compulsory insurance) as well as other any other fund from households or corporations.

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.

Reference

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

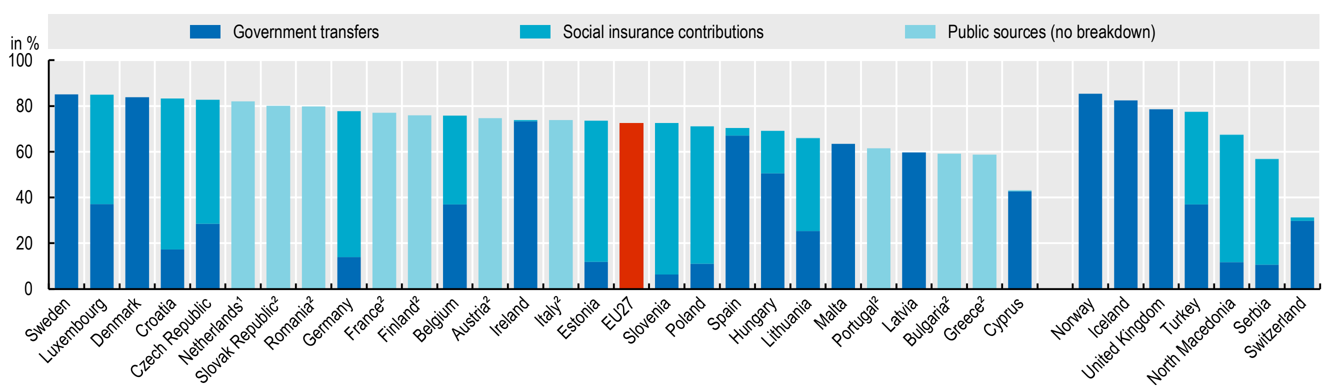
Figure 5.6. **Health expenditure by type of financing, 2018 (or nearest year)**



Note: Countries are ranked by government schemes and compulsory health insurance as a share of health expenditure. The EU average is unweighted. "VHI" stands for voluntary health insurance. The "Other" category refers to charities, corporations, foreign and undefined schemes.
Source: OECD Health Statistics 2020; Eurostat Database; WHO Global Health Expenditure Database.

StatLink https://stat.link/4rljp5

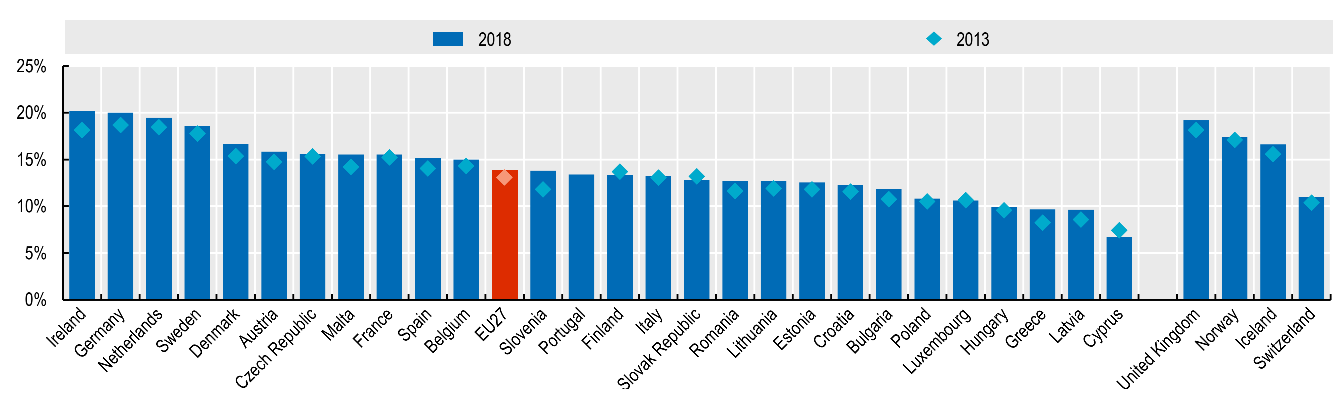
Figure 5.7. **Health expenditure from public sources as share of total health spending, 2018 (or nearest year)**



Note: The EU average is unweighted. 1. Public sources include spending by government schemes, social health insurance and compulsory private insurance. 2. Public sources include spending by government schemes and social health insurance schemes.
Source: OECD Health Statistics 2020; WHO Global Health Expenditure Database.

StatLink https://stat.link/4w2q7p

Figure 5.8. **Health expenditure from public sources as a share of total government expenditure, 2013 and 2018 (or nearest year)**



Note: For those countries without information on sources of revenues, data from financing schemes is used. No comparable data for Portugal for 2013. The EU average is unweighted.
Source: OECD Health Statistics 2020; OECD National Accounts Database; Eurostat database.

StatLink https://stat.link/shr2g1

A variety of factors, from disease burden and system priorities to organisational aspects and costs, help determine the allocation of resources across the various types of health care goods and services. In 2018, EU member states spent on average around 60% of their health budgets on curative and rehabilitative care, just over 20% on retail medical goods (mainly pharmaceuticals), and 12% on health-related long-term care. The remaining 5% was spent on collective services, such as prevention and public health (3%) as well as the administration of health care systems (Figure 5.9).

In 2018, the share of current health expenditure going to curative and rehabilitative care ranged from just over half of all health spending in Germany and the Netherlands to nearly three-quarters in Cyprus and Portugal. Breaking it down further, Romania had the highest proportion of spending on inpatient care (including day care in hospitals), accounting for 45% of health spending. For most EU countries (17), 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 (in both ambulatory settings and hospitals) accounted for just under half of all health spending (47%).

The other major category of health spending is retail medical goods (which mainly refers to pharmaceuticals) consumed in outpatient settings. A range of factors can influence spending on pharmaceuticals including differences in distribution channels, the prevalence of generic drugs, as well as relative prices in different countries. The share of medical goods spending tends to be highest in Central and Eastern European countries – in the Slovak Republic, it represented the largest component of health spending (33%). In contrast, the relative weight of medical goods on some Western European and Nordic countries' health budgets tends to be smaller (<15%). The variation between countries in price levels of medical goods is generally smaller than that for health services. Hence, because of the influence of international pricing, spending on medical goods will tend to make up a larger share of health spending in lower-income countries.

Countries' spending on health-related long-term care also varies considerably across the EU. Countries such as the Netherlands, Sweden and Denmark, with established formal arrangements for the elderly and the dependent population, allocated more than a quarter of their health spending to long-term care in 2018. In many Southern as well as Central and Eastern European countries, with more informal arrangements, expenditure on formal long-term care services accounts for a much smaller share of total spending.

Figure 5.10 presents the spending growth rates for key health goods and services for two time periods: at the start and in the aftermath of the financial crisis (2008-13) and in the most recent five-year period for which comprehensive data are available (2013-18). In the years following the financial crisis, annual spending growth rates for most parts of the health sector witnessed either a slowdown or even a reversal. Since 2013, average annual health spending growth rates have bounced back for most key health system functions, however still falling short of pre-crisis levels.

Between 2008 and 2013, retail pharmaceutical expenditure across the EU fell by an annual average rate of 1.2% following the implementation of various cost-containment policies in many EU countries. Between 2013 and 2018, spending on pharmaceuticals recovered, having risen by an average of 1.4% per year. Spending on inpatient care and administrative activities followed a similar pattern over these two time periods.

Spending for preventive services stagnated between 2008 and 2013 before returning to moderate growth in the second period. For outpatient care, while the average annual spending growth rate declined over the five years from the start of the financial crisis compared to the previous five-year period, it nevertheless remained positive at 0.7%, suggesting that these services were better protected from cuts relative to other health care functions. The same is true for long-term care (health), the only major health care function that reported strong spending growth throughout the 2008-13 period (4.3%). Since then, long-term care spending continued to grow strongly.

Definition and comparability

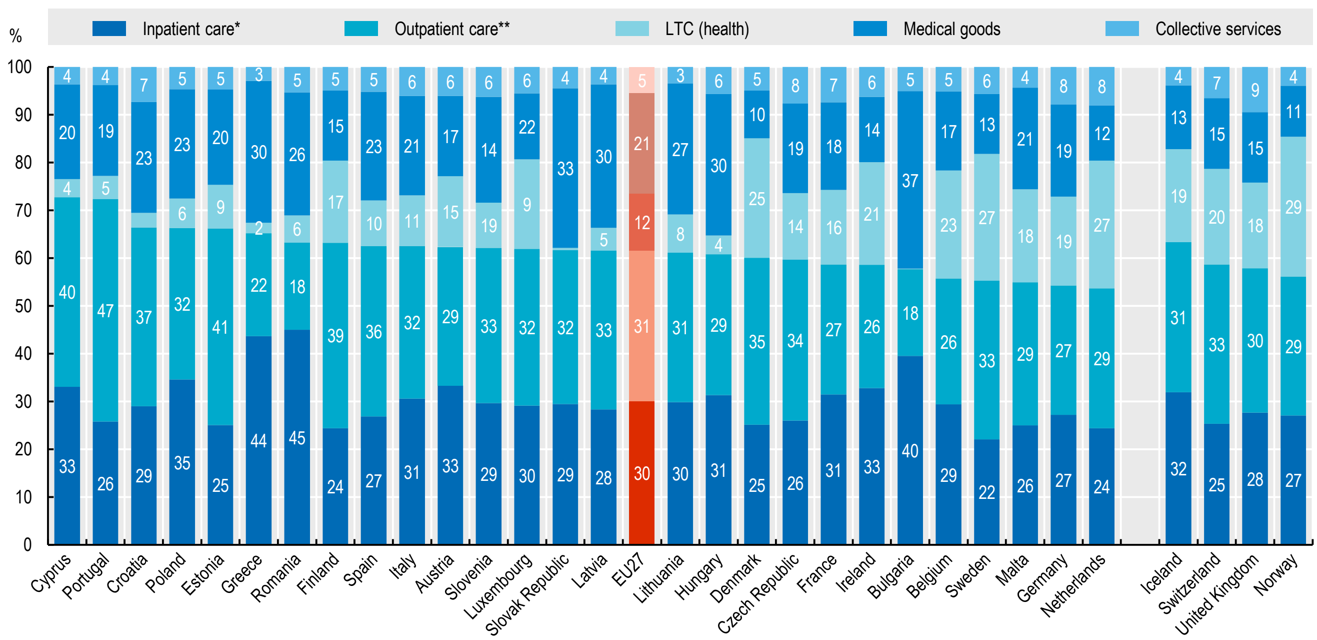
The System of Health Accounts (OECD, Eurostat and WHO, 2017) defines the boundaries of the health care system. Current health expenditure comprises personal health care (curative and rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public 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.

Reference

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

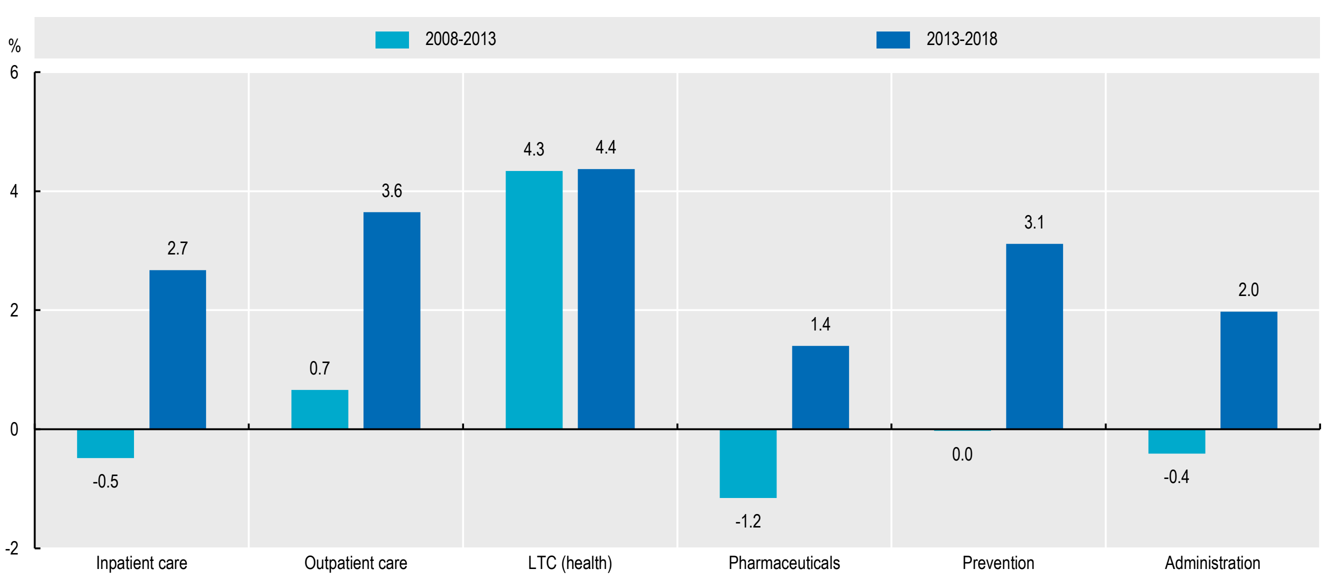
Figure 5.9. **Health expenditure by function, 2018**



Note: Countries are ranked by curative-rehabilitative care as a share of health expenditure. The EU average is unweighted. * Refers to curative-rehabilitative care in inpatient and day care settings. ** Includes home care and ancillary services and can be provided in ambulatory care settings or hospitals.
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/aruk46

Figure 5.10. **Growth rates of health expenditure per capita for selected functions, EU average, in real terms, 2008-18**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/g3bhjz

Effective primary health care is the cornerstone for efficient, people-centred, and equitable health systems. Strengthening primary care has been identified as an effective policy tool to improve care coordination and health outcomes and reduce wasteful spending, by limiting unnecessary hospitalisations and associated costs in hospitals and other parts of the health system. However, in many EU and OECD countries, primary care has not yet fully realised this potential (OECD, 2020).

Primary health care is a complex concept that stretches across different types of services and providers. No definitive consensus exists on which services or providers should be included. Data presented here defines spending on primary health care as general outpatient, dental and home-based curative care, as well as preventive services (collectively termed as "basic care services") when provided by ambulatory care providers – meaning that care in hospitals or outpatient specialist care are not included. Using this as a proxy, primary health care accounts for around 13% of health spending on average across EU countries, ranging from less than 10% in the Slovak Republic and Romania to more than 17% in Lithuania and Estonia (Figure 5.11). Primary health care spending as a share of total health spending remained relatively constant over the last five years in most EU countries, suggesting expenditure growth in line with overall health spending. Exceptions to this are Latvia and Romania – where primary health care spending grew on average by about 10% per year over the last five years – or Finland and the Slovak Republic, where primary health care spending retracted in real terms since 2013.

On average across EU countries, half of primary care spending is on general outpatient care services. A further 39% is related to dental care. Prevention services (9%) as well as home visits by GPs or nurses (2%) make up a much smaller proportion of spending on primary care. Looking at specific country examples, the share of general outpatient care provided by ambulatory providers is particularly high in Poland and reaches 12% of all health spending. In Germany, Austria and Romania, spending on general outpatient care is much lower in relative terms, accounting for less than 4.5% of total health spending (Figure 5.11).

In Lithuania and Estonia, the relatively large weight of primary care in total health spending is explained by the importance of dental care, which accounts for 50% of primary health care spending. In both countries, dental care constitutes 9% of their total health budget – nearly twice the EU average (5% of all health spending). Conversely, dental care spending is comparatively small in Poland, Belgium, Spain, the Netherlands and Romania, where it represents only around 3% of total health spending.

The "basic care services" described above can be delivered in various settings, including hospitals. The proportion of spending on all basic care services that are delivered by the ambulatory care sector may be interpreted as an approximate measure of allocative efficiency, as it could indicate what is delivered in the most appropriate setting. Nevertheless, the cross-country comparability of this measure remains limited due to the diversity of organisational models for primary health care across EU countries. For example, some EU countries have established dedicated primary health care units within hospitals. Across EU member states, 85% of all basic care spending is for services delivered by ambulatory care providers (Figure 5.12). This share stood at 90% or more in Belgium, Denmark, Latvia, Spain, Lithuania and Romania but was less than 75% in Estonia, Luxembourg and Switzerland.

Definition and comparability

International comparisons of what is spent on primary health care have to date been largely absent due to both the lack of a commonly accepted definition, and an appropriate data collection framework. Working with data and clinical experts and international partners, OECD has developed a methodological framework to estimate primary health care spending. The results presented here are based on this methodology (Mueller and Morgan, 2018).

Estimates are based on data submitted using the System of Health Accounts 2011 framework. The following functions are first identified as basic care services:

- General outpatient curative care (e.g. routine visits to a GP or nurse for acute or chronic treatment)
- Dental outpatient curative care (e.g. regular control visits as well as more complex oral treatment)
- Home-based curative care mainly refer to home visits by GPs or nurses
- Preventive care services (e.g. immunisation or health check-ups)

Where basic care services are provided by ambulatory health care providers such as medical practitioners, dentists, ambulatory health care centres and home health care service providers, this can be considered as a proxy for primary health care. It should be stressed that this proxy measure is a simplified approach to operationalise a complex multi-dimensional concept.

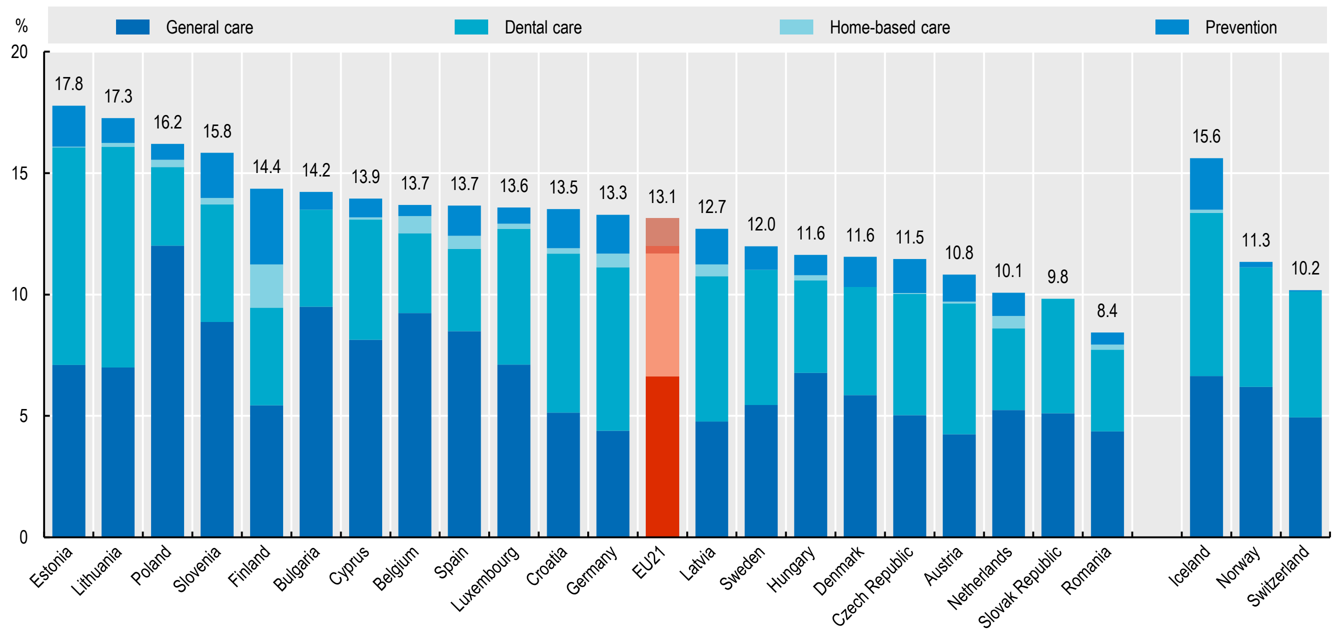
Comparability for this indicator is still limited and depends on countries' capacity and methods used to distinguish between general outpatient and specialist services.

References

Mueller, M. and D. Morgan (2018), "Deriving preliminary estimates of primary care spending under the SHA 2011 framework"; *http://www.oecd.org/health/health-systems/Preliminary-Estimates-of-Primary-Care-Spending-under-SHA-2011-Framework.pdf*.

OECD (2020), *Realising the Potential of Primary Health Care*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/a92adee4-en*.

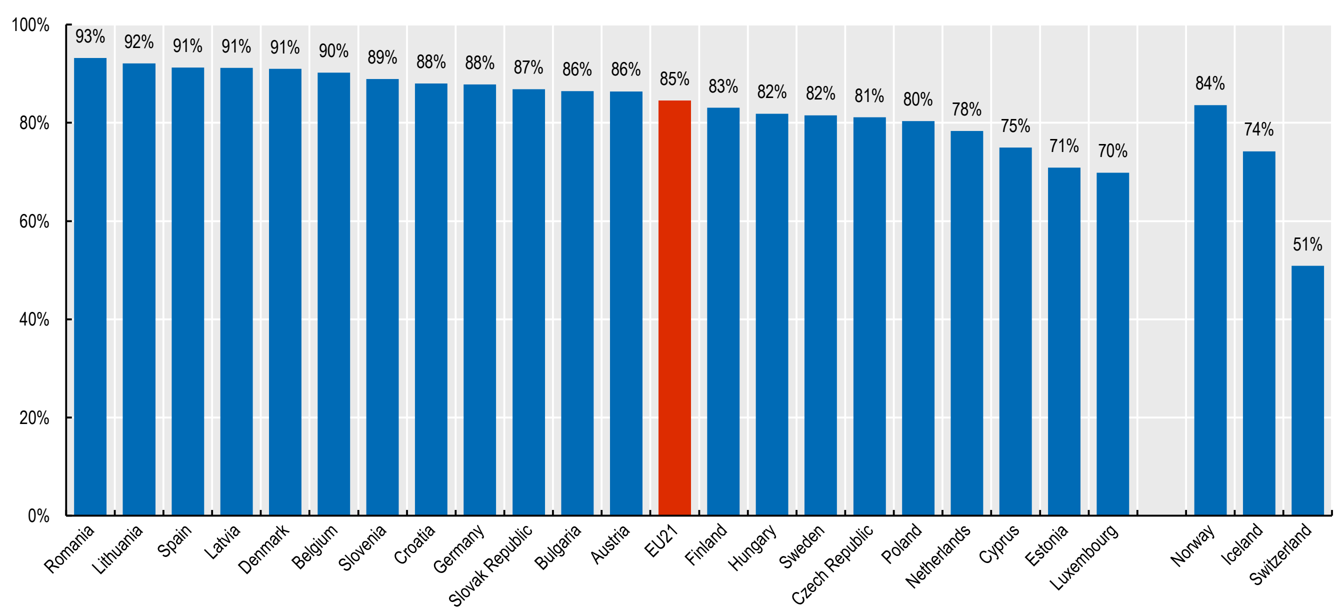
Figure 5.11. **Spending on primary health care services as share of total health spending, 2018**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/21hx7d

Figure 5.12. **Basic care spending delivered by ambulatory care providers as share of total basic care spending, 2018**



Note: Basic care services refers to general outpatient care, dental care, home-based care and preventive care. If provided by ambulatory care providers this is used as a proxy for primary health care. The EU average is unweighted.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/o67gqk

How and where health care is delivered can have a significant impact on spending for different goods and services. Health care can be provided in many different organisational settings, ranging from hospitals and medical practices to pharmacies and even private households caring for family members. Analysing health spending by provider can be particularly useful when considered alongside the functional breakdown of health expenditure, giving a fuller picture of the organisation of health systems (see indicator "Health expenditure by type of good and service").

Activities delivered in hospitals account for the largest proportion of health care expenditure in almost all EU countries. In 2018, hospitals received 39% of health system funding on average across EU countries. In Croatia, Romania and Cyprus, hospitals received more than 45% of their entire health care budget (Figure 5.13). On the other end of the scale, hospitals account for less than 30% of Germany's total health spending. This comparatively low share is partially due to country-specific organisational features stipulating a relatively strict separation between inpatient and outpatient service provision, which, in turn, results in comparatively limited outpatient activity in German hospitals.

After hospitals, the second-largest category of care providers are ambulatory providers. This category covers a wide range of facilities and, depending on the country-specific organisation of health service delivery, most spending relates either to medical practices including offices of GPs and specialists (e.g. Austria, France and Germany) or ambulatory health care centres (e.g. Finland, Ireland and Sweden). Across EU countries, care delivered by ambulatory providers accounts for around a quarter of health spending on average across EU countries. This share stands at 30% or above in Belgium, Germany and Luxembourg, but is less than 20% in Greece, Croatia, Malta, the Netherlands, Romania and Bulgaria. On average across the EU, around two-thirds of all spending on ambulatory providers relate to GP and specialist practices together with ambulatory health care centres, and one-fifth to dental practices.

Other main provider categories include retailers (mainly pharmacies selling prescription and over-the-counter medicines) – accounting for 20% of health spending on average across EU countries – and residential long-term care facilities (mainly providing inpatient care to long-term dependent people), making up 8% of health spending on average.

There is a large variation in the range of activities that may be performed by the same category of provider across countries, depending on the structure and organisation of each health system. This variation is most pronounced in hospitals (Figure 5.14). Although the majority of hospital expenditure in almost all EU countries is allocated to inpatient (curative-rehabilitative) care, in some countries hospitals constitute important providers of outpatient care services – for example, through accident and emergency departments, specialist outpatient units, or laboratory and imaging services provided to outpatients. In Germany, Greece and Bulgaria, hospitals are generally mono-functional, with the vast majority (>90%) of spending directed to inpatient care, and very little spending on outpatient and day care. On the other hand, outpatient care accounts for over 40% of hospital expenditure in Portugal, Finland, Denmark, Sweden and Estonia. In these countries, specialists typically receive outpatients in hospital outpatient departments.

To increase efficiency and reduce waiting times for selected procedures, many EU countries have shifted some medical services from inpatient to day care settings in recent years (OECD, 2017). As a result, in 2018 day care accounted for more than 10% of all hospital expenditure in seven EU countries.

Finally, the provision of inpatient long-term care in hospitals for people with long-term care needs (which does not refer to regular inpatient curative and rehabilitative care) makes up a sizeable share of hospital expenditure in some countries such as the Czech Republic, Romania and Iceland. This may be due to a lack of available beds in appropriate long-term care nursing facilities when patients requiring care cannot be discharged to their homes.

Definition and comparability

The different categories of health care providers are defined in the System of Health Accounts (OECD, Eurostat and WHO, 2017).

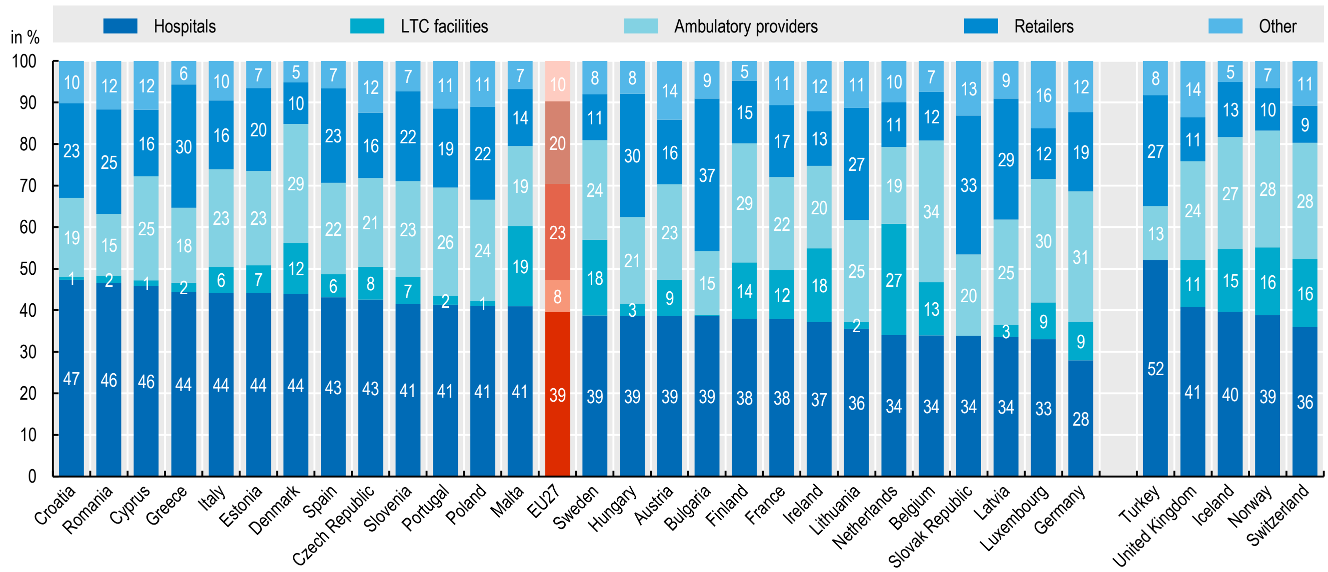
The main categories of providers are hospitals (acute and psychiatric), residential long-term care facilities, ambulatory providers (practices of GPs and specialists, dental practices, ambulatory health care centres, providers of home health care services), providers of ancillary services (e.g. ambulance services, laboratories), retailers (e.g. pharmacies), and providers of preventive care (e.g. public health institutes).

References

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

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

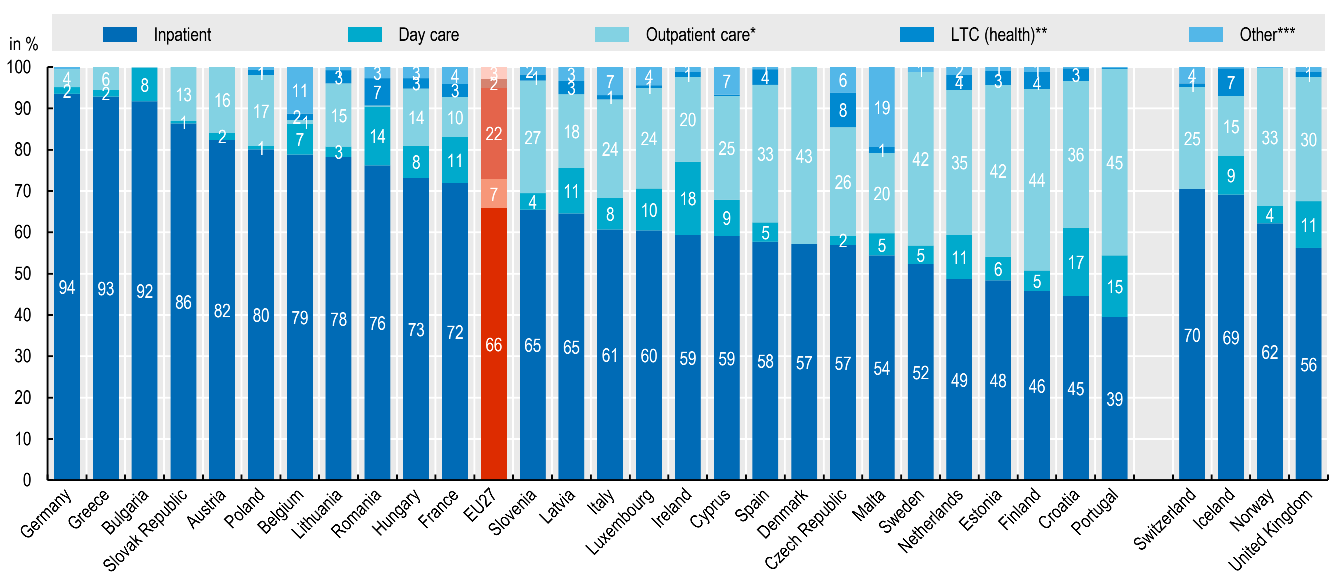
Figure 5.13. **Health expenditure by provider, 2018**



Note: The EU average is unweighted. In Belgium, spending for single day admissions in clinics is included under ambulatory providers.
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/ispd4q

Figure 5.14. **Hospital expenditure by type of service, 2018**



Note: The EU average is unweighted.
*Refers to curative-rehabilitative care provided to outpatients or at their homes and ancillary services. **Refers to inpatient LTC services for people with LTC needs.
***Includes medical goods and collective health services.
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/cveumh

Pharmaceutical care is constantly evolving, with an increasing number of novel medicines entering the market every year. These may offer alternatives to existing treatments, and in some cases, the prospect of treating conditions previously considered incurable. However, the costs of new pharmaceutical drugs can be very high, with significant implications for health care budgets. In 2018, retail pharmaceuticals (excluding those used during a hospital treatment) alone accounted for around one-sixth of all health care expenditure, and represented the third largest spending component in EU countries after inpatient and outpatient care. In total, the EU retail pharmaceutical bill was around EUR 190 billion in 2018. However, without accounting for spending on medicines used in hospital (generally included under inpatient care), this does not provide a complete picture of overall pharmaceutical expenditure.

Spending for retail pharmaceuticals averaged EUR 381 per person across EU member states in 2018, adjusted for differences in purchasing power. The variations in per capita retail pharmaceutical spending across countries can reflect differences in the basket of available medicines, pharmaceutical prices, consumption and the relative role of hospitals in dispensing pharmaceuticals, as well as the market penetration of generics (Figure 5.15). With EUR 615 per capita, Germany spent by far the most on pharmaceuticals among EU member states – 60% above the EU average. Belgium, France and Austria spent between 20-40% more on medicines per capita than the EU average. At the other end of the scale, Denmark and Croatia had relatively low spending levels.

Around four out of every five euros spent on retail pharmaceuticals goes on prescription medicines, with most of the rest on over-the-counter medicines (OTC). OTC medicines are pharmaceuticals that are generally bought without prescription. In most cases, their cost is fully borne by patients. The share of OTC medicines is particularly high in Poland, accounting for more than half of retail pharmaceutical spending, and stands at 30% or more in Romania, Latvia and Cyprus.

In most countries, the costs of pharmaceuticals are predominantly covered by government or compulsory insurance schemes (Figure 5.16). On average across EU countries, these schemes cover around 56% of all retail pharmaceutical spending, with out-of-pocket payments (41%) and voluntary private insurance (2%) financing the remaining part. Public coverage is most generous in Germany and France, where government and compulsory insurance schemes pay for more than 80% of all pharmaceutical costs. By contrast, in eight EU member states, public or mandatory schemes cover less than half the amount spent on medicines and coverage is particularly low in Bulgaria (27%) and Cyprus (17%).

In recent years, spending growth on retail pharmaceuticals in the EU was low compared to other health services (see indicator "Health expenditure by type of good and service") and was even negative in many countries during the years following the 2008 financial crisis. This was due in part to a combination of cost-containment policies and market dynamics, including generic and biosimilar competition (Belloni, Morgan and Paris, 2016).

However, new high cost treatments such as for Hepatitis C and some cancer drugs help explain a return to positive growth rates in more recent years. For example, the number of new cancer medicines and indications has been increasing rapidly, along with the prices. The value and sales of oncology medicines have more than doubled in Europe in the past decade.

Yet 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. Available data in a number of European countries suggest that pharmaceutical spending growth in the hospital setting has frequently outpaced that of retail pharmaceuticals, such as in the Czech Republic, Denmark, Finland, Germany or Spain (Figure 5.17). In some countries, this may reflect deliberate policy decisions to transfer high cost medicines to hospital dispensing.

Definition and comparability

Pharmaceutical expenditure covers spending on prescription medicines and over-the-counter products. Other medical non-durable goods (such as first aid kits and hypodermic syringes) are also included.

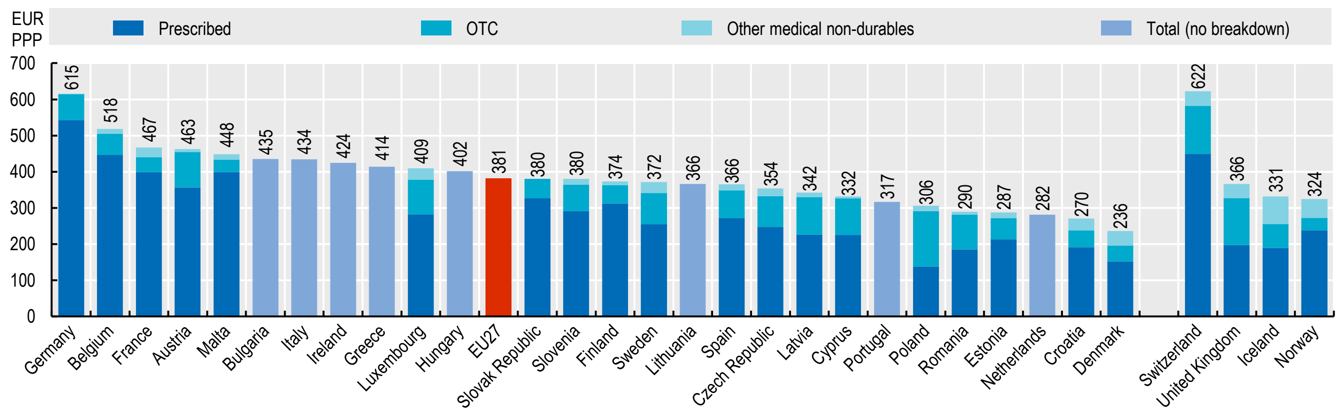
Retail pharmaceuticals are provided outside hospital care, such as those dispensed through a pharmacy or bought from a supermarket. Hospital pharmaceuticals include drugs administered or dispensed during an episode of hospital care. Expenditure on retail pharmaceuticals includes wholesale and retail 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 from retail pharmaceutical spending (available data suggests that their inclusion would add another 20%). Comparability issues exist regarding the administration and dispensing of pharmaceuticals for outpatients in hospitals. In some countries, the costs are included under curative care; in others, under pharmaceuticals.

