

Coronavirus disease 2019 (COVID-19) in the EU/EEA and the UK – tenth update

11 June 2020

Summary

Since 31 December 2019 and as of 9 June 2020, 7 069 278 cases of COVID-19 have been reported worldwide, including 405 587 deaths. EU/EEA countries and the UK reported 1 444 710 cases (20% of all cases), including 169 207 deaths (42% of all deaths).

The COVID-19 pandemic is posing an unprecedented threat to EU/EEA countries and the UK and to countries worldwide, many of which have been experiencing widespread transmission of the virus in the community for several months. While decreasing trends in disease incidence are being observed in the EU/EEA and the UK overall, some Member States are still reporting community transmission. In addition, the information available from sero-epidemiological studies suggests that the adaptive immunity of populations remains low.

The absence of an effective treatment or vaccine, combined with an exponential growth in infections from late February, led many countries to implement non-pharmaceutical interventions, such as 'stay-at-home' policies, alongside other community and physical distancing measures, such as the cancellation of mass gatherings, and the closure of educational institutions, work places and public spaces. This approach has collectively reduced transmission and, as of 9 June 2020, the 14-day incidence in the EU/EEA and the UK overall has declined by 80% since the peak on 9 April. The initial wave of transmission has passed its peak in all countries apart from Poland and Sweden.

Although these stringent physical distancing measures have reduced transmission, they are highly disruptive to society, both economically and socially. All countries that had implemented enforced 'stay-at-home' orders for the general population have initiated full or partial relaxation of these measures, and several have begun a full or partial re-opening of small retail shops and other public spaces. At the present time, just before the summer holiday period, as Member States relax limitations, there is a risk that people will not adhere firmly to the recommended measures still in place due to 'isolation fatigue'. Therefore, continuous efforts are needed to ensure that the remaining physical distancing and infection prevention control measures continue to be observed to limit the spread of the disease. The pandemic is not over, and hypothetical forecasting indicates a rise in cases is likely in the coming weeks.

At this stage, the following measures are essential to maintain a reduced level of transmission and avoid resurgence:

- A robust monitoring framework to closely monitor the epidemiological situation, rapidly detect increased transmission, assess the impact of the interventions in place and avoid a resurgence of COVID-19.
- An expanded testing strategy aiming for comprehensive testing of all individuals displaying symptoms compatible with COVID-19. In particular, a systematic or more comprehensive testing approach is suggested in high-risk populations or settings. It is suggested that testing should be ramped up and tests

made easily and quickly available to all individuals displaying symptoms compatible with COVID-19, including those with mild symptoms. Member States should also consider implementing PCR-based prevalence studies and sero-epidemiological studies to monitor the spread of disease.

- A framework for contact tracing, based on extensive testing, active case finding, early detection of cases, isolation of cases, quarantine and follow-up of contacts, possibly supported by electronic tools and applications.
- Long-term sustainable implementation of essential non-pharmaceutical interventions, irrespective of transmission rates, and the ability to amend strategies rapidly in response to indications of increased transmission. Reinstatement or introduction of further measures could be considered at local or regional level, or for specific population groups, depending on transmission patterns. Protection of the most vulnerable and at-risk populations is of paramount importance as they have suffered most of the burden from this pandemic in terms of morbidity, mortality and need for healthcare.
- A strong risk communication strategy should remind citizens that the pandemic is far from over. People need to be aware that the public health measures to limit the spread of the virus will continue to impact the way we move, work and travel, and our leisure activities for the foreseeable future. This is especially important as Europe moves towards the summer holidays, when changes in people's behaviour, activities and movements may cause people to switch back to pre-pandemic and potentially risky behaviour patterns. Four key risk communication messages are proposed:
 - This is a marathon, not a sprint.
 - We must not drop our guard.
 - We all need to adjust to a 'new normal'.
 - Together, our actions give us the power to control the spread of the virus.

What is new in this update?

- Updated epidemiological and sero-epidemiological information;
- Overview of response measures implemented in the EU/EEA countries and the UK;
- Options for response to minimise the risk of resurgence of COVID-19.

What are the risks being assessed in this update?

In this update of the RRA, we analyse the risk of COVID-19 for the general population and those with risk factors for severe disease, according to the current state of knowledge on the virus and associated disease and in light of the current stage of epidemic stage in the EU/EEA and the UK.

These risks are analysed in conjunction with the likelihood of a rise in COVID-19 incidence in the coming weeks as a consequence of lifting stricter community-level physical distancing measures in the EU/EEA and the UK.

- What is the risk of COVID-19 to the general population as of 10 June 2020 in the EU/EEA and the UK?
- What is the risk of COVID-19 to the population with defined factors associated with severe disease outcome as of 10 June 2020 in the EU/EEA and the UK?
- What is the likelihood of COVID-19 incidence rising to levels that require stricter response measures, as a consequence of lifting/adjusting community-level physical distancing measures?

Regularly updated information on the coronavirus disease 2019 (COVID-19) outbreak is available on [ECDC's website](#) [1], the European Commission website [2], and the World Health Organization (WHO) [website](#) [3]. This risk assessment is based on published information available as of 9 June 2020. The latest ECDC publications on COVID-19 are listed in Annex 1.

1. Event background

Epidemiological situation

Since ECDC's ninth risk assessment published on 23 April 2020 [4], and as of 9 June 2020, 4 552 287 new COVID-19 cases and 225 489 new deaths have been reported worldwide, out of a total of 7 069 278 reported cases and 405 587 deaths reported deaths since 31 December 2019 (Annex 2, Figures A and B). Since 23 April, the largest proportion of global cases and deaths have been in the Americas (53% of cases and 46% of deaths), with fewer in Asia (21% cases, 9% deaths) and in the EU/EEA and the UK (22% cases, 44% of deaths). The proportion of all global COVID-19 cases reported by the EU/EEA and the UK has declined from 41% on 23 April to 14% on 9 June. Although small in terms of the overall global picture, a proportional increase has been noted in cases reported from Africa (from 2% on 23 April to 6% on 9 June).

The main developments in the EU/EEA and the UK since the risk assessment dated 23 April 2020 can be summarised as follows:

- Of the 459 913 cases reported in the EU/EEA and UK since 23 April 34% (158 355) were reported from the UK, 11% (51 321) from Italy, 9% (40 984) from Spain, 8% (38 849) from Germany, 8% (36 864) from France and 6% (29 811) from Sweden (Figure 1).
- The 14-day incidence of reported COVID-19 cases in the EU/EEA and the UK, which provides an estimate of prevalence of active cases, was 16.1 per 100 000 population as of 9 June 2020. The 14-day incidence remains heterogeneous across EU/EEA countries and the UK, ranging from 0.1 per 100 000 in Croatia to 110.4 per 100 000 in Sweden (Figure 2). At sub-national level, there is substantial variation within and across countries, with some regions reporting no cases in the last 14 days and others reporting an incidence of more than 100 per 100 000 population (Figure 3).
- The overall number of daily cases reported, as well as the 14-day incidence, is declining in the EU/EEA and the UK overall, with an 80% decrease from the peak which occurred on 9 April 2020 (Figure 1; Annex 3, Figure C). The number of cases reported and the 14-day incidence is declining in the majority of EU/EEA countries and the UK (Figure 5). The 14-day incidence is at least 10% lower than the peaks observed earlier in 28 EU/EEA countries and the UK. In two countries (Poland and Sweden) the 14-day incidence is at the highest level observed to date (Annex 3, Figure C), although increases in testing in Sweden may partly explain this increase. At sub-national level, there is substantial variation across and within countries in the change in 14-day incidence (Figure 4).
- The number of countries reporting community-transmission has decreased, with only eight out of 20 reporting countries indicating community transmission throughout the country ([ECDC dashboard](#), sub-national level of transmission).
- The cumulative rate of COVID-19 deaths per 1 000 000 population is 329.6 for the EU/EEA and the UK, however there is considerable variation in the cumulative rate of reported COVID-19 deaths, ranging from 5 (Slovakia) to 839 (Belgium). Deaths continue to increase in 18 countries. Pooled estimates of all-cause mortality reported by [EuroMOMO](#) are now approaching normal expected levels following a period of substantially increased excess mortality that coincided with the COVID-19 pandemic peaks. A few countries are still seeing some excess mortality.

Figure 1. Distribution of new COVID-19 cases reported daily in EU/EEA countries and the UK, 9 June 2020

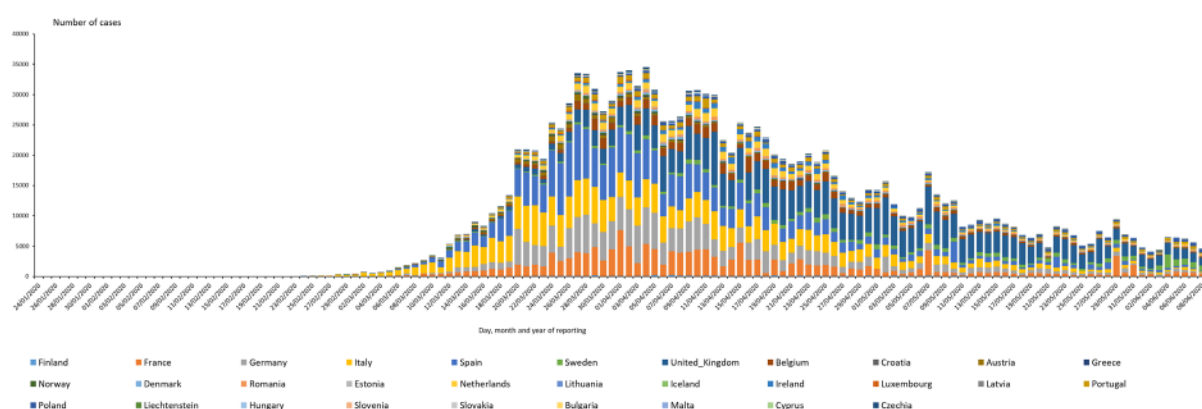
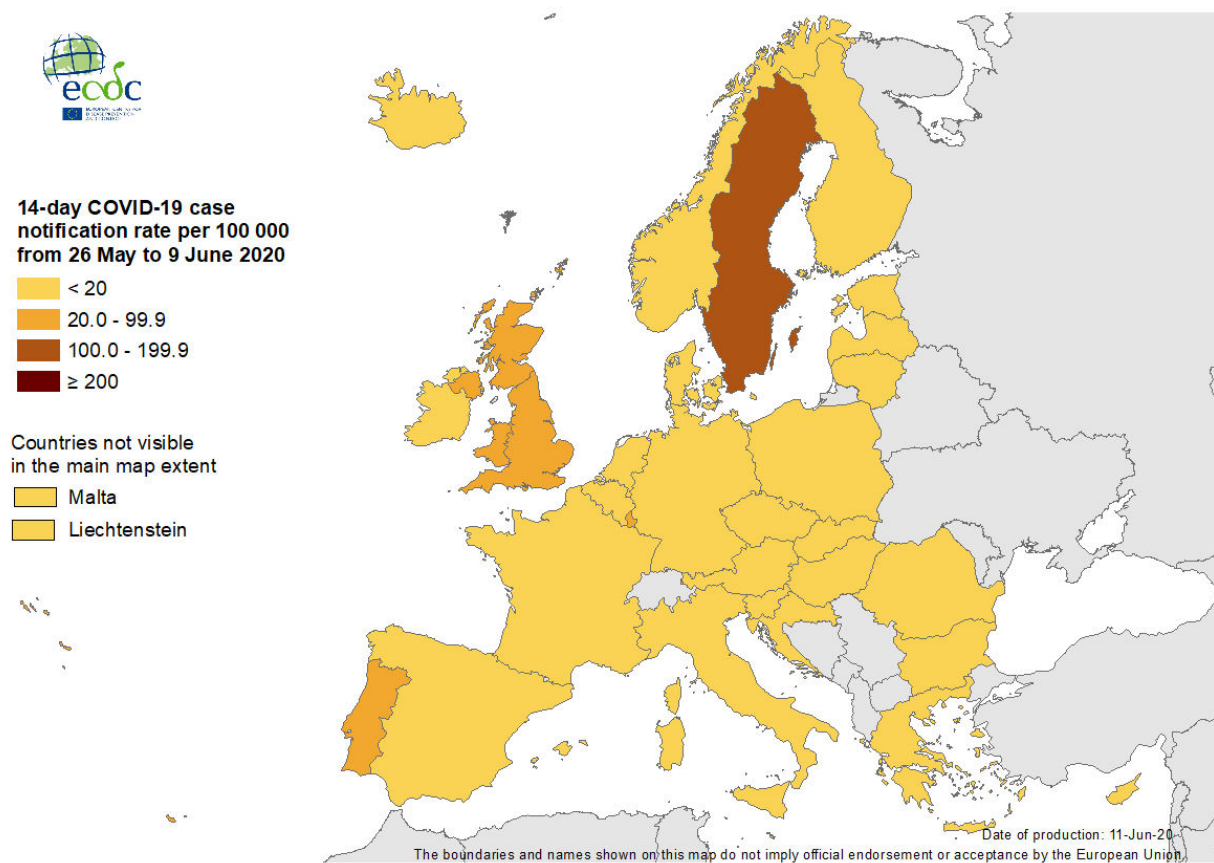


Figure 2. Incidence of reported COVID-19 cases/100 000 population in EU/EEA countries and the UK in the last 14 days (26 May–9 June 2020)



Note: Maps are based on either data reported directly to ECDC or data made available on national authoritative websites. Changes in testing capacity and policy can influence the overall incidence estimates for countries and should be taken into account when comparing across countries or time. Reporting delays may mean that data presented here can be updated in the future.

