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.

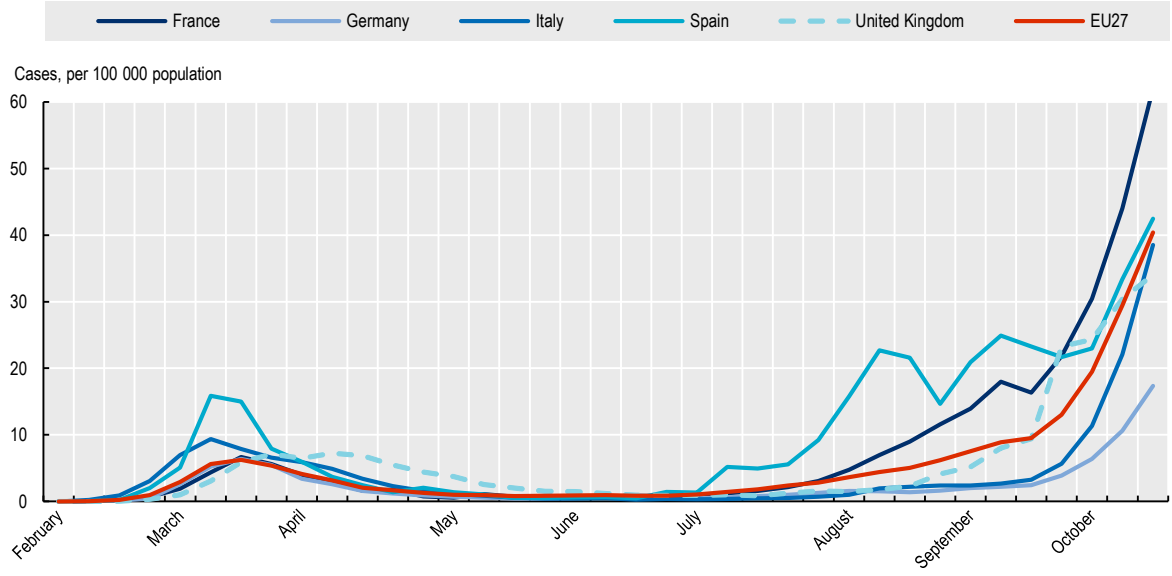
In this chapter, data and analysis cover 31 European countries, including all 27 EU countries plus Iceland, Norway, Switzerland and the United Kingdom.

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).

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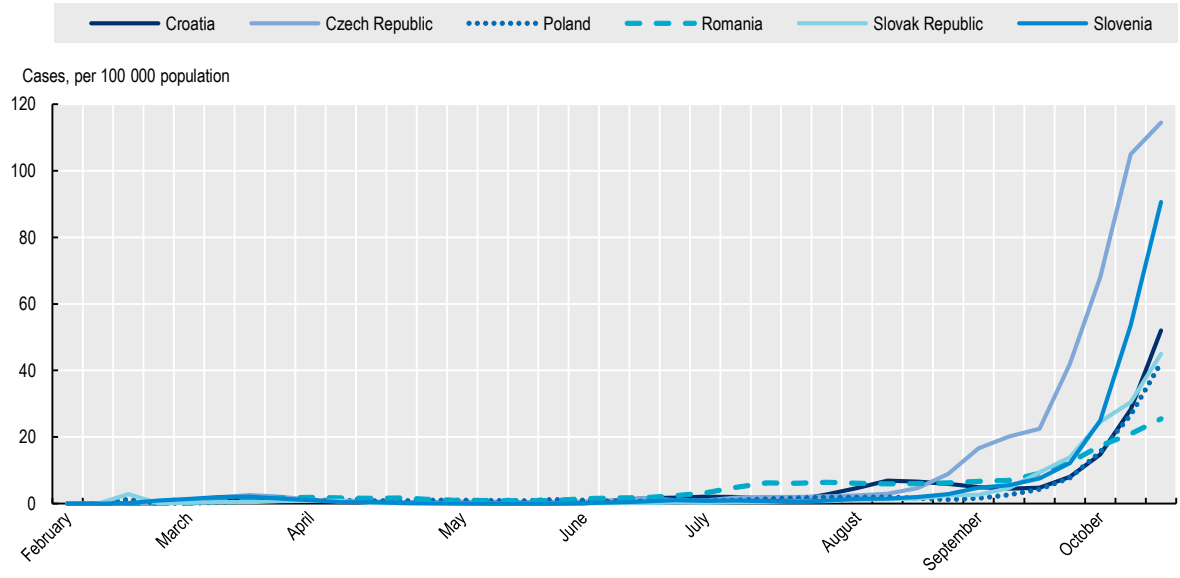
In terms of reported COVID-19 deaths, as of 31 October 2020, the United Kingdom reported the highest absolute number (over 46 000), followed by Italy, France and Spain with each reporting more than 35 000 deaths. Adjusting for population size, Belgium reported over 1 000 COVID-19 deaths per million people; 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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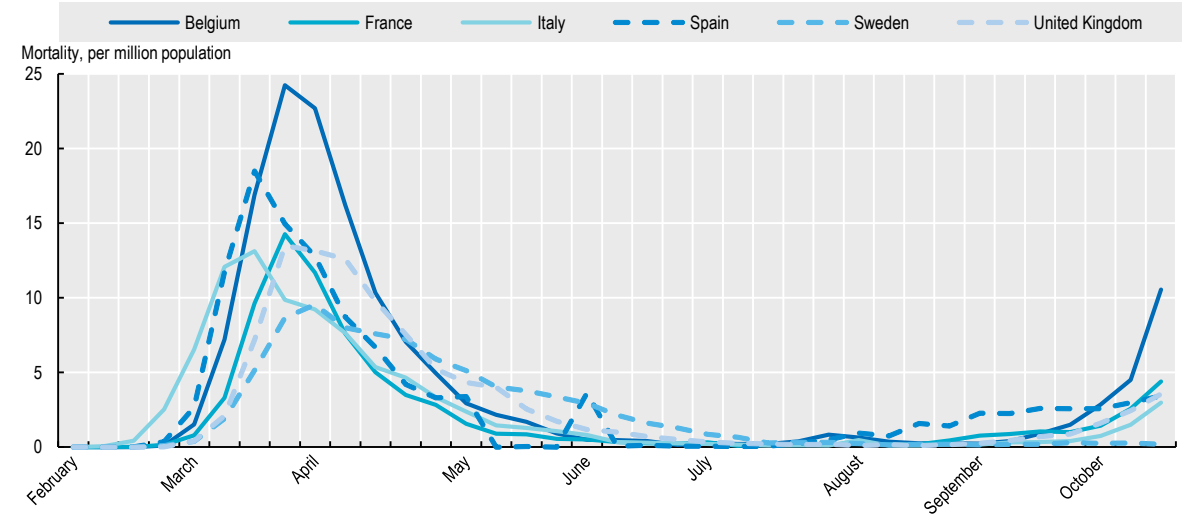
Figure 1.3. **Evolution in reported COVID-19 mortality rates in some of the most adversely affected countries in Europe, February to end of October 2020**