References

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*.

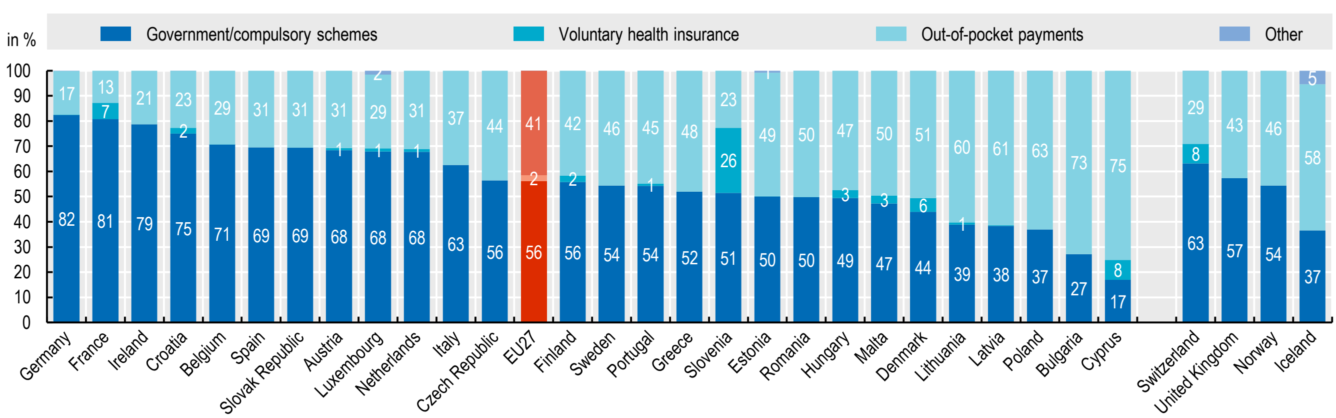
Figure 5.15. **Expenditure on retail pharmaceuticals per capita, 2018**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/84ynae

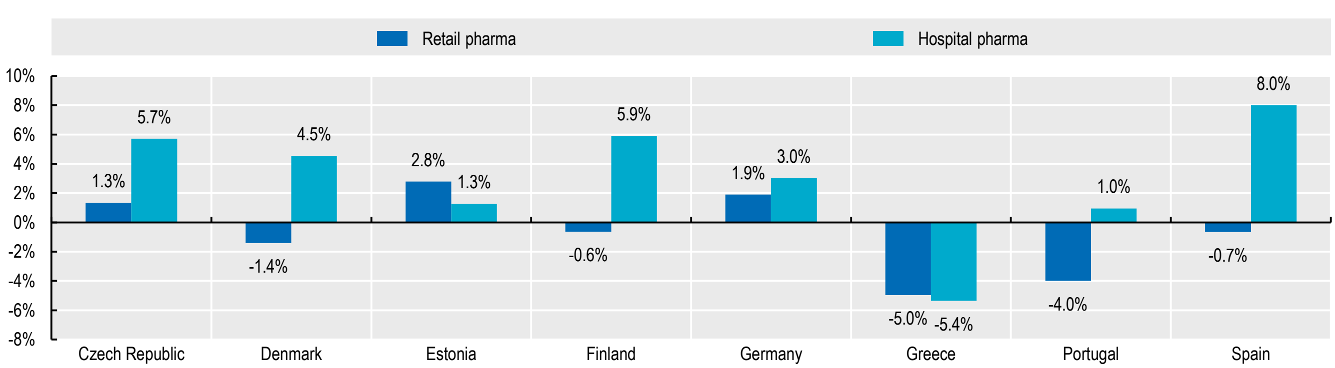
Figure 5.16. **Expenditure on retail pharmaceuticals by type of financing, 2018**



Note: The EU average is unweighted. The category 'Other' includes non-profit-schemes, enterprises and rest of world.
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/92znry

Figure 5.17. **Annual average growth in retail and hospital pharmaceutical expenditure, in real terms, 2008-18 (or nearest year)**



Note: Growth rates and time periods may have been adjusted by the OECD Secretariat to take account of breaks in series.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/f6bowg

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. However, the level of investment in buildings, machinery and technology tends to fluctuate more than current spending on health services over time, often responding to the economic climate whereby investment decisions may be postponed or brought forward.

In 2018, it is estimated that, on average, EU member states allocated around 0.4% of their GDP on capital investment in the health sector (Figure 5.18). This compares to an average of 8.3% of GDP allocated across EU health systems to health services and medical goods. Levels of capital investment on health vary significantly across EU countries and over time, even more so than overall health spending.

In relative terms, Belgium and Austria were the largest spenders on capital investment in the health sector in 2018, having allocated around 0.7% of their respective GDP. At the lower end, Cyprus and Hungary invested less than 0.2% of their GDP in 2018 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 and investment programmes on new equipment. Capital investment decisions also tend to be more strongly determined 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 on health grew by more than 20% in real terms on average across the EU in the three years prior to the 2008 financial crisis, over the following two years it fell by almost 10%. Between 2010 and 2014, average levels of capital investment in health across the EU slightly increased before a jump in 2015. In 2016, average capital investment dropped again and remained flat in 2017. As a result, the investment level in 2017 is only around the 2008 level (Figure 5.19).

Despite the 2008-09 economic crisis, between 2005 and 2018 capital spending in health continued to increase fairly steadily in real terms in some European countries. Sweden and Austria, for example, managed to maintain generally stable annual growth rates of capital investment in health over this extended period. Conversely, capital spending in health was very volatile in Ireland over this period. After having decreased significantly from 2007 to 2012 as a result of measures to balance public budgets, investment spending in health infrastructure and equipment in Ireland rebounded strongly in 2013 and has followed a generally upward trend ever since. On the other hand, Italy and the United Kingdom witnessed a severe reduction in their capital spending in health. In Italy, levels have been on a negative trajectory between 2010 and 2016 with only a small uptick in 2017. In the United Kingdom, capital spending in health dropped by almost 50% between 2009 and 2011 but has steadily increased since 2013. Nevertheless, in 2018, the investment level in health was still around 20% lower compared to its 2009 level.

The European Union has been supporting capital investment in national health systems across the EU via the European Structural and Investment Funds (ESIF) since 2014. The key objectives of these various funds in the area of health are to reduce health inequalities between regions and social groups, and to increase the effectiveness and accessibility of national health care systems (European Commission, 2020). Between 2014 and 2020, the European regional development fund (ERDF) and the European social fund (ESF) – two out of five funds subsumed under the ESIF – provided more than EUR 9 billion to member states for health-related investments. In the aftermath of the COVID-19 pandemic, investment support by the EU funds in the area of health systems will significantly increase in the coming years as part of the "Next Generation EU" recovery package.

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 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.

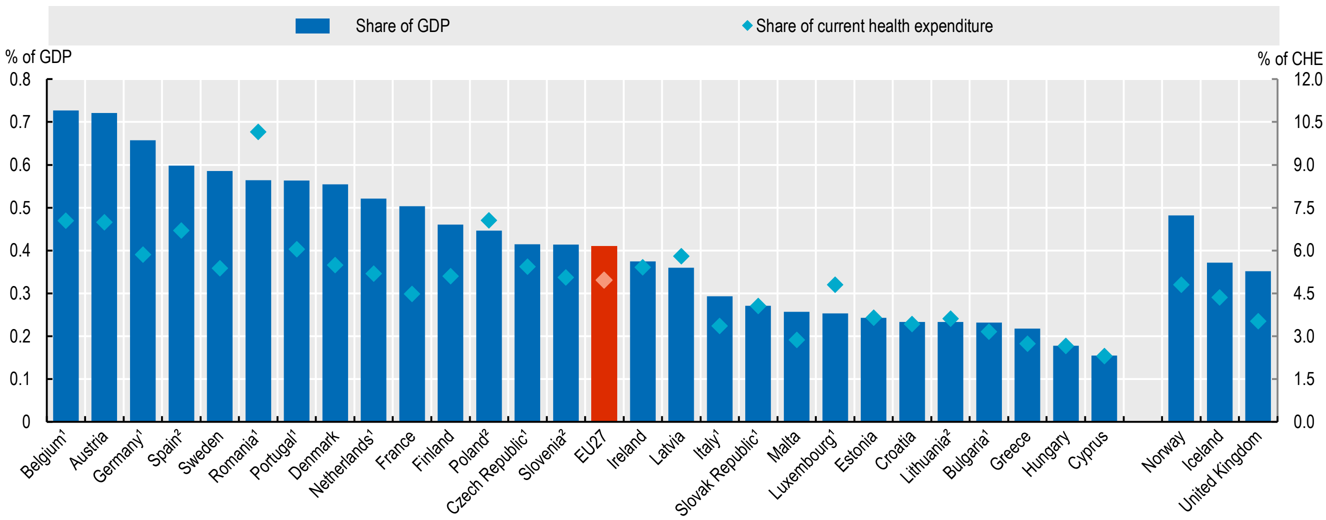
Gross fixed capital formation in health is reported by many countries under the System of Health Accounts. It is also included in National Accounts data where it is broken down by industrial sector according to the International Standard Industrial Classification (ISIC) Rev. 4. To estimate investment in health, section Q: Human health and social work activities or Division 86: Human health activities can be used. The former is normally broader than the SHA boundary while the latter is narrower.

References

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

European Commission (2020), *Health Investments by European Structural and Investment Funds2014-2020*, *https://ec.europa.eu/health/sites/health/files/health_structural_funds/docs/esif_factsheet_en.pdf*.

Figure 5.18. **Capital expenditure on health as a share of GDP and in relation to current health expenditure, 2018 (or nearest year)**



Note: The EU average is unweighted. 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 2020; OECD National Accounts; Eurostat Database.

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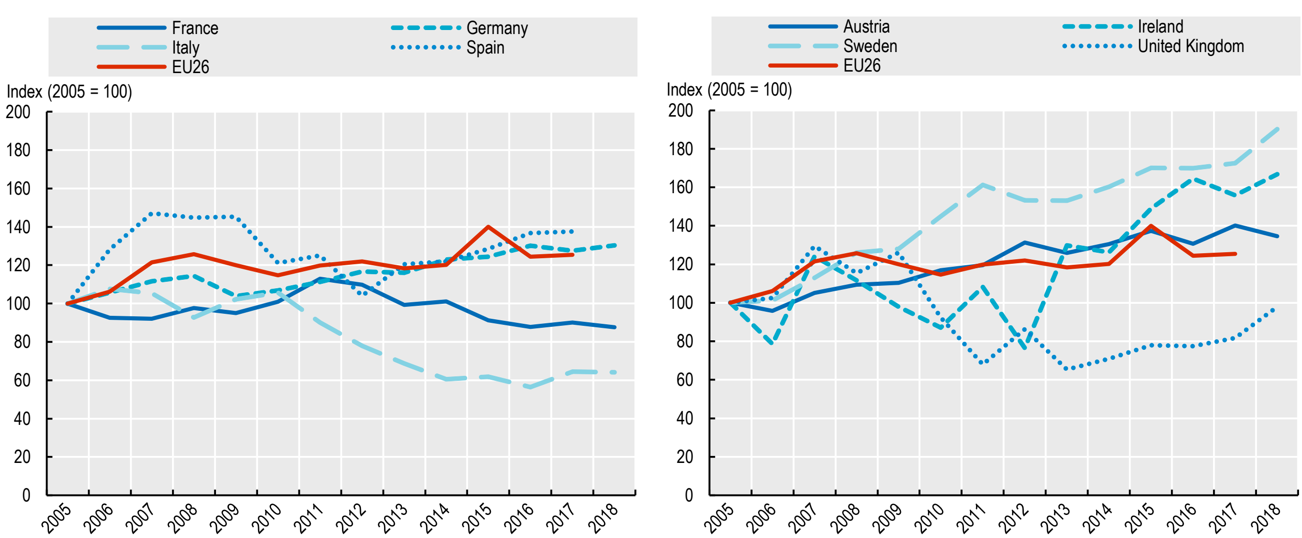
Figure 5.19. **Changes in gross fixed capital formation, in real terms, selected countries, 2005-18**



Note: The EU average is unweighted. Bulgaria not included due to break in series. The value in 2005 is set as 100.
Source: OECD Health Statistics 2020; OECD National Accounts; Eurostat Database.

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Health at a Glance: Europe 2020
State of Health in the EU Cycle

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 2017, more than 1 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. Vaccination rates among children and older people have decreased in several countries in recent years following anti-vaccination campaigns and a belief that vaccination might not be needed. It is important to tackle vaccine hesitancy and improve vaccination coverage to reduce the spread of communicable diseases that can be effectively prevented through vaccines and the burden on health systems. Progress has been made in tackling cancer in many countries through the implementation of population-based screening programmes to detect cancer earlier and the provision of effective and timely cancer care. These efforts have led to increased survival following diagnosis and reduced mortality from cancer in most countries, yet wide disparities in cancer care persist across countries. Promoting more patient-centred care has become a growing priority across EU countries in recent years to improve the quality of care and responsiveness to patients' expectations. Based on surveys seeking patient-reported experience measures (PREMs), citizens in most countries rate the quality of primary care high. These survey results signal clearly the importance of good provider/patient communication and patient involvement in care and treatment decisions.

Indicators of avoidable mortality can provide a general "starting point" to assess the effectiveness of public health and health care systems in reducing deaths before 75 years of age from various diseases and injuries. However, further analysis is required to assess more precisely different causes of potentially avoidable deaths and interventions to reduce them.

In 2017, over 1 million premature deaths across EU countries could have been avoided through better prevention and health care interventions. This amounts to about two-thirds of deaths under age 75. Of these deaths, most (644 000 or about 64% of the total) were considered preventable through effective primary prevention and other public health measures, while slightly more than one-third (372 000 or about 36%) were considered treatable through more effective and timely health care interventions.

Lung cancer (23% of all deaths from preventable causes), ischaemic heart diseases (12%), alcohol-related deaths (11%), and transport and other accidents (8%) accounted for more than half of preventable mortality (Figure 6.1). Other major causes included stroke (6%), suicide (6%) and chronic obstructive pulmonary disease (COPD) often related to smoking (6%).

The main treatable causes of mortality include ischaemic heart disease (20% of all deaths from treatable causes), colorectal cancer (16%), breast cancer (12%) and stroke (11%), which together account for about 60% of all deaths that could be avoided through the provision of timely and effective treatment. Pneumonia (6%), diabetes (4%) and hypertensive diseases (4%) are other major causes of premature deaths that are amenable to treatment.

Preventable mortality rates in 2017 were about three times lower in Cyprus and Italy compared with the rates in some Central and Eastern European countries such as Hungary, Latvia, Romania and Lithuania (Figure 6.2). Higher rates of premature death in these countries were mainly due to much higher mortality from ischaemic heart disease, accidents and alcohol-related deaths, as well as lung cancer in Hungary.

Mortality rates from treatable causes were also about three times lower in some Western and Northern European countries like France, the Netherlands, Spain, Sweden and Italy than in Central and Eastern European countries such as Romania, Latvia, Bulgaria and Lithuania. The higher rates in the latter group of countries were mainly driven by higher mortality rates from ischaemic heart disease, stroke and some treatable cancers.

Across the EU, preventable mortality rates were almost three times higher among men than among women (235 per 100 000 population for men, compared with 89 for women) because of higher death rates from all the leading causes of preventable death. Mortality rates from treatable causes were also nearly 40% higher among men than women, mainly due to higher death rates from ischaemic heart disease and stroke.

Definition and comparability

In 2019, the OECD and Eurostat adopted new joint definitions of avoidable mortality, including a list of preventable and treatable causes of mortality. Preventable mortality is defined as causes of death that can be mainly avoided through effective public health and primary prevention interventions (i.e. before the onset of diseases/ injuries, to reduce incidence). Treatable causes of mortality is defined as causes of death that can be mainly avoided through timely and effective health care interventions, including secondary prevention and treatment (i.e. after the onset of diseases, to reduce case-fatality).

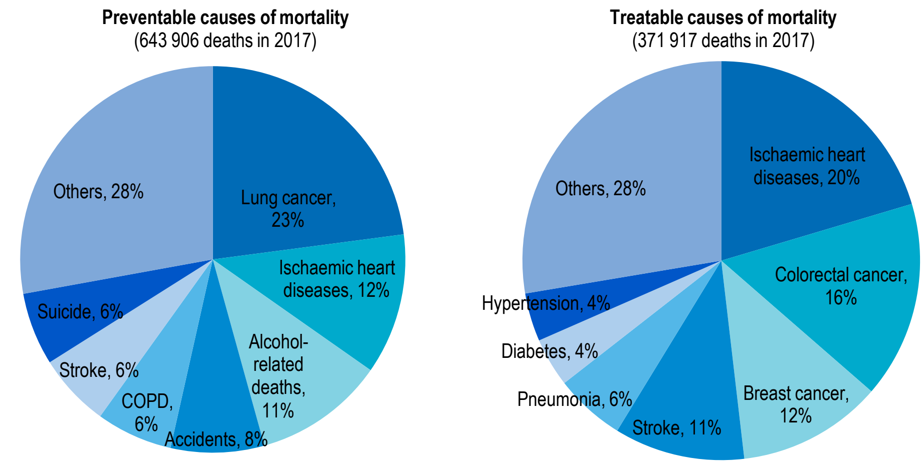
The attribution of each cause of death to the preventable or treatable mortality list was based on the criterion of whether it is predominantly prevention or health care interventions that can reduce death. Causes of death that can be both largely prevented and also treated once they have occurred were attributed to the preventable category on the rationale that if these diseases are prevented, there would be no need for treatment. In cases when there was no strong evidence of predominance of preventability or treatability (e.g. ischaemic heart disease, stroke, diabetes, hypertension), the causes were allocated on a 50%-50% basis to the two categories to avoid double-counting the same cause of death in both lists. The age threshold of premature mortality is set at 74 years (inclusive) for all causes (OECD/Eurostat, 2019).

References

Eurostat (2020), *Preventable and treatable mortality statistics*, Statistics Explained, July 2020.

OECD/Eurostat (2019), *Avoidable mortality: OECD/Eurostat lists of preventable and treatable causes of death*, *https://www.oecd.org/health/health-systems/Avoidable-mortality-2019-Joint-OECD-Eurostat-List-preventable-treatable-causes-of-death.pdf*.

Figure 6.1. **Main causes of avoidable mortality in the European Union, 2017**



Note: Data are based on the 2019 OECD/Eurostat revised definitions and lists of preventable and treatable causes of mortality. The new lists attribute half of all deaths for some diseases (e.g. ischaemic heart diseases, stroke, diabetes and hypertension) to the preventable mortality list and the other half to treatable causes, so there is no double-counting of the same death.
Source: Eurostat Database (data refer to 2017, except for France 2016).

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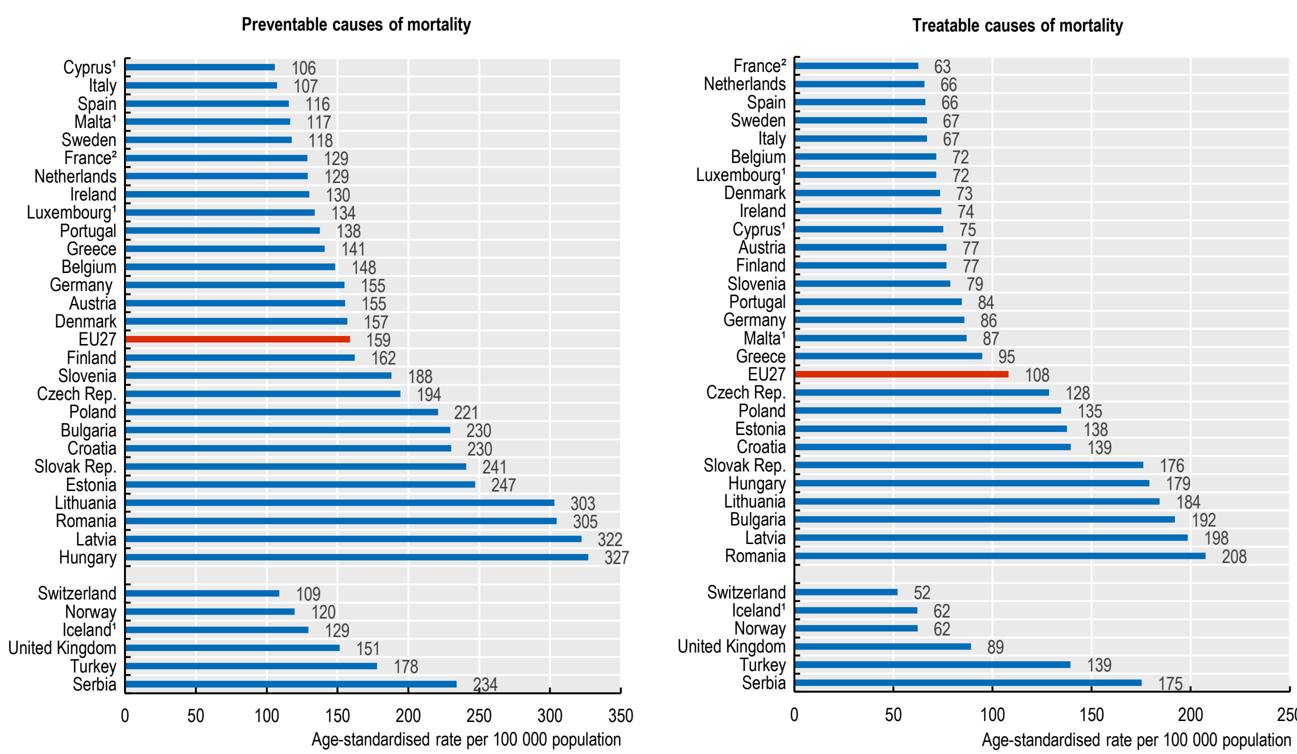
Figure 6.2. **Mortality rates from avoidable causes, 2017**



Note: The EU average is weighted. 1. Three-year average. 2. Data refer to 2016 for France.
Source: Eurostat Database.

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All EU countries have established childhood vaccination programmes to reduce the spread of many infectious diseases and related deaths, although the number and type of compulsory or recommended vaccines vary to some extent across countries.

In recent years, some parts of Europe witnessed a steep resurgence of vaccine-preventable diseases due to declining vaccine coverage driven at least partly by anti-vaccine campaigns. To counter these alarming trends, over the past years the European Commission has repeatedly called for stronger efforts and cooperation to tackle vaccine hesitancy and improve vaccination coverage to reduce the spread of vaccine-preventable diseases (European Commission, 2018). This has become even more important following the COVID-19 pandemic to avoid any additional burden on health systems.

The confinement measures following the COVID-19 outbreak have resulted in a sharp reduction in the spread of communicable diseases like measles between March and August 2020, but these reductions may only be temporary if vaccination coverage does not go up. One of the indirect consequences of the COVID-19 pandemic is that it disrupted the implementation of routine vaccination programmes in some countries, as some people feared exposure to the new virus, and restrictions on the movement of people impacted children's accessibility to immunisation services (WHO, 2020).

Vaccination against measles is included in all national childhood vaccination programmes in Europe, whereas vaccination against hepatitis B has been included in a growing number of countries, but not yet in most Nordic countries and Hungary (ECDC, 2020a). WHO has recommended a coverage of at least 95% of children with two doses of measles-containing vaccine and three doses of the hepatitis B vaccine by 2020 (WHO, 2012; WHO, 2017).

In 2018, on average across EU countries, 94% of one-year-old children received at least one dose of measles vaccination. Half of EU countries had not reached yet the target of at least 95% coverage (Figure 6.3). Measles outbreaks have occurred in recent years in several countries, even in those that had previously eliminated or interrupted endemic transmission. In 2019, WHO announced that Albania, the Czech Republic, Greece and the United Kingdom had lost their measles elimination status due to continuous transmission in 2017 and 2018. During the 12-month period from March 2019 to February 2020, the highest number of measles cases were reported in France (2 466), Romania (1 542), Italy (1 353), Bulgaria (1 347) and Poland (1 032). Most measles cases were reported among people who were not vaccinated, including children below age one who were too young to have received the first dose of the vaccine but also adolescents and adults (ECDC, 2020b).

On average, 93% of one-year-old children received hepatitis B vaccination in 2018 across those EU countries where this vaccination was part of the national immunisation programme. The vaccination rate was above the 95% target in several countries such as Malta, Portugal, Belgium, Cyprus, the Slovak Republic, Greece, Latvia, Luxemburg and Italy. However, less than 90% of one-year-old children were covered in Austria, Bulgaria, Germany, Montenegro and Switzerland (Figure 6.4). Data on childhood vaccination rate for hepatitis B are not available in most Nordic countries except Sweden, because this vaccine is not yet part of the general infant vaccination programme, although it is provided to high-risk groups.

Definition and comparability

Vaccination rates reflect the percentage of one-year-old children who have received the respective vaccination (at least one dose of measles-containing vaccine and three doses of hepatitis B vaccine). 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 the age group is not always strictly comparable across countries.

References

ECDC (2020a), *Monitoring the Responses to Hepatitis B and C Epidemics in the EU/EEA Member States, 2019*, Stockholm.

ECDC (2020b), *Monthly measles and rubella*, Stockholm.

ECDC (2020c), *Communicable Disease Threat Report, Week 28*, 5-11 July 2020, Stockholm.

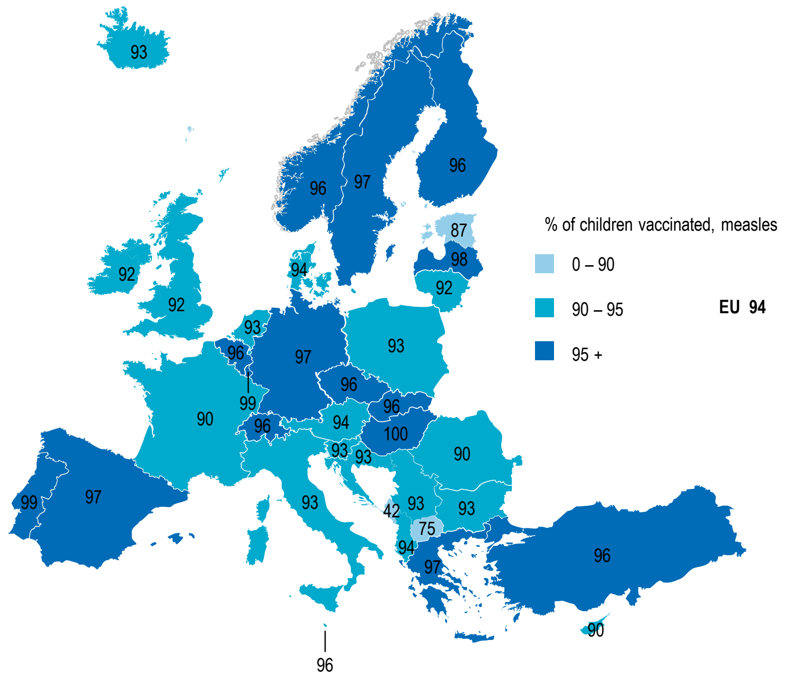
European Commission (2018), *Proposal for a Council Recommendation on Strengthening Cooperation against Vaccine Preventable Diseases*, European Commission, Brussels.

WHO (2020), *Special feature: immunisation and COVID-19*, Geneva.

WHO (2017), *Global Hepatitis Report*, Geneva.

WHO (2012), *Global Measles and Rubella Strategic Plan: 2012-20*, Geneva.

Figure 6.3. **Vaccination against measles, children aged 1, 2018**



Note: The EU average is unweighted.
Source: WHO/UNICEF.

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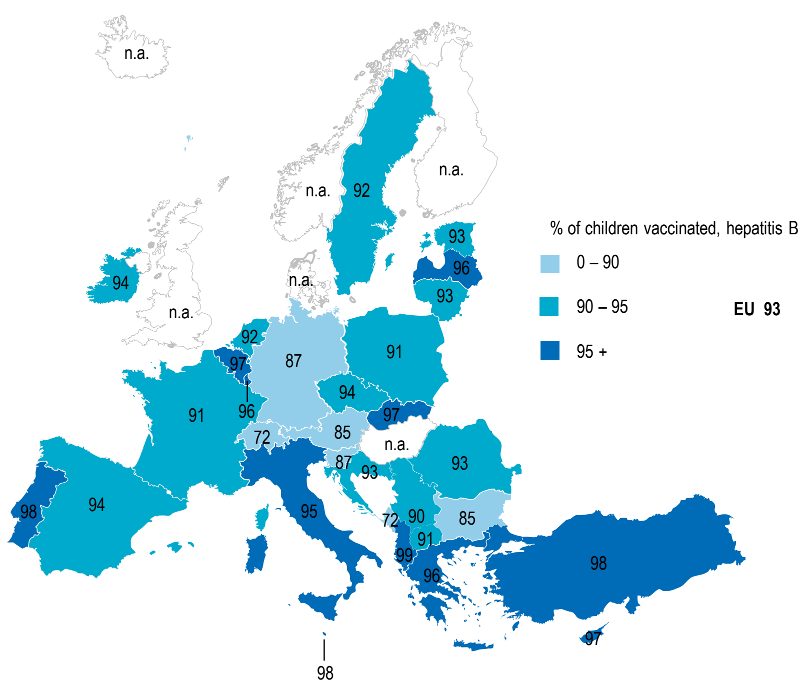
Figure 6.4. **Vaccination against hepatitis B, children aged 1, 2018**



Note: The EU average is unweighted. Data for Denmark, Finland, Iceland, Norway and Hungary are not available because national childhood vaccination programmes do not include hepatitis B. Data are not available for the United Kingdom. Data for Slovenia refer to children aged 5-6.
Source: WHO/UNICEF.

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Depending on the year, seasonal influenza affects between 4 and 50 million people across EU countries, Iceland, Norway, Switzerland and the United Kingdom, and 15 000 to 70 000 people die every year of causes associated with influenza (ECDC, 2020). Older people are at higher risk of serious complications and death from influenza. With the new coronavirus, older people will face an increased risk of viral infection during the 2020/21 winter season. Although influenza vaccination is never fully effective in preventing all influenza viruses that may spread in a given year, it does offer protection and can effectively reduce the burden of seasonal influenza.

WHO recommends that 75% of elderly people be vaccinated against seasonal influenza, and a 2009 EU Council Recommendation also set a goal of 75% vaccination coverage among older people (European Union, 2009). In addition to older people, the European Council also recommends influenza vaccination for persons with chronic conditions and health workers, and WHO recommends influenza vaccination for pregnant women and children as well.

All EU countries have national recommendations to promote influenza vaccination among older people, although the specific age threshold varies across countries. Despite this, in 2018 the flu vaccination coverage among the target group of people aged 65 and over was less than 50% in the majority of EU countries. On average, only 39% of people aged 65 and over were vaccinated against influenza, and no country reached the recommended target of 75% vaccination coverage (Figure 6.5). Vaccination rate against influenza among older people was particularly low in Central and Eastern European countries, with rates below 25% in all countries reporting these data.

Vaccination rates against influenza have gone in the wrong direction over the past decade in most EU countries. In countries like the Slovak Republic and Slovenia, vaccination coverage has halved between 2008 and 2018.

A 2019 Eurobarometer survey asked people who had not been vaccinated against influenza or other infectious diseases what were the reasons for this (European Union, 2019). On average across EU countries, over two in five people aged 65 and over reported that they did not get vaccinated in the past five years because they did not see the need for them. About one in five people in this age group who were not vaccinated for the past five years thought that they were still protected by vaccines they had received earlier. About one in ten people aged 65 and over who were not vaccinated thought that vaccines were not safe and could have side-effects or that vaccines were only necessary for children. One in five people aged over 65 also reported that they did not have vaccinations recently because this had not been offered to them by their general practitioner or another doctor. Some older people also reported that it was not easy to get access to vaccination and others also said that the vaccine was too expensive (Figure 6.6).

Strategies to increase vaccination coverage against influenza among older people need to address all these different beliefs and barriers. Targeted approaches through personalised invitations or phone calls to the target population, awareness building among health care providers, financial incentives to encourage health professionals to provide vaccinations and the provision of influenza vaccinations in pharmacies can help increase influenza vaccination coverage (WHO, 2018). The COVID-19 pandemic provides an opportunity to raise again public awareness of the benefits of vaccination in general and against seasonal influenza in particular, at a time when both the influenza viruses and the new coronavirus will spread in the 2020/21 winter season.

Definition and comparability

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

The main limitation in terms of data comparability arises from the use of different data sources, whether survey or programme, which are susceptible to different types of errors and biases. For example, data from population surveys may reflect some variation due to recall errors and irregularity of administration.

The Special Eurobarometer survey on Europeans' attitudes towards vaccination conducted in 2019 asked respondents who did not have any vaccination in the past five years to report all the reasons for not being vaccinated.

References

ECDC (2020), *Factsheet about seasonal influenza*, Stockholm.

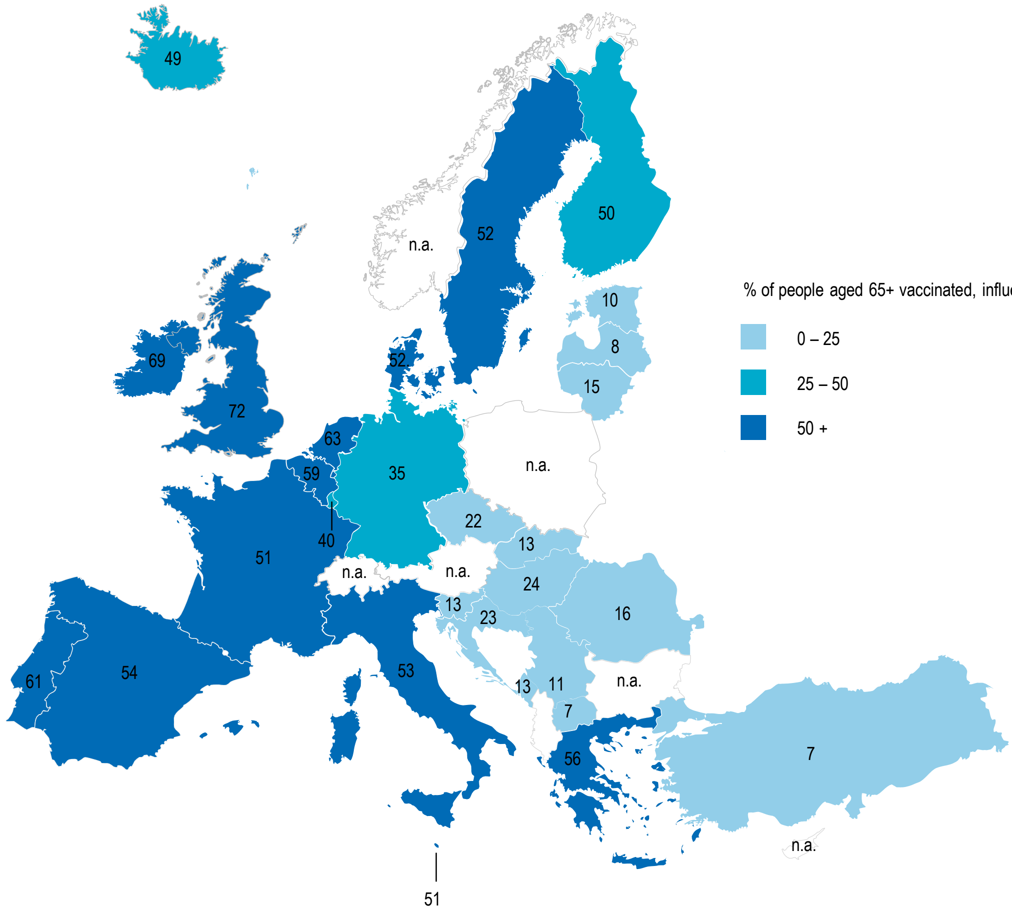
European Union (2009), "Council Recommendation of 22 December 2009 on Seasonal Influenza Vaccination (2009/1019/EU)", *Official Journal of the European Union*.

European Union (2019), *European attitudes towards vaccinations*, Special Eurobarometer 488, Brussels.

WHO (2020), *Influenza vaccination coverage and effectiveness*, Copenhagen.

WHO (2018), *The organisation and delivery of vaccination services in the European Union*, Copenhagen.

Figure 6.5. **Vaccination against influenza, people aged 65 and over, 2018 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020 and Eurostat Database.