Figure 3. Incidence of reported COVID-19 cases/100 000 population in EU/EEA countries and the UK at subnational level in the last 14 days (26 May–9 June 2020)

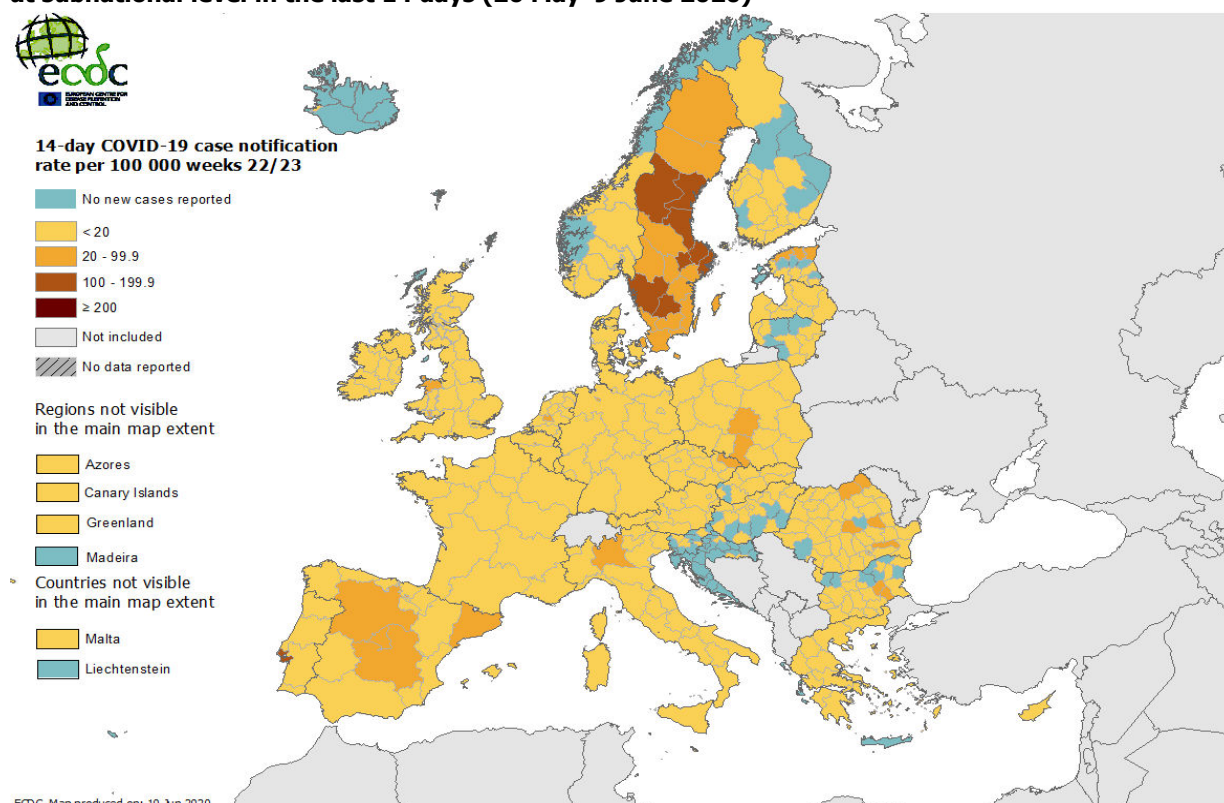
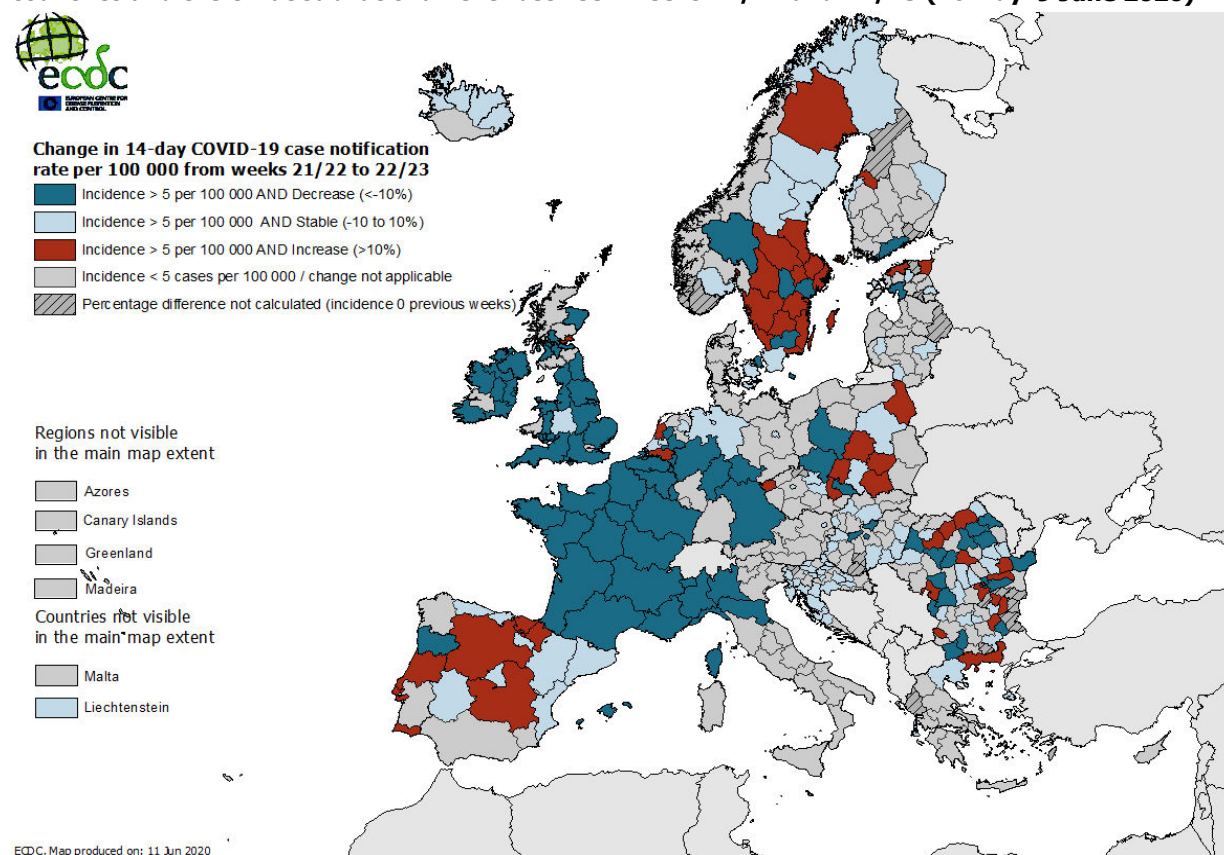
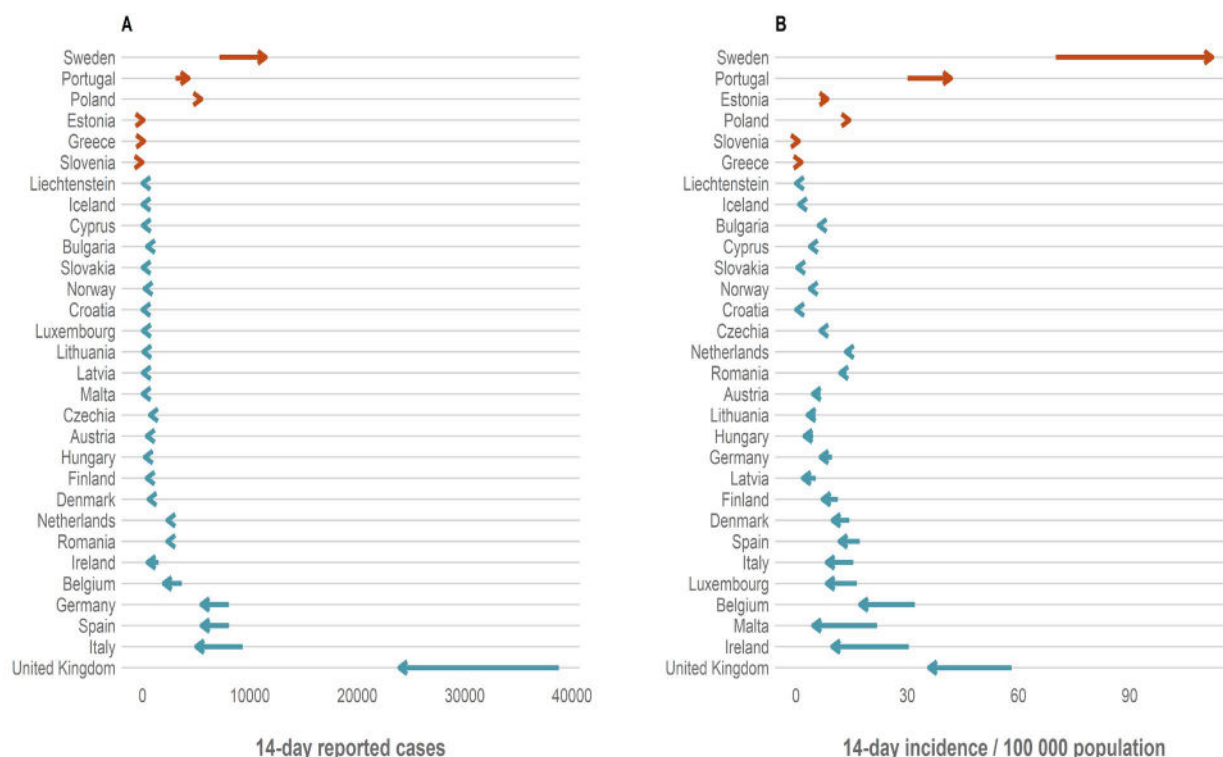


Figure 4. Change in 14-day incidence of reported COVID-19 cases/100 000 population in EU/EEA countries and the UK at subnational level between weeks 21/22 and 22/23 (26 May–9 June 2020)



Note: Maps are based on either data reported directly to ECDC or data made available on national authoritative websites. Changes in testing capacity and policy can influence the overall incidence estimates for countries and should be taken into account when comparing across countries or time. Reporting delays may mean that data presented here can be updated in the future.

Figure 5. Change in reported COVID-19 cases in (A) EU/EEA countries and the UK and (B) 14-day incidence of reported COVID-19 cases/100 000 population from 26 May-9 June 2020



Note: Data from France are not included in these figures due to changes in their surveillance system that occurred during the period.

Non-pharmaceutical interventions in place in countries and the lifting of interventions

As the transmission of COVID-19 increased, EU/EEA countries and the UK progressively implemented a variety of measures. An overview showing the daily incidence of reported COVID-19 cases per 100 000 population with a 7-day moving average, and the main non-pharmaceutical interventions (NPIs) at national level reported from public sources over time is presented in Annex 4. Following a reduction in virus transmission, almost all EU/EEA countries and the UK have started to ease their mitigation measures. For example, all countries implementing enforced 'stay-at-home' orders for the general population have initiated full or partial relaxation of these measures, and several have begun a full or partial re-opening of small retail shops and other public spaces (Annex 4).

Overall, as of 3 June, the median duration of implementation for each class of NPIs varied between countries. For countries that have implemented 'stay-at-home' orders at any time (16/31), median duration of the intervention was 59 days, while the median time since the end of the measure was 20 days (note that as of 3 June 'stay-at-home' orders remain partially in place in five countries). To date, non-enforced 'stay-at-home' recommendations for the general population have been implemented by 15/31 countries at some point during the pandemic with a median duration of 45 days.

For the 18/31 countries that have implemented 'stay-at-home' recommendations for risk groups at any time, the median duration of the intervention was 83 days, and the recommendation was still in place in all but one country as of 3 June. The situation relating to teleworking recommendations or workplace closures was similar, with a median duration of 80 days, and the measure was still in place in early June in 23/31 countries, with two countries having discontinued recommendations for teleworking or workplace closures.

The closures of educational institutions were still in place in several countries, varying from 12 countries still maintaining closure of daycare to 21 countries maintaining closures of higher education as of 3 June. Median time since the end of educational institution closures ranged from five days for primary schools, secondary schools and higher education, to seven days for daycare, with wide variation among countries where the measures were still in place and the countries whose institutions had already re-opened in April.

Closures of public places (including public transport) were in place in 30/31 countries at a national level, and the median duration of these closures was 80 days, with the majority (24/31) still having measures at least partially in place as of 3 June. The cancellation of mass gatherings of any type lasted for a median of 84 days, with 28/31

countries still having national recommendations or restrictions in place for gatherings of varying sizes. It should be noted that mass gathering cancellations and the closure of public spaces may have been imposed de facto by the implementation of stricter measures (such as nation-wide 'stay-at-home' orders) without them being explicitly cancelled, and therefore this may not have been captured in the ECDC response measures database.

As of 3 June, most countries (24/31) had also issued national voluntary recommendations (8/31) or mandatory obligations (16/31) to wear face masks in confined public spaces.

2. Disease background

On 31 December 2019, a cluster of pneumonia cases of unknown aetiology was reported in Wuhan, Hubei Province, China. On 9 January 2020, China CDC reported a novel coronavirus as the causative agent of this outbreak, coronavirus disease 2019 (COVID-19).

For more information and latest evidence on coronaviruses, epidemiology, transmission, clinical characteristics, diagnostic testing and screening, immune response, immunity, vaccine and treatment and transmission in different settings, please visit the page on COVID-19 disease background on ECDC's website:

<https://www.ecdc.europa.eu/en/2019-ncov-background-disease> (last updated on 10 June 2020).

Detailed epidemiological information on laboratory-confirmed cases reported to The European Surveillance System (TESSy) is published in ECDC's weekly COVID-19 surveillance report: <https://covid19-surveillance-report.ecdc.europa.eu/>

This update of the risk assessment only provides an overview of the latest information on individual and population immunity.

Individual and population immunity

Immunity in individuals

Most persons infected with SARS-CoV-2 display an antibody response between day 10 and day 21 after infection. In mild cases development of a detectable response can take longer (four weeks or more) and in a small number of cases antibodies (i.e. IgM, IgG) are not detected at all (at least during the period of the studies undertaken). The longevity of the antibody response is still unclear, although it is known that antibodies to other coronaviruses wane over time (range: 12–52 weeks from the onset of symptoms) and homologous re-infections have been observed [5].

T-cell responses against the SARS-CoV-2 spike protein have been characterised and correlate well with IgG and IgA antibody titres in COVID-19 patients, which has important implications for vaccine design and long-term immune response [6-8]. It is currently unknown whether antibody responses or T-cell responses in infected people confer protective immunity, and if so, how strong a response is needed for this to occur.