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

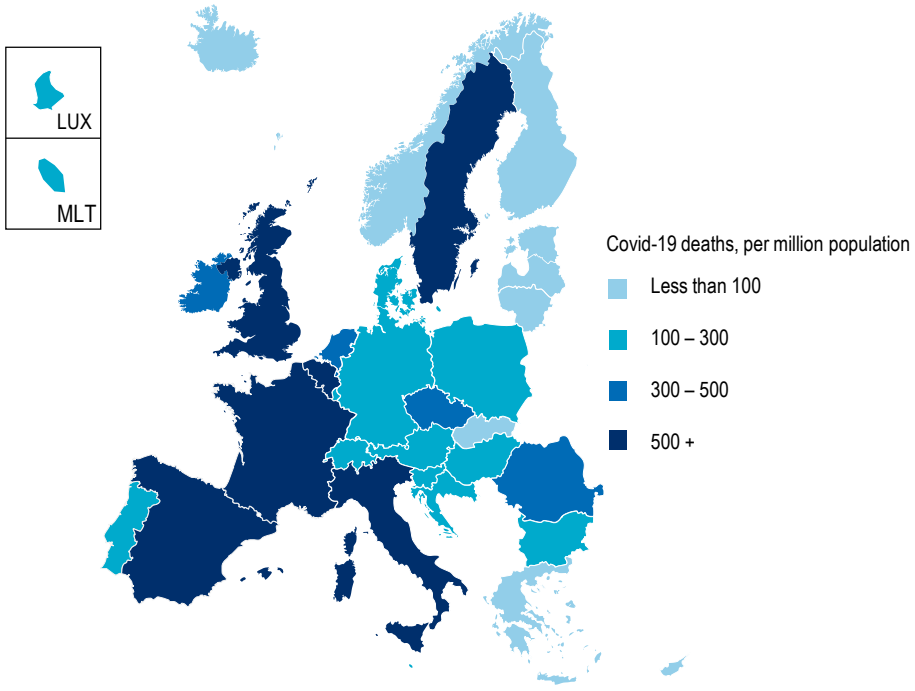
Excess mortality has less severe cross-country comparability limitations than reported COVID-19 deaths. However, it is not a direct measure of COVID-19 deaths, as it captures all excess deaths irrespective of their cause. National variations in underlying death rates related to various events and evolution 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).

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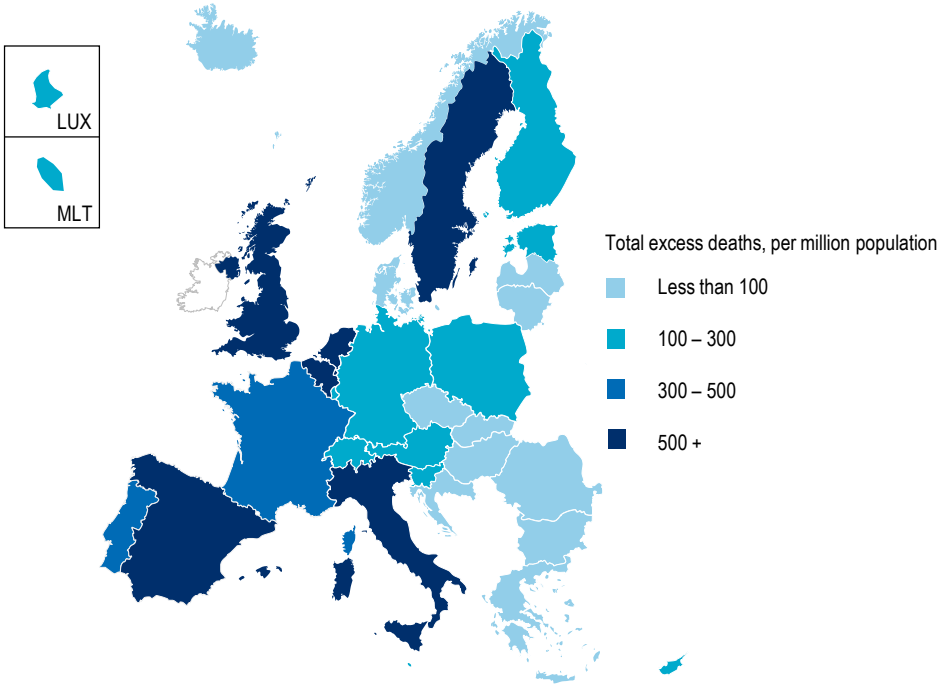
Figure 1.5. **Excess deaths per million population, March to June 2020**



