Strengthening population health surveillance:
a tool for selecting indicators
to signal and monitor the wider effects of the COVID-19 pandemic
Strengthening population health surveillance: a tool for selecting indicators to signal and monitor the wider effects of the COVID-19 pandemic
Abstract
The COVID-19 pandemic and the actions taken to control the spread of the coronavirus have a substantial impact on population health beyond the morbidity and mortality caused by the virus directly. To provide a comprehensive picture of the impact of the pandemic, suitable indicators for signalling and tracking these wider effects should be incorporated into national monitoring activities related to COVID-19. This document provides a tool for Member States to select suitable indicators for this purpose. It consists of 1) a longlist of mechanisms through which the COVID-19 pandemic influences population health and related indicator areas, 2) a set of important considerations for monitoring the wider effects of the pandemic focusing on health inequalities, data sources, and working with trends, and 3) a list of core indicators that can serve as a practical starting point for Member States for monitoring the wider effects of the pandemic.

This guidance document is part of the WHO Regional Office for Europe’s work on supporting Member States in strengthening their health information systems. Helping countries to produce solid health intelligence and institutionalized mechanisms for evidence-informed policy-making has traditionally been an important focus of WHO’s work and continues to be so under the European Programme of Work 2020–2025.

Keywords:
PANDEMIC, INFORMATION MANAGEMENT, HEALTH STATUS, HEALTH CARE, VULNERABLE POPULATIONS
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Background

Population health monitoring or surveillance can be defined as the regular and institutionalized production and dissemination of information and knowledge about the health status of a population and its determinants, aimed at informing policy-making (Verschuuren and van Oers (2019)). It is essential for policy-makers to have a reliable and clear picture of how health is distributed in a given population, and what indicators contribute to or reduce opportunities to be healthy. Therefore, surveillance of population health and well-being is the first of WHO’s ten Essential Public Health Operations (World Health Organization (no date a)). During the first phases of the COVID-19 pandemic, the focus of surveillance and monitoring has been on the transmissibility, severity and direct impact of COVID-19, and on public health and health care capacity to inform outbreak management and transformation strategies. However, as has become increasingly clear since then, the COVID-19 pandemic and the actions taken to control the spread of the coronavirus also have an impact on population health beyond the morbidity and mortality caused by the virus directly. These indirect or wider effects include both negative and positive impacts. To provide a comprehensive picture of the impact of the COVID-19 pandemic, suitable indicators for signalling these effects and keeping track of their development should be incorporated into national monitoring activities related to COVID-19. This will inform recovery strategies by enabling development of targeted interventions and effective application of resources to counteract the wider health effects of the COVID-19 pandemic.

Approach for this tool

Aim and structure

The aim of this document is to provide a tool for Member States to select suitable indicators for signalling and keeping track of the wider effects of the COVID-19 pandemic for incorporation into their national monitoring schemes, thus strengthening national population health surveillance in the COVID-19 era. This tool consists of:

- A longlist of mechanisms through which the COVID-19 pandemic influences population health and related indicator areas
- A set of important considerations for monitoring the wider effects of the COVID-19 pandemic:
  - Health inequalities and vulnerable groups
  - Data sources
  - Working with trends
- A list of core indicators.
As a first step in developing this tool, a conceptual framework was devised. There are many indirect effects of the outbreak that affect health through various pathways. The conceptual framework logically arranges these pathways, providing a clear and concise thinking aid for identifying and structuring the main indirect effects of the COVID-19 pandemic on population health. The framework is presented in the next section. Based on this framework, a longlist of mechanisms and indicator areas was developed. For example, one pathway through which the COVID-19 pandemic affects population health is fear of getting infected or spreading infection. One specific underlying mechanism that can be discerned under this pathway involves stockpiling disinfectants and cleaners, as a result of which people are more exposed to dangerous substances and use too much disinfectant or apply disinfectants improperly, which leads to an increase in poisonings. Relevant indicator areas for monitoring this development include the occurrence of poisoning incidents and the occurrence of related morbidity and mortality. Another mechanism through which fear of infection can influence population health is inappropriate use of antibiotics. This can result in an increase in antimicrobial resistance. Relevant indicator areas for keeping track of this development include antibiotics prescription and consumption patterns and the emergence and spread of drug-resistant pathogens.