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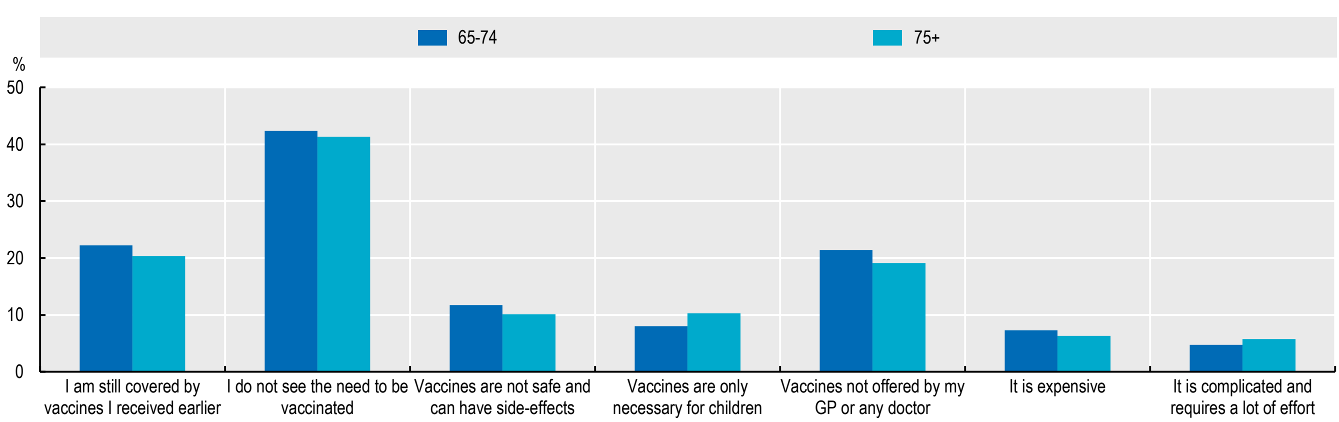
Figure 6.6. **Reasons for not getting vaccinated among people aged 65 and over, 2019**



Source: Eurobarometer 2019.

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Promoting more people-centred care has become a growing priority across EU countries in recent years to improve the quality of care and the responsiveness to patients' expectations. This has been accompanied by national and European efforts to develop and implement patient-reported experience measures (PREMs) and patient-reported outcomes measures (PROMs) to monitor progress for individual providers and at the national level. For example, Norway collects patient-reported measures through regular surveys and reports them at a provider level to inform the public on patient-reported provider performance and to increase accountability. The United Kingdom has been reporting PREMs at a provider level since 2002 for hospitals and since 2004 for GP practices (Fujisawa and Klazinga, 2017; OECD, 2020).

At the European level, the European Quality of Life Survey has collected information from people about their views on the quality of different services in their country, including different aspects of the health system. The results from the last wave of this survey from 2016 show that in most countries, citizens rated the quality of primary care (care provided by general practitioners/family doctors or at health centres) higher than the quality of hospital care and specialist care, with the exception of Finland and Sweden where the quality of hospital care and specialist care was rated higher (Figure 6.7). In general, citizens who rate the quality of primary care in their country higher than the EU average also generally rate the quality of hospital and specialist care above average, and vice versa. The perceived quality of both primary care and hospital care was generally lower in Greece, Poland and Latvia in 2016.

The perceived quality of both primary care and hospital and specialist care is generally higher among people who have used these services than among those who have not used them. In primary care, different aspects of the interactions between GPs or other primary care providers such as the personal attention given by professionals, the time devoted to consultations, and the extent of consultations about the care plan are also associated positively with the overall assessment of quality (Eurofound, 2016).

The importance of good provider/patient communication and patient involvement in care and treatment decisions also comes up clearly from the results of more specific surveys on patient experience. In those countries where these more specific data are available, most patients generally report positive experiences in their interactions with their primary care providers on these aspects of quality (OECD, 2019). For example, over 80% of patients in many countries reported in 2016 that a general practitioners/family doctors involved them in care and treatment decisions (Figure 6.8). The proportion was lower in Poland, but substantial progress has been achieved in monitoring and improving this aspect of quality and patient experience.

Definition and comparability

In the European Quality of Life Survey, the perceived quality of primary care and hospital and specialist care is based on a response scale to the following question, "In general, how do you rate the quality of the following two health care services?" A rating of 1 means very poor quality and 10 means very high quality.

An increasing number of countries have been collecting information on patient-reported experience measures (PREMs) in primary care based on a common module through nationally representative population surveys. Portugal collects this information through a nationally representative service user survey. For Germany, Norway, Sweden, Switzerland and the United Kingdom, the Commonwealth Fund's International Health Policy Surveys of 2010 and 2016 are used as a data source. There are limitations in data reliability and comparability related to the sample size and response rates. Data from this source refer to patient experience with a GP specifically (not any doctor).

References

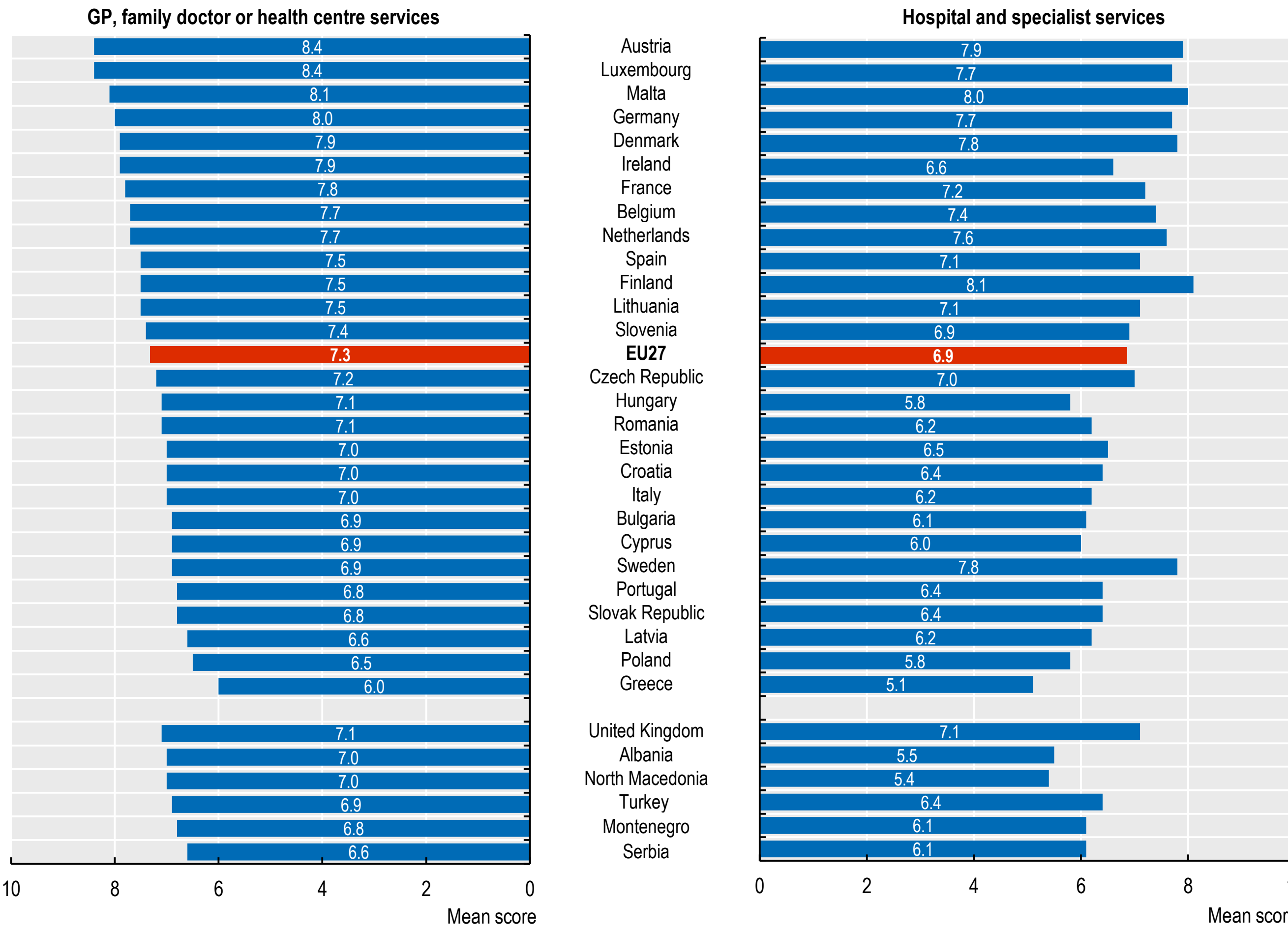
Eurofound (2016), *European Quality of Life Survey 2016: Quality of life, quality of public services, and quality of society*, Luxembourg.

Fujisawa, R. and N. Klazinga (2017), "Measuring patient experiences (PREMS): Progress made by the OECD and its member countries between 2006 and 2016," *OECD Health Working Papers*, No.102, OECD Publishing, Paris, *https://doi.org/10.1787/893a07d2-en*.

OECD (2020), *Patient-Reported Indicators Survey (PaRIS), http://www.oecd.org/health/paris/*.

OECD (2019), *Health at a Glance 2019: OECD Indicator*s, OECD Publishing, Paris, *https://doi.org/10.1787/4dd50c09-en*.

Figure 6.7. **People-reported quality of health services, 2016**



Note: The EU average is unweighted. A mean score of one means very poor quality and a mean score of ten means very high quality.
Source: European Quality of Life Survey 2016.

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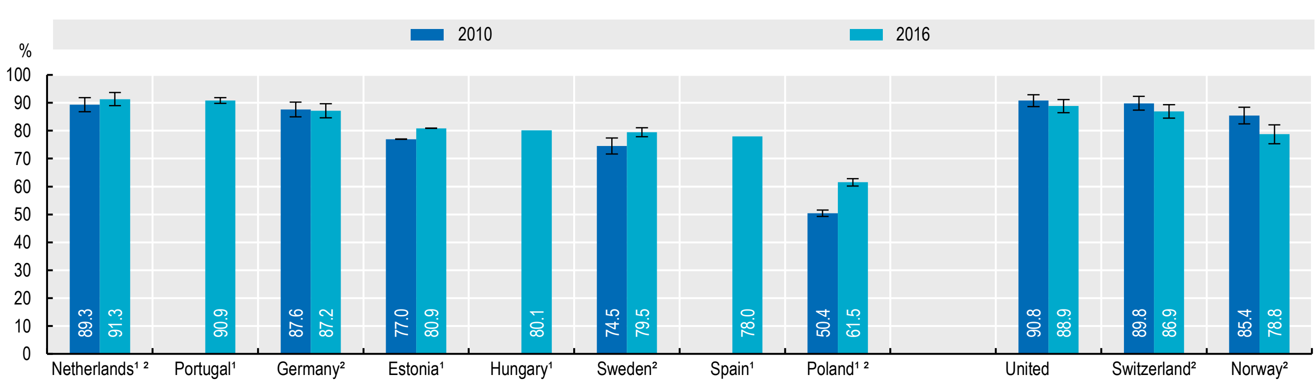
Figure 6.8. **Doctors involving patients in care/treatment decisions, 2010 and 2016 (or nearest years)**



Note: H refers to 95% confidence intervals. 1. National sources. 2. Data refer to patient experiences with regular doctor or regular practice.
Source: OECD Health Statistics 2020 and Commonwealth Fund International Health Policy Survey 2010 and 2016.

StatLink https://stat.link/9sxf2c

Asthma, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF) and diabetes are four widely prevalent long-term conditions. About 30 million children and adults under 45 years of age in Europe have asthma, and 5-10% of adults over age 40 have COPD (European Respiratory Society, 2020), It is estimated that more than 15 million people are affected by CHF (European Heart Network, 2019). And about 32 million adults have been diagnosed with diabetes in the EU (IDF, 2019). Common to all these four conditions is the fact that the evidence base for effective treatment is well established, and much of it can be delivered in primary care. Primary care is expected to serve as the first point of contact for people in health systems and to provide continuous and coordinated care over time, notably for people having chronic diseases. A well-performing primary care system should therefore reduce acute deterioration in people living with chronic conditions like asthma, COPD, CHF or diabetes, thereby preventing costly avoidable hospital admissions (OECD, 2020).

Figure 6.9 shows hospital admission rates for the two chronic respiratory diseases, asthma and COPD together. In 2017, admission rates for both conditions varied more than five-fold across EU countries, with Italy and Portugal reporting the lowest rates, and Denmark and Ireland reporting the highest rates. On average across EU countries, the admission rates for asthma and COPD have decreased slightly in recent years, with Italy, Ireland and the Slovak Republic achieving the biggest reductions (of more than 20% between 2012 and 2017).

Hospital admission rates for CHF also varied almost five-fold across EU countries in 2017. Portugal and Ireland have the lowest rates for this condition, whereas Lithuania, Poland and the Slovak Republic report rates almost twice the EU average. Admission rates for CHF have fallen slightly on average across EU countries between 2012 and 2017. Lithuania, Portugal and Romania have achieved the biggest reductions (Figure 6.10).

While avoidable hospital admissions for diabetes have also fallen in many countries over the past few years, there is still an almost five-fold variation in admission rates across countries. Italy, Spain and Portugal report the lowest rates, whereas the Slovak Republic, Lithuania and Malta report the highest rates (more than 50% higher than the EU average (Figure 6.11)). Between 2012 and 2017, avoidable hospital admissions for diabetes have decreased by more than 40% in Ireland and Portugal.

These declines reflect concerted efforts made to improve service provision in primary and community care settings. In Portugal, the National Strategy for Quality in Health 2015-20 improved the quality of organisational and clinical practice for people with chronic diseases, and increased the adoption of clinical guidelines. Progress in implementing these measures is supported by continuous quality monitoring. This shows improvement in the quality of primary care in recent years (OECD/European Observatory on Health Systems and Policies, 2019a). In addition, the creation of family health units staffed by multi-professional teams has allowed for greater care co-ordination and care continuity for people having chronic conditions.

In Lithuania, the role and responsibilities of some primary care providers have been expanded to allow for better chronic disease management. General practice nurses and nurse assistants are allowed to coordinate the care, to prescribe some medicines, and to monitor the progression of chronic diseases (OECD/European Observatory on Health Systems and Policies, 2019b).

Definition and comparability

The indicator is defined as the number of hospital admissions with a primary diagnosis of asthma, COPD, CHF or diabetes among people aged 15 years and over per 100 000 population. Avoidable admissions for diabetes include admissions for short-term and long-term complications and for uncontrolled diabetes without complications. Rates are age-sex standardised to the 2010 OECD population aged 15 and over.

Admissions resulting from a transfer from another hospital and where the patient dies during admission are excluded from the calculation, as these are considered unlikely to be avoidable. Disease prevalence and availability of hospital care may explain some, but not all, variations across countries. Differences in coding practices and data coverage of the national hospital sector may also affect the comparability of data.

References

IDF (2019), *Diabetes Atlas,* 9th edition, Brussels.

European Heart Network (2019), *Heart Failure and Cardiovascular Diseases – A European Heart Network Paper*, Brussels.

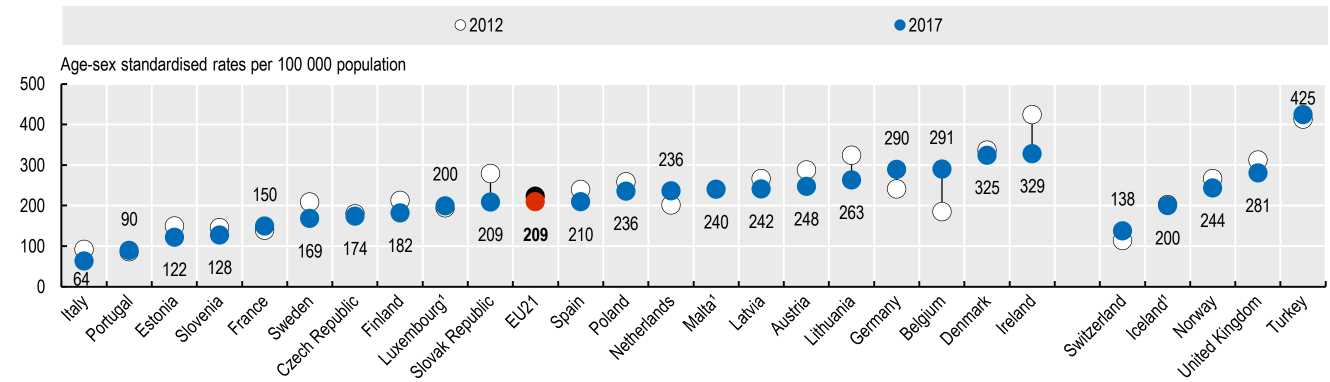
European Respiratory Society (2020), *European Lung White Book*, *https://www.erswhitebook.org/about/*.

OECD (2020), *Realising the Potential of Primary Health Care*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/a92adee4-en*.

OECD/European Observatory on Health Systems and Policies (2019a), *Portugal: Country Health Profile 2019*, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels, *https://doi.org/10.1787/85ed94fc-en*.

OECD/European Observatory on Health Systems and Policies (2019b), *Lithuania: Country Health Profile 2019*, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels, *https://doi.org/10.1787/35913deb-en*.

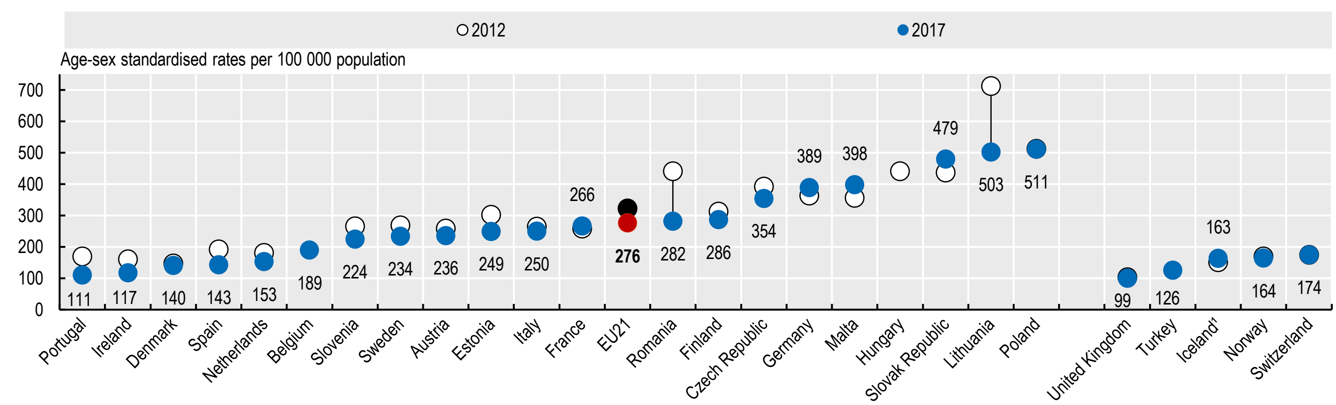
Figure 6.9. **Asthma and COPD hospital admission in adults, 2012 and 2017 (or nearest years)**



Note: The EU average is unweighted. 1. Three-year average.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/u0nypk

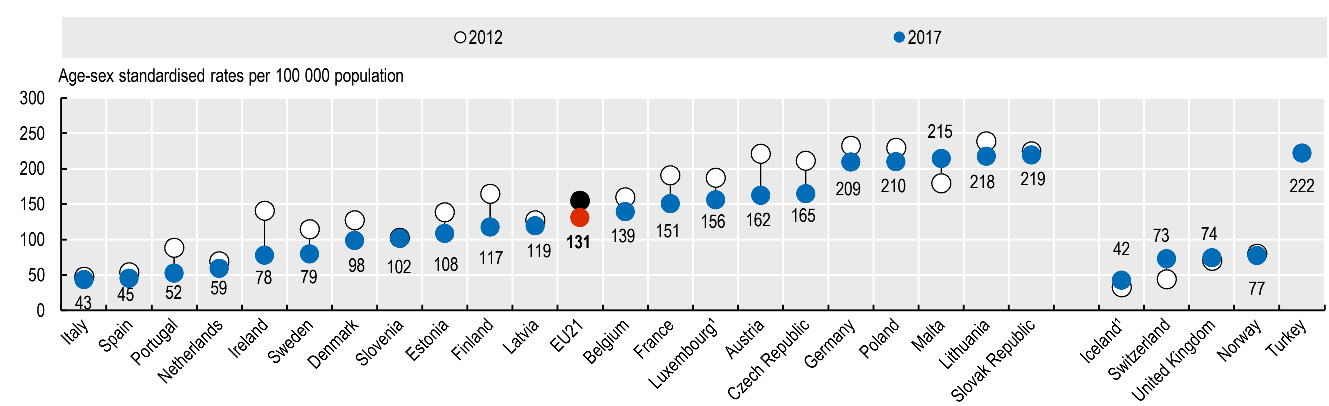
Figure 6.10. **Congestive heart failure hospital admission in adults, 2012 and 2017 (or nearest years)**



Note: The EU average is unweighted. 1. Three-year average.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/alqbou

Figure 6.11. **Diabetes hospital admission in adults, 2012 and 2017 (or nearest years)**



Note: The EU average is unweighted. 1. Three-year average.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/njm27v

Mortality due to coronary heart diseases has declined substantially over the past few decades (see indicator "Mortality from circulatory diseases" in Chapter 3). Reductions in smoking (see indicator "Smoking among adults" in Chapter 4) and improvements in treatment for heart diseases have contributed to these declines. Despite this progress, acute myocardial infarction (AMI or heart attack) remains the leading cause of cardiovascular deaths in Europe, highlighting the need for further reductions in risk factors and care quality improvements (OECD/The King's Fund, 2020).

A good indicator of acute care quality is the 30-day mortality rate following AMI 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 by differences in hospital transfers, average length of stay and AMI severity.

Figure 6.12 shows mortality rates within 30 days of admission to hospital for AMI using unlinked data – that is, only counting deaths that occurred in the hospital where the patient was initially admitted. Across EU countries, the lowest rates in 2017 were in Denmark, the Netherlands, and Sweden (less than 4% of patients aged 45 and over), while the highest rate was in Latvia (over 13%).

Figure 6.13 shows the same 30-day mortality rate but calculated based on linked data whereby the deaths are recorded regardless of where they occurred (i.e. either in the hospital where the patient was initially admitted, after transfer to another hospital or after being discharged). Based on these linked data, the AMI mortality rates in 2017 ranged from 4% in the Netherlands to over 14% in Latvia.

Thirty-day mortality rates for AMI have decreased substantially between 2007 and 2017. Across EU countries for which data are available, they fell by around 30% on average from 9.2% to 6.5% based on unlinked data and from 12.4% to 9.3% based on linked data. Better and more timely access to acute care following an AMI, including timely transportation of patients and admissions in specialised health facilities, such as percutaneous catheter intervention-capable centres, have contributed to the reduction in mortality rates (OECD, 2015).

Mortality rates for patients admitted with AMI vary significantly not only across countries, but also across different hospitals in each country. As shown in Figure 6.14, differences in 30-day mortality rates following AMI across hospitals in each country are often much larger than across countries. In general, a greater volume and concentration of acute care for AMI patients in specialised hospital services is associated with lower mortality rates (Lalloué et al., 2019).

Definition and comparability

The mortality rate measures the percentage of people aged 45 and over who died within 30 days following admission to hospital for AMI. National rates are age-sex standardised to the 2010 OECD population aged 45 and over admitted to hospital for AMI (ICD-10 codes I21-I22). The rates are also adjusted for co-morbidity and previous AMI (linked data only). The reference population for hospital rates is constructed from data from participating countries (Padget et al., 2019).

Besides differences in the coverage of deaths (numerator), the denominator varies between the indicator using linked and unlinked data. The indicator calculated with unlinked data uses a total number of admissions to hospital with a primary diagnosis of AMI as the denominator. The indicator using linked data uses a total number of patients admitted to hospital with a primary diagnosis of AMI as the denominator. If patients were admitted multiple times, the last admission is counted in the denominator.

Figure 6.14 is a turnip plot that graphically represents the relative dispersion of rates across hospitals in each country. Hospitals with fewer than 50 AMI admissions were excluded to improve data reliability.

References

Lalloué, B. et al. (2019), "Does size matter? The impact of caseload and expertise concentration on AMI 30-day mortality - A comparison across 10 OECD countries", *Health Policy*, Vol. 123/5.

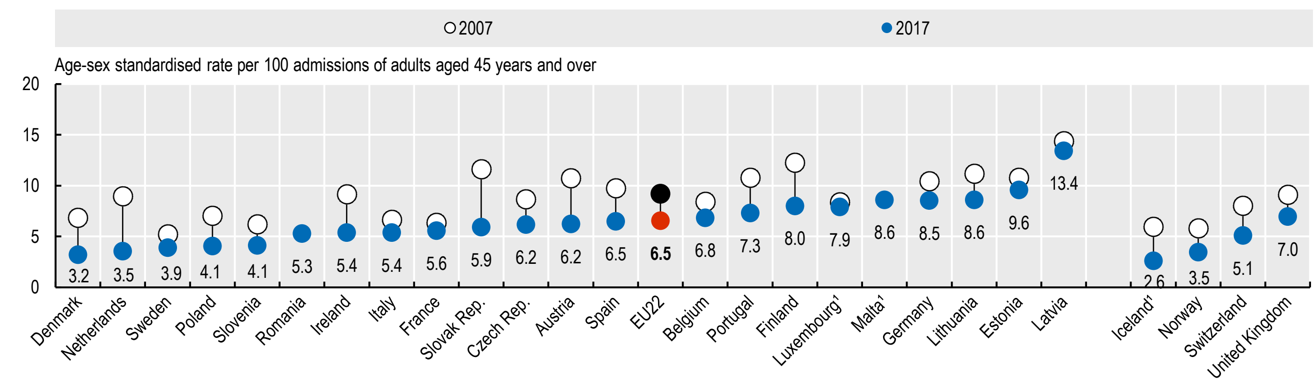
OECD (2015), *Cardiovascular Disease and Diabetes: Policies for Better Health and Quality of Care*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/2074319x*.

OECD/The King's Fund (2020), *Is Cardiovascular Disease Slowing Improvements in Life Expectancy?: OECD and The King's Fund Workshop Proceedings*, OECD Publishing, Paris, *https://doi.org/10.1787/47a04a11-en*.

Padget, M. et al (2019), "Methodological development of international measurement of acute myocardial infarction 30-day mortality rates at the hospital level", *OECD Health Working Papers*, No. 114, *https://doi.org/10.1787/181be293-en*.

Pessoa-Amorim, G. et al. (2020), "Admission of patients with STEMI since the outbreak of the COVID-19 pandemic: a survey by the European Society of Cardiology", *European Heart Journal – Quality of Care and Clinical Outcomes, https://doi.org/10.1093/ehjqcco/qcaa046*.

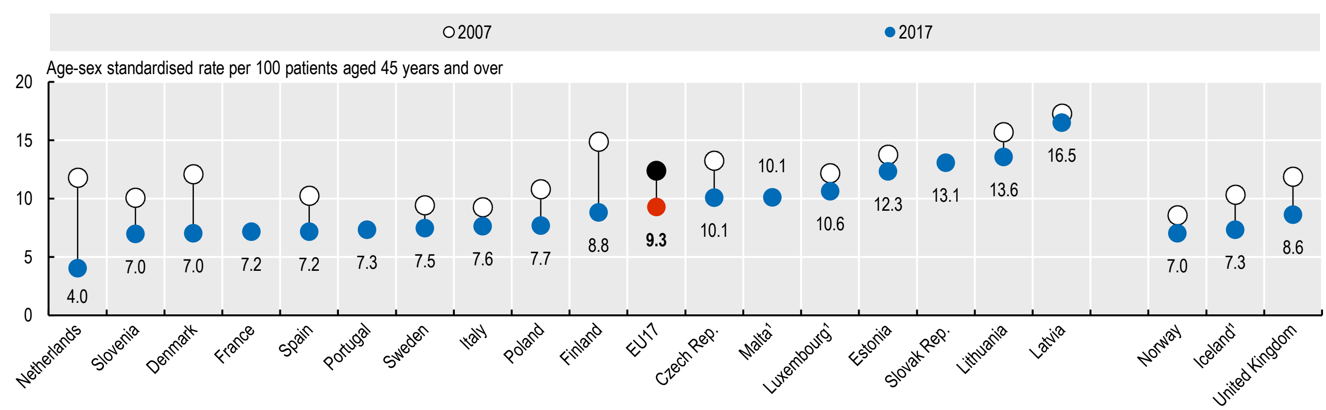
Figure 6.12. **Thirty-day mortality after hospital admission for AMI based on unlinked data, 2007 and 2017 (or nearest years)**



Note: The EU average is unweighted. 1. Three-year average.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/17xroq

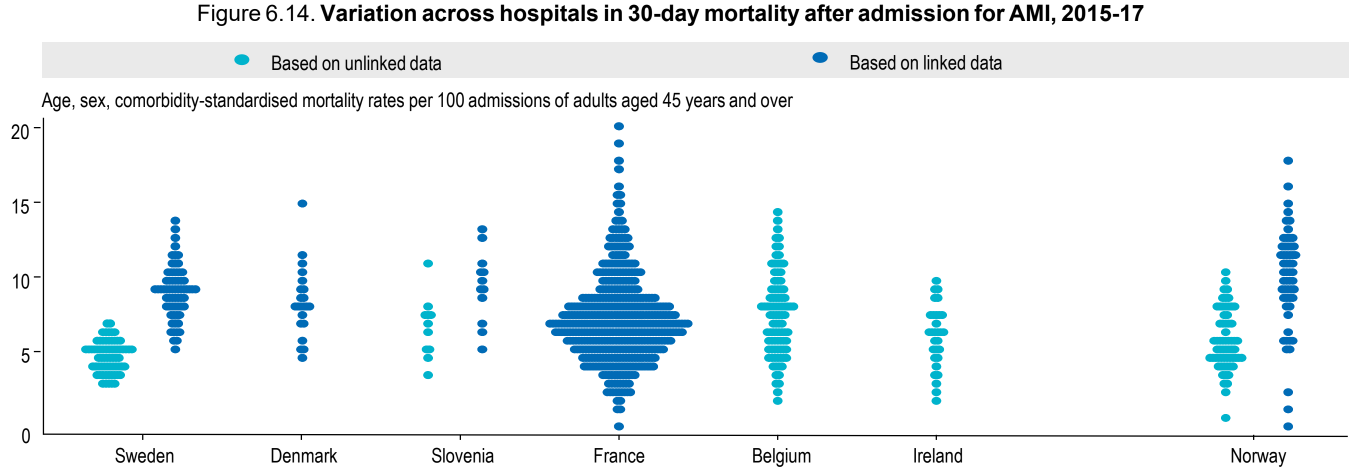
Figure 6.13. **Thirty-day mortality after hospital admission for AMI based on linked data, 2007 and 2017 (or nearest years)**



Note: The EU average is unweighted. 1. Three-year average.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/skni2h

Figure 6.14. **Variation across hospitals in 30-day mortality after admission for AMI, 2015-17**



Note: The width of each line represents the number of hospitals with the corresponding rate. Countries are ranked based on the interquartile range of linked data.
Source: OECD Hospital Performance Data Collection 2019.

StatLink https://stat.link/vgyzna

Stroke is the second leading cause of death after heart disease in Europe (see the indicator "Mortality from circulatory diseases" in Chapter 3). Across EU countries, stroke accounted for 375 000 deaths in 2017, and the number is expected to rise by one-third by 2035 due to population ageing and increases in some risk factors (OECD/The King's Fund, 2020). Of the two types of stroke, about 85% are ischaemic (caused by clotting) and 15% are haemorrhagic (caused by bleeding).

Figure 6.15 shows mortality rates within 30 days of hospital admission for ischaemic stroke where the death occurred in the same hospital as the initial admission (unlinked data). Figure 6.16 shows mortality rates where deaths are recorded regardless of where they occurred, including in another hospital or outside the hospital (linked data).

Using unlinked data, the mortality rates within 30 days of hospital admission for ischaemic stroke were highest in Latvia, Malta and Lithuania with rates over 15% in 2017. They were lowest in Nordic countries (Denmark, Iceland, Norway and Sweden) and in the Netherlands with rates of less than 6%. Generally, countries that have 30-day mortality rates 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 delivery influence outcomes for both stroke and AMI patients.

Across the smaller group of countries that reported linked data, the case-fatality rates were highest in Latvia and Lithuania, with over 20% of patients dying within 30 days of being admitted to hospital for stroke. They were lowest in the Netherlands and Norway, with rates below 9%. These rates are higher than those based on unlinked data because they capture all deaths.

Treatment for ischaemic stroke has advanced greatly over the last decades, with more effective systems and processes now in place in many European countries including specialised stroke units involving multidisciplinary teams devoted to care for stroke patients, and medical progress such as thrombolysis and thrombectomy (OECD, 2015). Between 2007 and 2017, 30-day case-fatality rates for ischaemic stroke decreased by over 15% on average across EU countries, based either on unlinked data (a reduction from 11.4% to 9.0%) or linked data (a reduction from 14.2% to 12.0%).

Since the onset of the COVID-19 pandemic, reduced or delayed access to care for stroke patients and stretched resources for stroke care delivery have been reported in some countries (Aguiar de Sousa et al., 2020; Bersano et al., 2020). This highlights the importance of continuous monitoring of mortality rates after hospital admissions for stroke to assess any impact of COVID-19 in the provision of timely and quality care to stroke patients.

Mortality rates following hospital admissions for ischaemic stroke vary not only across countries, but also across different hospitals in each country. Figure 6.17 shows that differences in 30-day mortality rates across hospitals within each country are often larger than differences across countries. Reducing these variations is key to providing more equitable care and reducing overall mortality rates.

Strategies to reduce mortality rates from stroke include providing timely transportation of patients, timely delivery of reperfusion therapy through pre-hospital triage via telephone or in the ambulance, evidence-based medical interventions and access to high-quality specialised facilities such as stroke units (OECD, 2015).

Definition and comparability

National mortality rates are defined in indicator "Mortality following acute myocardial infarction". The definition of ischaemic stroke only includes ICD-10 codes I63-I64 and may differ from broader definitions used at the national level.

Figure 6.17 is a turnip plot that graphically represents the relative dispersion of rates across hospitals in each country. The data include only ICD-10 I63 (cerebral infarction). Hospitals with fewer than 50 stroke admissions are excluded to improve data reliability. Rates are adjusted for age, sex, co-morbidity, stroke severity and previous stroke (linked data only).

References

Aguiar de Sousa, D. et al. (2020), "Maintaining stroke care in Europe during the COVID-19 pandemic: Results from an international survey of stroke professionals and practice recommendations from the European Stroke Organisation", *European Stroke Journal, http://dx.doi.org/10.1177/2396987320933746*.

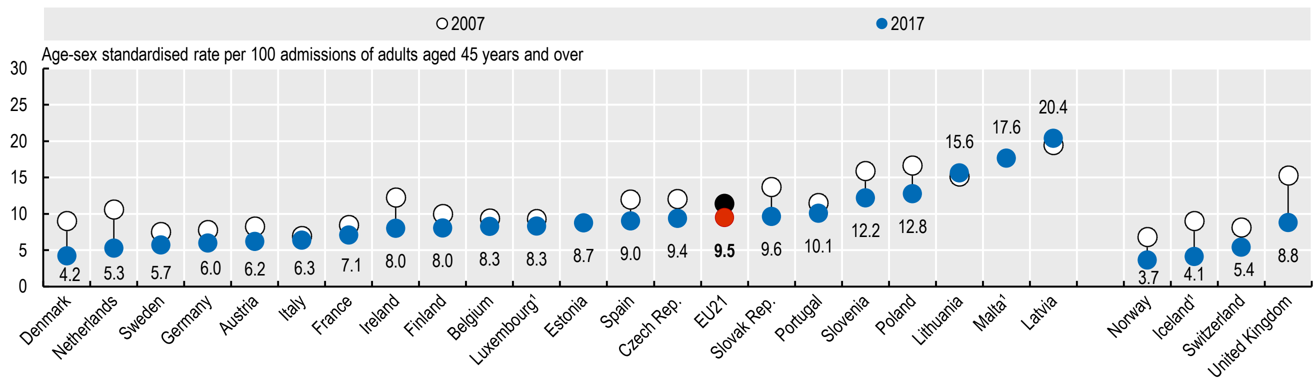
Bersano, A. et al. (2020), "Stroke care during the COVID-19 pandemic: experience from three large European countries", *European Journal of Neurology*, Vol. 27, *https://doi.org/10.1111/ene.14375*.

OECD/The King's Fund (2020), *Is Cardiovascular Disease Slowing Improvements in Life Expectancy?: OECD and The King's Fund Workshop Proceedings*, OECD Publishing, Paris, *https://doi.org/10.1787/47a04a11-en*.

OECD (2016), *OECD Reviews of Health Systems: Latvia 2016*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264262782-en*.

OECD (2015), *Cardiovascular Disease and Diabetes: Policies for Better Health and Quality of Care*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/2074319x*.