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.

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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.

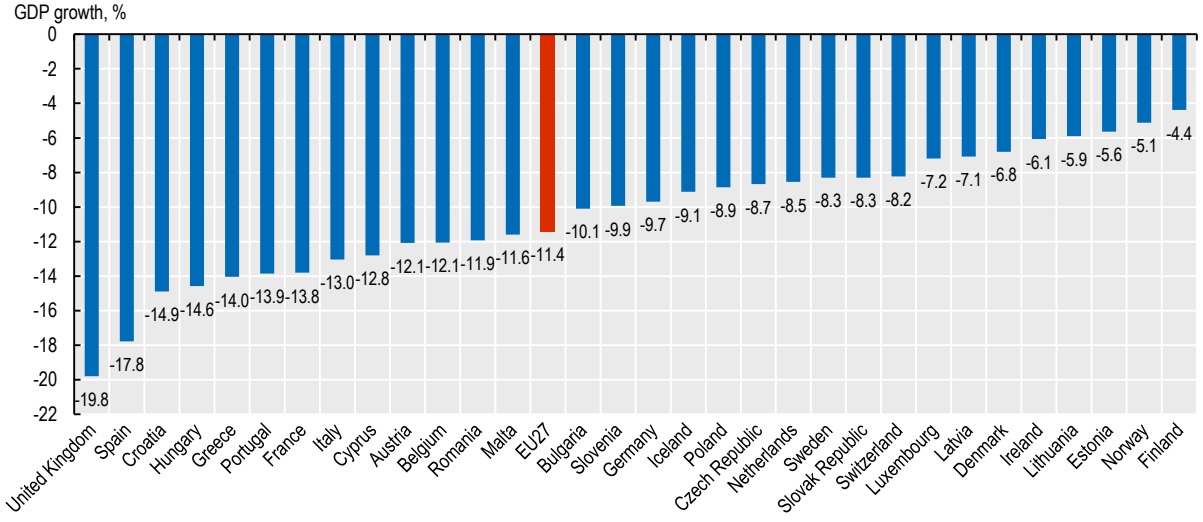
Analysis of excess mortality data shows broadly consistent results with reported COVID-19 deaths in terms of which countries were most adversely affected by COVID-19, with some exceptions. Spain and the United Kingdom recorded the highest excess death rates between March and June 2020 (over 950 excess 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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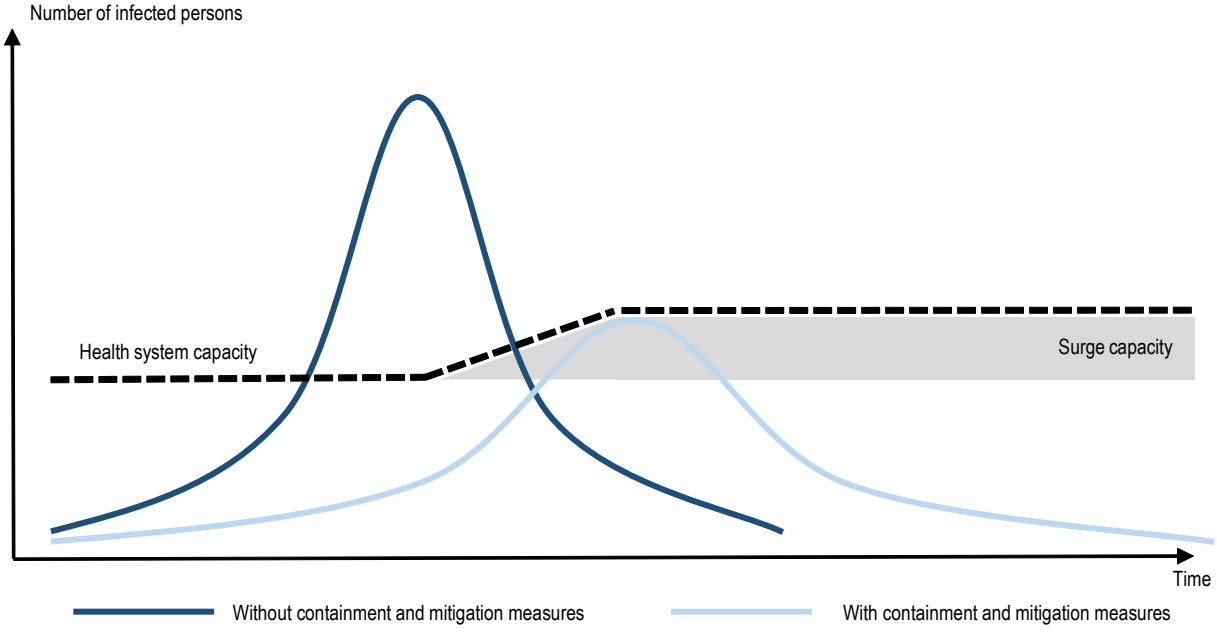
To what extent have containment and mitigation strategies adopted in European countries contributed to slowing the spread of COVID-19 during the first wave?