Reinfections with all seasonal coronaviruses occur in nature, usually within three years [9]. However, the elapsed time between infections does not mean that the protective immunity lasts for the same period, because reinfection is also dependent on re-exposure. Based on the minimum infection intervals and the observed dynamics of antibody waning, the duration of protective immunity may last six to 12 months. These results are in line with a model of the protective immunity and reinfection dynamics of HCoV-OC43 and HCoV-HKU1 in which the estimated duration of protective immunity against reinfection was about 10 months [10].

Population immunity

The updated overview of the findings of population-based sero-epidemiological studies (from random sampling, residual clinical samples or blood donor samples) in EU/EEA Member States are shown in Table 1. All EU/EEA Member States have low levels of seropositivity, even without adjusting for test sensitivity and specificity, and with current transmission patterns it is unlikely that population immunity levels reached by winter 2020–2021 will be sufficient for indirect protection.

Table 1. Preliminary results of first sero-epidemiological population studies in EU/EEA Member States and the UK from public sources

Country	Number (n)	Source of samples	Time of sampling (in 2020)	Laboratory method	Proportion of positive samples (%)
Austria [11]	269	General population	Week 18	n/a	4.7
Belgium [12]	3 397	Residual sera	Mid-April	EUROIMMUN IgG	6.0
Czechia [13]	26 549	General population	Week 18	Wantai rapid test	0.0-4.0
Denmark [14]	5 422	Blood donors	Week 18	EUROIMMUN Elisa	2.4
Finland [15]	2 800	General population	Weeks 16-23	Fluorescence-based multiplex	1.0-4.3*
Luxembourg [16]	1 862	General population	Weeks 17-19	EUROIMMUN IgG	1.97
Netherlands [17]	7 361	Blood donors	Weeks 15-16	Wantai Elisa	2.0
Spain [18]	60 983	General population	Weeks 18-19	Orient Gene IgM/IgG	5.0
Sweden [19]	1 104	Residual sera	Week 18	n/a	3.7-7.3
UK (England) [20]	7 694	Blood donors	Weeks 13-21	EUROIMMUN	8.5**
UK (Scotland) [21]	500	Blood donors	Week 13	Pseudotype microneutralisation assay	1.0

*confirmation with microneutralisation test 0.25–0.83%.

**adjusted for test sensitivity, specificity and age.

3. ECDC risk assessment

This assessment is based on information available to ECDC at the time of publication and unless otherwise stated, the assessment of risk refers to the risk that existed at the time of writing. It follows the ECDC rapid risk assessment methodology, with relevant adaptations. The overall risk is determined by a combination of risk of the probability of an event occurring and of its consequences (impact) to individuals or the population [22].

Risk assessment questions

- What is the risk of COVID-19 to the general population as of 10 June 2020 in the EU/EEA and the UK?
- What is the risk of COVID-19 to the population with defined factors associated with severe disease outcome as of 10 June 2020 in the EU/EEA and the UK?
- What is the risk of COVID-19 incidence rising to levels that require stricter response measures, as a consequence of lifting/adjusting community level physical distancing measures?

What is the risk of COVID-19 to the general population as of 10 June 2020 in the EU/EEA and UK?

The risk of COVID 19 in the general population of the EU/EEA and the UK is currently assessed as:

Low in areas where community transmission has been reduced and/or maintained at low levels and where there is extensive testing showing very low detection rates.

Moderate in areas where there is substantial ongoing community transmission and where appropriate physical distancing measures are not in place.

This assessment is based on the information below.

Decreasing trends in disease incidence are observed and sustained in almost all Member States, but several are still reporting ongoing community transmission:

- As of 10 June, 29 EU/EEA countries and the UK had a decreasing 14-day incidence, while the 14-day incidence was at the highest level yet observed in two countries (Poland and Sweden).
- Twenty-eight countries are reporting a current 14-day incidence below 20 cases per 100 000 population. In two countries (Portugal and the United Kingdom) the current 14-day incidence remains at a rate between 20 and 100 cases per 100 000 population. In one country (Sweden) the current 14-day incidence is above 100 cases per 100 000 population.
- There remains uncertainty as to the extent of viral circulation as there is limited information available on the proportion of community transmission that occurs outside of known transmission chains and/or due to importation across countries.

The implementation of robust response measures in the EU was temporarily associated with an observed decrease in incidence. Although the composition and intensity of implementation varied, all EU/EEA countries and the UK introduced a range of non-pharmaceutical interventions (recommended or enforced – refer to Annex 4). While uncertainty remains about the extent to which the combination and intensity of these measures had an impact on transmission, such measures appear to have been associated, at least temporarily, with decreases in the number of newly reported cases.

In summary, the probability of infection with SARS-CoV-2 for the general population ranges from low (in areas where community transmission has been reduced and/or maintained at low levels and where there is extensive testing, showing very low detection rates) to very high (in areas where appropriate physical distancing measures are not in place and where community transmission is still high).

While the majority of cases of COVID-19 have a mild course of illness, the analysis of data from TESSy shows that the risk of hospitalisation increases rapidly with age, from as early as 30 years, and that the risk of death increases from the age of 50 years, although the majority of hospitalisations and deaths are among the oldest age groups. Older males are particularly affected, being more likely than females of the same age to be hospitalised, require ICU/respiratory support, or die [23]. All-cause excess mortality from EuroMOMO, particularly at this time when competing drivers (influenza and high/low temperatures) are largely absent, shows considerable excess mortality in multiple countries, affecting both the 15–64 and 65+ years age groups in the pooled analysis. Once infected, no specific treatment for COVID-19 exists, however early supportive therapy may improve outcomes. There are ongoing trials that have demonstrated some evidence for limited reduction of symptom duration. There is evidence that since the start of the pandemic, case management, supportive treatment and care has improved.

Overall, the impact of COVID-19 is assessed as moderate for the general population.

What is the risk of COVID-19 to the population with defined factors associated with severe disease outcome as of 10 June 2020 in the EU/EEA and UK?

The risk of COVID 19 to the population with defined factors associated with severe disease outcome is currently assessed as:

Moderate in areas where community transmission has been reduced and/or maintained at low levels and where there is extensive testing showing very low detection rates.

Very high in areas where there is substantial ongoing community transmission and where appropriate physical distancing measures are not in place.

This assessment was based on the information below.

- The probability of infection in the different areas has been assessed above and is the same for populations with defined factors associated with severe disease outcome: from low to very high.
- Analysis of TESSy data shows that persons over 65 years of age and/or with underlying health conditions infected with COVID-19 are at increased risk of severe illness and death compared with younger individuals [23].
- Long-term care facilities (LTCFs), which commonly house the elderly and the frail, have been heavily affected by COVID-19. The disease spreads rapidly on introduction, causing high morbidity in residents, commonly with a case fatality of over 25%. LTCFs were the focus of over half of the fatal COVID-19 cases in several EU/EEA countries and the UK [24,25].

In summary, the impact of COVID-19 is assessed as very high in the population with defined factors associated with severe disease outcome.

What is the risk of COVID-19 incidence rising to levels that require stricter response measures, as a consequence of lifting/adjusting community level physical distancing measures?

The risk of COVID-19 incidence rising to a level that may require the re-introduction of stricter control measures is currently assessed as:

Moderate if measures are phased out gradually, when only sporadic or cluster transmission is reported, and when appropriate monitoring systems and capacities for extensive testing and contact tracing are in place.

High if measures are phased out when there is still ongoing community transmission, and no appropriate monitoring systems and capacities for extensive testing and contact tracing are in place.

This assessment was based on the information below.

- The implementation of robust response measures in EU/EEA countries and the UK was temporarily associated with a decrease in incidence.
- In the few weeks since the phase-out of some of the response measures, no rapid or major increase in incidence has been observed. Although the composition and intensity of implementation vary, all EU/EEA countries and the UK have introduced a range of non-pharmaceutical interventions to reduce transmission (recommended or enforced).
- In addition to the implemented response measures, other factors may have contributed to the observed decrease in incidence including seasonality, self-awareness of the population in disease prevention and adherence to measures implemented by governments, a better application of infection prevention and control measures in the community and healthcare settings, and an increase in the offer of testing for exposed and/or symptomatic individuals.
- The decrease in incidence at national level may hide a level of heterogeneity in disease incidence at subnational level.
- While decreasing trends in disease incidence are observed, Member States are still reporting community transmission.

The information available from sero-epidemiological studies (Table 1) provides an indication that the population immunity is still low (<10%), therefore there is still a risk that susceptible individuals may become infected.

Even though no major increases in disease incidence have been observed in the weeks since the phase-out of non-pharmaceutical interventions began, an associated upsurge may still be anticipated [10,26-28]. However, the re-establishment of transmission chains and larger clusters would take a few generations of infection.

The rate at which incidence of COVID-19 cases, and associated hospitalisations and deaths, could increase will depend on the effectiveness of the control measures that remain in place and on the extent to which people change their behaviour in comparison to the pre-COVID-19 era:

- If people are more cautious, having learned about the risks of the disease or if they are instructed to change their behaviour (e.g. by wearing masks), the transmission rate would be lower than before measures were introduced.
- However, the progressive lifting of the prohibition of mass gatherings may lead to some people meeting in larger numbers.
- Furthermore, the proportion of infections requiring hospitalisation or ICU care may be lower if older people and those who belong to risk groups restrict their contact rates to a greater extent than the general population following the phasing out of measures.

Figure 6 shows the projected incidence of COVID-19 averaged over the population of the EU/EEA and the UK until 7 July 2020, assuming that the control measures in place on 8 June 2020 are sustained and that human behaviour and social mixing will be the same as before the application of measures. It indicates that the lifting of control measures that has already taken place may result in an increase in SARS-CoV-2 transmission. It should, however, be noted that this type of upward trend may not be observed in every country or region. Attention should be paid to surveillance indicators at the local level to swiftly identify hotspots of transmission.

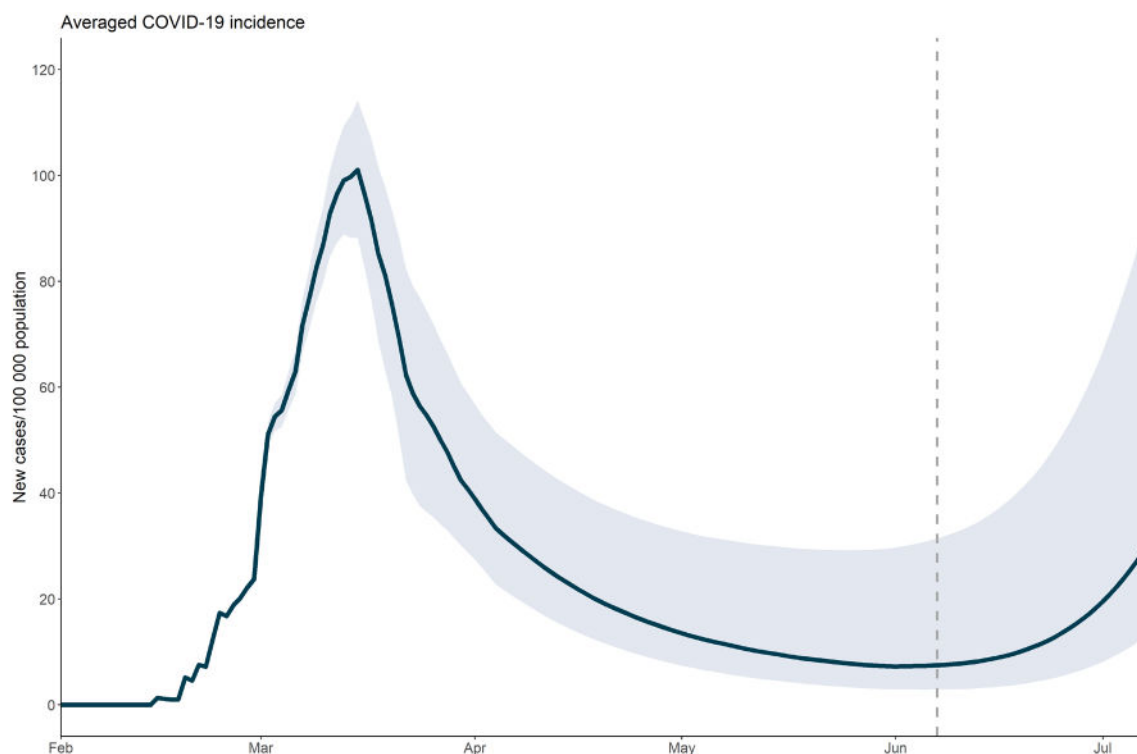
In summary, the probability of the risk of COVID-19 incidence rising to levels that require stricter response measures, as a consequence of lifting/adjusting community level physical distancing measures ranges from moderate (if measures are phased out gradually, when only sporadic or cluster transmission is reported, and when appropriate monitoring systems and capacities for extensive testing and contact tracing are in place) to very high (if measures are phased out when there is still ongoing community transmission, and no appropriate monitoring systems and capacities for extensive testing and contact tracing are in place).

An increase in COVID-19 incidence would be associated with increasing morbidity and mortality, with more severe morbidity and mortality likely if individuals at increased risk of severe outcome are not properly shielded. Such an increase, if not checked rapidly, may place healthcare systems under stress, as was seen in March and April 2020

in several EU/EEA countries and the UK. However, a set of control measures are now known to be effective in checking and reversing the trend towards increasing incidence within a period of about two-to-three weeks.

Therefore, the impact of COVID-19 incidence rising is assessed as moderate.

Figure 6. Projected daily incidence of COVID-19 in the EU/EEA and UK, as of 8 June 2020



Note: In the figure above, the prediction is made using the ECDC dynamic transmission model, calibrated to data on the number of newly reported COVID-19 cases and associated hospitalisations, ICU admissions and deaths, until 6 June 2020. Further details on the model structure, parameterisation and calibration can be found in the ECDC COVID-19 modelling report of 26 May 2020 [29]. The model simulates the effect of four classes of non-pharmaceutical intervention in place until 8 June 2020: cancellation of mass gatherings over 50 people, closure of public places, 'stay-at-home' recommendations and 'stay-at-home' orders. The effect of school closures is not implemented implicitly since it is presumed to be captured by the overarching effect of 'stay-at-home' recommendations. The effect of face masks was not included in the model. As of 3 June, most countries (24/31) had also issued national voluntary recommendations (8/31) or mandatory obligations (16/31) to wear face masks in confined public spaces. It should be noted that the model assumes the effective contact rate following the lifting of measures to be the same as before they were implemented. In this projection, no account has been taken of more risk-averse behaviour, or the wearing of face masks. Both of these factors would reduce incidence more significantly than predicted here.