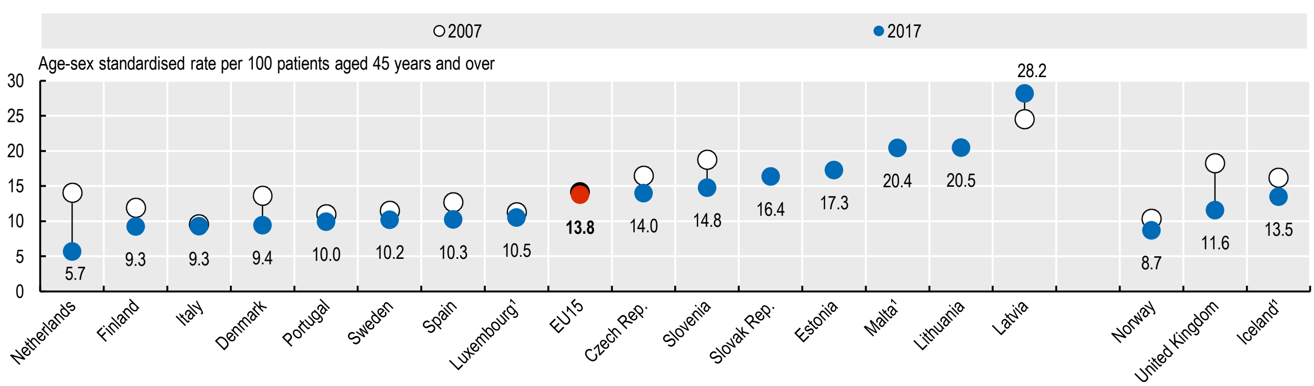
Figure 6.15. **Thirty-day mortality after admission to hospital for ischaemic stroke based on unlinked data, 2007 and 2017 (or nearest years)**



Note: The EU average is unweighted. 1. Three-year average.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/vmsknb

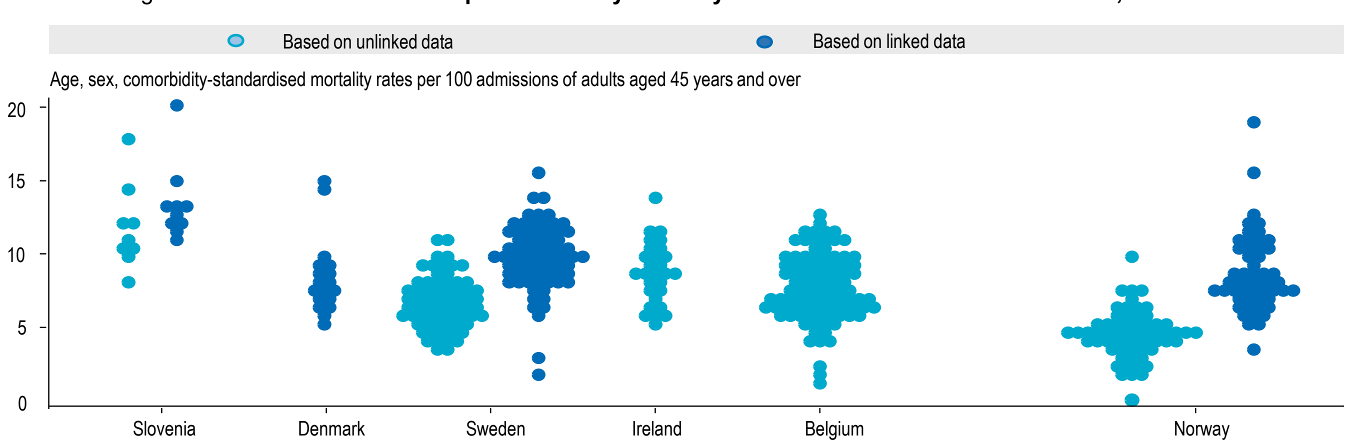
Figure 6.16. **Thirty-day mortality after admission to hospital for ischaemic stroke based on linked data, 2007 and 2017 (or nearest years)**



Note: The EU average is unweighted. 1. Three-year average.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/462uwx

Figure 6.17. **Variation across hospitals in 30-day mortality after admission for ischaemic stroke, 2015-17**



Note: The width of each line represents the number of hospitals with the corresponding rate. Countries are ranked based on the interquartile range of linked data.
Source: OECD Hospital Performance Data Collection 2019.

StatLink https://stat.link/u8e4ij

Hip fractures are common health problems and causes of hospitalisation among older people, often related to falls and the loss of skeletal strength from osteoporosis. With increasing life expectancy, hip fractures will likely have an even greater public health impact 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 improves patient outcomes and minimises the risk of complications, and that surgery should normally 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 that hip fracture surgery be performed on the day of hospital admission or the next day (NICE, 2017).

On average across EU countries, more than three quarters (76%) of patients aged 65 and over admitted for a hip fracture were operated within two days in 2017, with most of them being treated either on the same day of admission or the next day (Figure 6.18). In Denmark and the Netherlands, the proportion of patients operated within two days reached more than 95%. By contrast, less than half of patients aged 65 and over were operated within two days following their admission for a hip fracture in Latvia and Portugal.

Between 2012 and 2017, there has been a slight increase in the share of patients operated within two days on average across EU countries, from 73% to 76% (Figure 6.19). Substantial progress has been achieved in Italy and Spain in meeting the recommended clinical guideline of operating patients within two days, although both countries still remain far from achieving their target. Over the same time period, Latvia, Lithuania and Portugal moved away from this target, having registered a slight decrease in the share of hip-fractured patients undergoing surgery within two days of admission.

In Italy, progress achieved in providing surgical treatment within 48 hours of admission to a larger share of hip-fractured patients was mainly achieved by regularly monitoring and reporting waiting times at the hospital level and reducing waiting times in those regions and hospitals that were lagging behind (OECD, 2015a).

In Portugal, the proportion of patients operated within two days after a hip fracture has decreased from 47% in 2011 to 44% in 2017, 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, 2015b).

Waiting times for surgery in general are influenced by many factors, including hospitals' surgical theatre capacity and the management of demand for different surgical procedures (OECD, 2020).

Definition and comparability

The indicator of waiting times for surgery following admission for a hip fracture is defined as the proportion of patients aged 65 years and over admitted to hospital with a diagnosis of upper femur fracture who had surgery within two calendar days of 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 in some countries.

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

References

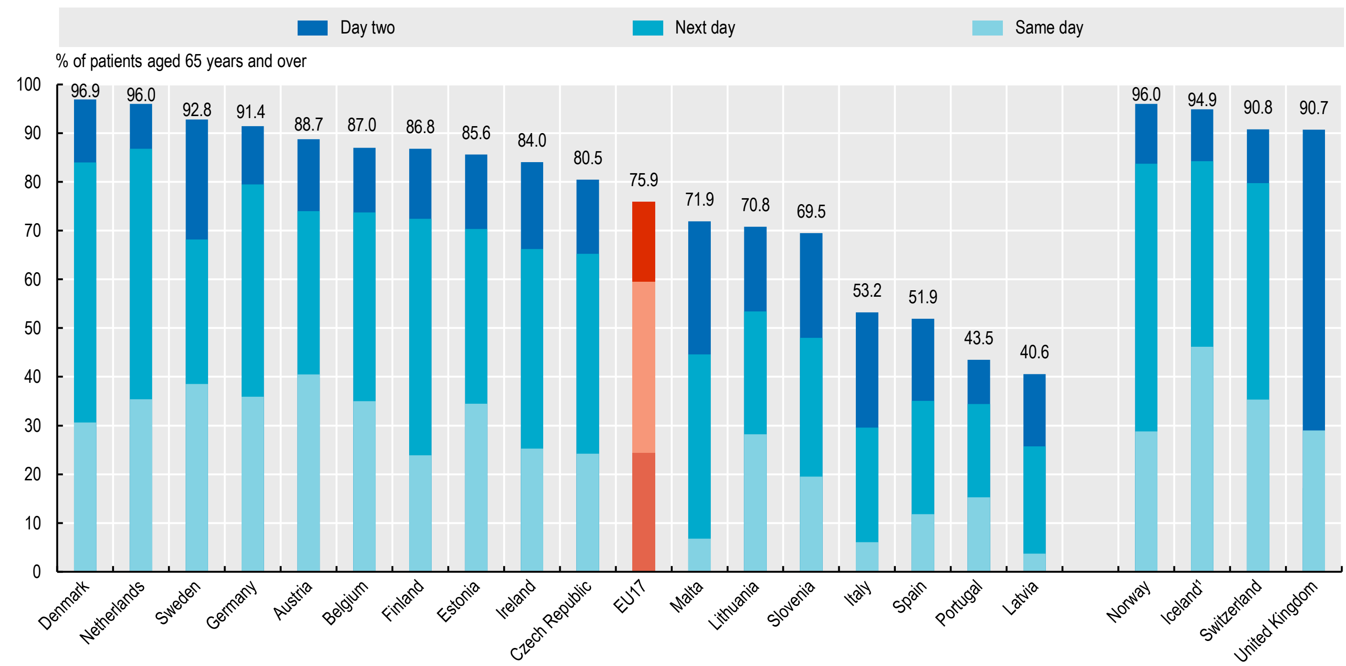
NICE (2017), *Hip Fracture: The Management of Hip Fracture in Adults*, NICE Clinical Guideline No. 124, issued June 2011, last updated May 2017.

OECD (2020), *Waiting Times for Health Services: Next in Line*, Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/242e3c8c-en*.

OECD (2015a), *OECD Reviews of Health Care Quality: Italy: Raising Standards*, OECD Reviews of Health Care Quality, OECD Publishing, Paris, *https://doi.org/10.1787/9789264225428-en*.

OECD (2015b), *OECD Reviews of Health Care Quality: Portugal: Raising Standards*, OECD Reviews of Health Care Quality, OECD Publishing, Paris, *https://doi.org/10.1787/9789264225985-en*.

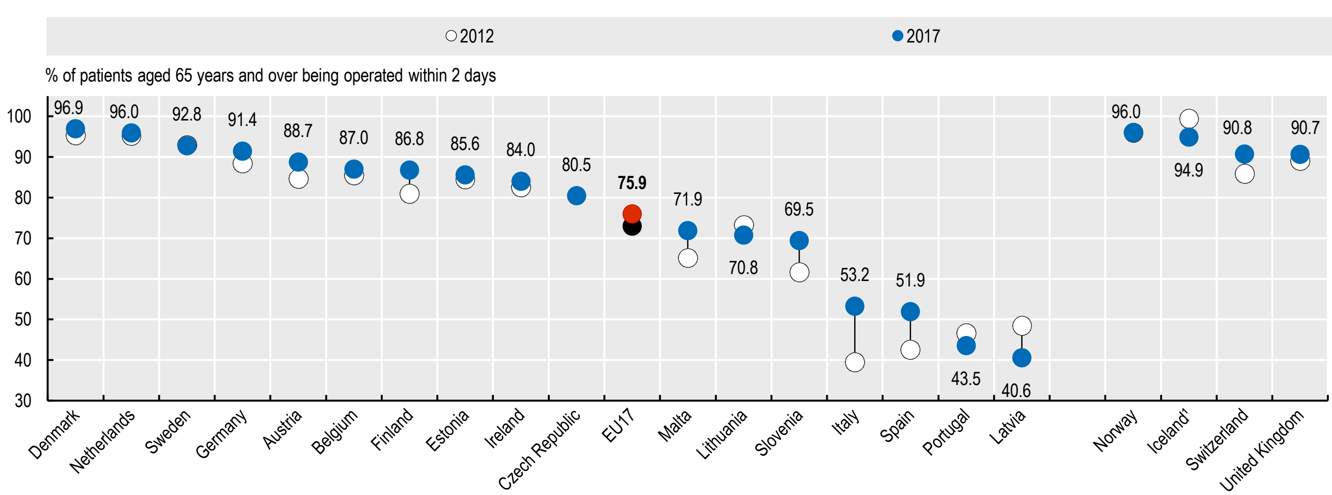
Figure 6.18. **Hip fracture surgery initiation after admission to the hospital, 2017 (or nearest year)**



Note: The EU average is unweighted. Sweden provided data within 12, 24 and 48 hours. 1. Three-year average.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/8ldikc

Figure 6.19. **Hip fracture surgery initiation within two days after admission to the hospital, 2012 and 2017 (or nearest years)**



Note: The EU average is unweighted. 1. Three-year average.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/9k602d

Breast cancer is the most frequent cancer among women in Europe, and it is expected that more than 355 000 new cases will be diagnosed in the EU in 2020 (see indicator "Cancer incidence and mortality" in Chapter 3). The main risk factors for breast cancer are age, genetic predisposition, estrogen replacement therapy, and lifestyle factors including obesity, physical inactivity, nutrition habits and alcohol consumption.

Since the 1980s, most European countries have adopted breast cancer screening programmes to improve early detection rates (OECD, 2013). The increasing number of countries that have set up population-based mammography screening programmes have contributed to increasing the share of women diagnosed at an early stage. Together with technological advances in treatment of breast cancer, these two factors have contributed to a significant reduction in mortality from breast cancer over the last decades. During the period 2010-14, about half of women diagnosed with breast cancer in EU countries were at an early stage, while 10% of women were diagnosed at an advanced stage (Figure 6.20).

In all European countries, the five-year net survival for women with breast cancer has improved in recent years, reflecting earlier detection from increased screening and overall improvement in the quality of cancer care (Allemani et al., 2018). For women diagnosed at an early or localised stage, the cumulative probability of surviving their cancer for at least five years after diagnosis is on average 96% in the EU. However, survival for women diagnosed at an advanced stage is still low at 38% (Figure 6.21).

For all stages of breast cancer combined, Western European countries have all attained a five-year net survival of at least 80%, but net survival is still lower in several Central and Eastern European countries, despite increases in recent years.

The COVID-19 pandemic severely disrupted breast cancer screening programmes and treatments in the first half of 2020. Many European countries reported delays in routine screening programmes because some mammography units were temporarily shut down or because many women avoided to go to their mammogram appointment for fear of being infected (EC, 2020). This may result in a greater proportion of women diagnosed at a more advanced stage. The quality of cancer care was also adversely affected during the COVID-19 pandemic by delays in access to treatment and postponement of follow-up (EC, 2020). This emphasises the need for continuous monitoring of survival to draw lessons from any adverse impact for the future.

In recent years, health care providers and patients in European countries have increasingly used patient-reported outcome measures (PROMs) to help inform difficult clinical decisions on breast cancer treatment based on each patient's own assessment of quality of life during or after treatment (OECD, 2019).

The rate of mortality from breast cancer in the EU as a whole is expected to be about 34 per 100 000 women in 2020, without taking into account any possible impact of COVID-19 (Figure 6.22).

Definition and comparability

The stage at diagnosis for breast cancer is categorised according to the Tumour, Nodes, Metastasis (TNM) staging system (7th edition). In this analysis, "early or localised stages" refers to tumours without lymph node involvement or metastasis (T1-3, N0, M0), "intermediate stage" refers to tumours with lymph node involvement but no metastasis (T1-3, N1-3, M0), and "advanced stage" refers to large tumours with ulceration or involvement of the chest wall, and those that have metastasised to other organs (T4, any N, M0 or M1).

Five-year net survival is the cumulative probability that cancer patients survive their cancer for at least five years since diagnosis, after controlling for the risks of death from other causes and taking into account that competing risks of deaths are higher in the elderly. Cancer survival estimates are age-standardised with the International Cancer Survival Standard (ICSS) weights.

Cancer patient data were provided by national or regional cancer registries. Quality control, analysis of stage distribution and estimation of age-standardised five-year net survival were performed centrally as part of CONCORD, the global programme for the surveillance of cancer survival, led by the London School of Hygiene and Tropical Medicine (Allemani et al., 2018). International comparisons of net survival by stage are affected by coding practices and the completeness of data on stage, which differ widely between countries, so caution is needed in interpreting these data.

See indicator "Cancer incidence and mortality" in Chapter 3 for the sources and method underlying cancer mortality rates.

References

Allemani, C. et al. (2018), "Global surveillance of trends in cancer survival 2000-14 (CONCORD-3): analysis of individual records for 37 513 025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries", *The Lancet*, Vol. 391/10125, pp. 1023-1075, *https://doi.org/10.1016/S0140-6736(17)33326-3*.

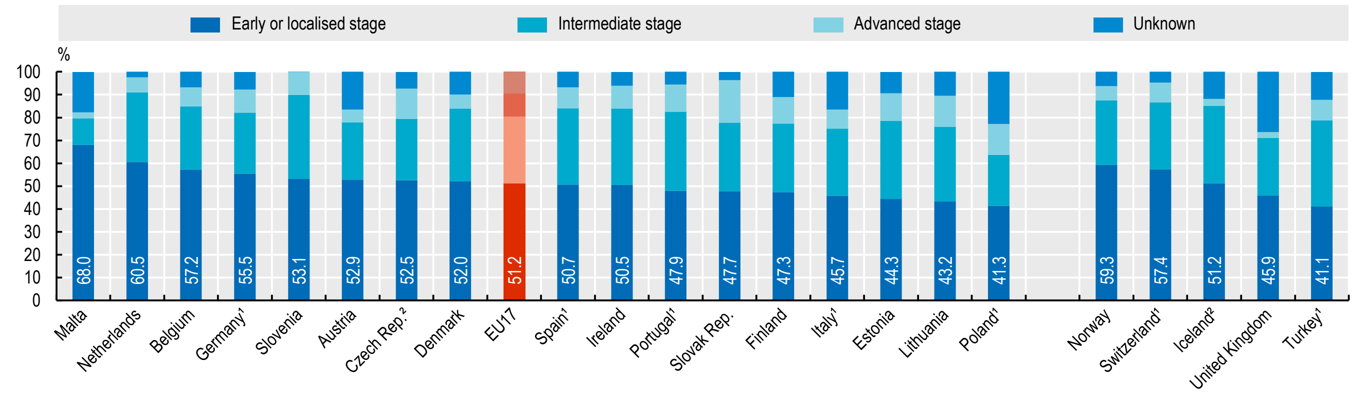
EC (2020), *European week against cancer: responding to cancer care challenges during the COVID-19 pandemic*.

JRC (2020), ECIS – European Cancer Information System, available at *https://ecis.jrc.ec.europa.eu*.

OECD (2019), *Health at a Glance 2019: OECD Indicators*, OECD Publishing, Paris, *https://doi.org/10.1787/4dd50c09-en*.

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

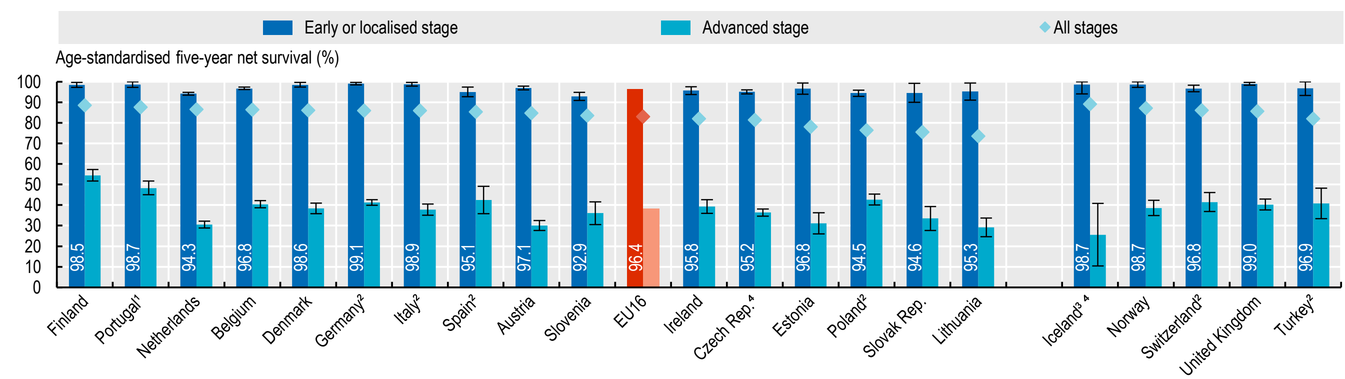
Figure 6.20. **Breast cancer stage distribution, women diagnosed during 2010-14**



Note: The EU average is unweighted. 1. Coverage is less than 100% of the national population. 2. Data for 2004-09.
Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

StatLink https://stat.link/6xl23u

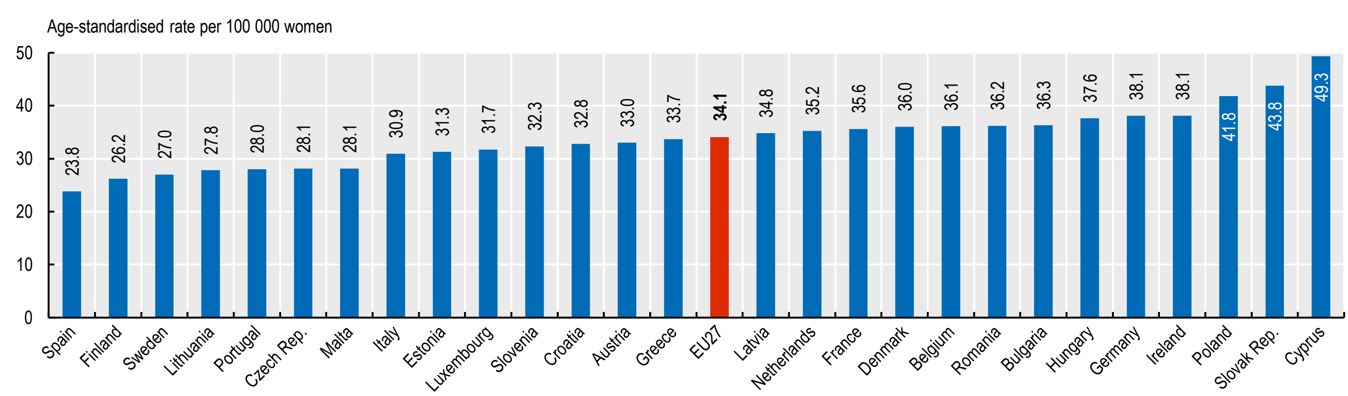
Figure 6.21. **Breast cancer five-year net survival by stage at diagnosis, women diagnosed during 2010-14**



Note: The EU average is unweighted. H refers to 95% confidence intervals. 1. Coverage is less than 100% of the national population for stage-specific survival estimates. 2. Coverage is less than 100% of the national population. 3. Survival estimates for advanced stage are not age-standardised. 4. Data for 2004-09.
Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

StatLink https://stat.link/ac8n1z

Figure 6.22. **Breast cancer mortality rates, estimates for 2020**



Note: The EU average is weighted.
Source: ECIS – European Cancer Information System 2020.

StatLink https://stat.link/p4cg6v

In Europe, lung cancer is the second most commonly diagnosed form of cancer after prostate cancer among men, and the third most common cancer after breast and colorectal cancer among women. In 2020, about 320 000 people in EU countries are expected to be newly diagnosed with lung cancer, and it is expected to continue to be the leading cause of cancer death with over 257 000 deaths across the EU (JRC, 2020). The main risk factors for lung cancer are tobacco smoking and environmental factors, particularly air pollution.

Partly reflecting different historical trends in smoking between men and women, the incidence of lung cancer is higher among men than women in all European countries, although the gender gap has narrowed as incidence rates decreased more rapidly among men in most countries in recent decades (Fidler-Benaoudia et al., 2020). In 2020, the incidence rate of lung cancer among men in the EU as a whole is expected to be close to 100 per 100 000 men, more than twice the rate among women (45 per 100 000 women). The incidence rates are almost the same for men and women in Denmark and Sweden, reflecting a narrower gender gap in smoking in recent decades (Figure 6.23).

Compared with breast and colorectal cancers, lung cancer continues to be associated with relatively low survival after diagnosis. For patients diagnosed with lung cancer during 2010-14, the cumulative probability of surviving their cancer for at least five years (after correction for other causes of death) was 15% on average across EU countries. These probabilities range from 10% or less in Croatia, Lithuania and Bulgaria to 20% in Austria, Sweden, Iceland and Switzerland (Figure 6.24). This suggests significant differences in timely diagnosis and access to pharmaceuticals and other treatments. Various pharmaceuticals have been approved and covered by public payers for lung cancer treatment in Europe, but the availability of new drugs for the treatment of some types of lung cancer (e.g. non-small cell) varies greatly across countries (OECD, 2020).

Between 2000-04 and 2010-14, five-year net survival following diagnosis of lung cancer increased from 11% to 15% on average across EU countries. All EU countries have achieved progress except Croatia.

The overall mortality rate from lung cancer in 2020 is expected to be 54 per 100 000 population in the EU as a whole. Cross-country variations in mortality rate are more than three-fold for men and more than four-fold for women (Figure 6.25). Hungary is expected to have the highest mortality rate from lung cancer in 2020 for both men and women. Reflecting differences in incidence rates, the gender gap in mortality rates is small in Nordic countries such as Sweden and Denmark, and large in some Southern and Eastern European countries (e.g. Greece and Estonia).

In general, trends in mortality rates for lung cancer have followed trends in incidence rates with a time lag as survival probabilities have remained relatively low in all countries. This is partly due to the absence of any large-scale screening programme for lung cancer in EU countries, particularly for high-risk populations, impeding the detection and treatment of lung cancer at an early stage. Effective treatment of lung cancer also remains difficult. The most promising approach to reducing lung cancer mortality is therefore to strengthen prevention to further reduce incidence, notably through tobacco control policies and policies to reduce air pollution (see Chapter 2 on air pollution).

Definition and comparability

The 2020 cancer incidence and mortality estimates have been computed using the European Cancer Information System (ECIS) which is used for reporting the cancer burden in Europe. See the indicator "Cancer incidence and mortality" in Chapter 3 for additional information on the method underlying these estimations.

Five-year net survival is the cumulative probability that cancer patients survive their cancer for at least five years since diagnosis, after controlling for the risks of death from other causes and taking into account that competing risks of deaths are higher in the elderly. Cancer survival estimates are age-standardised with the International Cancer Survival Standard (ICSS) weights.

Cancer patient data were provided by national or regional cancer registries. Quality control, analysis of stage distribution and estimation of age-standardised five-year net survival were performed centrally as part of CONCORD, the global programme for the surveillance of cancer survival, led by the London School of Hygiene and Tropical Medicine (Allemani et al., 2018).

References

Allemani, C. et al. (2018), "Global surveillance of trends in cancer survival 2000-14 (CONCORD-3): analysis of individual records for 37 513 025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries", *The Lancet*, Vol. 391/10125, pp. 1023-1075, *https://doi.org/10.1016/S0140-6736(17)33326-3*.

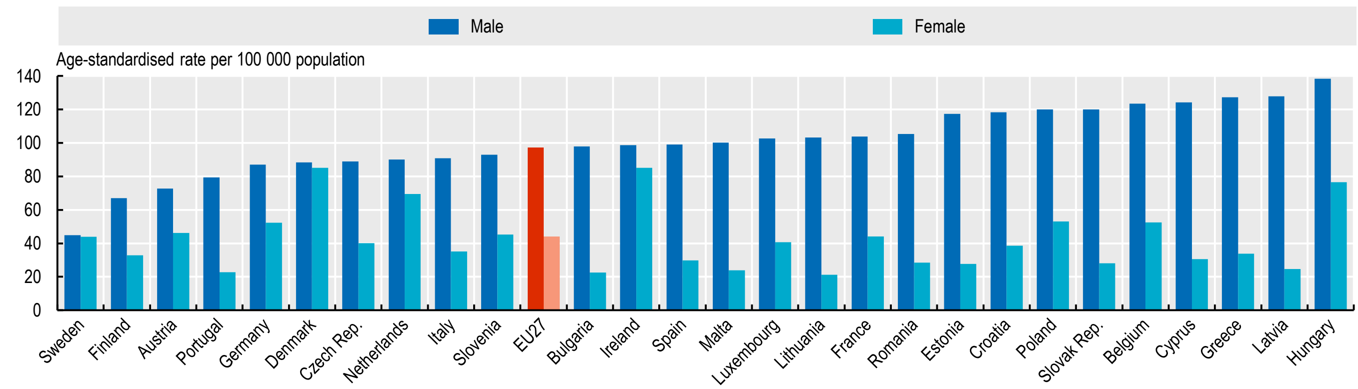
Fidler-Benaoudia, M. et al. (2020), "Lung cancer incidence in young women vs . young men: A systematic analysis in 40 countries", *International Journal of Cancer*, Vol. 147/3, pp. 811-819, *http://dx.doi.org/10.1002/ijc.32809*.

JRC (2020), ECIS – European Cancer Information System, *https://ecis.jrc.ec.europa.eu*.

OECD (2020), *Addressing Challenges in Access to Oncology Medicines*, OECD, Paris, *https://www.oecd.org/health/health-systems/addressing-challenges-in-access-to-oncology-medicines.htm*.

WHO (2019), *WHO global report on trends in prevalence of tobacco use 2000-25, third edition*, WHO Organization, Geneva.

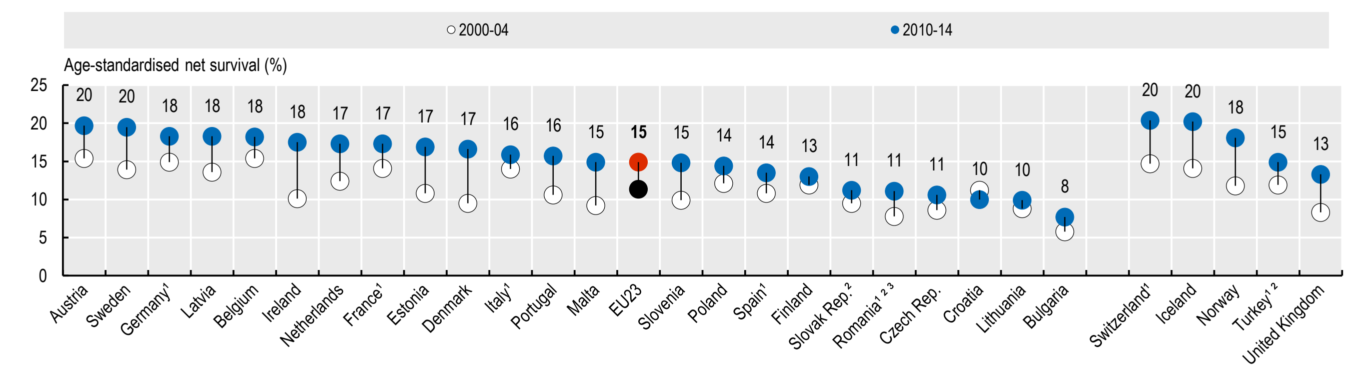
Figure 6.23. **Lung cancer incidence rates by sex, estimates for 2020**



Note: The EU average is weighted.
Source: ECIS – European Cancer Information System 2020.

StatLink https://stat.link/zn79y0

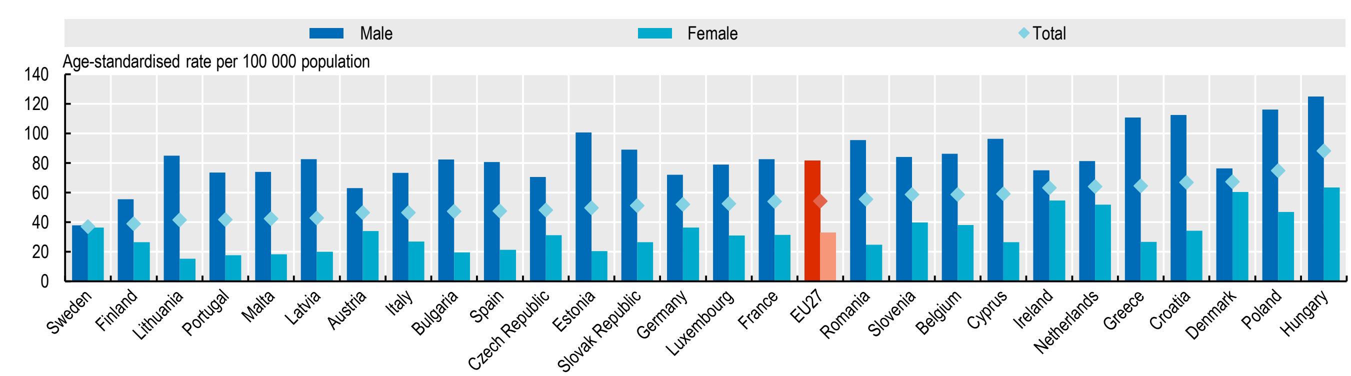
Figure 6.24. **Lung cancer five-year net survival (%), patients diagnosed during 2000-04 and 2010-14**



Note: The EU average is unweighted. 1. Coverage is less than 100% of the national population. 2. Survival estimates are considered less reliable. 3. Data for 2000-04 refer to 2005-09.
Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

StatLink https://stat.link/g0kn1w

Figure 6.25. **Lung cancer mortality rates by sex, estimates for 2020**



Note: The EU average is weighted.
Source: ECIS – European Cancer Information System 2020.

StatLink https://stat.link/zct8ga

Colorectal cancer is the third most common cause of cancer death after prostate and lung cancers among men, and the second most common cause after breast cancer among women. It is estimated that about 190 000 men and 150 000 women will be diagnosed with colorectal cancer in the EU in 2020, and 156 000 people will die from it (see indicator "Mortality from cancer" in Chapter 3; JRC, 2020). The main risk factors for colorectal cancer include age; ulcerative colitis; a personal or family history of colorectal cancer or polyps; lifestyle factors, such as a diet high in fat and low in fibre, physical inactivity, obesity, tobacco and alcohol consumption.

After having introduced population-based screening programmes for breast and cervical cancer, a growing number of European countries have also introduced free, large scale screening programmes for colorectal cancer. These programmes provide faecal occult blood tests either annually or every other year, mostly to people in their 50s and 60s (EC, 2017; IARC, 2017). Participation rates in colorectal cancer screening varies from a high of over 70% in the Netherlands to a low of less than 20% in Hungary (in 2014) and Latvia (in 2018). Hungary has introduced a new population-based screening programme for colorectal cancer in 2020 to increase screening rates. In most countries, screening rates are at least slightly higher among women than men (Figure 6.26).

Cross-country variations in survival following a diagnosis of colon cancer are wider than for many other types of cancer, such as breast and lung cancer (see indicators "Breast cancer outcomes" and "Incidence, survival and mortality for lung cancer"). This suggests large differences in the capacity to ensure timely diagnosis and access to pharmaceuticals and other treatments for colon cancer. On average across EU countries, the five-year net survival for colon cancer was about 60% for people diagnosed during 2010-14, ranging from 65% or more in Belgium, Finland, Sweden and Germany to less than 55% in many Central and Eastern European countries including Latvia, Croatia, the Slovak Republic, Romania, Bulgaria and Poland (Figure 6.27). These countries also have low five-year net survival for rectal cancer (Allemani et al., 2018). Various drugs have been approved and covered by public payers for colorectal cancer treatment in Europe, but the availability of new drugs varies across countries (OECD, 2020).

Advances in diagnosis and treatment of colorectal cancer, including improved surgical techniques, radiation therapy and combined chemotherapy, have contributed to increasing survival rates between 2000-04 and 2010-14. The average five-year net survival rate for colon cancer in EU countries increased from 54% to 59% between 2000-04 and 2010-14, and from 51% to 58% for rectal cancer. Survival for colon cancer increased particularly rapidly in many Central and Eastern European countries (Bulgaria, the Czech Republic, Denmark, Estonia, Latvia, Lithuania and Slovenia).

In all EU countries, mortality rates from colorectal cancer are substantially higher among men than among women (Figure 6.28). Together with the promotion of healthy lifestyles, efforts to increase colorectal cancer screening rates, particularly among men, may reduce this gender gap to some extent.

Definition and comparability

Colorectal cancer screening rates are based on programme or survey data. Differences in the target population and screening frequency in national screening programmes may limit the comparability of programme-based data. 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 since diagnosis, after controlling for the risks of death from other causes and taking into account that competing risks of deaths are higher in the elderly. Cancer survival estimates are age-standardised with the International Cancer Survival Standard (ICSS) weights.

Cancer patient data were provided by national or regional cancer registries. Quality control, analysis of stage distribution and estimation of age-standardised five-year net survival were performed centrally as part of CONCORD, the global programme for the surveillance of cancer survival, led by the London School of Hygiene and Tropical Medicine (Allemani et al., 2018).

The 2020 cancer mortality estimates have been computed using the European Cancer Information System (ECIS) which is used for reporting the cancer burden in Europe. See the indicator "Cancer incidence and mortality" in Chapter 3 for additional information on the method underlying these estimations.

References

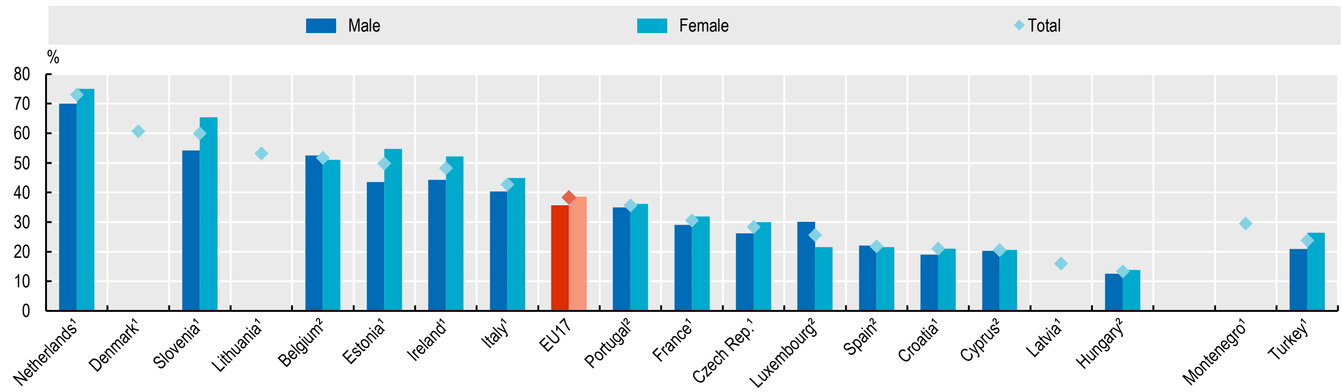
Allemani, C. et al. (2018), "Global surveillance of trends in cancer survival 2000-14 (CONCORD-3): analysis of individual records for 37 513 025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries", *The Lancet*, Vol. 391/10125, pp. 1023-1075, *https://doi.org/10.1016/S0140-6736(17)33326-3*.