Member States are encouraged to select indicator areas that are relevant for their national situation and define specific indicators for those areas to be included in their (sub)national monitoring schemes. Data structures and indicator sets already in use can be built on, such as existing population health surveillance and health system performance assessment frameworks. When additional indicators are needed, the recommendation is to make use of existing, preferably internationally agreed, indicator definitions as much as possible. WHO has various indicator resources that can be used for reference, including:

- Global Reference List of 100 Core Health Indicators (World Health Organization (2018))
- WHO Global Health Observatory (Global Health Observatory (no date a))
- WHO Mortality Database (Global Health Observatory (no date b))
- WHO Global Health Expenditure Database (Global Health Expenditure Database (no date))
- WHO European Health Information Gateway (European Health Information Gateway (no date))
- Surveillance networks for infectious diseases: European Region measles and rubella surveillance (WHO Epi Data (no date)), global measles and rubella surveillance (World Health Organization (no date b)), polio surveillance (regional and global (Case Count (no date)), weekly epidemiological records (World Health Organization (no date c)).

In addition, useful indicators can also be found in other international organizations, such as the United Nations’ Sustainable Development Goal (SDG) indicators (United Nations (no date a), the OECD’s Health Care Quality and Outcomes (OECD (2018)), and the European Commission’s European Core Health Indicators (European Commission (no date)).

As a second element, this tool contains a set of important considerations for working with indicators to signal and keep track of the wider effects of the COVID-19 pandemic. These are aspects that need careful thought in order to reach an appropriate and policy-relevant set of indicators. First, in terms of the wider impacts of the COVID-19 pandemic on population health, several specific vulnerable groups can be identified. Given the fact that the pandemic has forcefully exposed the inequalities...
in our society (Stiglitz (2020)), it is important to apply an equity lens when monitoring the wider effects of COVID-19 to gain insight into who is most heavily affected by the outbreak, supporting targeted actions and deployment of resources where they are needed the most. Therefore, this tool contains an overview of groups that are likely to be affected the most by the wider effects of the COVID-19 pandemic, providing guidance for relevant disaggregations of indicators. Second, the tool describes important aspects related to data sources for monitoring the wider effects of the COVID-19 pandemic, including the potential use of alternative data sources (that is, data sources that are not commonly used for population health surveillance) and the desired frequency of data collection, which will differ for different kinds of indicators. Finally, as regards the wider effects COVID-19, the main goal will be to learn whether a certain indicator value has changed compared to the situation prior to the COVID-19 pandemic, that is, determine whether there is a disruption in the time trend. The tool explains the importance of setting an appropriate baseline and defining appropriate parameters for follow-up.

The third element of this tool is a list of core indicators. This list is based on the longlist of mechanisms and indicator areas, and contains a concise set of indicators that reflect the most important wider effects of the COVID-19 pandemic and are well-established and already being used regularly in many countries. Thus, in most cases, these indicators can easily be used as part of monitoring activities related to COVID-19. Therefore, the list of core indicators can serve as a practical starting point for Member States for monitoring the wider effects of the COVID-19 pandemic.

**How the tool was developed**

The conceptual framework for structuring the pathways of the wider effects of the COVID-19 pandemic was developed by first developing a draft framework based on the findings of a quick literature scan, including a first set of underlying mechanisms and indicator areas to populate the longlist. Next, the draft framework and the preliminary longlist were reviewed through an internal consultation among WHO experts at the regional and global level, as well as an external consultation (see the acknowledgement section at the beginning of this document). The experts suggested additional mechanisms through which population health can be affected and indicator areas that could be used to capture them, including additional literature to substantiate the suggested mechanisms. This feedback was processed in the next version of the tool. It is noted that, because the identified mechanisms and related developments in population health are often preliminary in nature, peer-reviewed research papers and official statistics are often not yet available to substantiate them. Therefore, other information sources (for example, press releases from international organizations, news items) are also used for reference in this tool, as are experiences from earlier crises.