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

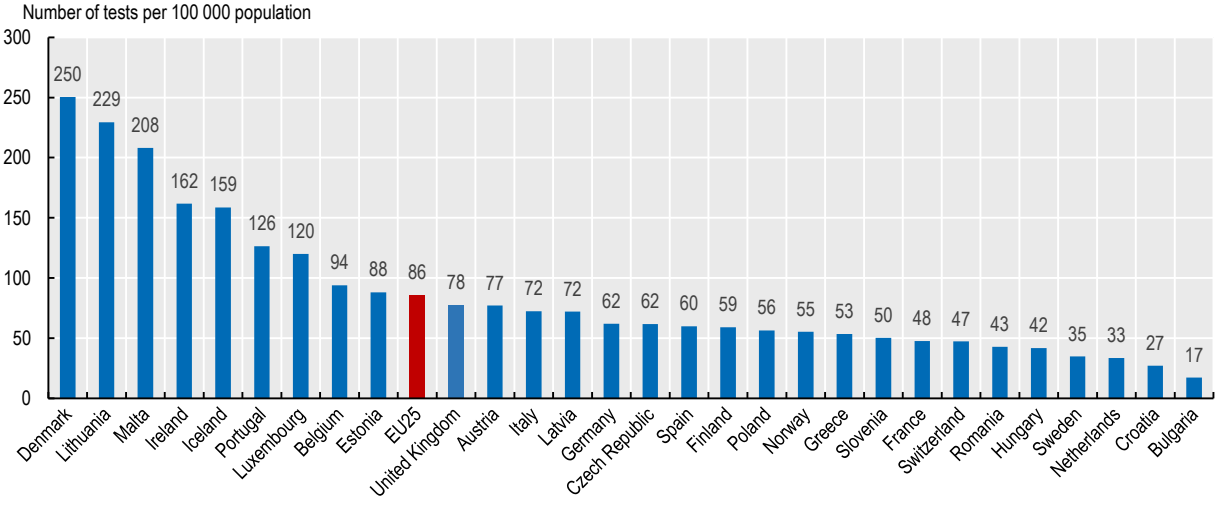
Sweden) did not make any recommendation to the general population regarding the utilisation of face masks.

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.

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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

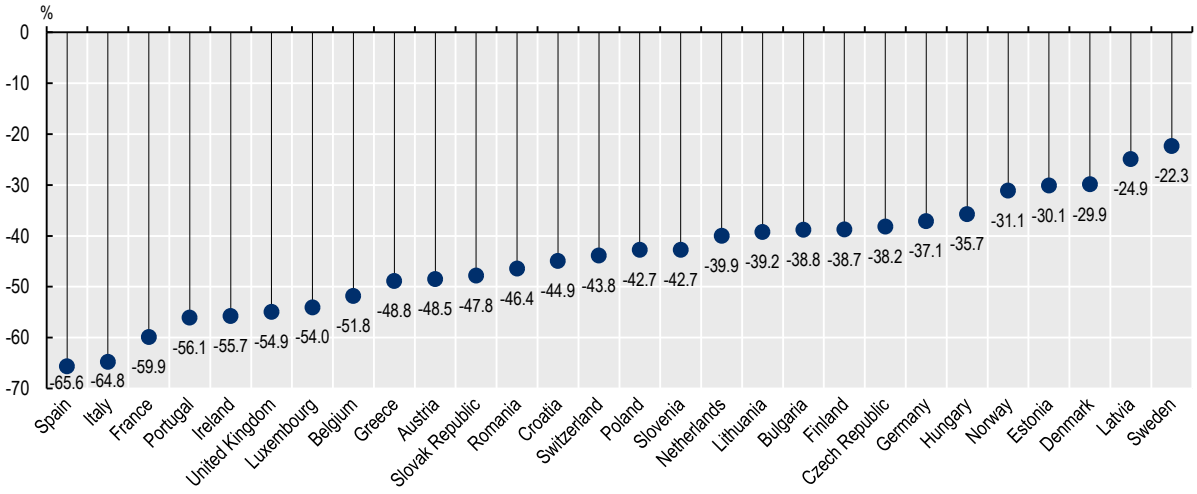
There is no commonly accepted method to estimate the relative efficacy of the different containment and mitigation strategies adopted by countries during the first wave of the pandemic. In this section, analysis focuses first on the general effect of these policies on population mobility, relying on 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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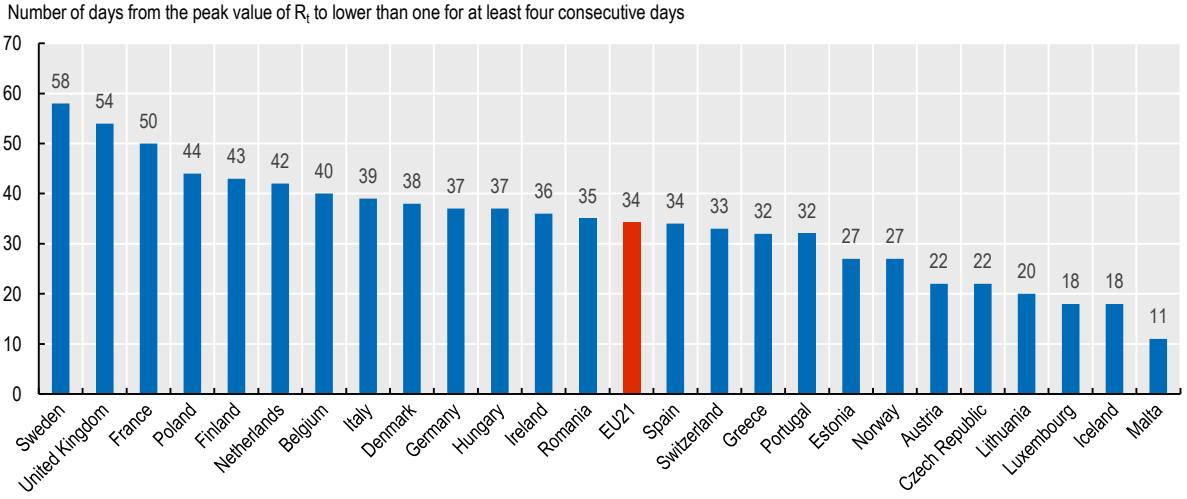
It took on average 34 days to European countries to control the first wave of the outbreak