EC (2017), *Cancer Screening in the European Union 2017: Report on the implementation of the Council Recommendation on cancer screening*, European Commission, Brussels.

JRC (2020), ECIS – European Cancer Information System, available at *https://ecis.jrc.ec.europa.eu.*

OECD (2020), *Addressing Challenges in Access to Oncology Medicines*, OECD, Paris, *https://www.oecd.org/health/health-systems/addressing-challenges-in-access-to-oncology-medicines.htm*.

Figure 6.26. **Coverage of colorectal cancer screening programmes by sex, 2018 (or nearest year)**



Note: The EU average is unweighted. Gender-specific data are not available for Denmark, Latvia, Lithuania and Montenegro. 1. Programme. 2. Survey.
Source: OECD/Eurostat/WHO-Europe Joint Questionnaire on Non-Monetary Health Care Statistics – 2020 Pilot Data Collection.

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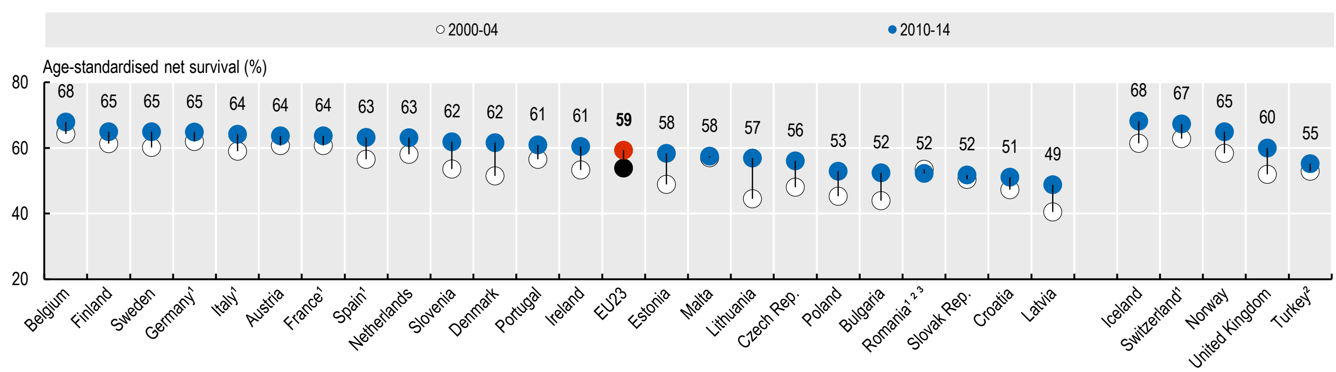
Figure 6.27. **Colon cancer five-year net survival (%), patients diagnosed during 2000-04 and 2010-14**



Note: The EU average is unweighted. 1. Coverage is less than 100% of the national population. 2. Survival estimates are considered less reliable. 3. Data for 2000-04 refer to 2005-09.
Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

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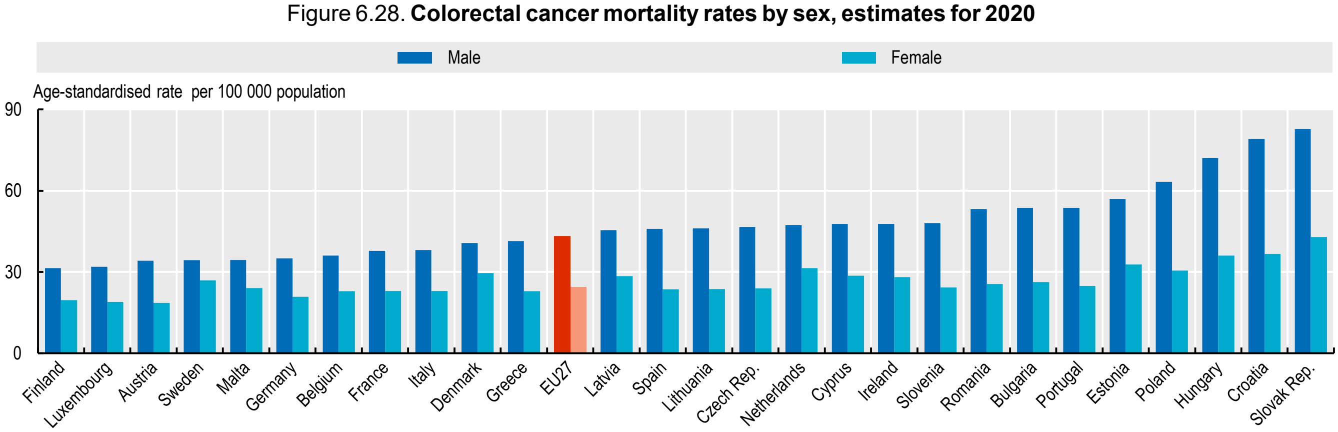
Figure 6.28. **Colorectal cancer mortality rates by sex, estimates for 2020**



Note: The EU average is weighted.
Source: ECIS – European Cancer Information System 2020.

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The ECDC estimates that 3.1-4.6 million people acquire a health care-associated infection (HAI) each year in acute care hospitals in EU countries, Iceland, Norway and the United Kingdom (Suetens et al., 2018). HAIs can lead to significant increases in patient morbidity, mortality and cost for the health system. More than 90 000 people die each year in EU countries, Iceland, Norway and the United Kingdom due to the six most common infections in health care settings (Cassini, 2016). HAIs are the single most deadly and costly adverse event, representing up to 6% of public hospital budgets (Slawomirski et al, 2018).

Prevention of HAIs is even more critical in the long-term care (LTC) sector, as residents of LTC facilities are more frail and have additional risk factors for developing HAIs. During the COVID-19 pandemic, LTC facilities have been particularly vulnerable places for the spread of infections, with several countries reporting large outbreaks that led to high death rates. The high prevalence of conditions such as dementia and other neurological disorders among LTC residents made it more difficult to diagnose people with COVID-19 at an early stage, and many cases were identified too late (ECDC, 2020; see also Chapter 1 on resilience to COVID-19).

Most HAIs are considered to be avoidable through better infection prevention and control. 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).

On average across EU countries, 5.7% of patients acquired an infection during their hospital stay in 2016-17 (Figure 6.29). Cross-country differences in the prevalence of HAIs need to be interpreted with caution, because the data are affected by sites selected for data collection, differences in reporting practices and varied risks of developing HAIs among patients (see more details in “Definition and comparability”).

Compounding the impact of HAIs are infections due to antimicrobial-resistant (AMR) bacteria, which can lead to complications, longer hospital stays, or death. A single antibiotic-resistant infection has been estimated to cost between EUR 8 500 and 34 000 more than a non-resistant infection, due to additional hospital days and additional treatment costs (OECD, 2017). The inappropriate and excessive use of antibiotics contribute to the increasing incidence of HAIs caused by AMR bacteria in hospitals and in the community, making these HAIs difficult or even impossible to treat. The share of antibiotic-resistant infections ranged from about 5% in Finland to over 60% of all HAI cases in Romania and Cyprus, although these rates should also be interpreted with caution due to small sample sizes in some cases (Figure 6.29).

In LTC facilities, the prevalence of HAIs among LTC residents was 3.6% on average across EU countries in 2016-17 (Figure 6.30). Cross-country differences also need to be interpreted with caution because of differences in reporting practices and in patient mix. The impact of HAIs in LTC facilities is also increased by the rise of AMR bacteria. On average across countries, about one-third of HAIs in LTC facilities were resistant to antibiotics, about the same proportion as in hospitals.

Definition and comparability

The data are based on a point prevalence survey (PPS) of health care-associated infections conducted in 2016-17 in acute care hospitals and LTC facilities in Europe, initiated and coordinated by ECDC. 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 health care-associated infections.

PPSs currently represent the best tool for collecting internationally comparable HAI data, but they are subject to possible biases due to facility selection, reporting practices or observer training. Many factors – including increased patient age, limited mobility and use of invasive medical devices – may increase the risk of developing an HAI and may influence the variability of rates between countries.

References

Cassini, A. et al. (2016), “Burden of Six Healthcare-Associated Infections on European Population Health: Estimating Incidence-Based Disability-Adjusted Life Years through a Population Prevalence-Based Modelling Study”, *PLOS Medicine*, Vol. 13/10, p. e1002150, *http://dx.doi.org/10.1371/journal.pmed.1002150*.

ECDC (2020), *Surveillance of COVID-19 at long-term care facilities in the EU/EEA*, Stockholm.

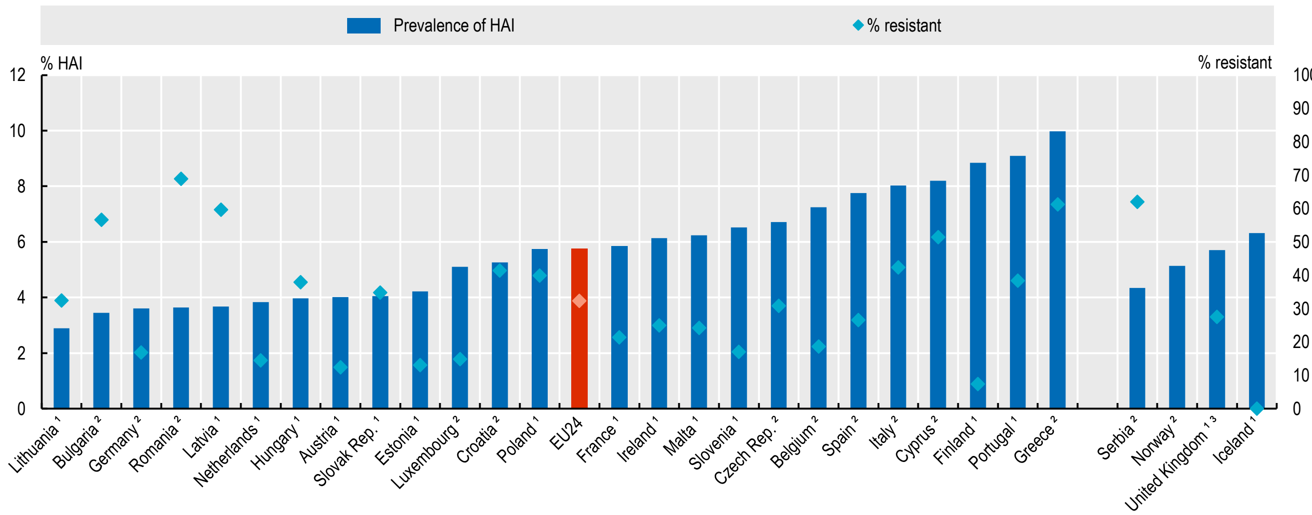
OECD (2017), *Tackling Wasteful Spending on Health*, OECD Publishing, Paris, *https://doi.org/10.1787/9789264266414-en*.

Slawomirski, L. et al (2017), “The economics of patient safety: Strengthening a value-based approach to reducing patient harm at national level”, *OECD Health Working Papers*, No. 96, OECD Publishing, Paris, *https://doi.org/10.1787/5a9858cd-en*.

Suetens, C. et al. (2018), “Prevalence of healthcare-associated infections, estimated incidence and composite antimicrobial resistance index in acute care hospitals and long-term care facilities: results from two European point prevalence surveys, 2016 to 2017”, *Eurosurveillance*, Vol. 23/46, *http://dx.doi.org/10.2807/1560-7917.es.2018.23.46.1800516*.

WHO (2016), *Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Care Facility Level*, Geneva.

Figure 6.29. **Percentage of hospitalised patients with at least one health care-associated infection and the proportion of these infections resistant to antibiotics, 2016-17**



Note: The EU average is unweighted. Country representativeness of data is limited in Bulgaria and the Netherlands. Data from Norway include partial imputation for missing types of infections. 1. Under 5% of patients were included from intensive care units (ICU). 2. Over 5% of patients were included from ICU. 3. Unweighted average for England, Northern Ireland and Wales.
Source: Suetens, C. et al. (2018), ECDC 2016-17 Point prevalence survey.

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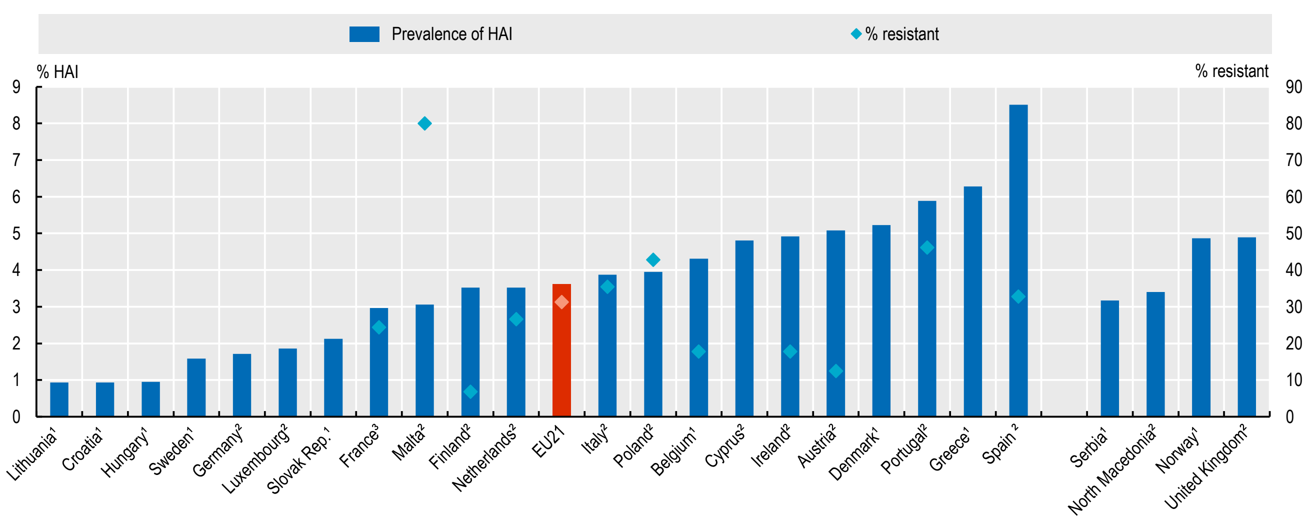
Figure 6.30. **Percentage of long-term care facility residents with at least one health care-associated infection and the proportion of these infections resistant to antibiotics, 2016-17**



Note: The EU average is unweighted. Based on composite antibiotic resistance indicator developed by ECDC. Only countries with over 15 bacteria isolated included. 1. Under 45% of residents sampled were wheelchair bound or bedridden. 2. Over 45% of residents sampled were wheelchair bound or bedridden, suggesting higher risks of HAIs. 3. No data was available on the proportion of wheelchair bound or bedridden residents.
Source: ECDC.

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The safety and adequacy of prescribing guidelines and practices can be analysed to develop indicators of health care quality, supplementing consumption and expenditure information (see indicator "Pharmaceutical expenditure" in Chapter 5). The overuse, underuse or misuse of prescription medicines can cause significant hazards to health and lead to wasteful expenditure (OECD, 2017). These risks apply notably to the use of antibiotics, opioids and benzodiazepines.

Antibiotics should be prescribed only where there is a need that is clearly supported by evidence to reduce the risk of resistant strains of bacteria. Furthermore, second-line antibiotics such as quinolones and cephalosporins should generally be used only when first-line antibiotics have proven ineffective. Antimicrobial resistance (AMR) is a growing threat to people's health and to economies (OECD, 2018).

Total volumes of all antibiotics prescribed in primary care varied over three-fold across European countries in 2017, with Estonia and Sweden reporting the lowest volumes (at 10 DDD per 1 000 population per day), and Greece and Italy reporting the highest (at about 30 DDD or more). Volumes of second-line antibiotics varied over 20-fold across countries: Denmark, Norway, Sweden and the United Kingdom reported the lowest volumes of second-line antibiotics, whereas Greece, Italy and the Slovak Republic reported the highest (Figure 6.31). Besides cross-country differences in the prevalence of antibiotic-resistant bacteria, variation in the volumes of antibiotics prescribed is likely to be explained by differences in the guidelines and incentives that influence primary care prescribers and attitudes and expectations of patients regarding the treatment of infectious diseases.

Opioids are often used to treat acute pain and pain associated with cancer. Over the last decade, they have been used increasingly to treat chronic pain, despite the risk of dependence, dose increase, shortness of breath and death (OECD, 2019). Across EU countries, the average volume of opioids prescribed in primary care in 2017 was almost 15 defined daily doses (DDDs) per 1 000 population per day. Iceland reports volumes more than twice the EU average, while Italy and Estonia report the lowest volumes (Figure 6.32). While these numbers reflect prescription patterns in primary care, they are also influenced by differences in the availability of these products, as the availability of opioids is also low in these countries (OECD, 2019). Cross-country variations can also be explained in part by differences in clinical practice in pain management, as well as differences in regulation, legal frameworks for opioids, prescribing policies and treatment guidelines.

Despite the risk of adverse side effects such as fatigue, dizziness and confusion, benzodiazepines are often prescribed for older adults for anxiety and sleep disorders. Long-term use of benzodiazepines can lead to adverse events (falls, road accidents and overdoses), tolerance, dependence and dose escalation. As well as the period of use, there is concern about the type of benzodiazepine prescribed, with long-acting types not recommended for older adults because they take longer for the body to eliminate (OECD, 2017).

Italy reports the lowest use of long-acting benzodiazepines among people aged 65 and over (close to 0) while Estonia, Slovenia and Spain report the highest use among the 12 EU countries providing these data. Their chronic use is also lowest in Italy but highest in Ireland, Portugal and Spain (Figure 6.33). The large variation can be explained in part by different reimbursement and prescribing policies for benzodiazepines, as well as possible differences in disease prevalence and treatment guidelines.

Definition and comparability

Defined daily dose (DDD) is the assumed average maintenance dose per day for a drug used for its main indication in adults. For instance, the DDD for oral aspirin equals 3 grammes, the assumed maintenance daily dose to treat pain in adults. DDDs do not necessarily reflect the average daily dose actually used in a given country. For more detail, see *http://www.whocc.no/atcddd*.

Data coverage varies across countries. Austria, Latvia, Estonia, Portugal, Spain and Sweden include data for primary care physicians only, while others include data from other providers. Data relate to reimbursed prescriptions, with the exception of Iceland, the Netherlands (for benzodiazepines only) and Slovenia, which include non-reimbursed medicines. Data for Germany are based on prescription data of statutory health insurance for outpatient care. Further information on sources and methods is available at the following OECD website: *https://qdd.oecd.org/subject.aspx?Subject=hcqo_meta*.

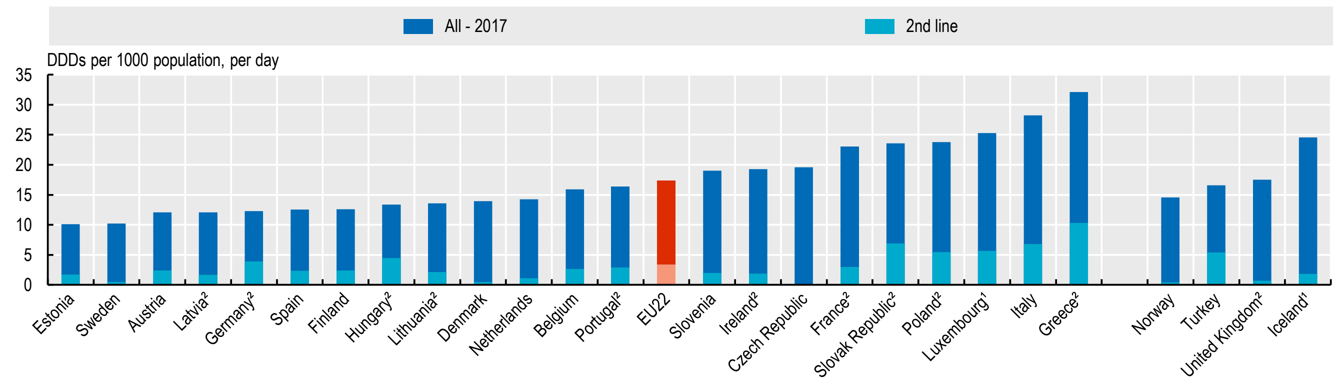
References

OECD (2019), *Addressing Problematic Opioid Use in OECD Countries*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/a18286f0-en*.

OECD (2018), *Stemming the Superbug Tide: Just A Few Dollars More*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/9789264307599-en*.

OECD (2017), *Tackling Wasteful Spending on Health*, OECD Publishing, Paris, *https://doi.org/10.1787/9789264266414-en*.

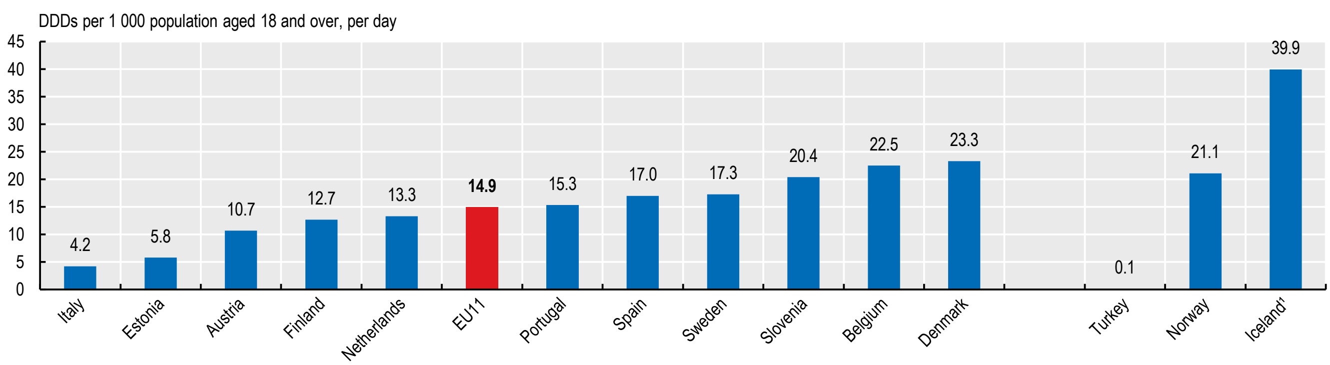
Figure 6.31. **Overall volume of antibiotics prescribed in primary care, 2017 (or nearest year)**



Note: The EU average is unweighted. All antimicrobial products defined with ATC code J01, and second-line with ATC codes J01D and J01M. 1. Three-year average. 2. Data from European Centre for Disease Prevention and Control as OECD Health Statistics data are not available.
Source: OECD Health Statistics 2020 and ECDC.

StatLink https://stat.link/8nk16b

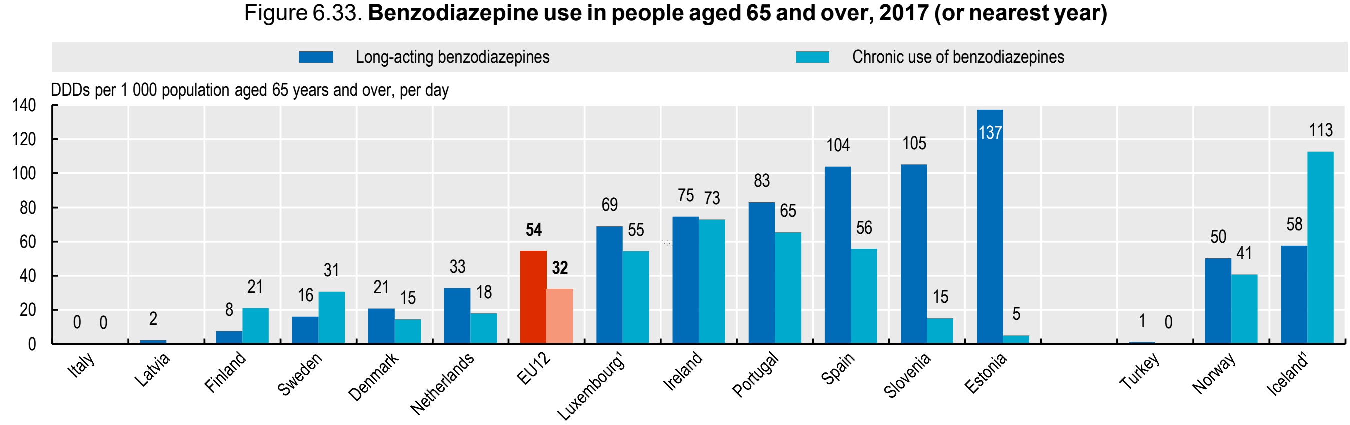
Figure 6.32. **Overall volume of opioids prescribed in primary care, 2017 (or nearest year)**



Note: The EU average is unweighted. Exclusion of products used in the treatment of addiction. 1. Three-year average.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/wvsztx

Figure 6.33. **Benzodiazepine use in people aged 65 and over, 2017 (or nearest year)**



Note: The EU average is unweighted. 1. Three-year average.
Source: OECD Health Statistics 2020.

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Health at a Glance: Europe 2020
State of Health in the EU Cycle

PART II

Chapter 7

Accessibility: Affordability, availability and use of services

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. Effective access to care can be restricted for financial reasons, but also because of health workforce shortages, long waiting times or long distance to travel to the closest health care facility. In most EU countries, only a small share of the population reported unmet needs for health care in 2018, but this proportion was higher among low-income households, mainly for financial reasons. On average across EU countries, around a fifth of all health spending is paid out-of-pocket by households, but with wide variations across countries. In general, countries that have a higher share of out-of-pocket spending also have a higher proportion of the population facing catastrophic out-of-pocket payments for health services, particularly among low-income groups. Although the number of doctors and nurses per population has increased over the past decade in nearly all EU countries, shortages persist in many countries and were brought to light during the COVID-19 pandemic. Long waiting time for some health services such as elective surgery is an important policy issue in many EU countries, as it restricts timely access to care and generates patient dissatisfaction. Even before the COVID-19 pandemic, waiting times for elective surgery were on the rise in many countries as the demand for surgery was increasing more rapidly than the supply.

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. There are many ways to seek information from the population about unmet health care needs that will provide different results. The data presented here are based on the EU Statistics on Income and Living Conditions survey (EU-SILC) as they are the most timely and comparable source of information available across all EU countries.

In all European countries, most of the population in 2018 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 8% of the population reported some unmet needs for health care, with the burden falling mostly on people from low-income households, particularly in Greece. Nearly one in five Greek people in the lowest income quintile reported going without some medical care when they needed it – these unmet needs were mainly for financial reasons. In Estonia, long waiting times are the main reason for people to report unmet care needs, which are partly explained by the limited volume of some services (such as specialist consultations) fully reimbursed by public health insurance. The Estonian Health Insurance Fund provided additional funding in 2018 to improve the availability of specialist services and treatments, which resulted in a reduction in waiting times for at least some services (OECD, 2020a).

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 is only partially included (or not included at all) in public schemes in many countries and so must either be paid out-of-pocket or covered through purchasing private health insurance (see indicator "Extent of health care coverage"). More than 1 in 12 people (8%) in Portugal, Latvia and Greece reported unmet needs for dental care in 2018, mainly for financial reasons. According to EU-SILC, only a very small proportion of people in Malta, the Netherlands, Luxembourg, Germany and Austria reported unmet dental care needs in 2018, but in the latter three countries at least, this proportion was much greater based on the results from the European Health Interview Survey in 2014 only including those who said that they actually had dental care needs (OECD, 2020b).

Unmet needs for medical care and dental care have generally decreased on average across EU countries since reaching a peak around 2013, although unmet medical care needs increased in 2018 in some countries like Estonia, Finland and Poland (Figure 7.3 and Figure 7.4). The gap in unmet medical and dental care needs between poor people and rich people remains large: on average across EU countries, people in the lowest income quintile are still four times more likely to report unmet medical care needs than those in the highest quintile, and 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 or treatment, in some countries (e.g. Czech Republic, Slovenia and Spain) the question only refers 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.

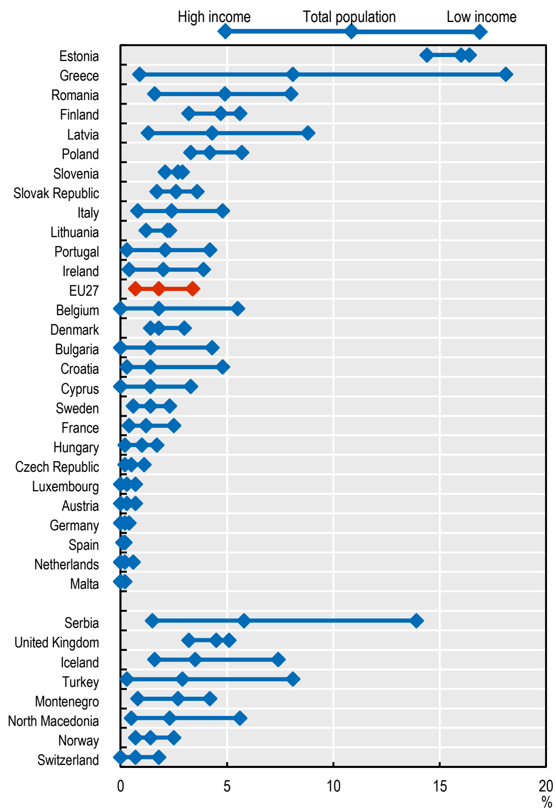
Income quintile groups are computed on the basis of the total equivalised disposable income attributed to each member of the household. The first quintile group represents the 20% of the population with the lowest income, and the fifth quintile group the 20% of the population with the highest income.

References

OECD (2020a), *Waiting Times for Health Services: Next in Line*, OECD Health Policy Studies, OECD Publishing, *https://doi.org/10.1787/242e3c8c-en*.

OECD (2020b), *Unmet needs for health care: Comparing approaches and results from international surveys*, *https://www.oecd.org/health/health-systems/Unmet-Needs-for-Health-Care-Brief-2020.pdf*.

Figure 7.1. **Unmet need for medical examination due to financial, geographic or waiting time reasons, 2018**



Note: EU weighted average.
Source: Eurostat Database (EU-SILC).

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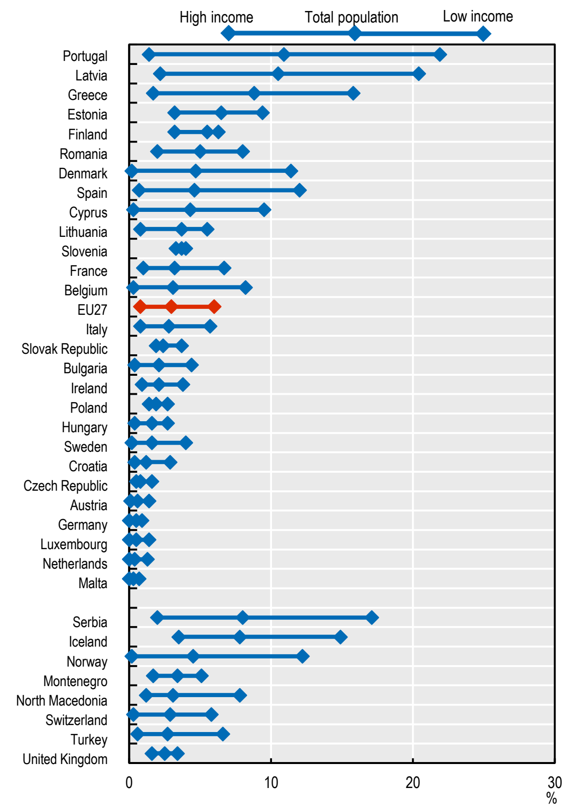
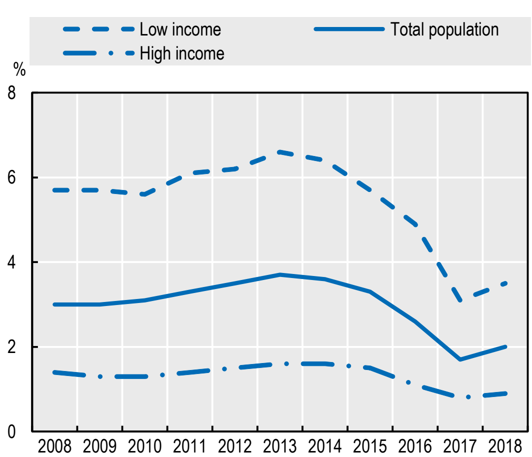
Figure 7.2. **Unmet need for dental examination due to financial, geographic or waiting time reasons, 2018**



Note: EU weighted average.
Source: Eurostat Database (EU-SILC).

StatLink https://stat.link/gofi9w

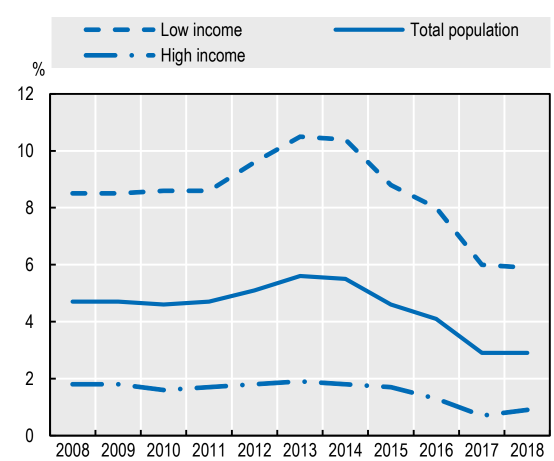
Figure 7.3. **Evolution in unmet medical care need due to financial, geographic or waiting time reasons, all EU27 countries, 2008-18**



Source: Eurostat Database, based on EU-SILC.

StatLink https://stat.link/wcthyq

Figure 7.4. **Evolution in unmet dental care need due to financial, geographic or waiting time reasons, all EU27 countries, 2008-18**



Source: Eurostat Database, based on EU-SILC.

StatLink https://stat.link/rqphn3

Where health systems fail to provide adequate financial protection, people may not have enough money to pay for health care or meet other basic needs. As a result, lack of financial protection can reduce access to health care, undermine health status, deepen poverty and exacerbate health and socio-economic inequalities. On average across EU member states, around a fifth of all spending on health care comes directly from patients through out-of-pocket (OOP) payments (see indicator "Financing of health expenditure" in Chapter 5). People experience financial hardship when the burden of such OOP payments is large in relation to their ability to pay. Poor households and those who have to pay for long-term treatment such as medicines for chronic illness are particularly vulnerable.

The share of household consumption spent on health care provides an aggregate assessment of the financial burden of OOP expenditure. Across EU member states, about 3% of total household spending was on health care goods and services, ranging from 2% or less in France, Luxembourg, Slovenia, Romania and Croatia to more than 7% in Malta (Figure 7.5). The share is also relatively high in Switzerland (6%).

Health systems in EU countries differ in the degree of coverage for different health goods and services (see indicator "Extent of health care coverage"). Household spending on pharmaceuticals and other medical goods was the main health care expense for people, followed by spending on outpatient care (Figure 7.6). These two components typically account for almost two-thirds of household spending on health care. Household spending on dental care and long-term health care can also be high, averaging 13% and 11% of OOP spending on health respectively, followed by spending on inpatient care (10%).

The indicator most widely used to measure financial hardship associated with OOP payments for households is the incidence of catastrophic spending on health (Cylus et al., 2018). This varies considerably across European countries, from fewer than 2% of households experiencing catastrophic health spending in France, Sweden, the United Kingdom, Ireland, the Czech Republic and Slovenia, to over 8% of households in Portugal, Poland, Greece and Hungary. In Latvia, Lithuania and Bulgaria, the proportion is even higher, reaching 15% or more (Figure 7.7). Across all countries, poorer households (i.e. those in the bottom consumption quintile) 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 OOP payments typically have a lower incidence of catastrophic spending. However, policy choices are also important, particularly around coverage policy (WHO Regional Office for Europe, 2019). Population entitlement to publicly financed health care is a prerequisite for financial protection, but not a guarantee of it. Countries with a low incidence of catastrophic spending on health are also more likely to exempt poor people and frequent 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 the United Kingdom).

Definition and comparability

Out-of-pocket (OOP) 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 ideally include estimations of informal payments to health providers.

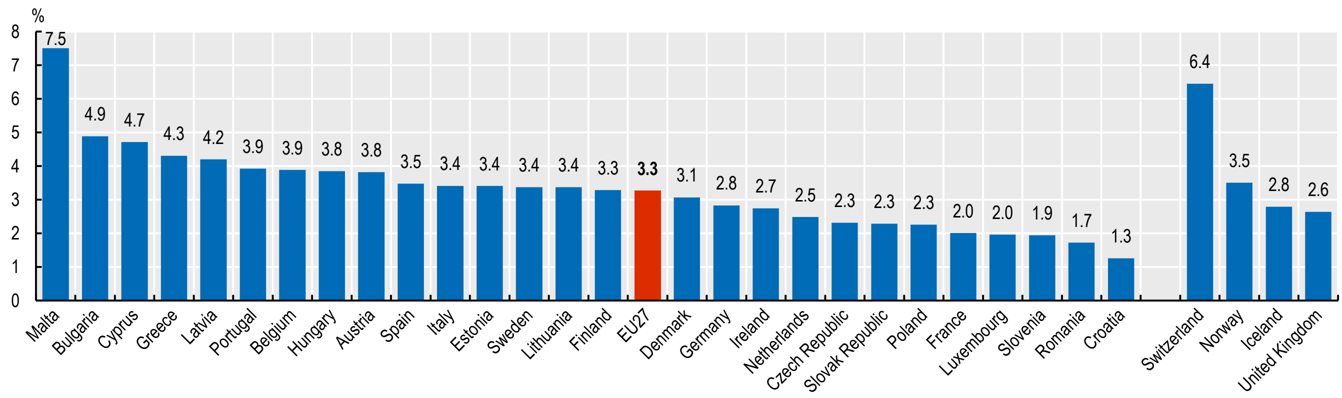
Catastrophic health spending is an indicator of financial protection used to monitor progress towards universal health coverage (UHC). It is defined as OOP payments that exceed a predefined percentage of the resources available to a household to pay for health care. Household resources available to pay for care can be defined in different ways, leading to measurement differences. In the data presented here, these resources are defined as household consumption 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.