4. Options for response

In order to monitor and minimise the risk of COVID-19 incidence in the EU/EEA and the UK rising to levels that require stricter response measures, and in light of the ongoing community transmission, the following options for response are suggested, irrespective of the overall response strategy selected by a country.

4.1 Monitoring framework to rapidly detect increased transmission

In this phase of the pandemic, it is vital to closely monitor the epidemiological situation and the impact of the interventions in place by means of a robust monitoring framework and a strong testing strategy to avoid a resurgence of COVID-19.

To monitor and evaluate the epidemiological situation, to track interventions in place and their effect, and to identify gaps to improve service delivery, ECDC has developed a framework with key pillars of COVID-19 preparedness, prevention and control activities. The framework is harmonised with WHO's COVID-19 Strategic Preparedness and Response monitoring and evaluation framework [30]. The framework (publication pending) presents sets of indicators and provides guidance on how to collect and analyse data for the indicators applicable at EU, national and/or sub-national levels.

The main pillars proposed by ECDC monitor aspects such as surveillance, country-level coordination, laboratory activities and testing capability, case management, maintenance of essential health services, infection prevention and control, vaccine monitoring and risk communication and community engagement.

Indicators under each pillar provide further information on variables for disaggregation, recommended monitoring levels, frequency of data collection, and potential sources for data collection to aid Member States in adequately monitoring the effects of interventions on to combat COVID-19.

A sub-set of suggested indicators from the comprehensive monitoring framework for COVID-19 can be used to guide policymakers when deciding whether containment measures can be gradually lifted and/or whether they need to be re-introduced.

4.2 Testing strategy

ECDC recommends that testing efforts are maximised with the aim of offering timely testing to all symptomatic cases, including mild cases. Some of the obstacles that hindered this approach earlier in the year, such as shortages of testing assays, kits and laboratory supplies, and shortages in personal protective equipment, have for the most part been overcome.

Testing of all symptomatic cases together with timely and effective contact tracing are currently the main pillars of the COVID-19 public health response. In addition, surveillance systems need to be reinforced to monitor the spread of infection and rapidly detect increasing incidence.

The current number of COVID-19 cases reported in Member States is influenced by testing strategies and practices [31], as well as the sensitivity, representativeness and comprehensiveness of surveillance systems. Six months into the epidemic, few unbiased population-based estimates of disease prevalence have been reported in the EU/EEA and UK [23,32].

In order to guide the various response measures, and to help decide when certain measures need to be reintroduced, Member States need to implement surveillance systems that are:

- sufficiently sensitive and timely to detect an upsurge of cases;
- representative of the general population and the entire national territory in order to tailor response measures; and
- comprehensive enough to ensure that all cases are detected, including those living in high-risk settings.

In order to address these objectives, ECDC proposes multiple complementary testing methods:

1. Comprehensive testing of all people with COVID-19-compatible symptoms.
2. Testing of persons displaying symptoms compatible with COVID-19 as part of syndrome-based surveillance systems.
3. Systematic random or comprehensive testing of high risk populations or settings, irrespective of symptoms (e.g. healthcare workers, LTCFs) [24].
4. Testing of close contacts
5. Random testing of the general population, irrespective of symptoms (point prevalence studies).
6. Testing of serological markers (sero-epidemiological studies).

Comprehensive testing of all people with COVID-19-compatible symptoms

To allow for prompt contact tracing, and follow-up and quarantine of contacts, all symptomatic individuals, including those with mild symptoms, should be tested in a timely manner.

People displaying symptoms compatible with COVID-19 should be tested as soon as possible after symptom onset to enable contact tracing to prevent further transmission. Public health authorities need to monitor indicators, such as the time from symptom onset to testing and contact tracing [23]. Special emphasis needs to be given to the testing of populations with low socioeconomic status as they are at higher risk of infection and less likely to access care [33].

Based on comprehensive testing of this type, surveillance systems need to track the evolution of cases, hospitalisations, ICU admissions, and COVID-19-related deaths. Rapid and efficient notification systems are the basis of COVID-19 surveillance and need to be strengthened, where indicated.

Testing of persons displaying symptoms compatible with COVID-19 as part of syndrome-based surveillance systems

To monitor COVID-19 trends and complement comprehensive testing, Member States should implement random testing of symptomatic cases based on their national, regional and local healthcare systems.

Several approaches can be used to select symptomatic cases for random testing, including existing influenza outpatient sentinel surveillance systems which may be expanded to increase coverage and sensitivity; regional or national telephone helplines; consultations through online healthcare apps, self-assessment online questionnaires, or other forms of population-based participatory syndromic surveillance schemes. The data on the number of persons with compatible symptoms, number of persons tested, and confirmed cases should be made available to local or regional public health authorities in a timely fashion so that it can be useful for taking action in the event of increased positivity rates.

Systematic random or comprehensive testing of high-risk populations or settings, irrespective of symptoms

In high-risk populations (e.g. elderly, healthcare workers (HCW)) or specific settings (e.g. LTCFs, prisons, migrant reception and detention centres, homeless shelters), systematic or more comprehensive testing is useful in preventing excessive burden and mortality. Symptomatic residents and staff, including residents with atypical symptoms or clinical signs, should be tested immediately. When a first case is confirmed in a resident or staff member, particularly at a LTCF, a comprehensive strategy to test all residents and staff should be strongly considered, including those without symptoms, due to the large proportion of asymptomatic individuals who are believed to contribute to transmission in such settings [24].

Testing of close contacts

Current ECDC guidance on contact tracing recommends testing contacts if they develop symptoms [34]. In addition, there are some settings, such as LTCFs and prisons, where the testing of asymptomatic contacts is recommended due to the high risk of transmission [24]. Outside such settings, asymptomatic contacts may be tested if resources allow, focusing initially on high-risk exposure (close) contacts. This could allow for onward tracing of *their* contacts sooner, which would be beneficial for the breaking of transmission chains. If asymptomatic contacts are tested, it is essential that data are collected to evaluate the effectiveness of such approaches, due to the paucity of evidence in this field and the limited understanding of asymptomatic transmission in the community.

Random testing of the general population, irrespective of symptoms (point prevalence studies)

Member States should consider performing repeated cross-sectional point prevalence studies of SARS-CoV-2 infection in the general population to understand the virus circulation in different geographical areas. ECDC has recently published methodology for setting up efficient prevalence studies by pooling clinical samples [23]. The methodology is accompanied by an R package to support pool size optimisation and to estimate prevalence from pooled RT-PCR test results. Studies of this type can be repeated on a regular basis in order to monitor trends of infection prevalence.

Testing serological markers (sero-epidemiological studies)

Sero-epidemiological studies can complement other surveillance approaches and allow for the monitoring of the proportion of the population that has previously been infected. These studies can be carried out by testing cohorts of people in the community or in high-risk settings (e.g. households, healthcare settings) or through cross-sectional surveys (e.g. from blood banks). WHO Unity Study protocols are available for setting up such studies [35].

Timely testing, specimens and accessibility of testing

In many countries the timely testing of all cases displaying symptoms compatible with COVID-19 requires significant efforts and novel practical solutions. In addition to locations where laboratory testing is traditionally performed (i.e. hospitals and primary care), sampling and/or testing needs to be offered closer to the community. This could include drive-in or mobile testing facilities [36]. To further improve accessibility to testing, simplicity of testing and acceptance, the sampling of alternative specimens and self-sampling methods can be applied.

There are studies that suggest that upper respiratory specimens other than nasopharyngeal specimens can be used for testing. In a meta-analysis, 91% (95% CI = 80–99%) sensitivity was found for saliva tests and 98% (95% CI 89–100%) sensitivity for nasopharyngeal swab (NPS) tests in previously-confirmed COVID-19 infected patients [37]. Saliva and anterior nasal swab [38] could be considered as an additional or alternative specimen to nasopharyngeal specimen. In particular, in situations where nasopharyngeal swabbing is not accepted, these specimens offer a less-invasive option that can also be considered for self-sampling. In addition, self-sampling reduces the exposure of healthcare workers to the virus and preserves limited PPE [38]. The use of validated point-of-care testing, when this becomes available, may be integrated into the diagnostic infrastructure.

To encourage the population to seek testing, the indications for testing should be widely advertised and testing made easily available to the general public. A clear communication strategy is needed in all countries explaining the rationale and benefits of this strategy.

Cost-effectiveness of testing policy

The cost of widespread testing may be substantial but needs to be weighed against the high cost of hospitalisation, intensive care, and the need to take indiscriminate population measures (e.g. 'stay-at-home' policies). Keeping infection levels low through widespread testing, contact tracing, and more targeted physical distancing recommendations is expected to reduce these costs.

4.3 Contact tracing

Contact tracing is an effective and essential public health measure for the control of COVID-19. The aim is to promptly identify and manage contacts of COVID-19 cases in order to reduce further onward transmission. ECDC has published guidance on contact tracing which includes novel technology-based approaches that may assist in the identification and management of contacts, including specific contact management software (e.g. Go.Data, web-based tools and mobile phone applications (apps)) [39]. On 10 June 2020, ECDC published further guidance on mobile applications to support the dialogue between public health authorities and app developers to ensure that the main epidemiological and operational considerations are taken into account, while also understanding the technological limitations of apps [40]. Public health authorities should be closely involved in the ongoing evaluation and calibration of mobile apps to support contact tracing, especially since empirical data on their effectiveness has not yet been published [41]. Conventional contact tracing should be carried out in parallel with the use of apps since their effectiveness is linked to coverage and an encounter is only detected when both parties have the same app installed [41]. It should also be noted that some groups, including older people, are less likely to have a smartphone.

4.4 Non-pharmaceutical interventions to prevent a large upsurge

Lifting control measures carries the concomitant risk of increased incidence and a departure from the lower transmission rates maintained in most EU/EEA countries and in the UK in recent weeks.

Estimating the effectiveness of any given type of control measure is made challenging by the fact that many countries implemented a suite of measures all at once and in conjunction with similar actions being taken in other countries. In this case, it is necessary to make assumptions about which measure has the dominant effect in a certain setting. For example, where a 'stay-at-home' order is in place, it is not possible to evaluate how much transmission could be reduced by avoiding large indoor gatherings. As countries around the world lift their various measures at different times it will be possible to discern the relative effectiveness of these measures more precisely. If individual countries share their experience and information this can help to inform policy for all. Mobility data, such as that provided by telecommunications companies, give an early indication of the degree to which behaviour has changed as a result of lifting of an intervention [27]. This indication can be available up to a week earlier than the reporting of confirmed cases or hospitalisations associated with resultant increased transmission.

If an increase in the number of reported cases is observed, Member States may consider reinstating the measures that have been lifted or choosing an alternative approach. The strict control measures implemented across many European countries in March and April 2020 appear to have been effective in reducing transmission. However, in this section, we consider the alternatives to 'stay-at-home' orders or recommendations.

It should be noted that people's behaviour may be considerably altered by the COVID-19 pandemic and that it will remain so, even in the absence of legislated control measures. Sweden, for example, did not mandate staying at home but Google mobility data showed that in Stockholm County during the week of 6 April 2020, there was a 49% reduction in the flow of people through transport hubs; a 48% reduction in the number of people working in their usual workplace and a 30% reduction in presence at retail and leisure spaces, compared with baseline levels [42]. Following the phasing out of formal control measures, other countries may also observe continued radical changes in the way people work, travel and socialise.

4.4.1 General measures

In the coming months, some NPIs should be maintained whether or not there is an observed increase in the number of reported COVID-19 cases. NPIs, such as keeping a recommended >2 metres physical distance between individuals in public places; avoiding small, medium-sized and mass gatherings, and implementing a wider policy of teleworking, should be maintained to avoid increased morbidity and mortality (Table 2).

One approach to reducing the intensity of physical distancing involves 'social bubbles' [43,44]. Consistently meeting with the same people, whether friends or co-workers, can allow for a greater degree of contact between people while still minimising the risk of SARS-CoV-2 transmission and associated outbreaks.

The use of face masks in the community should be considered as a complementary measure for occasions when physical distancing cannot be guaranteed, such as when shopping for groceries or using public transport [45,46].

The key to the effectiveness of face masks is using them properly and this can be improved through information campaigns. Recommendations on the use of face masks in the community should carefully take into account evidence gaps, the supply situation, and potential negative side effects.

Meticulous hand and respiratory hygiene, and avoiding touching the face, nose, eyes and mouth should continue to be advocated.

Individuals with symptoms compatible with COVID-19 should be relieved of their work duties and managed in accordance with the national guidance for diagnostic testing and isolation.

The phasing-out of measures involves significant planning and logistical support and adequate notice should be given. In order to adapt to 'the new normal', businesses will need to review how to accommodate guidelines practically by reducing customer/client density and protecting the wellbeing of their staff. Planned adaptations should be sustainable so that they can be maintained in the months to come.

Over the summer, special considerations should be borne in mind. Lifting or partially lifting travel restrictions in the tourist season may lead to longer-distance transmission [27,47]. Other regions receiving a large number of visitors from a locality with more substantial community transmission could see a consequent increase in the number of cases identified by surveillance. The effect of temperature and humidity on transmission of SARS-CoV-2 is not well understood but it is hypothesised that the impact of control measures, and their lifting, will play a larger role in the trajectory of the pandemic than any climatic factors, as observed in other countries with less seasonal climates.

Border closures were implemented extensively in response to SARS-CoV-2, with the aim of reducing long-distance transmission and importation. However, available evidence does not support recommending border closures, which cause significant secondary effects and societal and economic disruption in the EU. Border closures result in substantial challenges for logistics, trade and the movement of people, particularly during a crisis period. It is therefore essential that, while allowing people to move within or between countries, measures should be in place to minimise the risk of infection when travelling across borders and to prevent the re-introduction of sustained community transmission [48].

Countries should also be prepared to amend strategies rapidly in response to indications of increased transmission. Reinstatement or introduction of further interventions could be considered at local or regional level, or for specific population groups, according to the focus of transmission. The goal is to implement NPIs in the most effective and targeted way possible, minimising the social and economic impact on the regions and in groups that are less likely to experience high morbidity or mortality. Table 2 presents a range of control measures that should be maintained or could be considered if there is a need for re-escalation.