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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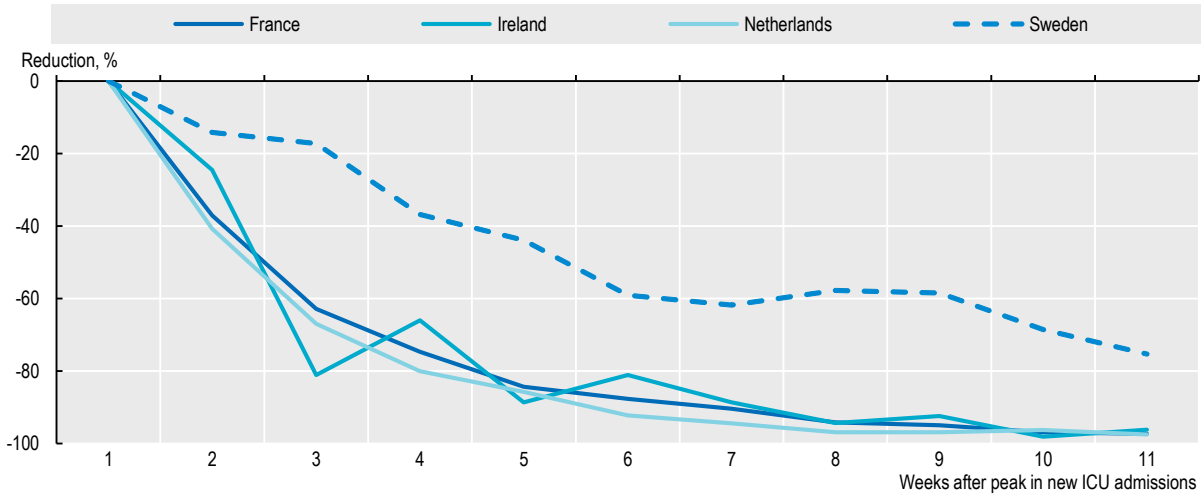
Along with the R_t, another indicator that reflects the impact of containment and mitigation strategies is the number of daily ICU admissions for patients suffering from critical forms of COVID-19. This indicator is useful to analyse the dynamic of the epidemic, since admission criteria to ICUs are similar 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.

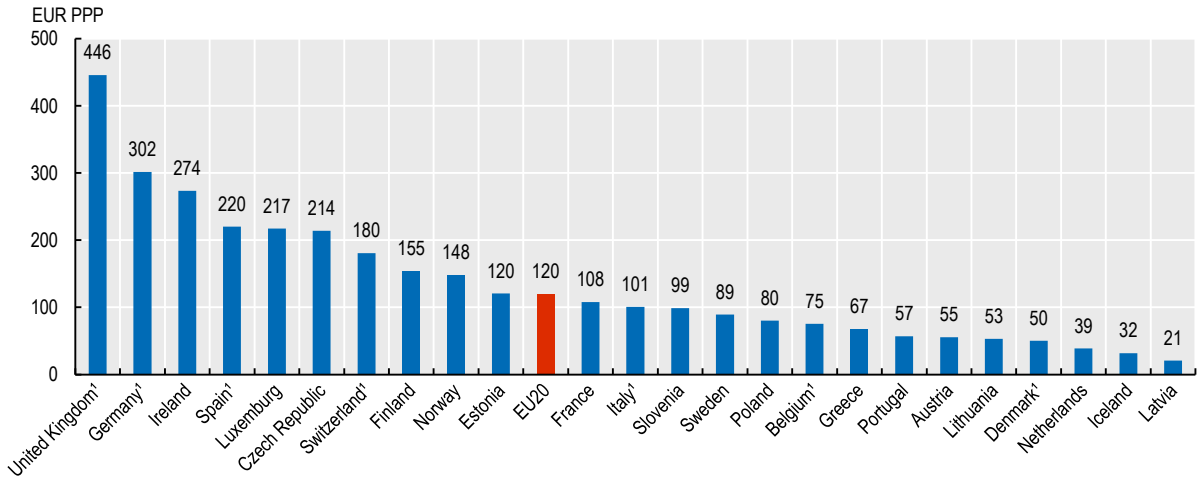
Governments freed up additional resources to strengthen health system responses to COVID-19

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.