References

Cylus, J., Thomson, S., Evetovits, T. (2018), *Catastrophic health spending in Europe: equity and policy implications of different calculation methods*, Bulletin of the World Health Organization (96).

WHO Regional Office for Europe (2019), *Can people afford to pay for health care? New evidence on financial protection in Europe*, Copenhagen.

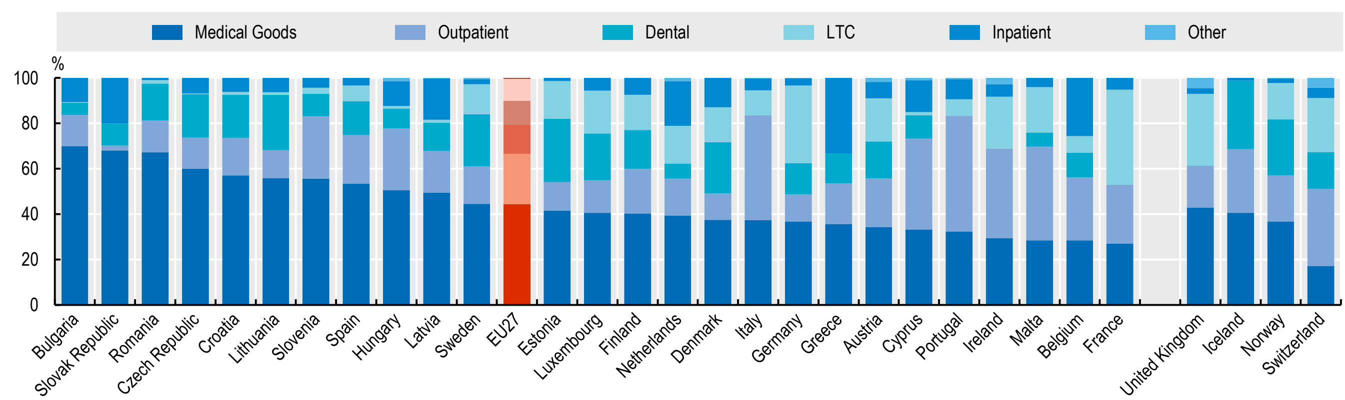
Figure 7.5. **Out-of-pocket spending on health as share of final household consumption, 2018 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020, OECD National Accounts database.

StatLink https://stat.link/qb82cj

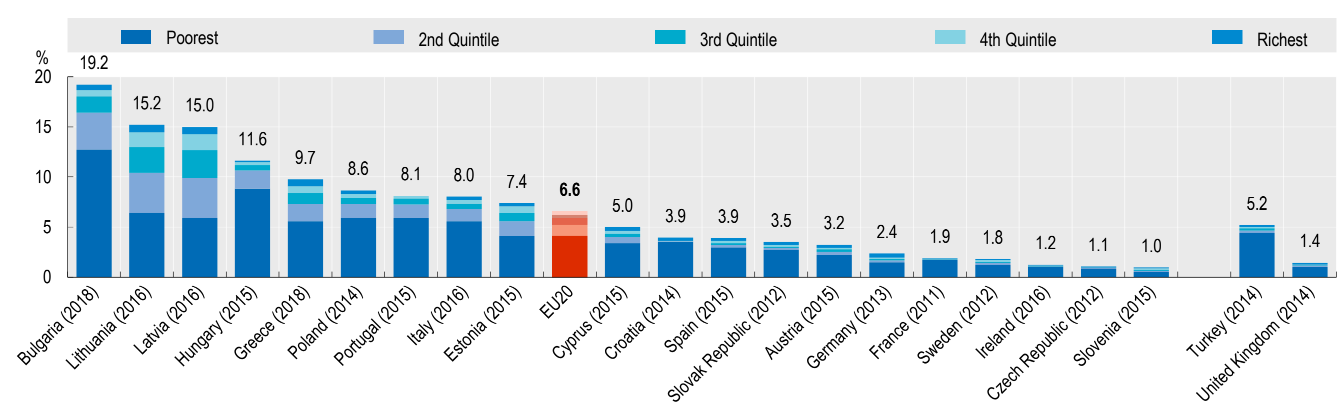
Figure 7.6. **Out-of-pocket spending on health, by type of services, 2018 (or nearest year)**



Note: The EU average is unweighted. The “Medical Goods” category includes retail pharmaceuticals and therapeutic appliances. The “Other” category includes preventive care, administrative services and services unknown.
Source: OECD Health Statistics 2020.

StatLink https://stat.link/p17lwk

Figure 7.7. **Share of households with catastrophic health spending by consumption quintile, latest year**



Note: The EU average is unweighted.
Source: WHO Regional Office for Europe, 2019.

StatLink https://stat.link/cwjs64

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 of health care costs for a core set of services, usually including consultations with doctors, tests and examinations, and hospital care (Figure 7.8). Yet, in some countries coverage of these core services may not be universal. In Ireland, for example, only Medical Card and GP Card holders (less than 50% of the population) were covered for the costs of GP visits in 2019, 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, 2019a).

Three EU countries (Bulgaria, Romania and Cyprus) still had at least 10% of their population not covered for health care costs in recent years. In Bulgaria, at least one person in ten did not have health insurance in 2017, although other estimates suggest that this proportion may be closer to one in seven. This mainly concerns people in informal employment, long-term unemployed people and the Roma population who do not pay health insurance premiums either because they cannot afford it or for other reasons (OECD/European Observatory on Health Systems and Policies, 2019b). In general, people without insurance have free access to some services, like emergency care or care during pregnancy, but they need to cover all other costs out of pocket.

In Romania, the number of people without coverage is difficult to quantify because of the significant number of Romanians working abroad who are still counted as residents (around 3 to 4 million people) and thus appear in the statistics as having no insurance. The uninsured population living in Romania include mainly people working in the agricultural sector, the self-employed, unemployed people who are not registered for unemployment or social security benefits, and Roma people who do not have identity cards (precluding them from enrolling into the social security system). As in Bulgaria, the uninsured can only access a minimum benefits package, covering emergency care, treatment of communicable diseases and care during pregnancy (OECD/European Observatory on Health Systems and Policies, 2019c).

In 2019, Cyprus started to implement a major reform to move towards universal health coverage through the implementation of a National Health Insurance System (NHIS), although not all the population had registered to be beneficiaries of the new system as of early 2020. Beyond addressing coverage gaps, the new NHIS also aims to address the current fragmentation between the public and private systems (European Commission, 2020).

Although basic primary health coverage generally covers a defined set of benefits, in many countries accessing health services entails some degree of cost sharing for the majority of users. In most 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 EU countries, only a small proportion of the population has an additional private health insurance, with the exception of France, Slovenia, Belgium, the Netherlands, Luxembourg and Croatia, where half or more of the population has private coverage (Figure 7.9).

Definition and comparability

Population coverage for health care is defined as the share of the population covered for a 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.

References

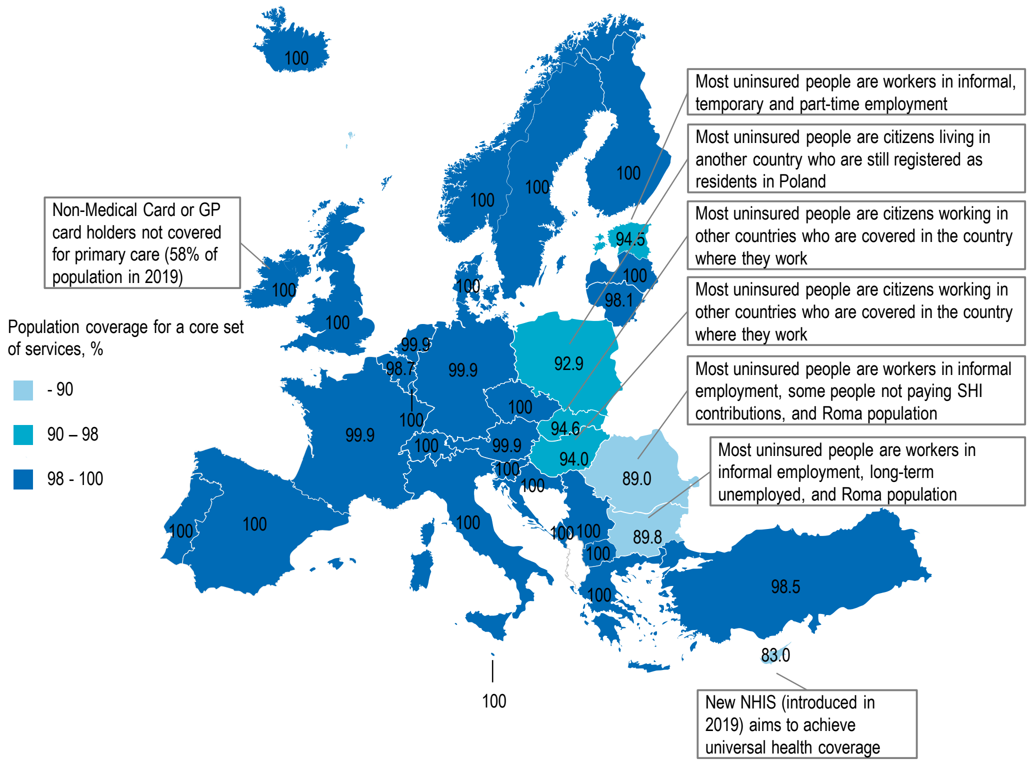
OECD/European Observatory on Health Systems and Policies (2019a), *Ireland: Country Health Profile 2019*, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels, *https://doi.org/10.1787/2393fd0a-en*.

OECD/European Observatory on Health Systems and Policies (2019b), *Bulgaria: Country Health Profile 2019*, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels, *https://doi.org/10.1787/34781ac1-en*.

OECD/European Observatory on Health Systems and Policies (2019c), *Romania: Country Health Profile 2019*, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels, *https://doi.org/10.1787/f345b1db-en*.

European Commission (2020), *2020 European Semester: Country Report – Cyprus*, *https://ec.europa.eu/info/publications/2020-european-semester-country-reports_en*.

Figure 7.8. **Population coverage for a core set of services, 2018 (or nearest year)**

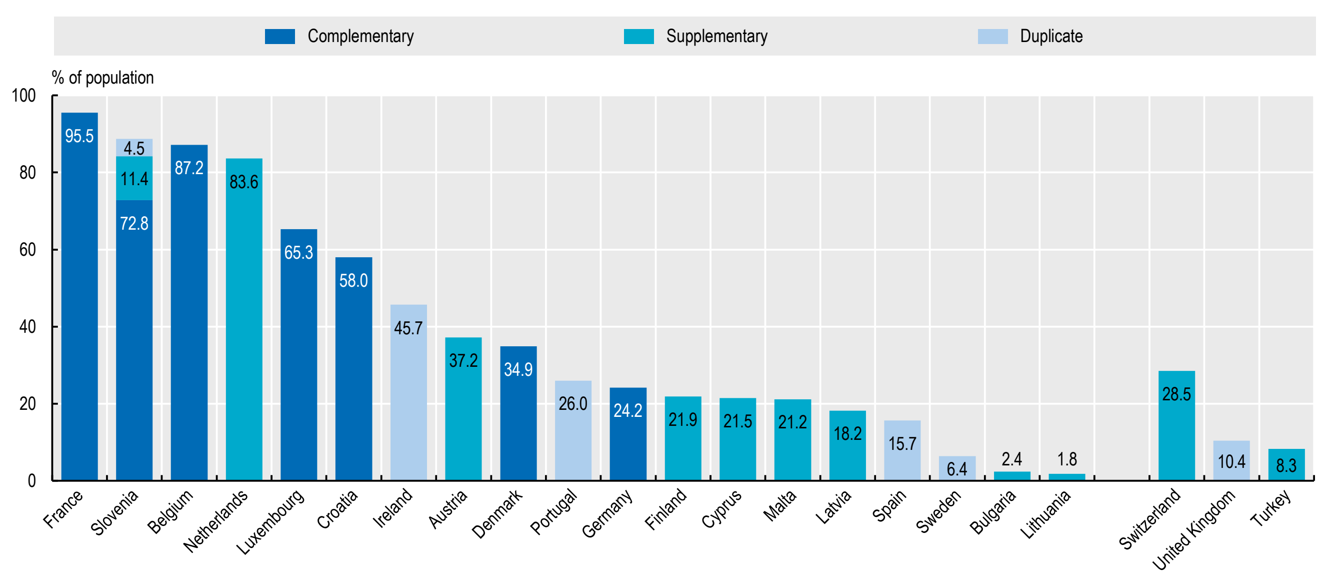


Note: This includes public coverage and primary private health coverage.

Source: OECD Health Statistics 2020; European Observatory Health Systems in Transition (HiT) Series for non-OECD countries.

StatLink https://stat.link/koqnfb

Figure 7.9. **Private health insurance coverage, 2018 (or nearest year)**



Note: This excludes primary PHI. PHI can be both complementary and supplementary in Denmark and Germany.

Source: OECD Health Statistics 2020; and Voluntary health insurance in Europe, Observatory Studies Series, 2016, for non-OECD countries.

StatLink https://stat.link/8vwkip

In addition to the share of the population entitled to core health services, the extent of health care coverage is defined by the range of services included in a publicly defined benefit package and the proportion of costs covered. Figure 7.10 assesses the extent of coverage for selected health care goods and services, by calculating the share of expenditure covered under government schemes or compulsory health insurance. Differences across countries in the extent of coverage can be due to specific goods and services being included or excluded in the publicly defined benefit package (e.g. a particular drug or medical treatment); different cost-sharing arrangements; or some services only being covered for specific population groups in a country (e.g. dental treatment).

On average, across EU member states, almost three-quarters of all health care costs were covered by government or compulsory health insurance schemes (see indicator "Financing of health expenditure" in Chapter 5), but in all countries this proportion varies across the types of care service.

Inpatient services in hospitals are more comprehensively covered than any other type of care. Across the EU, 88% of all inpatient costs are borne by government or compulsory insurance schemes. In many countries, patients have access to free acute inpatient care, or only have to make a small co-payment. As a result, coverage rates are near 100% in Estonia, Romania, Sweden, Norway and Iceland. Only in Cyprus and Greece is the financial coverage for the cost of inpatient care 70% or lower. In these countries, some patients may choose treatment in private facilities, where coverage is not (fully) included in the public benefit package.

Around three-quarters of spending on outpatient medical care in EU member states are borne by government and compulsory insurance schemes. Coverage ranged from under 40% in Cyprus and below 60% in Bulgaria, Greece, Italy, Malta and Portugal to 90% or more in the Czech Republic, Denmark, Germany, the Slovak Republic and Sweden. Outpatient primary and specialist care are frequently free at the point of service, but user charges may still apply for specific services or if non-contracted private providers are consulted. For example in Denmark, where 92% of total costs are covered, user charges exist for visits to psychologists and physiotherapists.

Public coverage for dental care costs is far more limited across the EU due to restricted service packages (frequently limited to children) and higher levels of cost-sharing. On average, only around 30% of costs are borne by government schemes or compulsory insurance. Only three EU countries (Croatia, Germany and the Slovak Republic) publicly cover more than half of total spending for dental care. In Greece and Spain, dental care costs for adults without any specific entitlement are not covered. Voluntary health insurance may play an important role in providing financial protection when dental care is not comprehensively covered in the benefit package (e.g. in the Netherlands).

Coverage for pharmaceuticals is also typically less comprehensive than for inpatient and outpatient care. Across the EU, 56% of pharmaceutical costs are covered by government or compulsory insurance schemes. This share is less than 40% in Bulgaria, Cyprus, Latvia, Lithuania and Poland. Coverage is most generous in Germany (82%) and France (81%). Over-the-counter medications – which by their nature are not usually covered by public schemes – play an important role in some countries (see indicator "Pharmaceutical Expenditure" in Chapter 5).

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 care goods and services, with the exception of dental care. Government and compulsory insurance schemes cover more than 50% of these expenses in only four EU countries. In the 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.

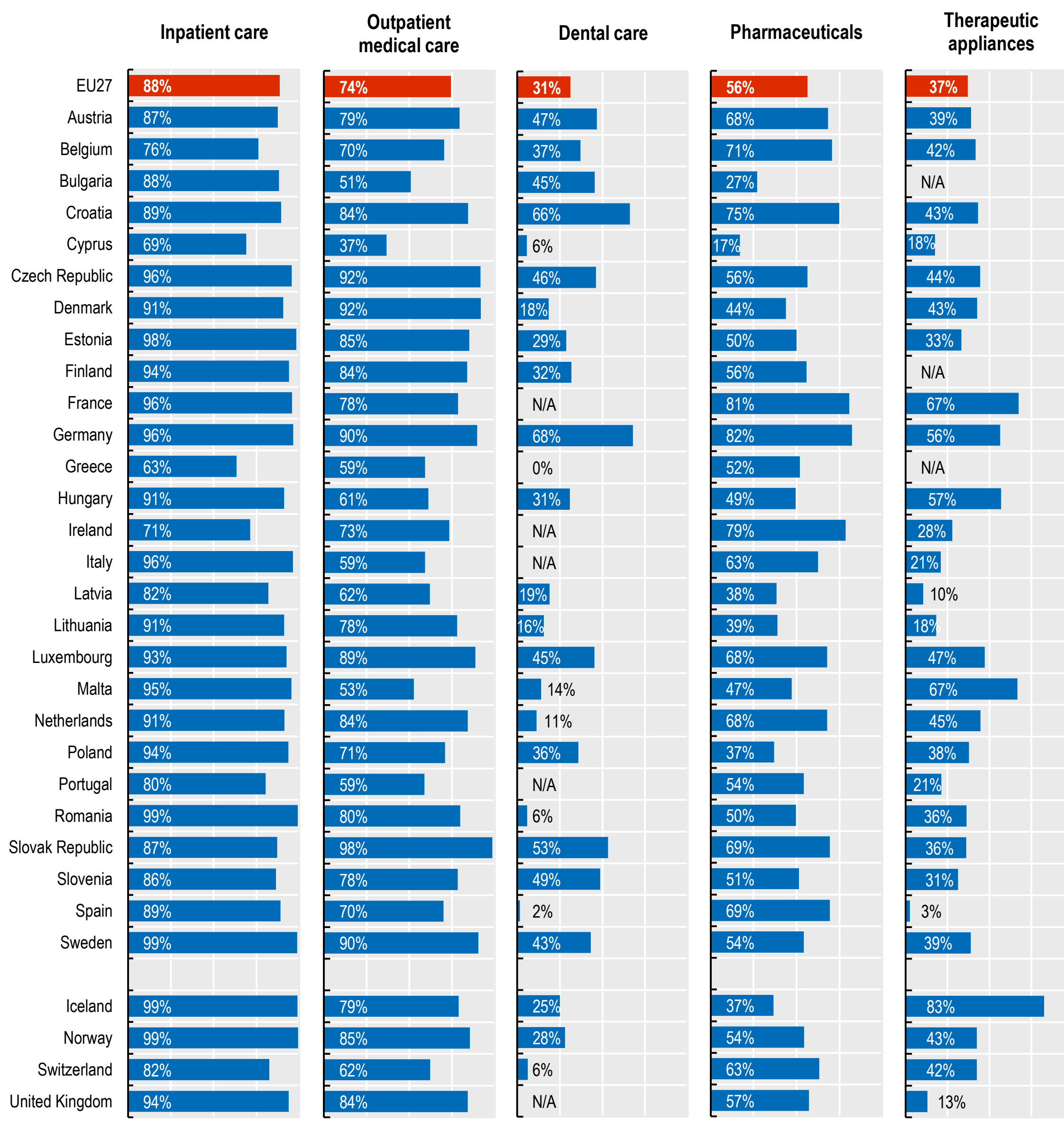
Definition and comparability

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. Coverage provided by voluntary health insurance and other voluntary schemes such as charities or employers is not considered. The core functions analysed here are defined based on definitions in the System of Health Accounts 2011. Hospital 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. Therapeutic appliances are glasses and other eye products, hearing aids and other medical devices.

Comparing the shares of the costs covered for different types of services is a simplification in assessing the full extent of health care coverage in a country. For example, a country with more restricted population coverage but a very generous benefit basket may display a lower share of coverage than a country where the entire population is entitled to services but with a more limited benefit basket. Yet, this method is still useful to highlight any gaps in coverage.

Figure 7.10. **Health care coverage for selected goods and services, 2018 (or nearest year)**

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. The EU average is unweighted.

Source: OECD Health Statistics 2020.

StatLink https://stat.link/gq439x

Doctors and other health workers are crucial for addressing the health needs of the population in normal circumstances and even more so during exceptional circumstances such as the COVID-19 pandemic. Proper access to medical care requires a sufficient number of doctors, with a proper mix of generalists and specialists and a proper geographic distribution to serve the population in the whole country.

In 2018, Greece had the highest number of doctors with 6.1 per 1 000 population, but this number is an over-estimation as it includes all doctors 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 (the number of practising doctors in Portugal is likely slightly below the EU average). On the other side of the spectrum, the number of doctors per capita was lowest in Poland, Luxembourg, Romania and Belgium (Figure 7.11).

Between 2008 and 2018, the number of doctors per capita increased in all EU countries, although the rise in France, Latvia, Estonia and the Slovak Republic has been very marginal. On average across EU countries, the number increased from 3.3 doctors per 1 000 population in 2008 to 3.8 in 2018, a growth of 15% taking into account the population increase.

There were a lot of concerns in the late 2000s about projected shortages of doctors arising from population ageing and the ageing of the medical workforce (OECD, 2008). These concerns prompted many EU countries to take actions to anticipate the retirement of a large number of doctors, notably by increasing the number of medical students, to replace those retiring (OECD, 2016). Several countries also took actions to postpone the retirement of current doctors and recruited more doctors from abroad (OECD, 2019a).

In many countries, the main concern has been about growing 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, only about one in five doctors were GPs in 2018 (Figure 7.12). Greece and Poland have the lowest share of GPs, while Portugal, Finland and Belgium have been able to maintain a better balance between GPs and specialists. Several countries have taken steps over the past decade to increase the number of postgraduate training places in general medicine. For example, in France, about 40% of all new postgraduate training places have been allocated to general medicine since 2017, a greater proportion than in most other EU countries. However, in France as in other countries, it remains a challenge to attract a sufficient number of medical students to fill the available training places, given the lower remuneration and perceived prestige of general practice (OECD/European Observatory of Health Systems and Policies, 2019).

The uneven geographic distribution of doctors and difficulties in recruiting and retaining doctors in remote and sparsely populated areas is another persisting challenge in many European countries. In all countries, the density of physicians is generally greater in urban regions, reflecting the concentration of specialised services such as surgery in urban centres as well as physicians' preferences to live and practice in cities. Differences in the density of doctors between urban and rural regions are highest in the Slovak Republic, the Czech Republic and Greece (OECD, 2019b).

Many countries provide different types of financial and other 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 (OECD, 2016).

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 that do not set such a threshold.

References

OECD (2008), *The Looming Crisis in the Health Workforce: How Can OECD Countries Respond?*, OECD Publishing, Paris, *https://doi.org/10.1787/9789264050440-en*.

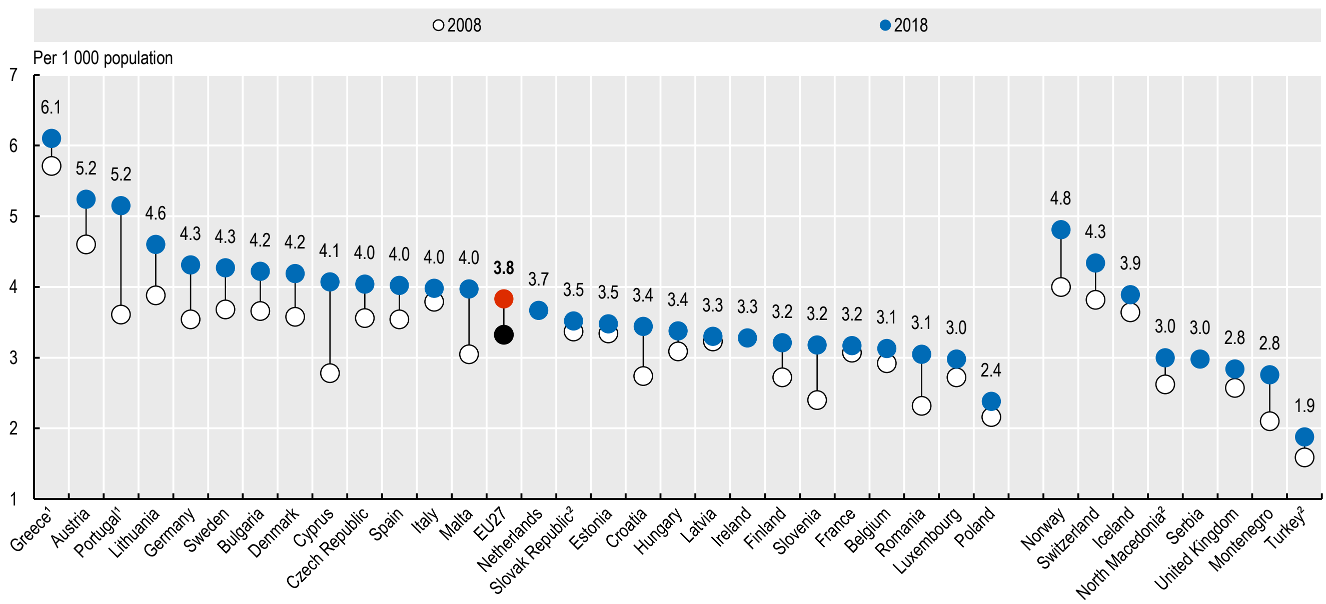
OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264239517-en*.

OECD (2019a), *Recent trends in International Migration of Doctors, Nurses and Medical Students*, OECD Publishing, Paris, *https://doi.org/10.1787/5571ef48-en*.

OECD (2019b), *Health at a Glance 2019: OECD Indicators*, OECD Publishing, Paris, *https://doi.org/10.1787/4dd50c09-en*.

OECD/European Observatory on Health Systems and Policies (2019), *France: Country Health Profile 2019*, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels, *https://doi.org/10.1787/d74dbbda-en*.

Figure 7.11. **Practising doctors per 1 000 population, 2008 and 2018 (or nearest year)**



Note: The EU average is unweighted. 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 2020; Eurostat Database.

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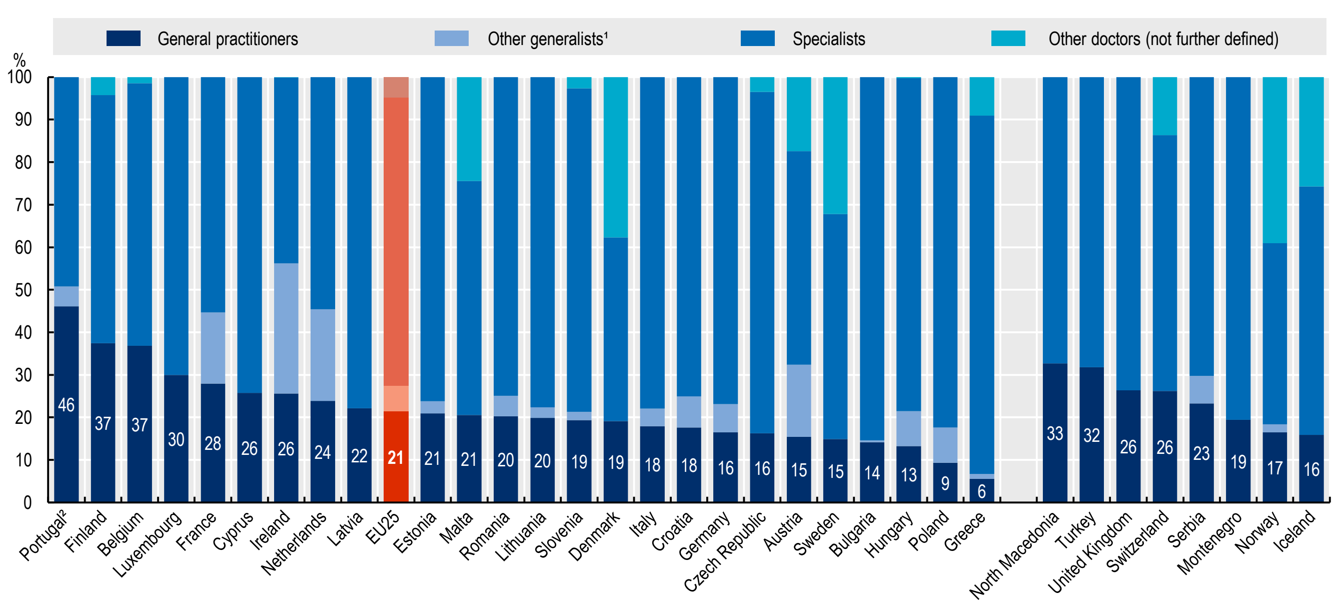
Figure 7.12. **Share of different categories of doctors, 2018 (or nearest year)**



Note: The EU average is unweighted. 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 2020; Eurostat Database.

StatLink https://stat.link/52bsc4

Consultations with doctors are, for most people, the most frequent contacts with health services and often provide an entry point for subsequent medical treatment. Consultations can take place in different settings, including doctors' offices, hospital outpatient departments or patients' own homes. Increasingly, consultations can also take place online and through video calls, through the development of teleconsultations (Oliveira Hashiguchi, 2020). The use of teleconsultations increased greatly during the COVID-19 pandemic as a way to protect both patients and doctors and avoid spreading the virus. For example, in France, the number of teleconsultations reached close to 1 million per week in April 2020 compared to around 10 000 per week before March. In Norway, the share of teleconsultations with a general practitioner rose from 5% before the pandemic to almost 60% during the pandemic.

In 2018, on average across EU countries, people had between six and seven physical (face-to-face) consultations with a doctor in that year. The number of consultations with doctors was highest in the Slovak Republic, Hungary, Germany, Lithuania and the Netherlands, with nine consultations or more per year. It was lowest in Sweden, Greece, Denmark and Finland (Figure 7.13).

Differences in health service delivery and payment methods can explain some of the variations across countries. In Sweden, Finland and Ireland, 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 to consult doctors. In these countries, nurses can play a greater role in the management of patients with chronical diseases and in dealing with patients with minor health issues (OECD, 2020). Some countries, which pay their doctors mainly by fee-for-service (e.g. the Slovak Republic, the Czech Republic or Germany), tend to have higher consultation rates than other countries where doctors are mainly paid by salaries or capitation (Finland, Denmark, Sweden). The level of co-payment may also explain some of the variations across countries. In Switzerland and Ireland, for example, patient co-payments are high for a large proportion of the population, which may result in fewer consultations.

The estimated number of consultations per doctor is highest in Poland, Hungary and the Slovak Republic, with more than 3 000 consultations per doctor per year. It is lowest in Sweden, Denmark, Austria, Finland and Bulgaria with less than 1 500 consultations per doctor (Figure 7.14). 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 other services delivered by doctors for hospital inpatients, time spent on research, administration or care co-ordination, as well as new ways of interacting with patients.

Looking at trends over time in the estimated number of consultations per doctor per year, the number has decreased slightly since 2000 in Austria, Denmark, France, Germany and Sweden, as the number of doctors has increased more rapidly than the number of traditional consultations, whereas it has increased in Poland (Figure 7.15).

As already noted, alternatives to traditional face-to-face consultations are growing rapidly in many countries through the use of digital technologies, providing new opportunities to facilitate patient and doctor interactions in various ways. In 2019, primary care physicians in Sweden and the United Kingdom were more likely to report offering patients web-based communication options such as prescription refill, test results or visit summary viewing capabilities than those in France, Switzerland, Norway and the Netherlands (Michelle et al., 2019).

Definition and comparability

Consultations with doctors refer to the number of face-to-face 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, 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, leading to an under-estimation.

The data for the Netherlands exclude contacts for maternal and child care. In Austria and 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. Ireland, Spain).

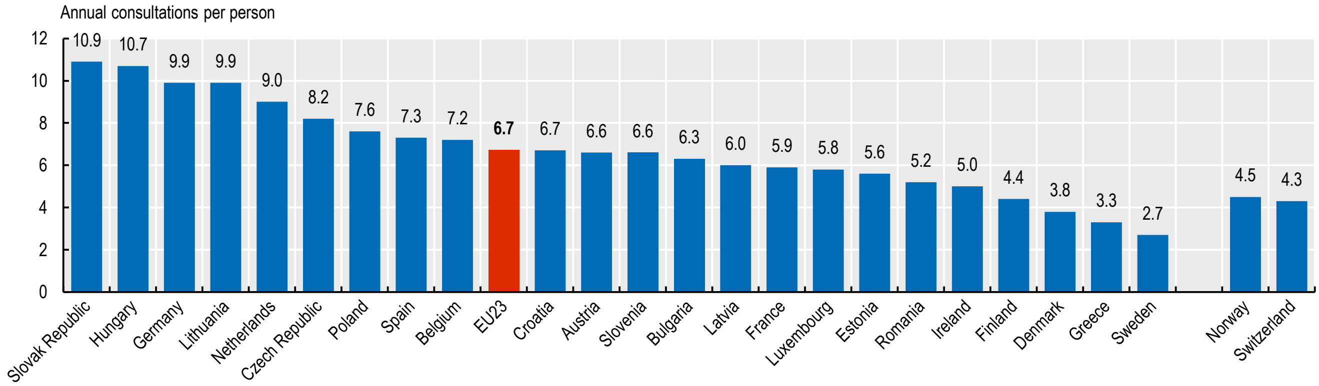
References

Michelle, M. et al. (2019), "Primary Care Physicians' Role in Coordinating Medical and Health-Related Social Needs in Eleven Countries", *Health Affairs,* Vol. 39/1, *https://doi.org/10.1377/hlthaff.2019.01088*.

OECD (2020), *Realising the Potential of Primary Health Care*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/a92adee4-en*.

Oliveira Hashiguchi, T. (2020), "Bringing health care to the patient: An overview of the use of telemedicine in OECD countries", *OECD Health Working Papers,* No. 116, OECD Publishing, *http://dx.doi.org/10.1787/8e56ede7-en*.

Figure 7.13. **Number of doctor consultations per person, 2018 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020; Eurostat Database.

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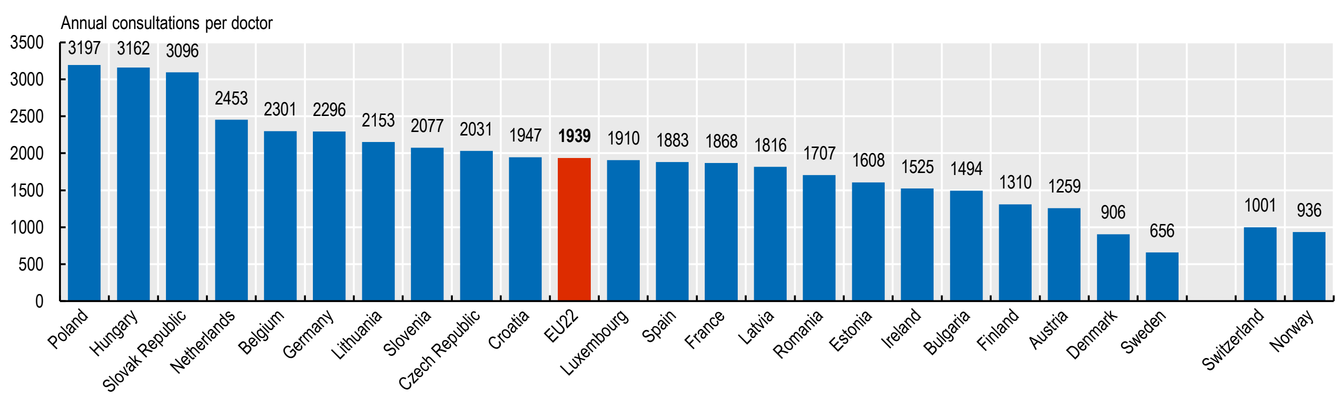
Figure 7.14. **Estimated number of consultations per doctor, 2018 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020; Eurostat Database.