Table 2. Selected non-pharmaceutical interventions which should be maintained regardless of transmission rates and those that should be considered in case of increased incidence

Non-pharmaceutical intervention	To be maintained regardless of transmission rates	To be considered in the event of increased incidence	Geo-level	Comment
Isolation and quarantine				
Recommended isolation of confirmed, probable and possible COVID-19 cases	x		National	
Quarantine for contacts of cases	x		National	
Quarantine of specific groups (e.g. travellers from a region or a country with high incidence of COVID-19).		x	National	Can be implemented, but: - Challenging to harmonise classification across countries and regions; - Administrative borders may not match epidemiologically relevant areas; - Questionable effectiveness when community transmission is ongoing across EU/EEA and the UK.
Physical distancing				
'Stay-at-home' orders and recommendations		x	Sub-national (preferably)	To consider at local/regional level first to minimise socio-economic disruption and political acceptability.
Recommended >2 metres physical distance between individuals in public places	x		National	
Interventions in place on opening/closing of public spaces (e.g. closure of non-essential shops, restaurants, entertainment venues)		x	Sub-national (preferably)	To consider at local/regional level first to minimise socio-economic disruption and political acceptability. To consider closing largest and most crowded spaces first.
Interventions in place on opening/closing of public transport		x	Sub-national (preferably)	To consider at local/regional level first.
Interventions in place on opening/closing workplaces		x	Sub-national (preferably)	To consider at local/regional level first.
Interventions in place on teleworking	x		National	
Interventions in place on opening/closing of schools (preschool, primary, secondary and tertiary)		x	Sub-national (preferably)	To consider, depending on pupils' age. Questionable effectiveness, especially in younger age-groups. To consider negative externalities.
Interventions in place for risk groups and vulnerable populations	x		National	To also consider for hard-to-reach populations (e.g. testing in ethnic minorities or deprived populations).
Mass gatherings				
Interventions in place on public gatherings (small, medium and mass gatherings)	x		National	
Face masks				
Recommendation to use face mask in public spaces	x		National	
Limitations on internal movements				
National movement restrictions or recommendations		x	Sub-national	Prefer recommendation over restriction. To consider at local/regional level first, avoiding border closures.
Hygiene measures				
Meticulous hand and respiratory hygiene	x		National	

4.4.2 Targeted measures

For a given level of community transmission, measures to protect risk groups help to mitigate the number of cases that develop severe disease or lead to death. For example, differential recommendations on physical distancing could be made for older people, or for those with underlying health conditions.

Medical face masks may also be considered specifically for the personal protection of individuals vulnerable to unfavourable outcomes in the community, such as older people and those with underlying medical conditions [46].

In areas with community transmission, the wearing of medical face masks should be considered by all healthcare staff providing care to patients. In LTCFs, workers who have direct contact with residents should wear medical face masks or FFP2 respirators in addition to other PPE that are part of droplet and contact precautions [46].

LTCF administrators and healthcare administrators should implement the measures for COVID-19 preparedness and infection prevention and control described in national guidance, or that issued by ECDC: 'Infection prevention and control for COVID-19 in healthcare settings – Third update' [49]. In particular, the designated contact point at the facility (e.g. a liaison nurse), responsible for training in IPC and standard precautions, should ensure training of all who work within the facility, including new staff. All people in healthcare settings and LTCFs, and all who enter those institutions, should practice strict adherence to IPC, including meticulous hand hygiene measures, i.e. using soap and water, or alcohol-based hand rub [46,50].

4.5 Risk communication

It is important for risk communication efforts to remind citizens that the pandemic is ongoing.

People need to be aware that the public health measures aimed at limiting the spread of the virus will continue to impact the way we move, work and travel, and our leisure activities for the foreseeable future. This change in our lives will continue in some form or other for as long as there is no vaccine and/or effective treatment, because a very large proportion of the population still remains susceptible to the disease.

There are a number of uncertainties with regard to our scientific understanding of COVID-19. For example, concerning immunity after infection, the potential infectivity of asymptomatic cases and of children, and the use of facemasks at community level as a preventive measure. These uncertainties need to be acknowledged in risk communication efforts, as do the possibilities to change advice as the evidence base grows [51]. In addition, communication needs to take into account geographical variations in level of the epidemic, and advice may need to be adapted locally.

Some examples of surveys done in different countries have reported varying views and expectations in the population with regard to the lifting of measures. Some people favour less restrictions, and others favour a more careful approach on lifting restrictions [52,53]. From the public health perspective, communication efforts need to emphasise that a careful approach is needed. The population has already made enormous sacrifices in recent months, and we run the risk of jeopardising our collective achievements in limiting the spread of the disease by 'lifting our guard' too soon.

Communication messages should therefore emphasise that we all have the power, through the decisions we make about our movements and our behaviour, to limit the spread of the disease. To get this message across, clear information is needed for citizens on the risk levels of different activities, in order to empower them to take informed decisions. Furthermore, during the period when measures are being lifted, it is important to use careful messaging to encourage people to respect and support the choices of those who prefer to retain more rigorous physical distancing measures for a longer period than their peers. Equally, it is important that those who need to apply more rigorous measures because of their elevated risk of severe disease should be encouraged to do so.

The actions people take at this phase in the pandemic will help to:

- protect them from disease;
- protect those around them who may be at increased risk of severe disease (such as elderly family members and friends, or those with underlying health conditions);
- continue to protect the capacity of the healthcare system to cope with any potential upsurge in cases, to catch up with provision of non-COVID-related healthcare services that may have been adversely affected, and to allow healthcare workers to recuperate from their intensive work in recent months.

Continuous reminders are also needed about the importance of maintaining high standards of hand hygiene and respiratory etiquette, of staying at home if experiencing any COVID-compatible symptoms, and of complying with any other recommendations from the national public health authorities regarding physical distancing and other preventive measures. This is especially important as Europe moves towards the summer holidays, when changes in people's behaviour, activities and movements may cause them to switch back to pre-pandemic and potentially risky behaviour patterns.

Furthermore, it is important for those at greatest risk of serious illness – people living in LTCFs, those with pre-existing health conditions, and elderly people living in the community – to feel the solidarity of the rest of the population if they remain in isolation. Support mechanisms also need to be strengthened for them in order to ensure their continued access to essential services.

If upsurges in transmission occur, public health authorities may need to re-introduce or strengthen physical distancing and other measures, the level of which will depend on national/local contexts and the epidemiological situation. Clear information to the public is therefore needed on the mechanisms in place to monitor the situation, as well as the triggers that will be used and the rationale for reintroduction of certain measures.

5. Limitations

This assessment is undertaken based on information available to ECDC at the time of publication.

There is still limited epidemiological and clinical information on COVID-19 (e.g. efficiency of different modes of transmission, proportion of mild and asymptomatic cases, transmission during incubation and recovery period, effectiveness of treatment regimes, risk factors for severe illness other than age and effective preventive measures).

There are several challenges to assessing the effectiveness of physical distancing measures. It is important to keep in mind that pre/post 'stay-at-home' order comparisons cannot take into account many of the factors that may have influenced disease occurrence, severity, deaths and trend, in recent weeks and months. For instance, if patient management improved over time (including management of patients during early stages of the disease in the community), this could influence trends in hospitalisation, severity and deaths due to COVID-19. In addition, potential concomitant changes in the pathogenicity of COVID-19, for which there is no evidence as yet, would not be accounted for and therefore these would be attributed to the effect of the 'stay-at-home' measures. Finally, the type of 'stay-at-home' measures and compliance with them may vary by country, and by region within each country, and over time making it difficult to assess its overall impact.

It is also important to consider that the lag-time between infection, symptoms, diagnosis, disease notification, death, and death notification should be factored into the analysis, and may be subject to several biases including changes in testing and reporting over time. This means that the effects of introducing any measure will not be seen until weeks after its full implementation, and its impact will continue to be observed for weeks after the measure will have been lifted.

If assessing the impact of 'stay-at-home' measures had potential challenges, assessing the impact of specific measures could be even more complex. These measures are in fact being lifted in the context of a general societal re-opening that is taking place in a variety of forms across Member States (and across regions within each Member State) for a number of different reasons. The factors for consideration include number of, type of, and compliance with other measures still in place; changes in individual behaviour related to physical distancing; differences and changes in population immunity; cultural and societal aspects; regional differences; and changes in testing and reporting.

Since SARS-CoV-2 is a novel pathogen, many features of its transmission and infection dynamics are not yet well characterised. Therefore, the uncertainties of published results and the outcome of modelling exercises should be taken into account when interpreting these findings.

Given these limitations, ECDC will revise the current risk assessment as soon as more information becomes available.

6. Source and date of request

ECDC internal decision, 28 May 2020.

7. Consulted experts

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Annex 1. ECDC publications on COVID-19 (1 February 2020 – 10 June 2020)

- [Mobile applications in support of contact tracing for COVID-19 - A guidance for EU EEA Member States. 10 June 2020.](#)
- [COVID-19 infection prevention and control for primary care, including general practitioner practices, dental clinics and pharmacy settings. 9 June 2020.](#)
- [Options for the decontamination and reuse of respirators in the context of the COVID-19 pandemic. 8 June 2020.](#)
- [Conducting in-action and after-action reviews of the public health response to COVID-19. 4 June 2020.](#)
- [Methodology for estimating point prevalence of SARS-CoV-2 infection by pooled RT-PCR testing. 28 May 2020.](#)
- [Considerations for travel-related measures to reduce spread of COVID-19 in the EU/EEA. 26 May 2020.](#)
- [Projected baselines of COVID-19 in the EU/EEA and the UK for assessing the impact of de-escalation of measures. 26 May 2020.](#)
- [COVID-19 Aviation Health Safety Protocol: Guidance for the management of airline passengers in relation to the COVID-19 pandemic. 20 May 2020](#)
- [Surveillance of COVID-19 at long-term care facilities in the EU/EEA. 19 May 2020.](#)
- [Rapid risk assessment: Paediatric inflammatory multisystem syndrome and SARS -CoV-2 infection in children. 15 May 2020.](#)
- [Infection prevention and control and preparedness for COVID-19 in healthcare settings - third update. 13 May 2020.](#)
- [Contact tracing for COVID-19: current evidence, options for scale-up and an assessment of resources needed. 5 May 2020.](#)
- [Considerations for infection prevention and control measures on public transport in the context of COVID-19. 29 April 2020.](#)
- [Coronavirus disease 2019 \(COVID-19\) and supply of substances of human origin in the EU/EEA - First update. 29 April 2020.](#)
- [Rapid Risk Assessment: Coronavirus disease 2019 \(COVID-19\) in the EU/EEA and the UK– ninth update. 23 April 2020.](#)[Strategies for the surveillance of COVID-19. 23 April 2020.](#)
- [Contact tracing: Public health management of persons, including healthcare workers, having had contact with COVID-19 cases in the European Union - second update. 9 April 2020.](#)
- [Rapid risk assessment: Coronavirus disease 2019 \(COVID-19\) pandemic: increased transmission in the EU/EEA and the UK – eighth update. 8 April 2020.](#)
- [Using face masks in the community - Reducing COVID-19 transmission from potentially asymptomatic or pre-symptomatic people through the use of face masks. 8 April 2020.](#)
- [Guidance for discharge and ending isolation in the context of widespread community transmission of COVID-19 – first update. 8 April 2020.](#)
- [An overview of the rapid test situation for COVID-19 diagnosis in the EU/EEA. 1 April 2020.](#)
- [Infection prevention and control and preparedness for COVID-19 in healthcare settings - second update. 31 March 2020.](#)
- [Infection prevention and control in the household management of people with suspected or confirmed coronavirus disease \(COVID-19\). 31 March 2020](#)
- [Contact tracing: Public health management of persons, including healthcare workers, having had contact with COVID-19 cases in the European Union – first update. 31 March 2020.](#)
- [Cloth masks and mask sterilisation as options in case of shortage of surgical masks and respirators. 26 March 2020.](#)
- [Disinfection of environments in healthcare and non-healthcare settings potentially contaminated with SARS-CoV-2. 26 March 2020.](#)

- [Rapid risk assessment: Novel coronavirus disease 2019 \(COVID-19\) pandemic: increased transmission in the EU/EEA and the UK – seventh update. 25 Mar 2020.](#)
- [Considerations related to the safe handling of bodies of deceased persons with suspected or confirmed COVID-19. ECDC. Stockholm. 23 March 2020.](#)
- [Coronavirus disease 2019 \(COVID-19\) and supply of substances of human origin in the EU/EEA. ECDC. Stockholm. 23 March 2020.](#)
- [Guidance for health system contingency planning during widespread transmission of SARS-CoV-2 with high impact on healthcare services. 17 March 2020.](#)
- [Rapid risk assessment: Novel coronavirus disease 2019 \(COVID-19\) pandemic: increased transmission in the EU/EEA and the UK – sixth update. 25 Mar 2020.](#)
- [Considerations relating to social distancing measures in response to COVID-19 – second update. 23 March 2020.](#)
- [Novel coronavirus \(SARS-CoV-2\) - Discharge criteria for confirmed COVID-19 cases. 10 March 2020.](#)
- [Resource estimation for contact tracing, quarantine and monitoring activities for COVID-19 cases in the EU/EEA. 2 March 2020.](#)
- [Rapid risk assessment: Outbreak of novel coronavirus disease 2019 \(COVID-19\): increased transmission globally – fifth update. 2 March 2020](#)[Guidance for wearing and removing personal protective equipment in healthcare settings for the care of patients with suspected or confirmed COVID-19. 28 February 2020.](#)
- [Checklist for hospitals preparing for the reception and care of coronavirus 2019 \(COVID-19\) patients. 26 February 2020.](#)
- [Interim guidance for environmental cleaning in non-healthcare facilities exposed to SARS-CoV-2. 18 February 2020.](#)
- [Guidelines for the use of non-pharmaceutical measures to delay and mitigate the impact of 2019-nCoV. 10 February 2020.](#)
- [Personal protective equipment \(PPE\) needs in healthcare settings for the care of patients with suspected or confirmed novel coronavirus \(2019-nCoV\). 7 February 2020.](#)