StatLink https://stat.link/8fp4ge

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.

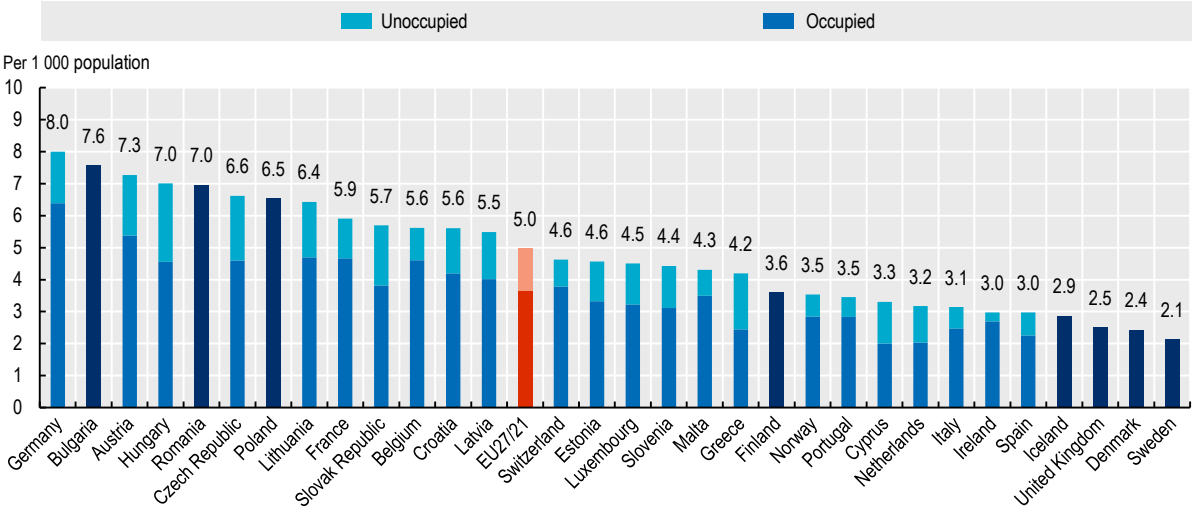
Some health systems lacked sufficient hospital beds, equipment, supplies and medicines to treat COVID-19 patients, but policies to boost surge capacity have helped

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.

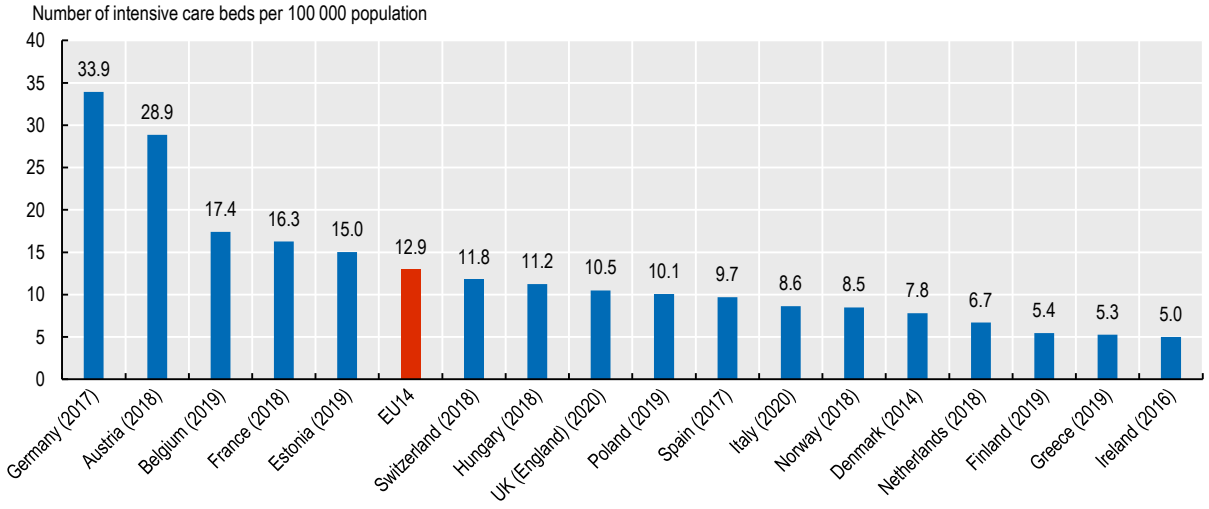
Notwithstanding definitional differences, the most recent publicly available data suggest that, before the COVID-19 crisis, the variation in ICU capacity across 17 European countries ranged from 34 ICU beds per 100 000 people in Germany, to five ICU beds per 100 000 people in Ireland (Figure 1.15).

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.