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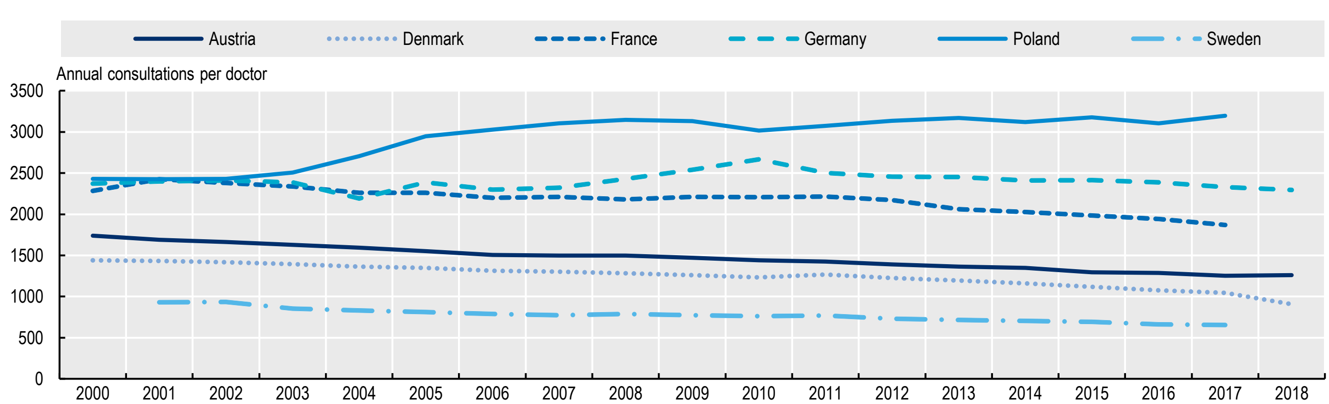
Figure 7.15. **Evolution in estimated number of consultations per doctor, selected countries, 2000-18**



Source: OECD Health Statistics 2020; Eurostat Database.

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Oral health is an important, although often neglected public health issue. The economic burden of oral diseases is substantial. Oral diseases account for more than 5% of total health spending on average across EU countries, and productivity losses due to oral diseases have been estimated at around EUR 57 billion a year (Platform for Better Oral Health in Europe, 2019). Dentists play a key role in both preventing and treating oral health problems.

In 2018, there were between 0.4 and 1.2 practising dentists per 1 000 population across EU countries (Figure 7.16). Greece, Cyprus, Portugal, Bulgaria, Lithuania, Estonia and Luxembourg had the highest number of dentists per capita, with at least one dentist per 1 000 population, although the numbers in Greece and Portugal are over-estimated as they include all dentists licensed to practice. The number of dentists per capita was lowest in Poland, Malta and the Slovak Republic.

Between 2008 and 2018, the number of dentists per capita increased or remained stable in most EU countries, except in Greece and Denmark where it decreased. The number of dentists per capita rose particularly strongly in Portugal, Spain, Romania, Lithuania and Hungary, with an increase of 40% or more since 2008 (Figure 7.16). In most of these countries, this rise in the number of dentists was driven by a large increase in the number of students admitted and graduating from dentistry programmes.

While there is no general consensus about how often people should visit a dentist, the recommendation in several countries is that children should have a visit at least once a year to prevent and treat quickly any problem, while adults without problems may wait as long as two years. On average across EU countries, people had just over one consultation with a dentist in 2018. The number of consultations with a dentist was highest in the Netherlands, the Czech Republic and Lithuania, whereas it was lowest in Romania and Ireland (Figure 7.17).

A higher number of dentists per capita generally tends to be associated with a higher number of dentist consultations. However, for a given number of dentists per capita, there can be wide differences in the average number of dentist consultations. For instance, while the Netherlands has slightly fewer dentists per capita than Austria and France, the average number of dentist consultations is almost two times greater.

The higher number of consultations in the Netherlands can be explained by the strong preference of people for regular dental check-ups arising from well-established programmes to promote prevention of oral health issues at a young age. The National Dutch programme “Keep your Mouth Healthy” provides oral health education to children and is considered one of the best practices in Europe. Several other European countries have similar programmes of oral health promotion and prevention among children and adolescents (Platform for Better Oral Health in Europe, 2015).

The extent of public coverage for dental care costs can also partly explain some of the cross-country variations in the number of dentist consultations (see indicator “Extent of health care coverage”). In Romania for example, only 6% of dental care spending is publicly funded. By contrast, in Germany, more than 60% of dental spending is publicly covered. In the Netherlands, while dental care is not comprehensively covered in the benefit package, voluntary health insurance plays an important role in providing financial protection for dental care.

Definition and comparability

The number of dentists includes both salaried and self-employed dentists. In most countries, the data only include dentists providing direct services to clients/patients. This is not the case however in Ireland, Greece, Montenegro, Portugal and Spain, where the data refer to all dentists licensed to practice (including those who may not be actively practising), resulting in an over-estimation of the number of practising dentists.

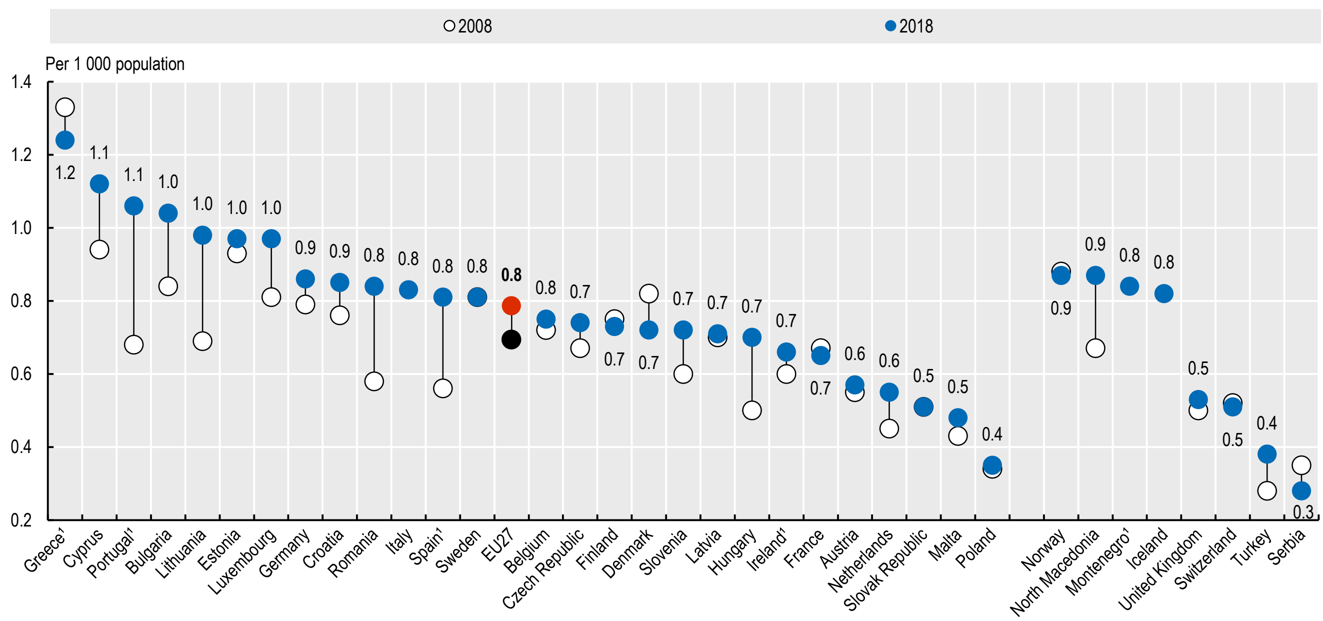
The average number of consultations with a dentist per year includes visits at the dentist’s office as well as in outpatient departments in hospital, although the coverage of these settings may differ across countries. The data come mainly from administrative sources, although in some countries (Ireland, 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 some surveys only cover adults, resulting in an under-estimation if the number of visits among children is greater. Austria, Cyprus, Hungary, Serbia and the United Kingdom do not cover consultations privately financed or provided in the private sector, also resulting in an under-estimation.

References

Platform for Better Oral Health in Europe (2019), *Why Oral Health Matters: Policy recommendations to improve oral health in the EU*, *http://www.oralhealthplatform.eu/*.

Platform for Better Oral Health in Europe (2015), *Best Practices in Oral Health Promotion and Prevention from Across Europe*, *http://www.oralhealthplatform.eu/*.

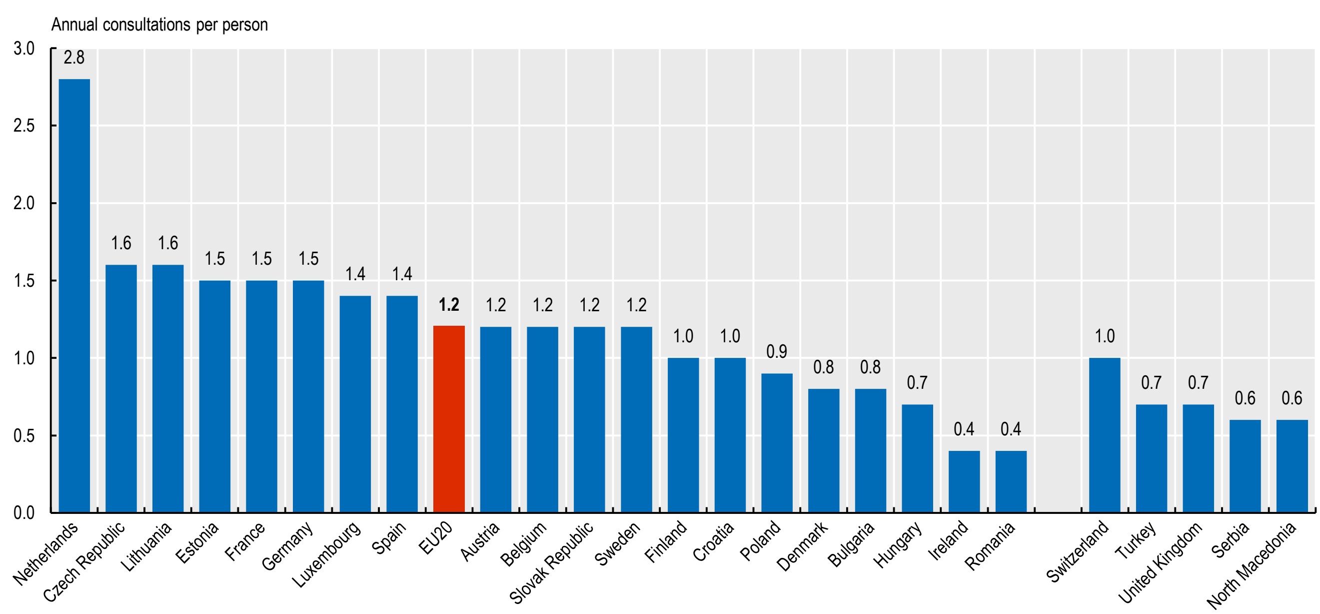
Figure 7.16. **Practising dentists per 1 000 population, 2008 and 2018 (or nearest year)**



Note: The EU average is unweighted. 1. Data refer to all dentists licensed to practice, resulting in an over-estimation of practising dentists.
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/tb0zvx

Figure 7.17. **Number of dentist consultations per person, 2018 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/aiye8k

Nurses play a critical role in providing care in hospitals and long-term care institutions under normal circumstances, and their role was even more critical during the COVID-19 pandemic. Pre-existing shortages of nurses were exacerbated during the peak of the epidemic, also because many nurses themselves became infected by the virus (see Chapter 1 on resilience to COVID-19).

The demand for nurses is expected to continue to rise in the years ahead because of population ageing while many nurses are approaching retirement age. Concerns about growing shortages have prompted actions in many countries to increase the training of new nurses. Some countries have also addressed current shortages by recruiting nurses from abroad (OECD, 2019). Increasing the retention rate of nurses in the profession remains a key issue in most countries to avoid current and future shortages.

On average across EU countries, there were 8.2 nurses per 1 000 population in 2018, a rise from 7.4 in 2008 (Figure 7.18). Among EU countries, the number of nurses per capita was highest in 2018 in Finland, Germany and Ireland. The number was greater in Norway, Switzerland and Iceland, although about one-third of nurses in these latter two countries and in Finland are trained at a lower level than general nurses and perform lower tasks. In some other countries that have relatively low numbers of nurses 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.

Between 2008 and 2018, the number of nurses per capita has increased in most EU countries, except in Latvia, the Slovak Republic and Ireland where it has decreased at least slightly. Looking at other European countries, the number of nurses per capita has increased substantially in Norway and Switzerland. In Switzerland, this has been driven mainly by a strong rise in the number of lower-level nurses. In Norway, the government has adopted a series of measures in recent years to recruit more students to nursing education programmes and improve the working conditions of nurses to increase retention rates. A multi-year *Competence Lift 2020* action plan was adopted in 2016 to increase the number and competencies of nurses and other health workers to avoid future shortages. This action plan will be extended over the next five years under the *Competence Lift 2025*.

The number of nurses per capita has come down in the United Kingdom over the past decade, driven at least partly by a reduction in the number of domestic graduates until 2017 as well as a sharp reduction in the inflow of foreign-trained nurses in 2017, although the numbers have picked up since then. Important changes in the mix of nurses and other clinical staff (including health care assistants and nursing assistants) have also occurred over the last decade. While in 2009/10 the number of nurses and support staff were roughly equal, by 2018/19, there were about 10% more support staff than nurses in full-time equivalent employment (Buchan et al., 2019).

Nurses greatly outnumber physicians in most EU countries. In 2018, there were more than two nurses per doctor on average across EU countries, with the nurse-to-doctor ratio reaching about four or more in Finland, Luxembourg, Ireland, Switzerland, Iceland and Norway (Figure 7.19). The ratio was much lower in Southern European countries as well as in Latvia.

In response to shortages of doctors, several countries have started to implement more advanced roles for nurses in hospital and primary care, including "nurse practitioner" roles. Evaluations of nurse practitioners in primary care in countries like Finland, the United Kingdom and Ireland show that advanced practice nurses can improve access to services and reduce waiting times, while delivering the same quality of care as doctors for a range of patients, including those with minor illnesses and those needing routine follow-ups. These evaluations find a high patient satisfaction rate, while the impact on cost is either cost-reducing or cost-neutral (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).

References

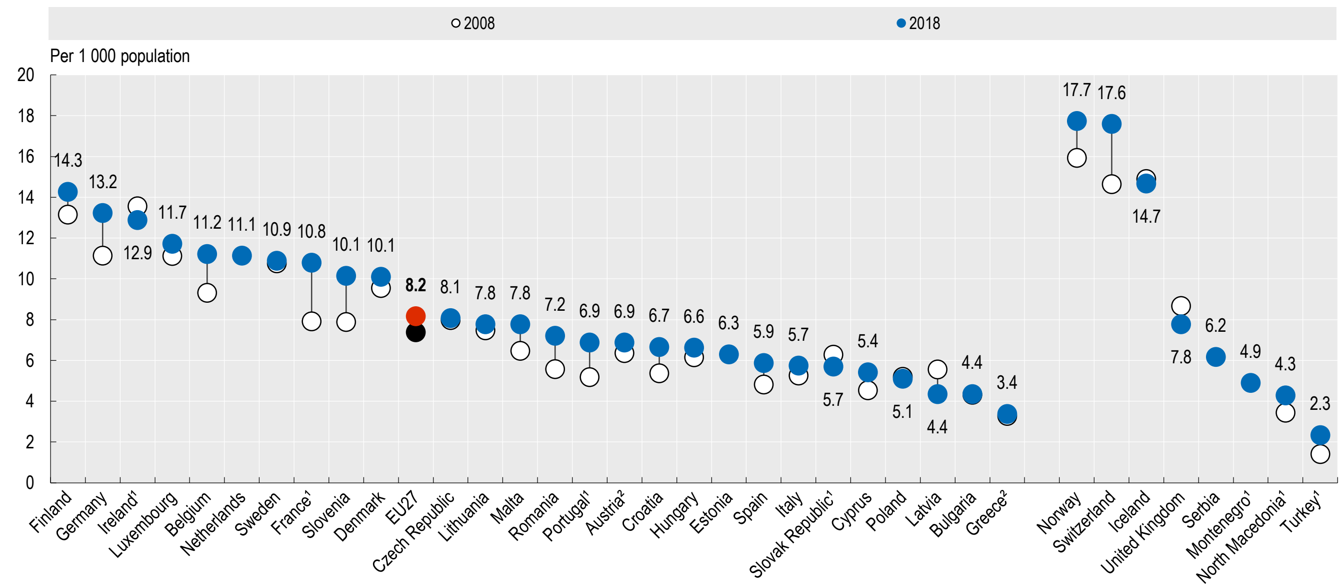
Buchan, J. et al. (2019), *Falling short: the NHS workforce challenge*, The Health Foundation.

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 (2019), *Recent trends in International Migration of Doctors, Nurses and Medical Students*, OECD Publishing, Paris, *https://doi.org/10.1787/5571ef48-en*.

OECD/European Observatory on Health Systems and Policies (2019), *Norway: Country Health Profile 2019*, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels, *https://doi.org/10.1787/2e821540-en*.

Figure 7.18. **Practising nurses per 1 000 population, 2008 and 2018 (or nearest year)**

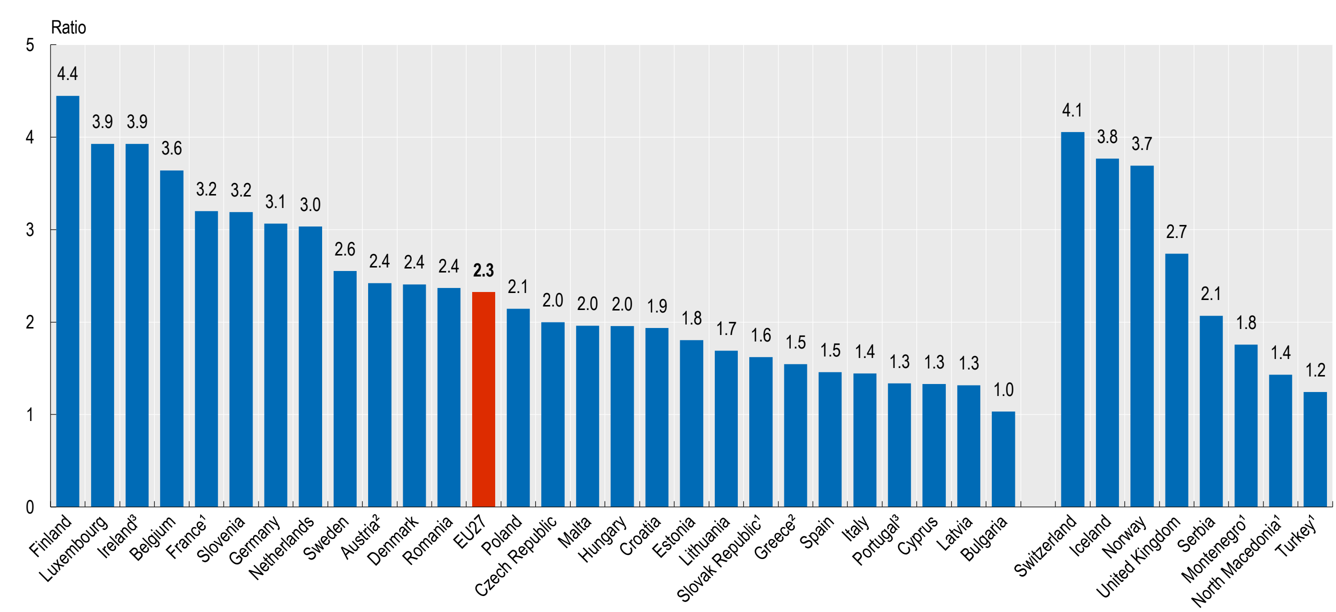


Note: The EU average is unweighted. 1. Data include not only nurses providing direct care to patients, but also those working in the health sector as managers, educators, researchers, etc. 2. Austria and Greece report only nurses employed in hospital.

Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/re6boq

Figure 7.19. **Ratio of nurses to doctors, 2018 (or nearest year)**



Note: The EU average is unweighted. 1. For countries that have not provided data for practising nurses and/or practising doctors, the numbers relate to "professionally active" nurses and doctors. 2. For Austria and Greece, the data refer to nurses and doctors employed in hospitals. 3. The ratio for Ireland is overestimated (professionally active nurses / practising doctors) while the ratio for Portugal is underestimated (professionally active nurses / all doctors licensed to practise).

Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/yd4u2q

Technology plays an important role in health systems, allowing physicians to better diagnose and treat patients. However, new technologies can also drive up costs, particularly if they are overused or misused.

This section focusses on the use of three diagnostic imaging technologies that can help diagnose different health problems: computed tomography (CT), magnetic resonance imaging (MRI) and positron emission tomography (PET) exams. CT and MRI exams both show images of internal organs and tissues, while PET scans show other information and problems at the cellular level. Unlike more traditional radiography and CT scanning, MRI and PET exams do not expose patients to ionising radiation, which can increase the risk of cancer if the exposition of radiation is not properly managed. CT exams were first introduced in the 1970s, MRI exams in the 1970s and the 1980s, while PET exams were introduced later on, around the year 2000.

The most recent data from 2018 show that the use of these three diagnostic exams taken together was highest in Austria, France, Luxembourg, Belgium and Germany, with utilisation rates 50% higher than the average across EU countries. The utilisation rate was lowest in Romania and Bulgaria with rates more than 50% lower than the EU average (Figure 7.20).

Figure 7.21 highlights the large variation in the use of MRI exams between Western European countries and Central and Eastern European countries. While the use of MRI exams has increased over the past two decades in all countries, there remain in 2018 a ten-fold difference in their use between the three countries that use them the most (Germany, Austria and France) and the three countries that use them the least (Cyprus, Romania and Bulgaria).

In most countries, CT exams continue to be the most frequently used of the three diagnostic technologies considered here. This is notably the case in countries like Belgium, Luxembourg, Greece, Portugal, Cyprus, Romania and Bulgaria where the use of CT exams is still more than two-times greater than MRI exams (Figure 7.20). This is because the use of CT exams has continued to increase during the past two decades, although in most cases at a slower rate than that of MRI exams. In Germany, both CT exams and MRI exams have continued to increase over the past 15 years, but the use of MRI exams has increased more rapidly so that it is now almost equal to that of CT exams. The use of PET scans has also increased over the past two decades, but remain much more limited than that of CT exams and MRI exams.

Clinical guidelines have been developed in many countries to help physicians determine when they should use these different diagnostic technologies and to avoid overuse, although these guidelines are not always implemented in practice. Through the Choosing Wisely® campaign, which began in the United States in 2012 and emulated in other countries since then, medical societies have identified a number of cases when MRI or other imaging tests are frequently used but are unlikely to provide any benefit to patients. One example is to use MRI to seek a diagnosis for low back pain or for migraine. 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).

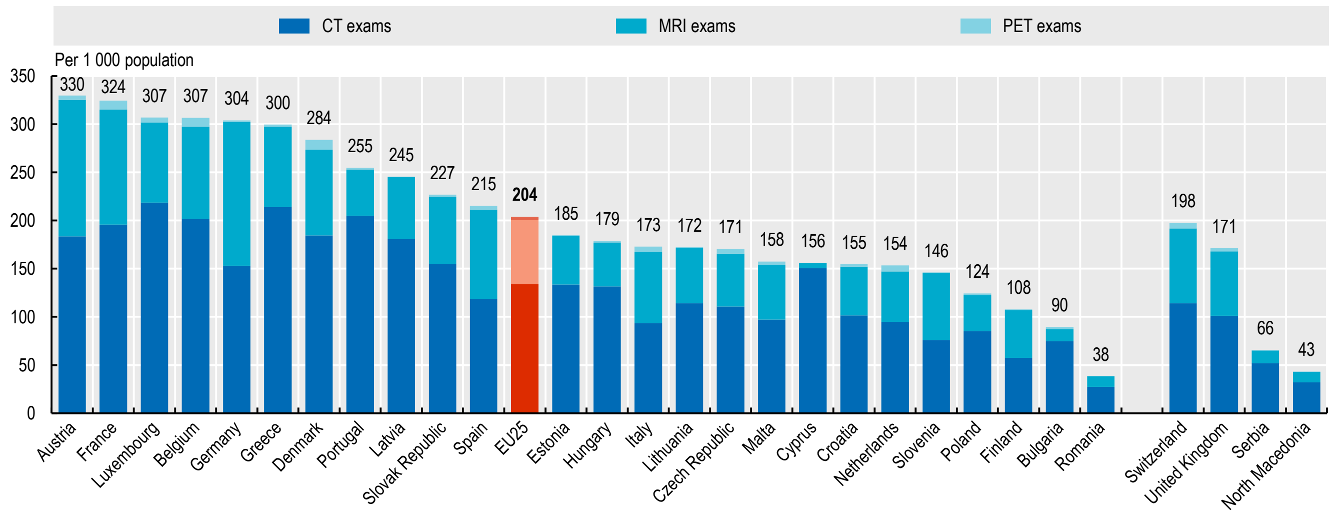
Definition and comparability

While the data in most countries cover CT, MRI and PET exams in hospitals as well as in the ambulatory sector, the data coverage is more limited in some countries. Any CT, MRI and PET exams performed outside hospitals are not included in Portugal, Switzerland and the United Kingdom. Exams in Cyprus only cover public hospitals. The Netherlands only report data on publicly financed exams.

References

Choosing Wisely UK (2018), Clinicians Recommendations: Royal College of Physicians, *http://www.choosingwisely.co.uk/i-am-a-clinician/recommendations/*.

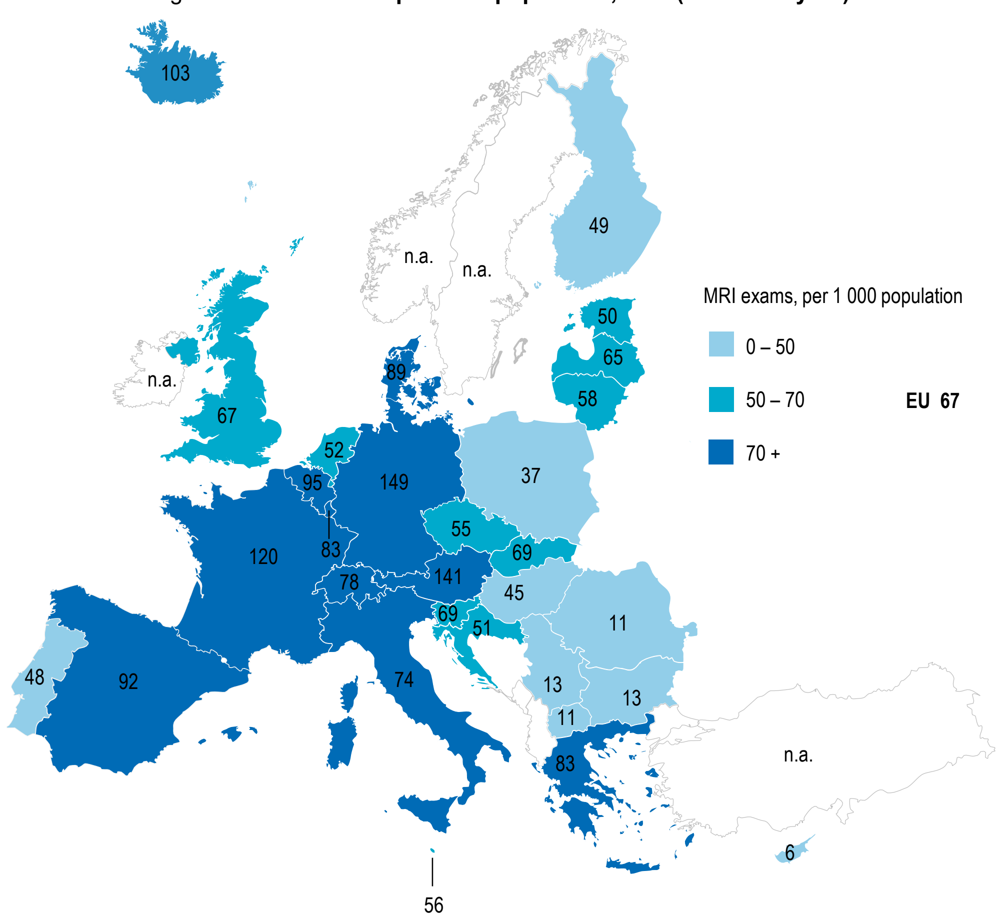
Figure 7.20. **CT, MRI and PET exams per 1 000 population, 2018 (or nearest year)**



Note: The EU average is unweighted. 1. Any exams outside hospital are not included in Portugal, Switzerland and the United Kingdom (resulting in an under-estimation).
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/jws7oh

Figure 7.21. **MRI exams per 1 000 population, 2018 (or nearest year)**



Note: The EU average is unweighted. Exams outside hospital are not included in Portugal, Switzerland and the United Kingdom (resulting in an under-estimation).
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/6jibr3

The number of hospital beds provides an indication of the resources available for delivering services to inpatients in hospitals for different types of care. The COVID-19 pandemic highlighted the need to have a sufficient number of hospital beds and flexibility in their use to address any unexpected increase in demand for intensive care, together with a sufficient number of doctors and nurses with the right skills to provide the required services (see Chapter 1 on resilience to COVID-19).

Germany, Bulgaria and Austria had the highest number of hospital beds per capita before the COVID-19 pandemic, with more than seven beds per 1 000 population in 2018. This was well above the EU average of five beds, and about three times greater than the number in Sweden, Denmark and the United Kingdom (Figure 7.22).

Since 2000, the number of hospital beds per capita has decreased in all EU countries due at least partly to the development of day care options and reductions in the average length of stay for hospitalised patients (see indicator "Average length of stay in hospital"). On average, the number of hospital beds per capita fell by slightly more than 20% between 2000 and 2018. This reduction was particularly pronounced in Finland, Denmark, Sweden, Latvia, the Netherlands and Estonia, with a reduction of more than one-third.

Hospital discharges in 2018 were highest in the three countries that had the highest number of hospital beds – Bulgaria, Germany and Austria. Discharge rates in these three countries were more than 40% higher than the EU average (Figure 7.23). The strong increase in hospital admission and discharge rates in Bulgaria over the past two decades has been driven by the rapid expansion of private hospitals in terms of bed capacity and activities, while the size of the public hospital sector was diminishing (OECD/European Observatory on Health Systems and Policies, 2019).

Hospital discharge rates in 2018 were lowest in the Netherlands, Portugal, Italy and Spain, with discharge rates more than one-third lower than the EU average. These variations in admission and discharge rates reflect to a large extent differences in the supply of beds, clinical practices, and payment systems that might provide incentives for hospitals to admit patients.

High occupancy rates of curative (acute) care beds can be symptomatic of a hospital sector under pressure, and may lead to bed shortages when there is an unexpected surge in demand as was the case under the COVID-19 pandemic. On the other hand, low occupancy rates reflect some underuse of resources. Although there is no general consensus about the "optimal" occupancy rate, an occupancy rate of about 85% is often considered as a maximum to reduce the risk of bed shortages when there is a sudden increase in need for admissions and to reduce the risk of infections and other patient safety issues (NICE, 2018). In 2018, the bed occupancy rate in curative (acute) care units was higher than 85% in one country only, Ireland (Figure 7.24). The bed occupancy rate in Ireland has increased over the past two decades to reach more than 90% in 2018. A 2018 government report concluded that the hospital infrastructure in Ireland was simply not adequate to meet the current demand and to cope with the projected increases due to population ageing (Department of Health, 2018).

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 acute hospitals only. Data for Sweden exclude private beds that are privately financed. Beds for same-day care may be included in some countries (e.g. Austria, Luxembourg, the Netherlands).

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, Greece, Ireland, Lithuania, Luxembourg, Montenegro, Norway, Serbia and Spain). These comprise between 3% and 10% of all discharges. Data for some countries do not cover all hospitals. In Ireland and the United Kingdom, data are restricted to public or publicly funded hospitals only. Data for the Netherlands and North Macedonia include only acute care, 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).

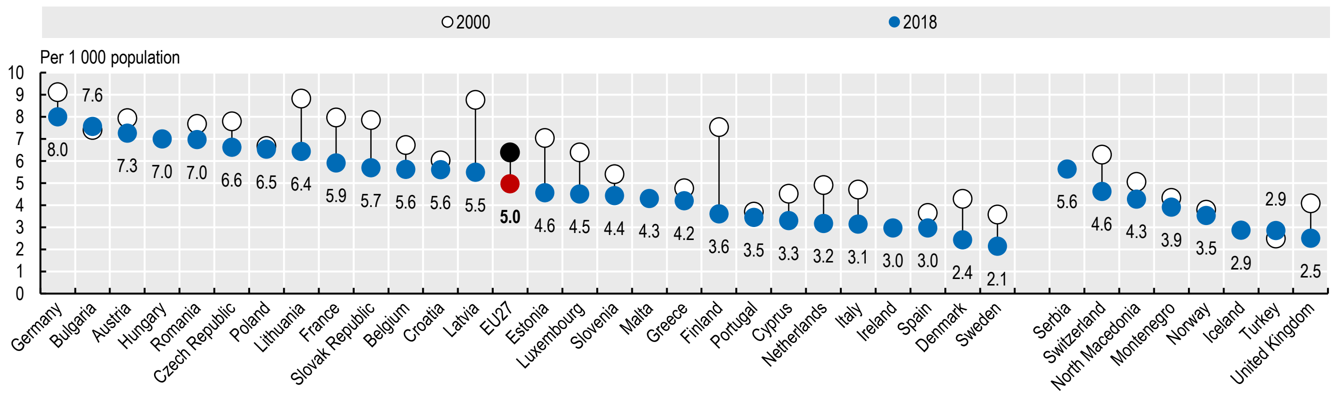
References

Department of Health (2018), *Health Service Capacity Review 2018 Executive Report: Review of Health Demand and Capacity Requirements in Ireland to 2031- Findings and Recommendations*, Dublin.

OECD/European Observatory on Health Systems and Policies (2019), *Bulgaria: Country Health Profile 2019*, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels, *https://doi.org/10.1787/34781ac1-en*.

NICE (2018), *Emergency and acute medical care in over 16s: service delivery and organisation, Chapter 39 Bed Occupancy*, NICE guideline 94, March 2018, *https://www.nice.org.uk/guidance/ng94/*.

Figure 7.22. **Hospital beds per 1 000 population, 2000 and 2018 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020, Eurostat Database.

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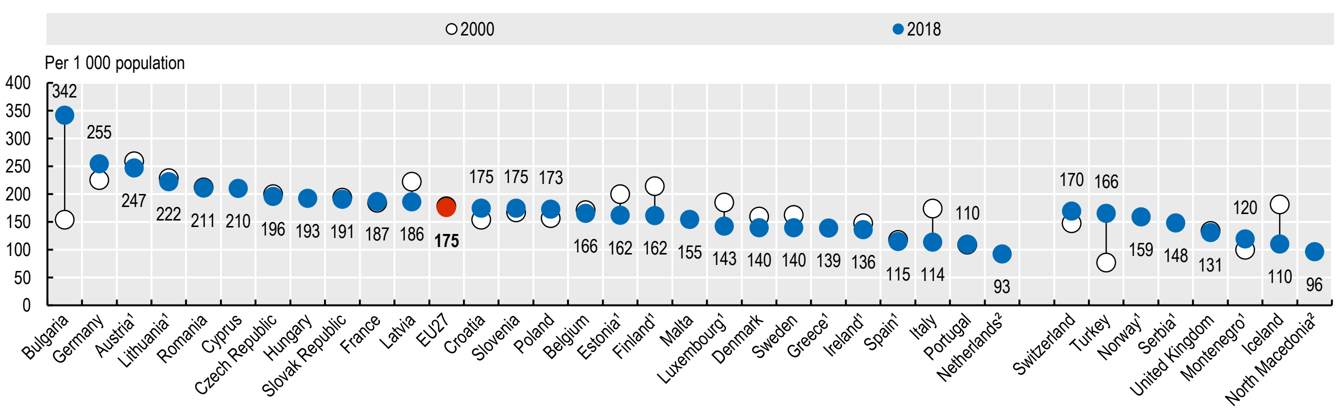
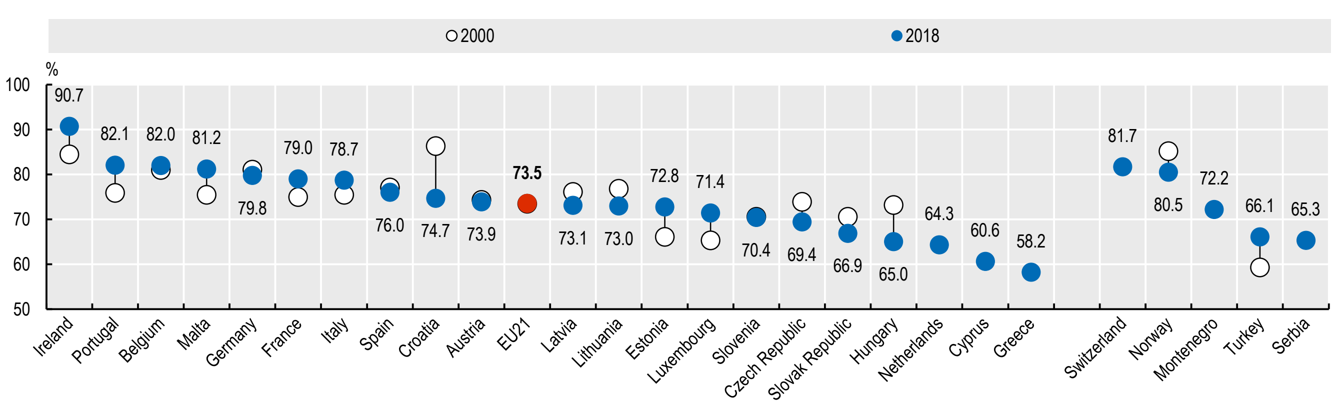
Figure 7.23. **Hospital discharges per 1 000 population, 2000 and 2018 (or nearest year)**



Note: The EU average is unweighted. 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 2020, Eurostat Database.