Annex 2. Global epidemic curve

Figure A. Distribution by continent of COVID-19 cases reported in accordance with the applied case definitions in the affected countries, as of 9 June 2020

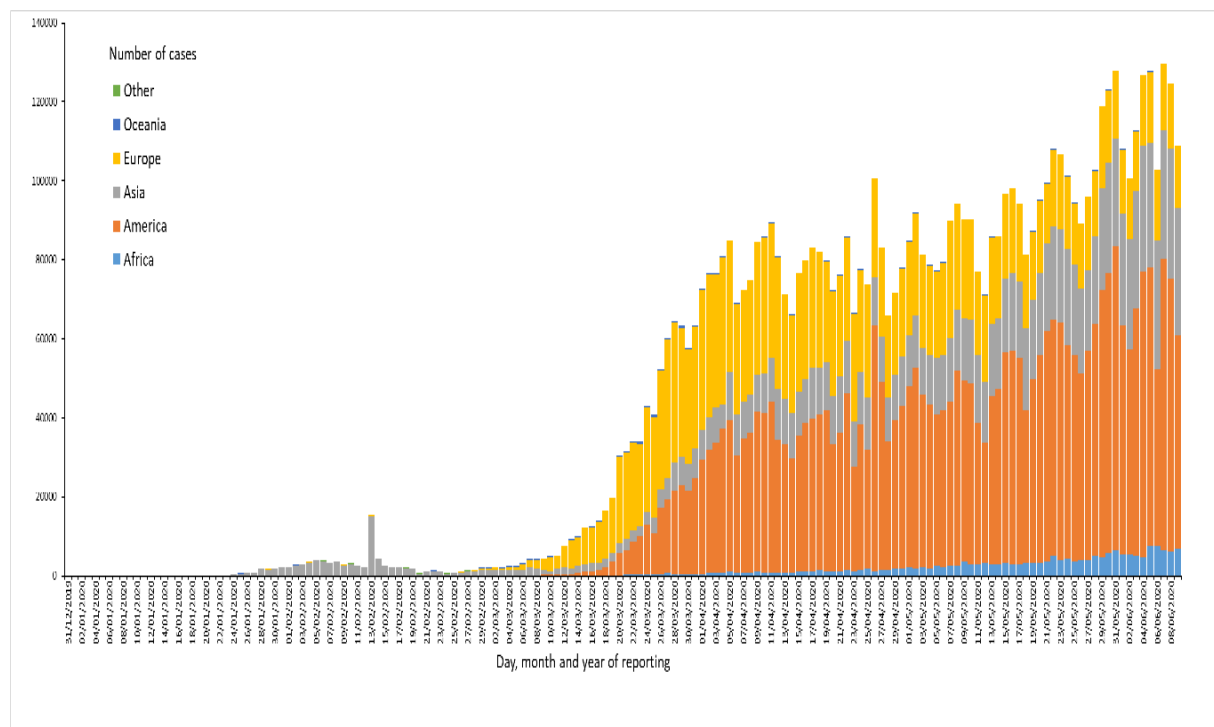
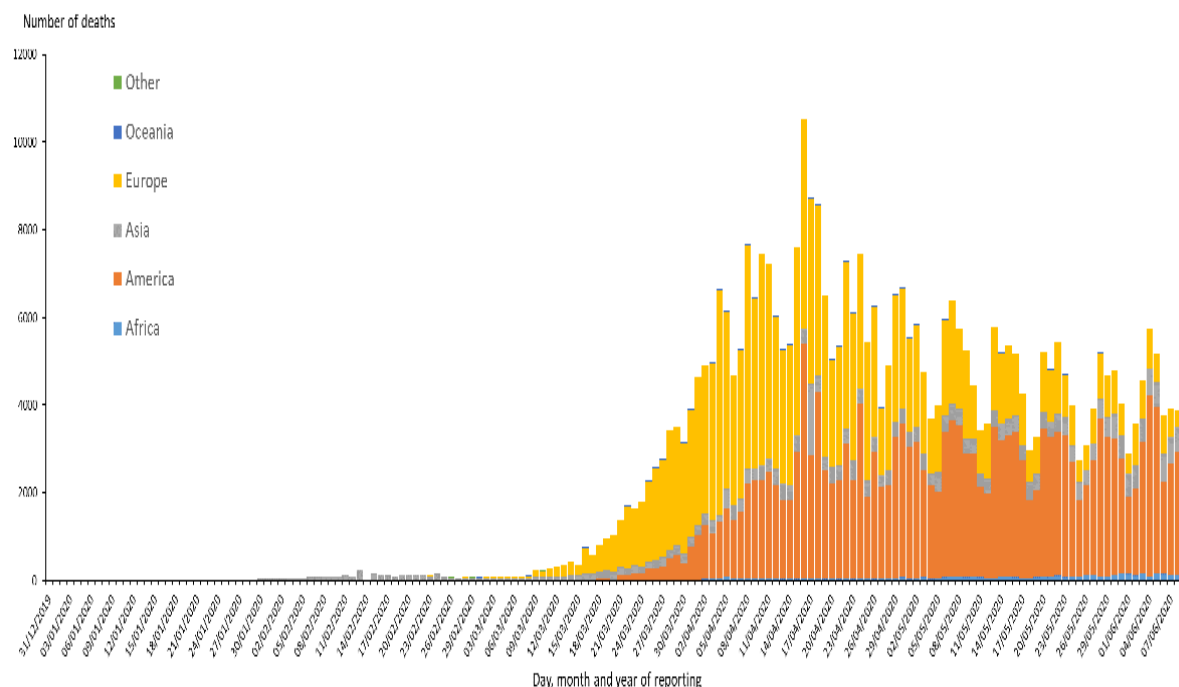
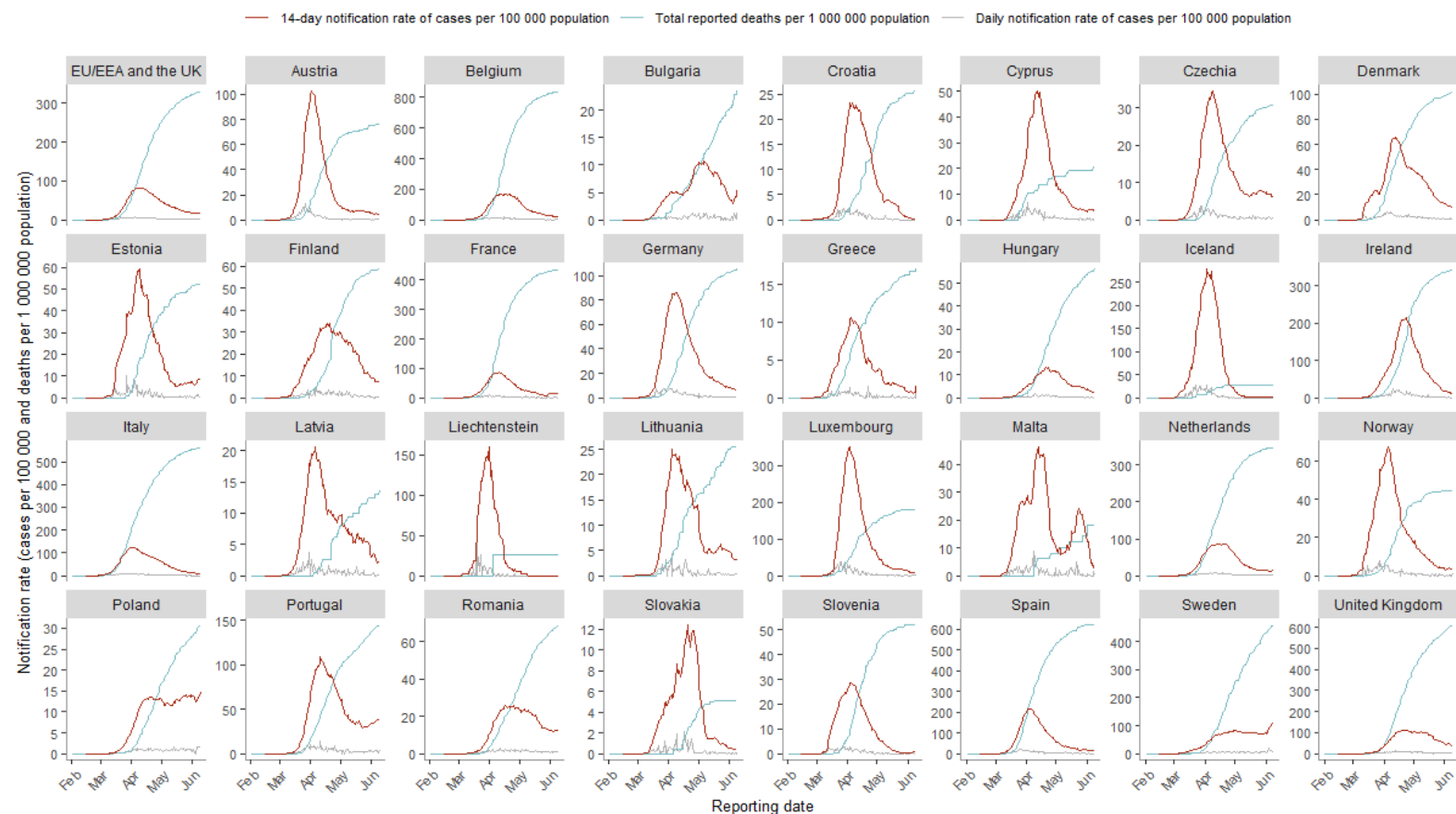


Figure B. Distribution by continent of COVID-19 deaths, as of 9 June 2020



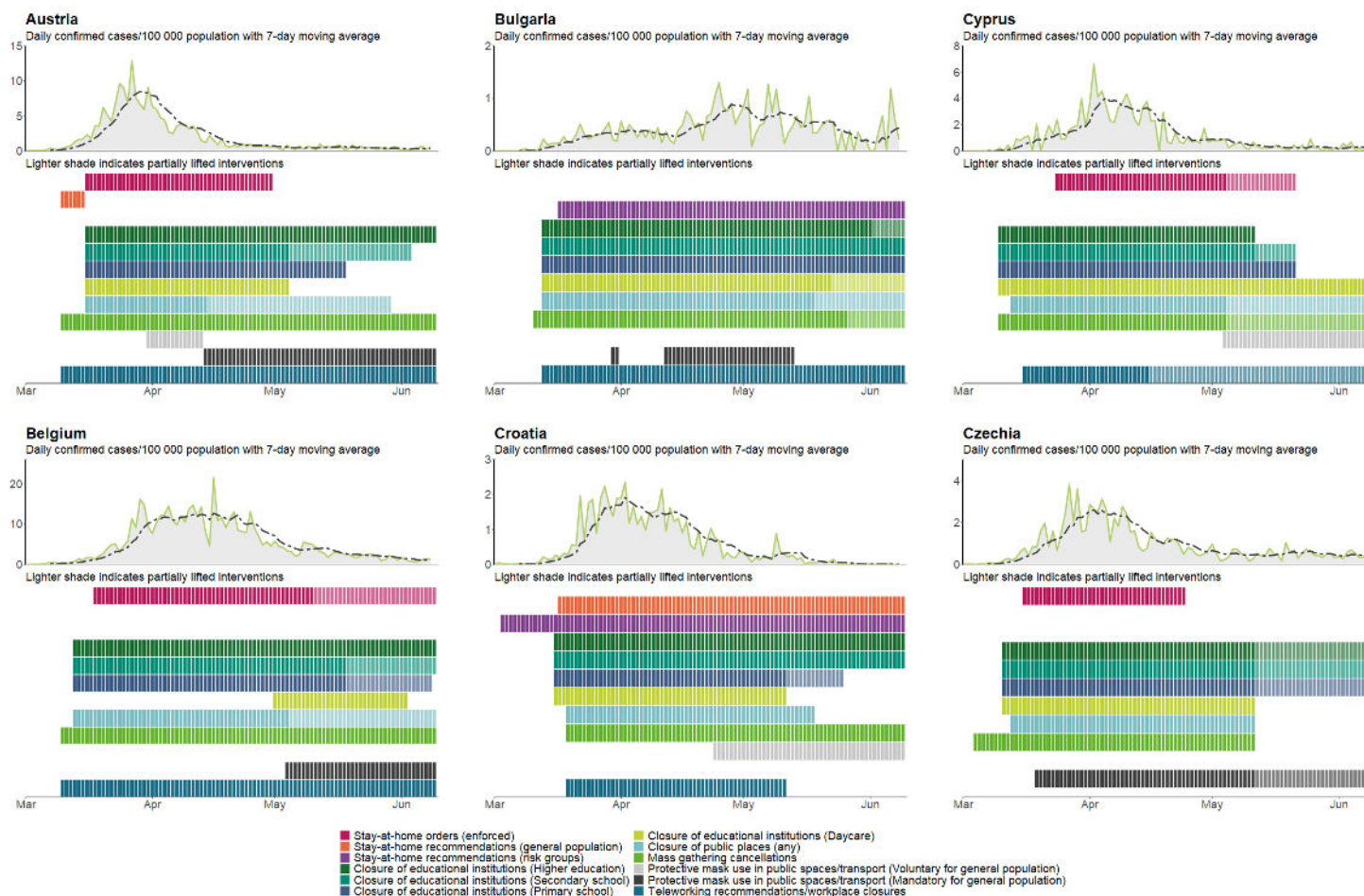
Annex 3. COVID-19 cases and deaths, EU/EEA and the UK

Figure C. Incidence in the last 14 days of reported COVID-19 cases, rate of deaths and daily new cases up to 9 June 2020



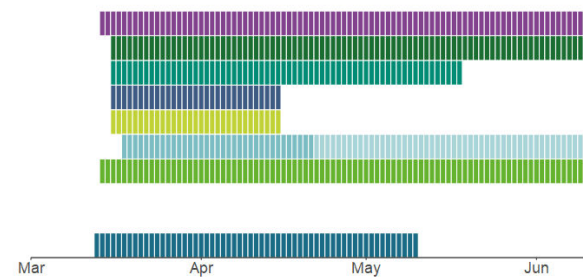
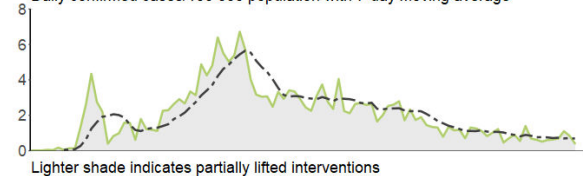
Annex 4. Response measures in EU/EEA countries and the UK, 3 June 2020