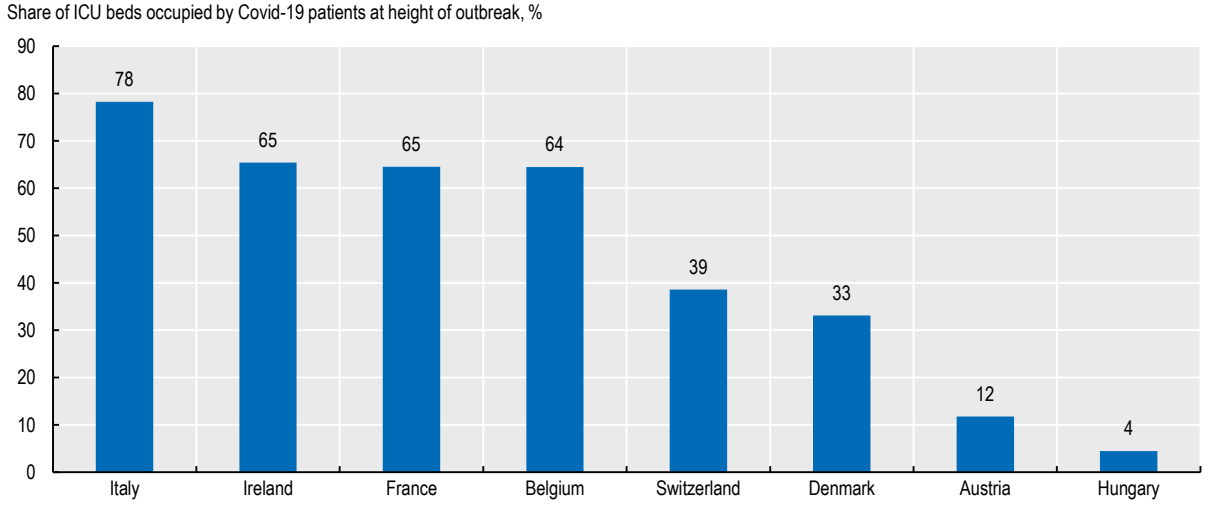
Figure 1.15. **Intensive care capacity – ICU beds before the COVID-19 crisis, latest year available**



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

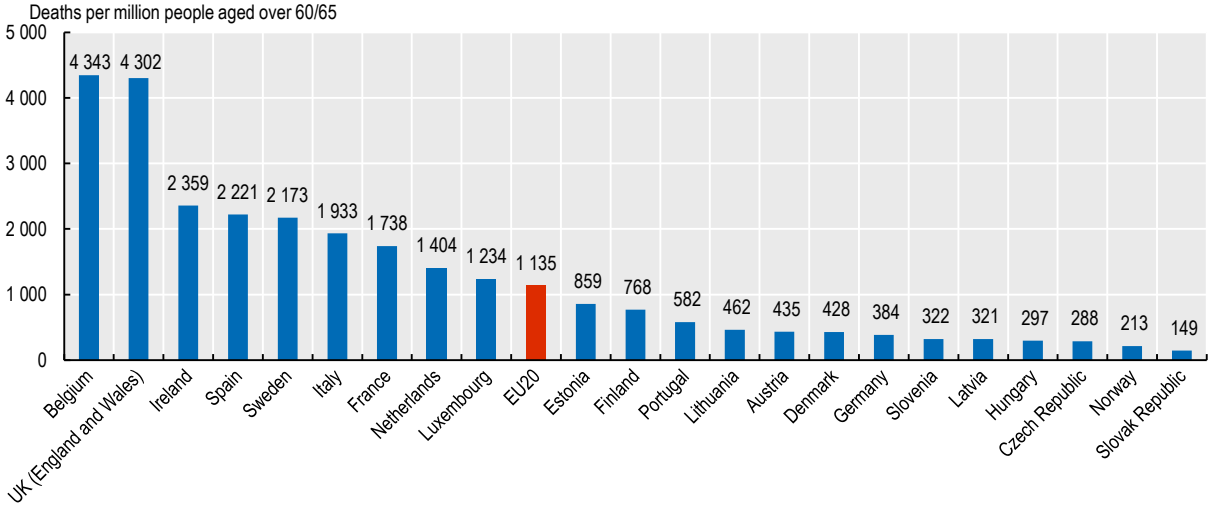
While COVID-19 has claimed the lives of many people across all age groups, people with comorbidities (e.g. obesity, cardiovascular diseases) and in particular older populations face an elevated risk of dying from COVID-19. Among 22 European countries with data available by age group, reported COVID-19 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)**