StatLink https://stat.link/cnxa6u

Figure 7.24. **Occupancy rate of curative (acute) care beds, 2000 and 2018 (or nearest year)**



Note: The EU average is unweighted.
Source: OECD Health Statistics 2020, Eurostat Database.

StatLink https://stat.link/i7aype

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. At the same time, some patients may be discharged too early, when staying in hospital longer could have improved their health outcomes or reduce chances of re-admissions.

In 2018, the average length of stay in hospitals for all causes of hospitalisation was 7.5 days across EU countries (Figure 7.25). The average length of stay was shortest in Bulgaria, Denmark, Sweden and Cyprus, with patients staying in hospitals for less than 6 days on average. The Netherlands had also one of the shortest stays, but the length of stay is under-estimated because it only includes stays for curative (acute) care that are typically shorter. The average length of stay was highest in Hungary, the Czech Republic, Luxembourg and Portugal, with patients staying in hospitals for more than 9 days on average. In Hungary and the Czech Republic, many hospitals have long-term care units, explaining at least partly relatively long average length of stay. In Germany, long average length of stay partly relates to extensive capacities to provide rehabilitation care in hospitals.

The average length of stay in hospital has decreased since 2000 in nearly all EU countries, falling from almost 10 days in 2000 to 7.5 days in 2018 on average. It fell particularly quickly in some countries that had relatively long stays in 2000 (e.g. Bulgaria, Finland, the United Kingdom, Switzerland, Croatia, Latvia and Lithuania). 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 36% reduction in average length of stay since 2000 has been accompanied by a 50% reduction in the number of hospital beds per capita (see indicator on hospital beds and discharges). Hungary and Italy are the only two countries where there has been a slight increase in average length of stay in hospital. In Hungary, this is mainly due to a growing use of hospital beds for rehabilitation and long-term care. The average length of stay for curative (acute) care has decreased in Hungary as in other countries over the past decade.

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 7.26 shows that the average length of stay for a normal delivery is generally greater in Central and Eastern European countries than in Western Europe. It ranges from less than two days in the Netherlands, Iceland and the United Kingdom, to almost five days in Hungary, Cyprus 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 and half days in 2018 on average in EU countries.

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, Austria and Sweden) 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. Strengthening access to primary care and community care can also help reduce hospital stays. An important constraint in many countries is the shortage of capacity and resources in intermediate or long-term care facilities, or in providing home-based care. Many countries (e.g. the Netherlands, France and Norway) have taken steps in recent years to increase the capacity of intermediate care facilities and home-based care that can serve as alternatives to hospitals (OECD, 2020). Such initiatives can provide effective responses to the needs of ageing populations and the growing burden of chronic conditions.

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 and North Macedonia where the data refer to curative/acute care only (resulting in a substantial under-estimation).

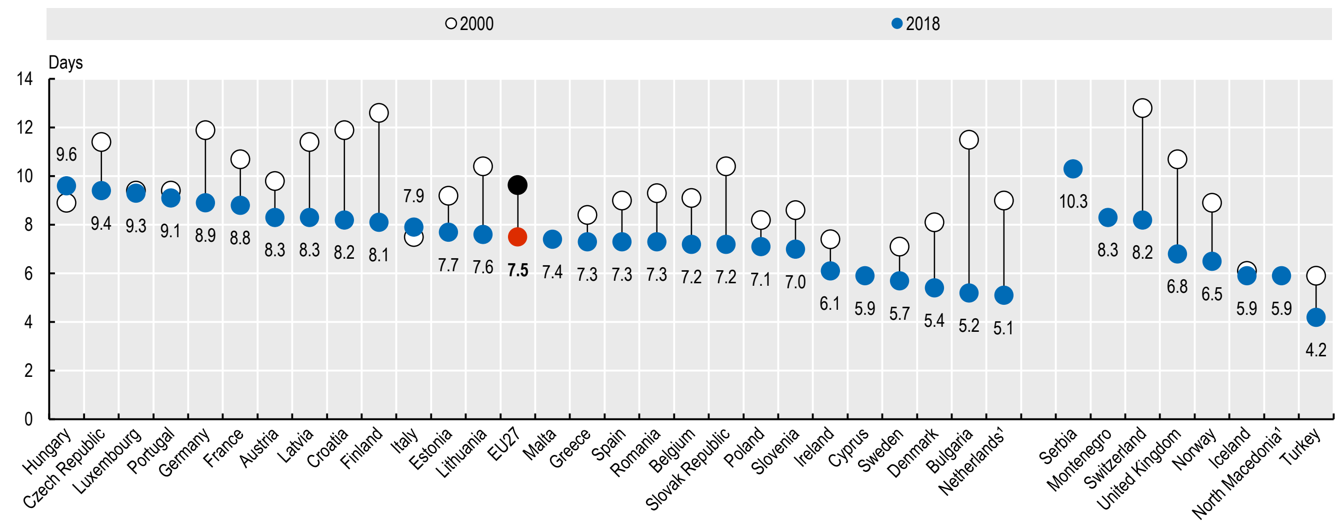
Average length of stay of healthy babies born in hospitals are excluded in several countries (e.g. Austria, Estonia, Finland, Greece, Ireland, Lithuania, Luxembourg, Montenegro, Norway, Serbia and Spain), resulting in a slight over-estimation of average length of stay compared with other countries. In Cyprus, Ireland and the United Kingdom, data are restricted to public or publicly funded hospitals only.

Data for normal delivery refer to ICD-10 code O80.

References

OECD (2020), *Realising the Potential of Primary Health Care,* OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/a92adee4-en*.

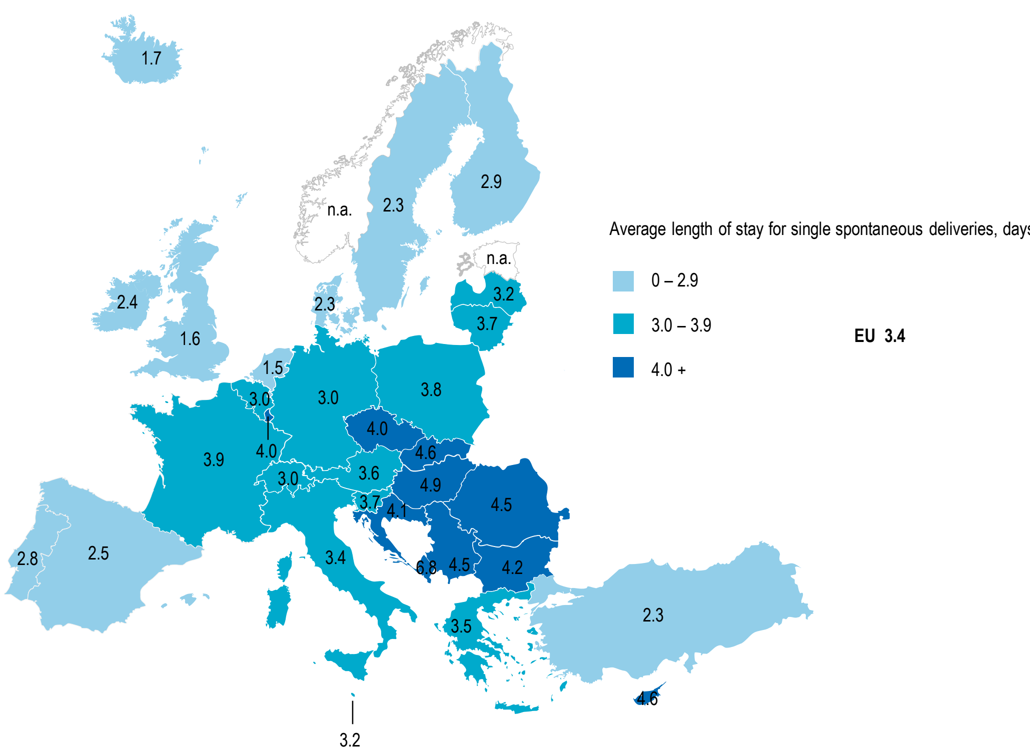
Figure 7.25. **Average length of stay in hospital, 2000 and 2018 (or nearest year)**



Note: The EU average is unweighted. 1. Data refer to average length of stay for curative (acute) care (resulting in an under-estimation).
Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/fw4135

Figure 7.26. **Average length of stay for normal delivery, 2018 (or nearest year)**



Source: OECD Health Statistics 2020; Eurostat Database.

StatLink https://stat.link/7gt3lr

Long waiting times for elective (non-urgent) surgery have been a longstanding issue in many European countries as they generate dissatisfaction for patients because the expected benefits of treatments are postponed. The COVID-19 pandemic will likely increase waiting times for many elective surgery, at least temporarily, as non-urgent interventions have often been postponed during the peak of the epidemic.

The data presented in this section focus on three high-volume surgical procedures: cataract surgery, hip replacement and knee replacement. They review the experience of patients who have been treated after waiting for a certain period of time and those who were still on the waiting list.

The median waiting times for people who received a cataract surgery in 2019 (or 2018) varied from about 30 days in Italy, Hungary and Denmark, to about 150 days in Estonia and 250 days in Poland (Figure 7.27, left panel). The proportion of patients remaining on the waiting list for a period of more than three months during that same year varied from 7% in Hungary to over 85% in Estonia, Poland and Slovenia (Figure 7.27, right panel).

For hip replacement, the median waiting times ranged from 35 to 50 days in Denmark, Hungary and Italy, to 180 days in Poland and 250 days in Estonia (Figure 7.28, left panel). The proportion of patients remaining on the waiting list for more than three months ranged from 25% of all patients in Sweden to 90% or more in Estonia and Slovenia (Figure 7.28, right panel).

The pattern is generally the same for knee replacement, although in most countries the waiting times are slightly longer than for hip replacement (Figure 7.29).

Among the group of countries with relatively short waiting times, Italy has managed to keep waiting times for elective surgery relatively short in recent years despite tight budgetary constraints, and Denmark and Hungary have managed to reduce waiting times through an effective policy mix. Denmark has managed to reduce waiting times over the past decade mainly through the implementation of a waiting time guarantee for patients, initially set at two months from a GP or specialist referral to treatment in 2002, but then reduced to one month in 2007 (OECD, 2020).

Hungary has achieved substantial progress in reducing waiting times for elective surgery in recent years through the implementation of a mix of supply-side measures and better management of demand. One of the main goals of the Hungarian 2014-20 health sector strategy has been to reduce waiting times to less than 60 days for minor surgery (like cataract surgery) and less than 180 days for major surgery (like hip and knee replacement) for all patients across the country. To achieve this goal, the government has adopted new laws and regulations on the management of waiting lists and supported the development of an online waiting list system to monitor the situation in real-time across the country. It also provided additional payments to reduce waiting times in selected clinical areas and hospitals, and encouraged a reallocation of patients from providers with longer waiting times to those with shorter waiting times (OECD, 2020).

Among the group of countries with long waiting times, the median waiting times to get a cataract surgery in Estonia decreased sharply between 2009 and 2014, but then increased again between 2014 and 2019 although it didn't go back to the very high level of a decade earlier. Recent trends in waiting times for hip and knee replacement are worse, with waiting times increasing to levels exceeding those of ten years ago. In 2018, the Estonian Health Insurance Fund provided an additional EUR 34 million to finance about 140 000 additional treatments with the goal of reducing waiting times for cataract surgery and hip and knee replacement. The increase in surgical activities in 2018 and 2019 led to a reduction in waiting times for cataract surgery and hip replacement, but not for knee replacement (OECD, 2020).

In Poland, waiting times for all three surgical interventions decreased substantially between 2014 and 2018 (latest year available), following the adoption of measures to increase the supply of elective surgery. Until 2018, if the demand for services exceeded what had been budgeted for, elective procedures were rationed through waiting lists and treatments were postponed to the next year. Since 2018, additional funding is provided for additional treatments. Information on waiting times for different treatments in public hospitals are now also more easily accessible to patients through a dedicated website. A growing number of Polish people also purchase a private health insurance to get quicker access to services in private hospitals (OECD, 2020).

Definition and comparability

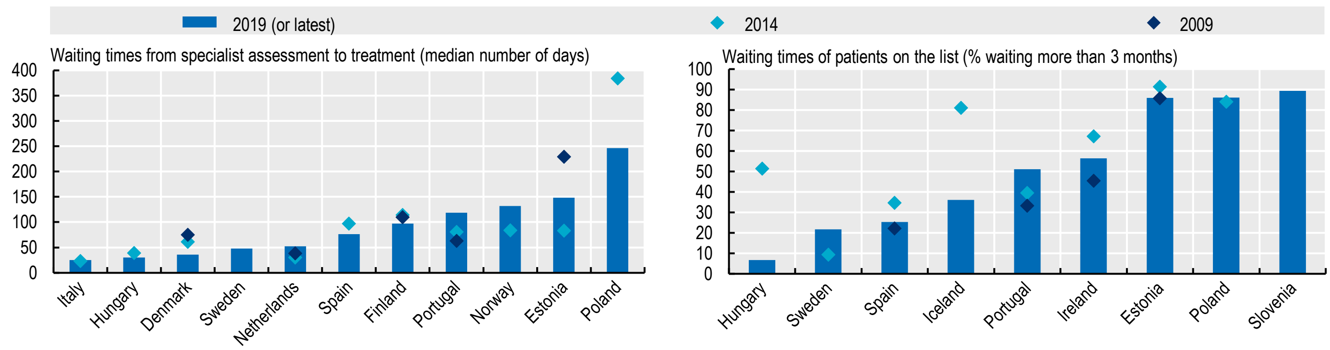
Two different measures of waiting times are presented in this section: 1) from the time that a specialist adds a patient to the waiting list for an operation to the time that the patient receives the operation; and 2) the waiting times for patients who are still on the waiting lists at a given point in time. Waiting times for the first measure are reported in 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 shorter 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. 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).

References

OECD (2020), *Waiting Times for Health Services: Next in Line*, OECD Health Policy Studies, OECD Publishing, Paris, *https://doi.org/10.1787/242e3c8c-en*.

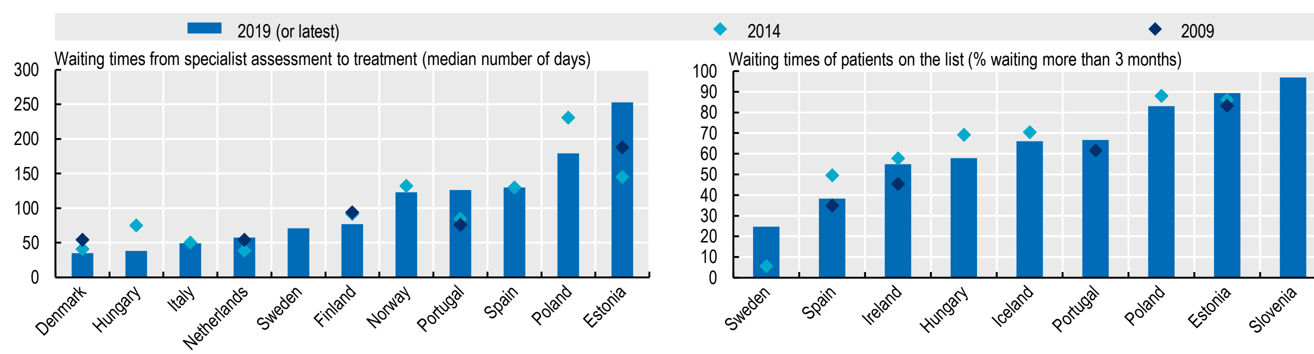
Figure 7.27. **Waiting times for cataract surgery, 2019 and trends since 2009**



Note: For the Netherlands, the data on waiting times is the mean number of days because the median is not available (resulting in an over-estimation compared with other countries). For Norway, waiting times are over-estimated because they start from the date when a doctor refers a patient for specialist assessment up to treatment (whereas in other countries they start only when a specialist has assessed the patient and decided to add the person on the waiting list).
Source: OECD Health Statistics 2020.

StatLink https://stat.link/rvq49l

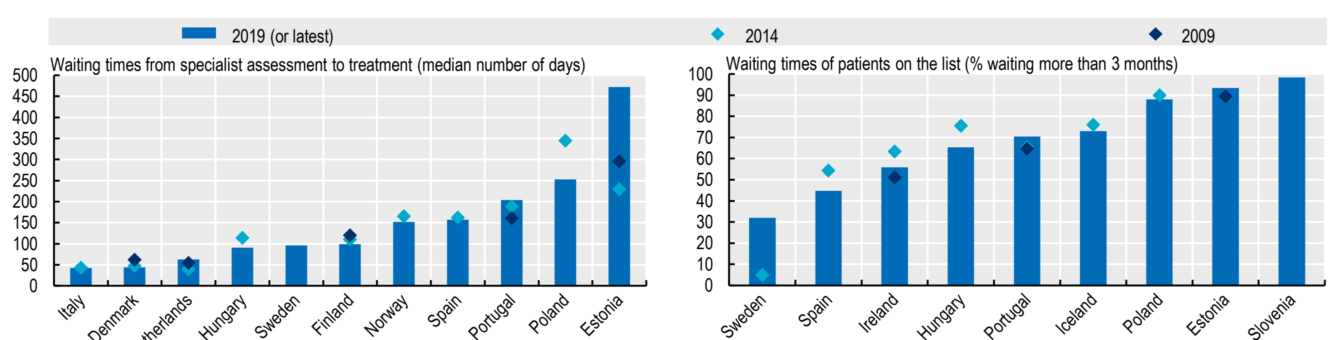
Figure 7.28. **Waiting times for hip replacement, 2019 and trends since 2009**



Note: For the Netherlands, the data on waiting times is the mean number of days because the median is not available (resulting in an over-estimation compared with other countries). For Norway, waiting times are over-estimated because they start from the date when a doctor refers a patient for specialist assessment up to treatment (whereas in other countries they start only when a specialist has assessed the patient and decided to add the person on the waiting list).
Source: OECD Health Statistics 2020.

StatLink https://stat.link/t94ek8

Figure 7.29. **Waiting times for knee replacement, 2019 and trends since 2009**



Note: For the Netherlands, the data on waiting times is the mean number of days because the median is not available (resulting in an over-estimation compared with other countries). For Norway, waiting times are over-estimated because they start from the date when a doctor refers a patient for specialist assessment up to treatment (whereas in other countries they start only when a specialist has assessed the patient and decided to add the person on the waiting list).
Source: OECD Health Statistics 2020.

StatLink https://stat.link/fbe6zm

Health at a Glance: Europe 2020
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ANNEX A

Statistical annex

Table A A.1. **Total population, mid-year, thousands, 1960 to 2019**

	1960	1970	1980	1990	2000	2010	2015	2016	2017	2018	2019
Austria	7 048	7 467	7 549	7 678	8 012	8 363	8 643	8 737	8 798	8 841	8 880
Belgium	9 153	9 656	9 859	9 967	10 251	10 896	11 274	11 331	11 375	11 427	11 503
Bulgaria	7 867	8 490	8 862	8 718	8 170	7 396	7 178	7 128	7 076	7 025	6 976
Croatia	4 140	4 412	4 600	4 777	4 468	4 296	4 208	4 172	4 130	4 091	4 067
Cyprus	573	614	509	580	694	829	848	852	860	870	882
Czech Republic	9 602	9 858	10 304	10 333	10 255	10 474	10 546	10 566	10 594	10 630	10 672
Denmark	4 580	4 929	5 123	5 141	5 340	5 548	5 683	5 728	5 765	5 794	5 814
Estonia	1 212	1 360	1 477	1 569	1 397	1 331	1 315	1 316	1 317	1 322	1 327
Finland	4 430	4 606	4 780	4 986	5 176	5 363	5 480	5 495	5 508	5 516	5 522
France	45 684	50 772	53 880	58 171	60 762	64 819	66 548	66 724	66 864	66 966	67 056
Germany[1]	55 608	61 098	61 549	63 202	82 212	81 777	81 687	82 349	82 657	82 906	83 093
Greece	8 332	8 793	9 643	10 197	10 806	11 121	10 821	10 776	10 755	10 733	10 717
Hungary	9 984	10 338	10 711	10 374	10 211	10 000	9 843	9 814	9 788	9 776	9 771
Ireland	2 829	2 957	3 413	3 514	3 805	4 560	4 702	4 755	4 807	4 867	4 934
Italy	50 200	53 822	56 434	56 719	56 942	59 277	60 731	60 627	60 537	60 422	60 302
Latvia	2 121	2 359	2 512	2 663	2 368	2 098	1 978	1 960	1 942	1 927	1 914
Lithuania	2 779	3 140	3 413	3 698	3 500	3 097	2 905	2 868	2 828	2 802	2 794
Luxembourg	314	339	364	382	436	507	570	582	596	608	620
Malta	327	303	317	354	390	415	445	455	468	485	504
Netherlands	11 487	13 039	14 150	14 952	15 926	16 615	16 940	17 030	17 131	17 232	17 345
Poland	29 637	32 664	35 574	38 111	38 259	38 043	37 986	37 970	37 975	37 975	37 965
Portugal	8 858	8 680	9 766	9 983	10 290	10 573	10 358	10 325	10 300	10 284	10 286
Romania	18 407	20 250	22 207	23 202	22 443	20 247	19 816	19 702	19 587	19 473	19 366
Slovak Republic	4 068	4 538	4 980	5 299	5 389	5 391	5 424	5 431	5 439	5 447	5 454
Slovenia	1 585	1 725	1 901	1 998	1 989	2 049	2 064	2 065	2 066	2 074	2 088
Spain	30 455	33 814	37 491	38 867	40 568	46 577	46 445	46 484	46 593	46 798	47 134
Sweden	7 485	8 043	8 311	8 559	8 872	9 378	9 799	9 923	10 058	10 175	10 279
EU27 (total)	**355 968**	**385 138**	**406 418**	**418 764**	**428 929**	**441 041**	**444 235**	**445 167**	**445 816**	**446 461**	**447 265**
Albania	1 609	2 135	2 672	3 267	3 060	2 913	2 881	2 876	2 873	2 866	2 854
Iceland	176	204	228	255	281	318	331	335	343	353	361
Montenegro	..	..	..	..	605	619	622	622	622	622	622
North Macedonia	1 392	1 629	1 891	1 882	2 026	2 055	2 070	2 072	2 075	2 076	2 077
Norway	3 581	3 876	4 086	4 241	4 491	4 889	5 189	5 235	5 277	5 312	5 348
Serbia	..	..	..	..	7 516	7 291	7 095	7 058	7 021	6 983	6 945
Switzerland	5 328	6 181	6 319	6 716	7 184	7 825	8 282	8 373	8 452	8 514	8 575
Turkey	27 438	35 294	44 522	56 104	65 809	73 142	78 218	79 278	80 313	81 407	82 579
United Kingdom	52 400	55 663	56 314	57 248	58 893	62 766	65 116	65 612	66 059	66 460	66 836

Note: Data for 2019 are provisional and subject to revisions.

1. Population figures for Germany prior to 1991 refer to West Germany.

Source: Eurostat Database (data extracted in September 2020).

StatLink https://stat.link/z4jwx1

Table A A.2. **Share of the population aged 65 and over, 1 January, 1960 to 2019**

	1960	1970	1980	1990	2000	2010	2015	2016	2017	2018	2019
Austria	12.1	14.0	15.5	14.9	15.4	17.6	18.5	18.4	18.5	18.7	18.8
Belgium	12.0	13.3	14.3	14.8	16.8	17.2	18.1	18.2	18.5	18.7	18.9
Bulgaria	7.4	9.4	11.8	13.0	16.2	18.2	20.0	20.4	20.7	21.0	21.3
Croatia	..	..	..	..	..	17.8	18.8	19.2	19.6	20.1	20.6
Cyprus	..	..	..	10.8	11.2	12.5	14.6	15.1	15.6	15.9	16.1
Czech Republic	9.5	11.9	13.6	12.5	13.8	15.3	17.8	18.3	18.8	19.2	19.6
Denmark	10.5	12.2	14.3	15.6	14.8	16.3	18.6	18.8	19.1	19.3	19.6
Estonia	10.5	11.7	12.5	11.6	14.9	17.4	18.8	19.0	19.3	19.6	19.8
Finland	7.2	9.0	11.9	13.3	14.8	17.0	19.9	20.5	20.9	21.4	21.8
France	11.6	12.8	14.0	13.9	15.8	16.6	18.4	18.9	19.3	19.7	20.1
Germany[1]	10.8	13.0	15.6	15.3	16.2	20.7	21.0	21.1	21.2	21.4	21.5
Greece	9.4	11.1	13.1	13.7	17.3	19.0	20.9	21.3	21.5	21.8	22.0
Hungary	8.9	11.5	13.5	13.2	15.0	16.6	17.9	18.3	18.7	18.9	19.3
Ireland	11.1	11.1	10.7	11.4	11.2	11.2	12.9	13.2	13.5	13.8	14.1
Italy	9.3	10.8	13.1	14.7	18.1	20.4	21.7	22.0	22.3	22.6	22.8
Latvia	..	11.9	13.0	11.8	14.8	18.1	19.4	19.6	19.9	20.1	20.3
Lithuania	..	10.0	11.3	10.8	13.7	17.3	18.7	19.0	19.3	19.6	19.8
Luxembourg	10.8	12.5	13.7	13.4	14.3	14.0	14.2	14.2	14.2	14.3	14.4
Malta	..	..	8.4	10.4	11.8	14.9	18.2	18.5	18.8	18.8	18.7
Netherlands	8.9	10.1	11.5	12.8	13.6	15.3	17.8	18.2	18.5	18.9	19.2
Poland	5.8	8.2	10.2	10.0	12.1	13.6	15.4	16.0	16.5	17.1	17.7
Portugal	7.8	9.2	11.2	13.2	16.0	18.3	20.3	20.7	21.1	21.5	21.8
Romania	..	8.5	10.3	10.3	13.2	16.1	17.0	17.4	17.8	18.2	18.5
Slovak Republic	6.8	9.1	10.6	10.3	11.4	12.4	14.0	14.4	15.0	15.5	16.0
Slovenia	..	..	..	10.6	13.9	16.5	17.9	18.4	18.9	19.4	19.8
Spain	8.2	9.5	11.1	13.4	16.5	16.8	18.5	18.7	19.0	19.2	19.4
Sweden	11.7	13.6	16.2	17.8	17.3	18.1	19.6	19.8	19.8	19.8	19.9
EU27 (total)	**..**	**..**	**..**	**13.7**	**15.6**	**17.6**	**19.0**	**19.3**	**19.7**	**20.0**	**20.3**
Albania	..	..	..	..	..	10.7	12.4	12.8	13.1	13.6	14.1
Iceland	8.0	8.8	9.8	10.6	11.6	12.0	13.5	13.9	14.0	14.1	14.2
Montenegro	..	..	..	..	12.2	12.9	13.7	14.1	14.4	14.8	15.2
North Macedonia	..	..	..	..	9.8	11.6	12.7	13.0	13.3	13.6	14.1
Norway	10.9	12.8	14.7	16.3	15.3	14.9	16.1	16.4	16.6	16.9	17.2
Serbia	..	..	..	..	16.0	17.0	18.5	19.0	19.4	19.9	20.4
Switzerland	10.2	11.2	13.8	14.6	15.3	16.8	17.8	18.0	18.1	18.3	18.5
Turkey	3.5	4.4	4.7	4.3	5.4	7.0	8.0	8.2	8.3	8.5	8.8
United Kingdom	11.7	12.9	14.9	15.7	15.8	16.3	17.7	17.9	18.1	18.2	18.4

Note: Data for 2019 are provisional and subject to revisions.
1. Population figures for Germany prior to 1991 refer to West Germany.
Source: Eurostat Database (data extracted in September 2020).

StatLink https://stat.link/iy7j29

Table A A.3. **Crude birth rate, per 1 000 population, 1960 to 2019**

	1960	1970	1980	1990	2000	2010	2015	2016	2017	2018	2019
Austria	17.9	15.0	12.0	11.8	9.8	9.4	9.8	10.0	10.0	9.7	9.6
Belgium	16.8	14.7	12.6	12.4	11.4	11.9	10.8	10.8	10.5	10.4	10.1
Bulgaria	17.8	16.3	14.5	12.1	9.0	10.2	9.2	9.1	9.0	8.9	8.8
Croatia	18.4	13.8	14.8	11.6	9.8	10.1	8.9	9.0	8.9	9.0	8.9
Cyprus	26.2	19.2	20.4	18.3	12.2	11.8	10.8	11.1	10.7	10.7	10.9
Czech Republic	13.4	15.0	14.9	12.6	8.9	11.2	10.5	10.7	10.8	10.7	10.5
Denmark	16.6	14.4	11.2	12.3	12.6	11.4	10.2	10.8	10.6	10.6	10.5
Estonia	16.7	15.8	15.0	14.2	9.4	11.9	10.6	10.7	10.5	10.9	10.6
Finland	18.5	14.0	13.2	13.1	11.0	11.4	10.1	9.6	9.1	8.6	8.3
France	17.9	16.7	14.9	13.4	13.1	12.8	12.0	11.8	11.5	11.3	11.2
Germany1	17.4	13.3	10.1	11.5	9.3	8.3	9.0	9.6	9.5	9.5	9.4
Greece	18.9	16.5	15.4	10.0	9.6	10.3	8.5	8.6	8.2	8.1	7.8
Hungary	14.7	14.7	13.9	12.1	9.6	9.0	9.4	9.7	9.7	9.6	9.5
Ireland	21.5	21.8	21.7	15.1	14.4	16.5	13.9	13.4	12.9	12.5	12.1
Italy	18.1	16.7	11.3	10.0	9.5	9.5	8.0	7.8	7.6	7.3	7.0
Latvia	16.7	14.6	14.1	14.2	8.6	9.4	11.1	11.2	10.7	10.0	9.8
Lithuania	22.5	17.7	15.2	15.4	9.8	9.9	10.8	10.7	10.1	10.0	9.8
Luxembourg	16.0	13.0	11.4	12.9	13.1	11.6	10.7	10.4	10.4	10.3	10.0
Malta	26.2	17.6	17.7	15.2	11.3	9.4	9.7	9.8	9.2	9.2	8.6
Netherlands	20.8	18.3	12.8	13.2	13.0	11.1	10.1	10.1	9.9	9.8	9.7
Poland	22.6	16.8	19.6	14.4	9.9	10.9	9.7	10.1	10.6	10.2	9.9
Portugal	24.1	20.8	16.2	11.7	11.7	9.6	8.3	8.4	8.4	8.5	8.4
Romania	19.1	21.1	18.0	13.6	10.4	10.5	10.2	10.4	10.3	10.4	9.6
Slovak Republic	21.7	17.8	19.1	15.1	10.2	11.2	10.3	10.6	10.7	10.6	10.5
Slovenia	17.6	15.9	15.7	11.2	9.1	10.9	10.0	9.9	9.8	9.4	9.3
Spain	21.7	19.5	15.2	10.3	9.8	10.4	9.0	8.8	8.4	7.9	7.6
Sweden	13.7	13.7	11.7	14.5	10.2	12.3	11.7	11.8	11.5	11.4	11.1
EU27 (total)	**18.5**	**16.4**	**14.1**	**12.2**	**10.5**	**10.4**	**9.7**	**9.8**	**9.7**	**9.5**	**9.3**
Albania	43.3	32.5	26.5	25.1	16.7	11.7	11.4	11.0	10.7	10.1	10.0
Iceland	28.0	19.7	19.8	18.7	15.3	15.4	12.5	12.0	11.9	12.0	12.3
Montenegro	..	..	..	..	15.2	12.0	11.9	12.2	11.9	11.7	11.6
North Macedonia	31.7	23.2	21.0	18.8	14.5	11.8	11.1	11.1	10.5	10.3	9.6
Norway	17.3	16.7	12.5	14.4	13.2	12.6	11.3	11.3	10.7	10.4	10.2
Serbia	..	..	..	..	9.8	9.4	9.3	9.2	9.2	9.2	9.3
Switzerland	17.7	16.1	11.7	12.5	10.9	10.3	10.5	10.5	10.3	10.3	10.0
Turkey	..	..	..	..	21.1	16.9	16.9	16.5	16.1	15.3	14.3
United Kingdom	17.5	16.2	13.4	13.9	11.5	12.9	11.9	11.8	11.4	11.0	10.7

Note: Crude birth rate is defined as the number of live births per 1 000 population.
1. Population figures for Germany prior to 1991 refer to West Germany.
Source: Eurostat Database (data extracted in September 2020).

StatLink https://stat.link/kev3i7

Table A A.4. **Total fertility rate, number of children per women aged 15-49, 1960 to 2018, or nearest year**

	1960	1970	1980	1990	2000	2010	2015	2016	2017	2018
Austria	2.69	2.29	1.65	1.46	1.36	1.44	1.49	1.53	1.52	1.47
Belgium	2.54	2.25	1.68	1.62	1.67	1.86	1.70	1.68	1.65	1.62
Bulgaria	2.31	2.17	2.05	1.82	1.26	1.57	1.53	1.54	1.56	1.56
Croatia	..	..	..	..	1.46	1.55	1.40	1.42	1.42	1.47
Cyprus	..	..	2.48	2.41	1.64	1.44	1.32	1.37	1.32	1.32
Czech Republic	2.09	1.92	2.08	1.90	1.15	1.51	1.57	1.63	1.69	1.71
Denmark	2.57	1.95	1.55	1.67	1.77	1.87	1.71	1.79	1.75	1.73
Estonia	1.98	2.17	2.02	2.05	1.36	1.72	1.58	1.60	1.59	1.67
Finland	2.72	1.83	1.63	1.78	1.73	1.87	1.65	1.57	1.49	1.41
France	2.73	2.47	1.95	1.78	1.89	2.03	1.96	1.92	1.90	1.88
Germany	..	..	..	..	1.38	1.39	1.50	1.60	1.57	1.57
Greece	2.23	2.40	2.23	1.39	1.25	1.48	1.33	1.38	1.35	1.35
Hungary	2.02	1.98	1.91	1.87	1.32	1.25	1.45	1.53	1.54	1.55
Ireland	3.78	3.85	3.21	2.11	1.89	2.05	1.85	1.81	1.77	1.75
Italy	2.40	2.38	1.64	1.33	1.26	1.46	1.35	1.34	1.32	1.29
Latvia	..	..	..	..	1.25	1.36	1.70	1.74	1.69	1.60
Lithuania	..	2.40	1.99	2.03	1.39	1.50	1.70	1.69	1.63	1.63
Luxembourg	2.29	1.97	1.50	1.60	1.76	1.63	1.47	1.41	1.39	1.38
Malta	..	..	1.99	2.02	1.68	1.36	1.37	1.37	1.26	1.23
Netherlands	3.12	2.57	1.60	1.62	1.72	1.79	1.66	1.66	1.62	1.59
Poland	..	..	..	2.06	1.37	1.41	1.32	1.39	1.48	1.46
Portugal	3.16	3.01	2.25	1.56	1.55	1.39	1.31	1.36	1.38	1.42
Romania	..	2.59	2.43	1.83	1.31	1.59	1.62	1.69	1.71	1.76
Slovak Republic	3.04	2.41	2.32	2.09	1.30	1.43	1.40	1.48	1.52	1.54
Slovenia	..	..	1.93	1.46	1.26	1.57	1.57	1.58	1.62	1.60
Spain	..	2.90	2.22	1.36	1.22	1.37	1.33	1.34	1.31	1.26
Sweden	2.07	1.92	1.68	2.13	1.54	1.98	1.85	1.85	1.78	1.76
EU27 (total)	**..**	**..**	**..**	**..**	**1.43**	**1.57**	**1.54**	**1.57**	**1.56**	**1.55**
Albania	..	..	..	..	1.90	1.63	1.59	1.54	1.48	1.37
Iceland	3.99	2.81	2.48	2.30	2.08	2.20	1.80	1.74	1.71	1.71
Montenegro	..	..	..	..	1.69	1.70	1.74	1.79	1.78	1.76
North Macedonia	..	..	..	2.23	1.88	1.56	1.50	1.50	1.43	1.42
Norway	2.94	2.50	1.72	1.93	1.85	1.95	1.72	1.71	1.62	1.56
Serbia	..	..	..	..	1.48	1.40	1.46	1.46	1.49	1.49
Switzerland	2.44	2.10	1.55	1.58	1.50	1.52	1.54	1.54	1.52	1.52
Turkey	..	..	..	..	..	2.04	2.14	2.11	2.07	1.99
United Kingdom	..	2.04	1.90	1.83	1.64	1.92	1.80	1.79	1.74	1.68

Source: Eurostat Database (data extracted in September 2020).

StatLink https://stat.link/d4im6h

Health at a Glance: Europe 2020

STATE OF HEALTH IN THE EU CYCLE

The 2020 edition of *Health at a Glance: Europe* focuses on the impact of the COVID-19 crisis. Chapter 1 provides an initial assessment of the resilience of European health systems to the COVID-19 pandemic and their ability to contain and respond to the worst pandemic in the past century. Chapter 2 reviews the huge health and welfare burden of air pollution as another major public health issue in European countries, and highlights the need for sustained efforts to reduce air pollution to mitigate its impact on health and mortality. The five other chapters provide an overview of key indicators of health and health systems across the 27 EU member states, 5 EU candidate countries, 3 European Free Trade Association countries and the United Kingdom. *Health at a Glance: Europe* is the first step in the *State of Health in the EU* cycle.

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