Figure D. Daily incidence of reported COVID-19 cases per 100 000 population, daily reported deaths per 1 000 000 population, both with 7-day moving average, and the public health response measures at national level reported from public sources over time

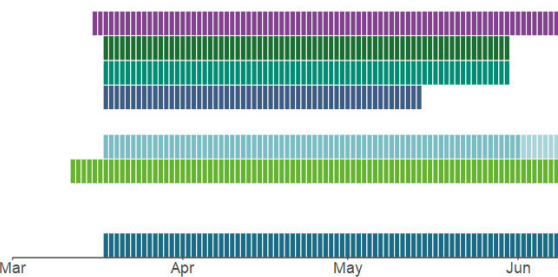
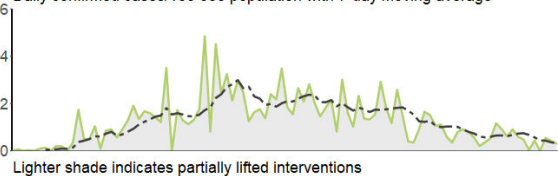


Denmark

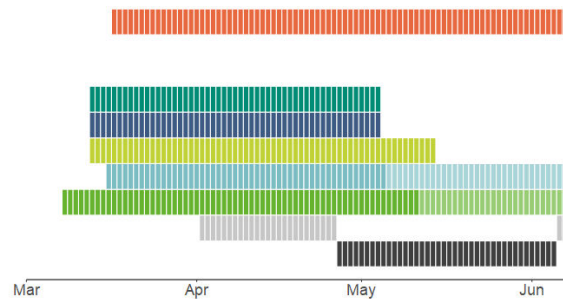
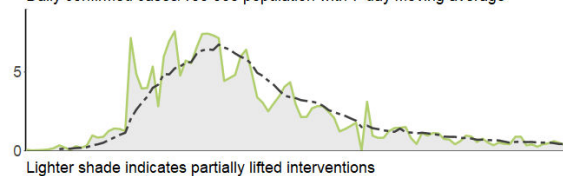
Daily confirmed cases/100 000 population with 7-day moving average

**Finland**

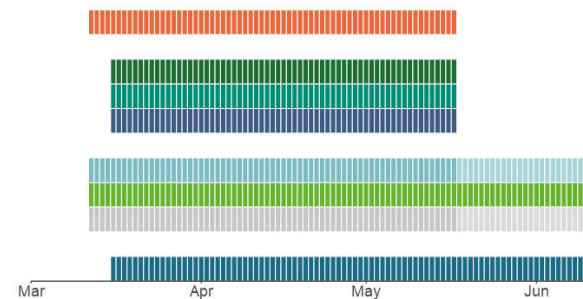
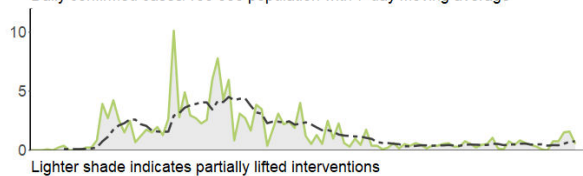
Daily confirmed cases/100 000 population with 7-day moving average

**Germany**

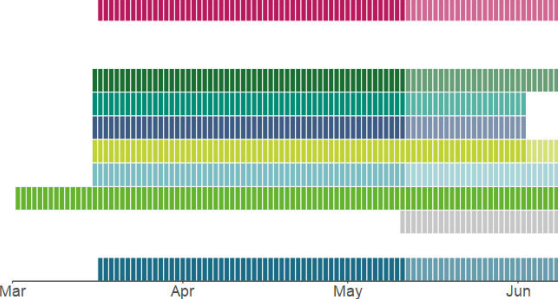
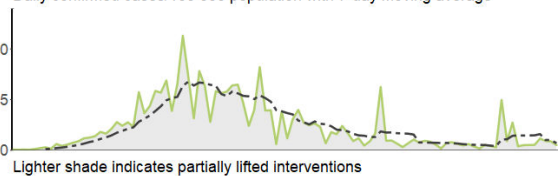
Daily confirmed cases/100 000 population with 7-day moving average

**Estonia**

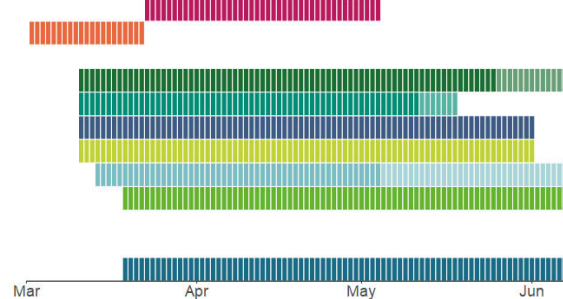
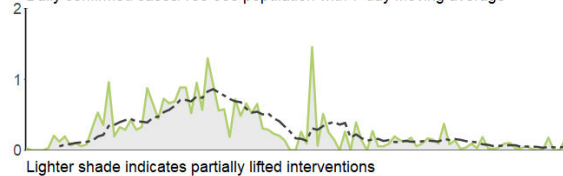
Daily confirmed cases/100 000 population with 7-day moving average

**France**

Daily confirmed cases/100 000 population with 7-day moving average

**Greece**

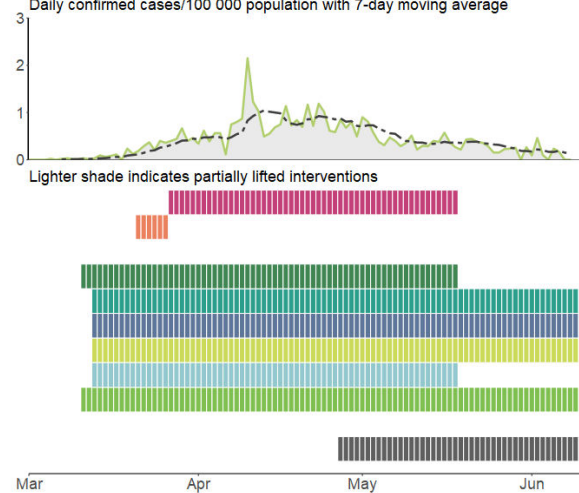
Daily confirmed cases/100 000 population with 7-day moving average



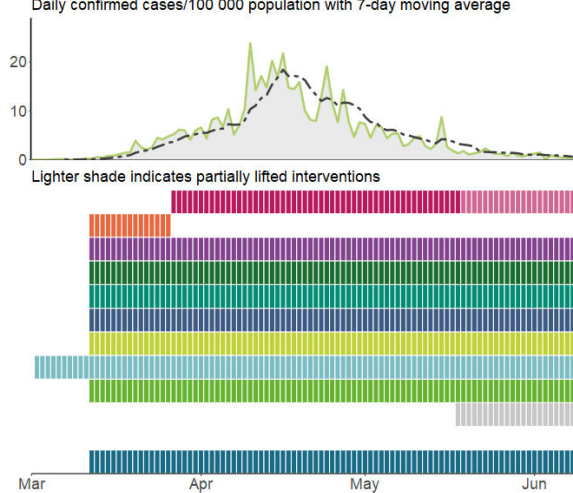
- Stay-at-home orders (enforced)
- Stay-at-home recommendations (general population)
- Stay-at-home recommendations (risk groups)
- Closure of educational institutions (Higher education)
- Closure of educational institutions (Secondary school)
- Closure of educational institutions (Primary school)
- Closure of educational institutions (Daycare)
- Closure of public places (any)
- Mass gathering cancellations
- Protective mask use in public spaces/transport (Voluntary for general population)
- Protective mask use in public spaces/transport (Mandatory for general population)
- Teleworking recommendations/workplace closures

Hungary

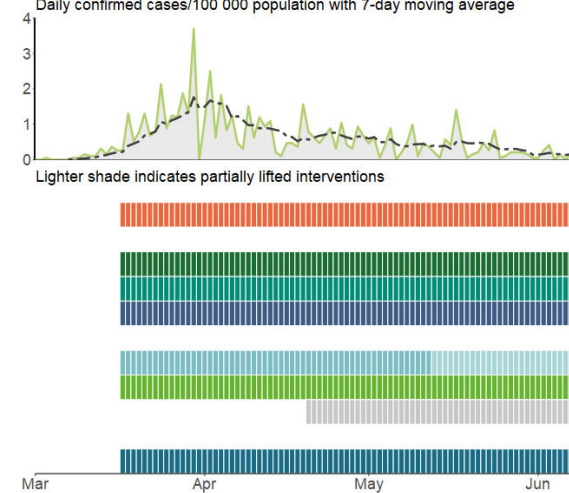
Daily confirmed cases/100 000 population with 7-day moving average

**Ireland**

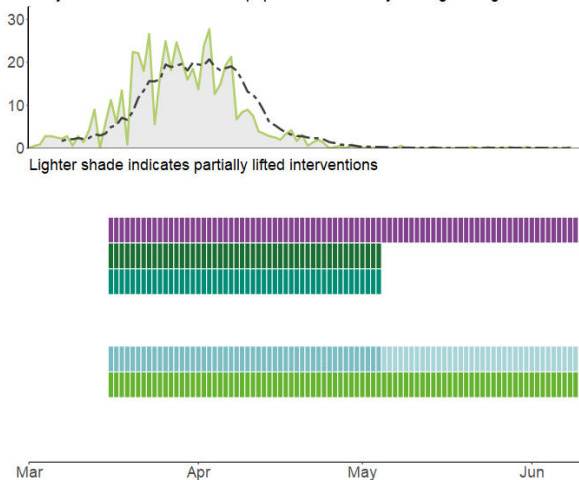
Daily confirmed cases/100 000 population with 7-day moving average

**Latvia**

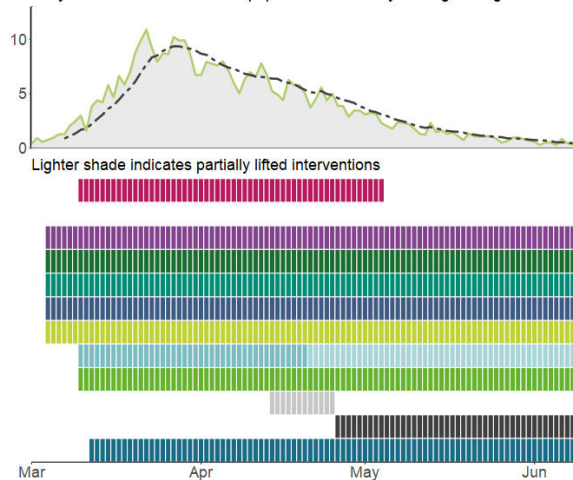
Daily confirmed cases/100 000 population with 7-day moving average

**Iceland**

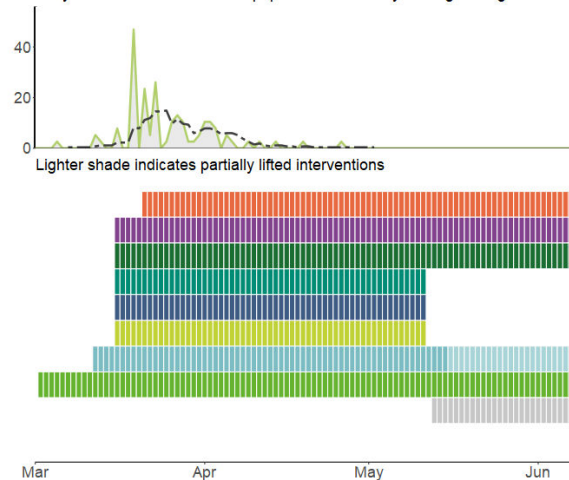
Daily confirmed cases/100 000 population with 7-day moving average

**Italy**

Daily confirmed cases/100 000 population with 7-day moving average

**Liechtenstein**

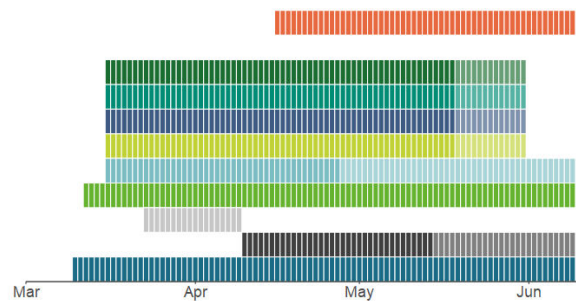
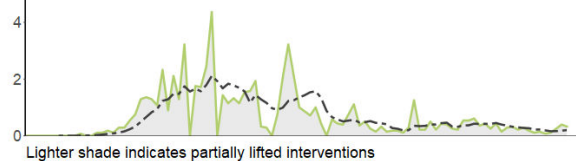
Daily confirmed cases/100 000 population with 7-day moving average



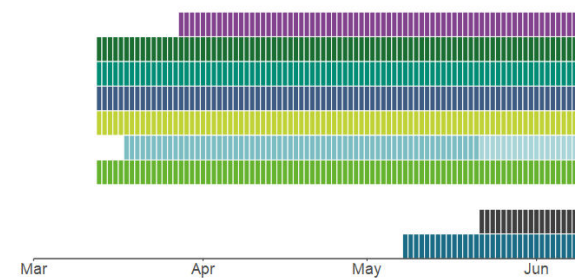
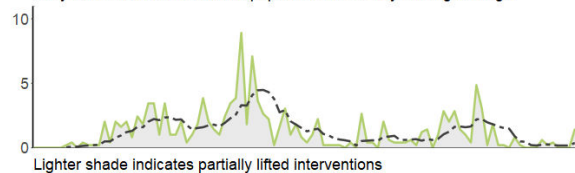
- Stay-at-home orders (enforced)
- Stay-at-home recommendations (general population)
- Stay-at-home recommendations (risk groups)
- Closure of educational institutions (Higher education)
- Closure of educational institutions (Secondary school)
- Closure of educational institutions (Primary school)
- Closure of educational institutions (Daycare)
- Closure of public places (any)
- Mass gathering cancellations
- Protective mask use in public spaces/transport (Voluntary for general population)
- Protective mask use in public spaces/transport (Mandatory for general population)
- Teleworking recommendations/workplace closures