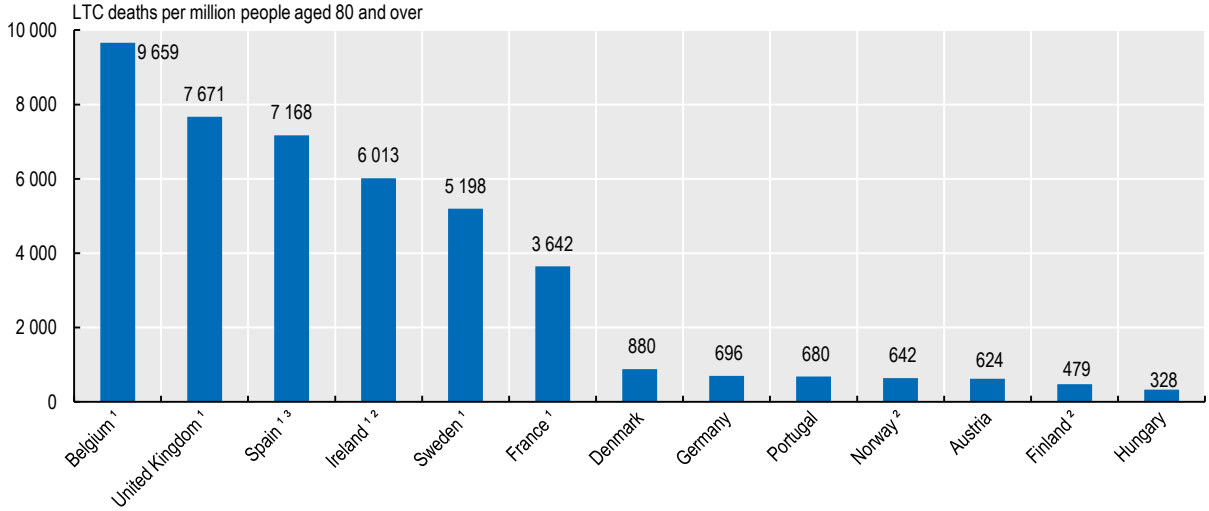


Note: Data on cumulative deaths up to mid-September/early October 2020, except for Portugal (August), Ireland and Luxembourg (July) and Spain (May). Data are not fully comparable due to different testing, reporting and coding procedures. In Belgium and Ireland, data include confirmed and suspected COVID-19 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.

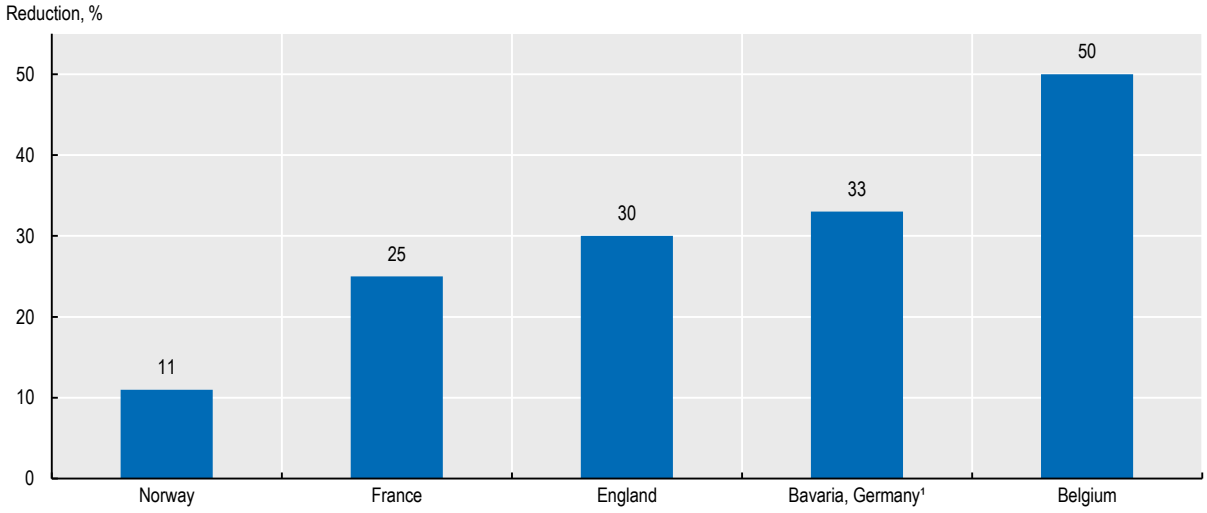
COVID-19 has led to postponed elective surgeries, fewer visits to emergency departments and less use of outpatient services, affecting both acute and chronic care patients

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*).

StatLink https://stat.link/32k6l0

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]).

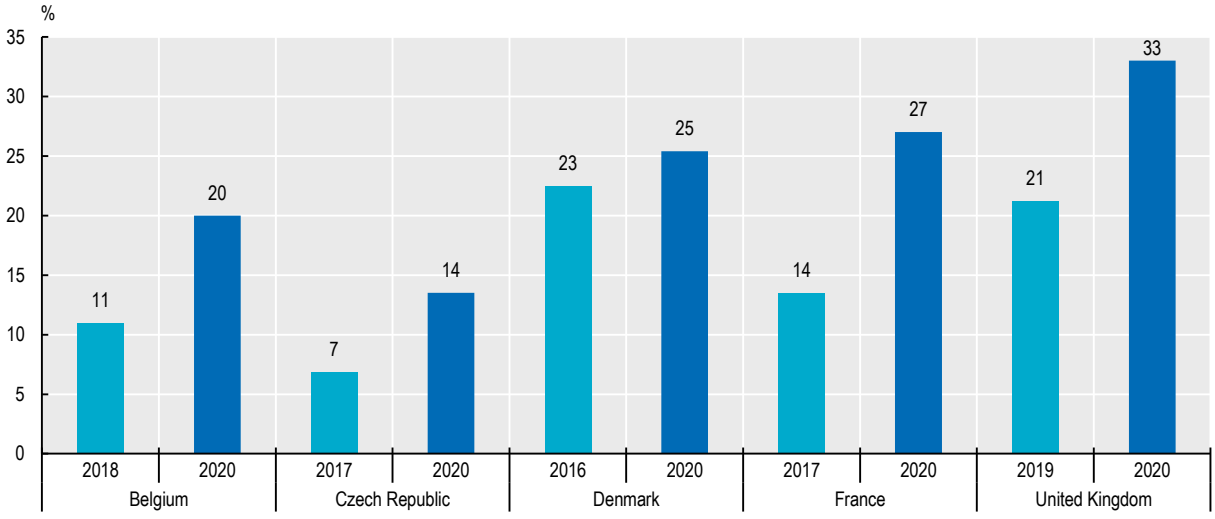
Emerging needs – the COVID-19 crisis has increased levels of mental distress

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*.

StatLink https://stat.link/2is10b

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.

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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.

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