Lithuania

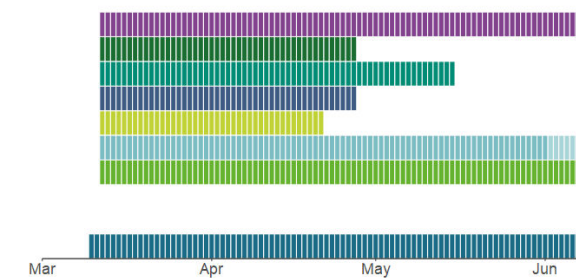
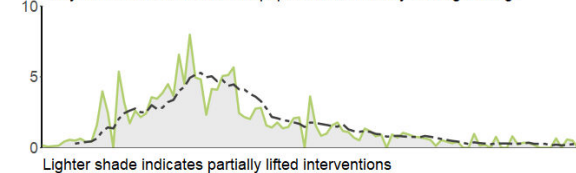
Daily confirmed cases/100 000 population with 7-day moving average

**Malta**

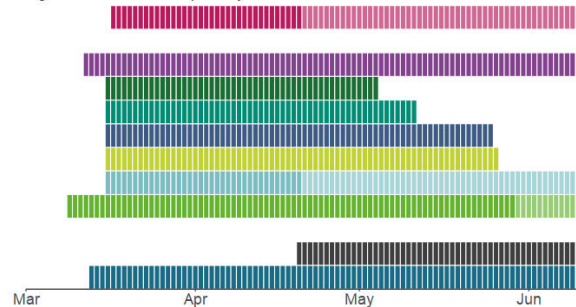
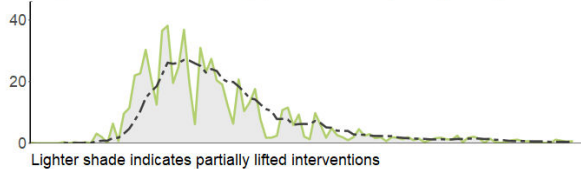
Daily confirmed cases/100 000 population with 7-day moving average

**Norway**

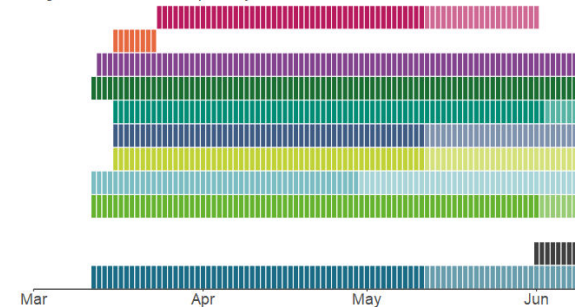
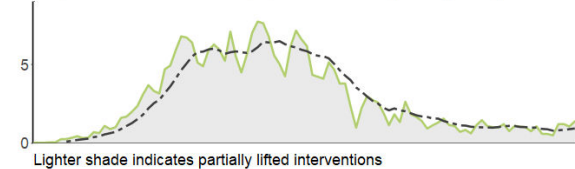
Daily confirmed cases/100 000 population with 7-day moving average

**Luxembourg**

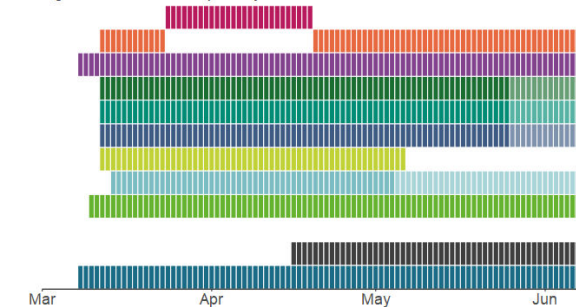
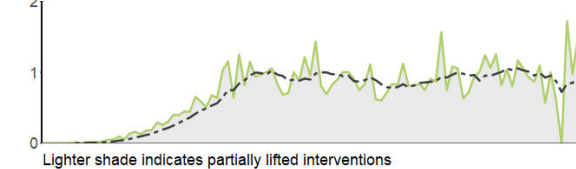
Daily confirmed cases/100 000 population with 7-day moving average

**Netherlands**

Daily confirmed cases/100 000 population with 7-day moving average

**Poland**

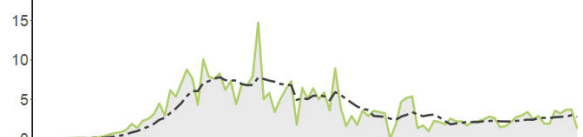
Daily confirmed cases/100 000 population with 7-day moving average



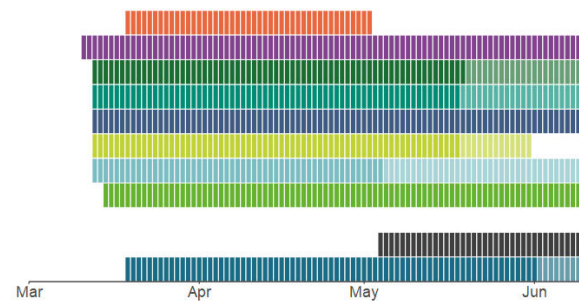
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Portugal

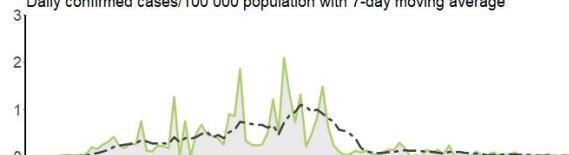
Daily confirmed cases/100 000 population with 7-day moving average



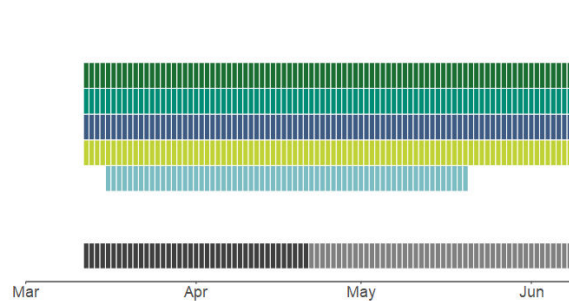
Lighter shade indicates partially lifted interventions

**Slovakia**

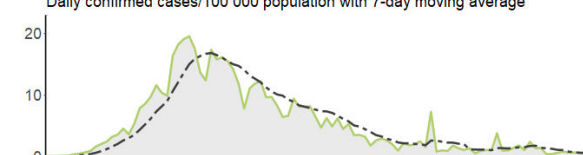
Daily confirmed cases/100 000 population with 7-day moving average



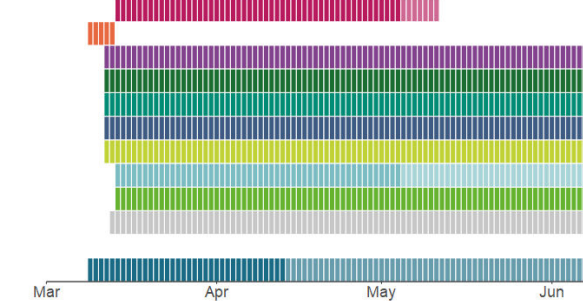
Lighter shade indicates partially lifted interventions

**Spain**

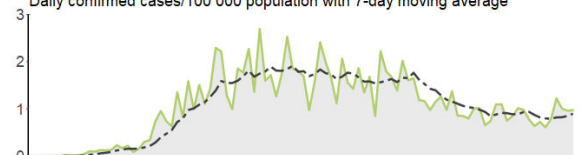
Daily confirmed cases/100 000 population with 7-day moving average



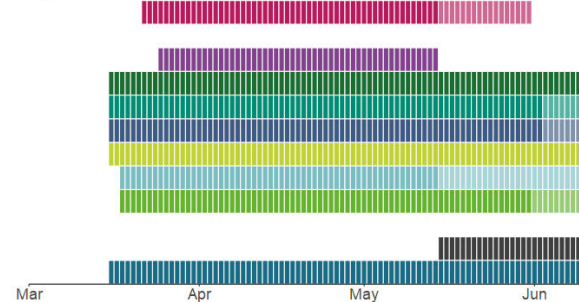
Lighter shade indicates partially lifted interventions

**Romania**

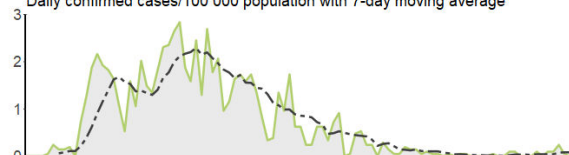
Daily confirmed cases/100 000 population with 7-day moving average



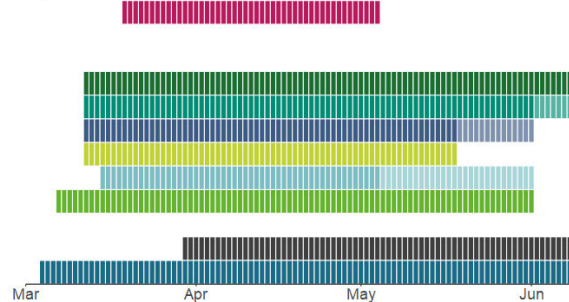
Lighter shade indicates partially lifted interventions

**Slovenia**

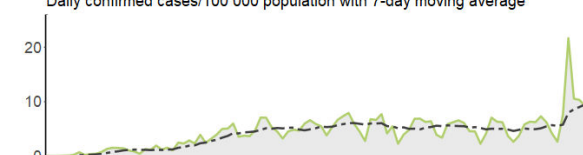
Daily confirmed cases/100 000 population with 7-day moving average



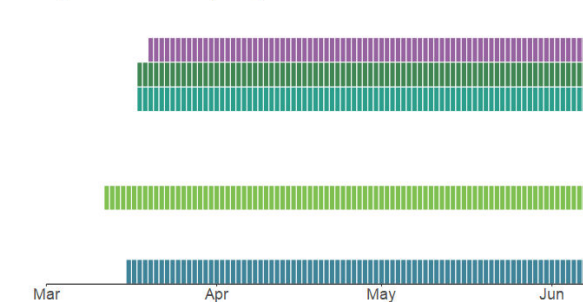
Lighter shade indicates partially lifted interventions

**Sweden**

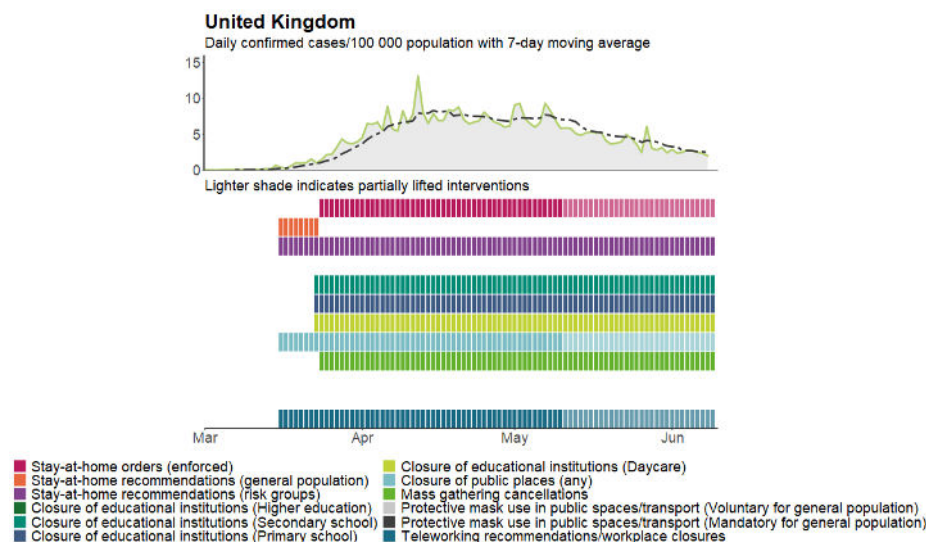
Daily confirmed cases/100 000 population with 7-day moving average



Lighter shade indicates partially lifted interventions



- Stay-at-home orders (enforced)
- Stay-at-home recommendations (general population)
- Stay-at-home recommendations (risk groups)
- Closure of educational institutions (Higher education)
- Closure of educational institutions (Secondary school)
- Closure of educational institutions (Primary school)
- Closure of educational institutions (Daycare)
- Closure of public places (any)
- Mass gathering cancellations
- Protective mask use in public spaces/transport (Voluntary for general population)
- Protective mask use in public spaces/transport (Mandatory for general population)
- Teleworking recommendations/workplace closures



**The data on response measures in Annex 4 are based on information available from official public sources as of Wednesday 3 June at 10:00 and may not capture measures being taken by countries that are not reported on publicly available websites. The situation is evolving rapidly and this represents a snapshot of the measures that countries in the EU/EEA and the UK have reported to date. The response measures displayed are national measures, reported on official public websites. Response measures collected include mass gathering cancellations (for specific events or a ban on gatherings of a particular size); closure of public spaces (including restaurants, entertainment venues, non-essential shops, partial or full closure of public transport etc.); closure of educational institutions (including daycare or nursery, primary schools, and secondary schools and higher education); 'stay-at-home' recommendations for risk groups or vulnerable populations (such as the elderly, people with underlying health conditions, physically disabled people etc.); 'stay-at-home' recommendations for the general population (which are voluntary or not enforced); and 'stay-at-home' orders for the general population (these are enforced and also referred to as 'lockdown'), use of protective masks in public spaces/on public transport (mutually exclusive voluntary recommendations and mandatory obligations shown separately) and also teleworking recommendations/closure of workplaces.*

The data on response measures has several limitations. Firstly, there is substantial heterogeneity in physical distancing policies and their implementation between countries. For instance, the level of enforcement of measures may vary between countries and there may be specific rules and exceptions to the measures, making interpretation of the data challenging. The measures displayed in these figures are measures reported at national level and it should be noted that due to the evolution of the outbreak in certain regions, regional or local measures often preceded national ones. The exact dates of introduction were often available from official sources but delays in their implementation may have occurred. Additionally, availability of public data from official government sources varies among countries. For some countries, data are no longer available on official websites concerning measures that are no longer in force, which may result in the data for more recent measures being more complete.