The draft version of the tool, developed as described above, was subsequently released for public consultation. Eleven responses were submitted. The feedback derived from this public consultation was processed in this final version of the tool. Most notably, the indicator shortlist was added to the document to provide Member States with a concrete starting point for monitoring the wider effects of the COVID-19 pandemic.

When selecting relevant mechanisms and indicator areas, the primary focus has been on what was happening in and relevant for the European Region. Nevertheless, the framework for structuring
the pathways for the main effects of the COVID-19 pandemic on population health and many of the indicator areas presented in this tool will also be useful for other geographical regions.

It is noted that the information presented in this document represents the state of play in January 2021. Knowledge is growing and new insights about the wider effects of the COVID-19 pandemic will continue to emerge. WHO will monitor these emerging insights and update this document when necessary. The respondents to the public consultation also indicated that they would deem it useful if WHO would regularly update this document to reflect the latest state of play.

**Conceptual framework**

*Five main pathways for the wider effects of the COVID-19 pandemic*

The framework presented in this document focuses on the wider effects of the COVID-19 pandemic and, therefore, looks beyond the morbidity and mortality directly caused by COVID-19. In other words, it focuses on the effects on the general population rather than on COVID-19 patients (see Fig. 1). The framework discerns five main pathways through which the COVID-19 pandemic and the related containment measures can have an impact on general population health. First, the COVID-19 pandemic is affecting population health directly by causing fear of getting infected or a loved one getting infected, or fear of spreading the infection to others. Then, there are four main pathways through which the pandemic has an indirect effect on population health. The first of these (Pathway 2 in Fig. 1) is impaired health care for non-COVID-19 conditions. In our framework, these health care effects have been subdivided into effects on access, quality, and financial protection, reflecting the goals of universal health coverage (World Health Organization (no date d)). Next, COVID-19-related containment measures, such as quarantine and stay-at-home measures, can impact health directly (Pathway 3). Finally, containment measures impact population health by affecting health determinants. Here, we can distinguish between risk factors, such as tobacco use, alcohol use and diet (Pathway 4), and wider determinants of health (Pathway 5). The wider determinants are also called the social determinants of health. These are the conditions in which people are born, grow, live, work and age (Dahlgren and Whitehead (1991); World Health Organization (2021)). More details on the underlying mechanisms through which health is affected can be found in the longlist of mechanisms and indicator areas (Table 1). Next to these five pathways, the framework also contains a domain that covers the concrete health outcomes in terms of general health status and well-being, morbidity and mortality.
**Fig. 1. Conceptual framework of the main pathways for the wider effects of the COVID-19 pandemic**

**Population affected:**
- COVID-19 patients
- General population*

**Pathway:**
- Morbidity and mortality caused by COVID-19 and its treatment

**Outcomes:**
- Short- and long-term health outcomes

1. Fear of getting infected or spreading infection
2. Impaired healthcare for non-COVID-19 conditions Access, quality, financial protection
3. Direct effects of containment measures
4. Indirect effects of containment measures through risk factors
5. Indirect effects of containment measures through wider determinants of health

**Scope of this WHO tool**

*Several vulnerable groups (e.g. women, children, older people, prisoners, migrants, people experiencing homelessness) are likely to be affected more severely. Specific attention should be given to these groups while monitoring the wider effects of the COVID-19 pandemic on population health.*

### Health can be affected through different pathways in parallel

The framework presented in Fig. 1 is a simplified rendering of reality, aimed at illustrating the main pathways through which the COVID-19 pandemic can affect general population health. The framework does not reflect the fact that in practice health outcomes can be affected by various mechanisms in parallel, and that there can be interconnections between the different mechanisms. For example, mental health can be negatively affected by fear caused by the COVID-19 pandemic directly, by stress caused by containment measures such as working from home in combination with school closures, and by stress caused by (fear of) losing one’s job. The occurrence of vaccine-preventable diseases and measurements thereof can be influenced by COVID-19 containment measures, reduced resources for infectious disease surveillance, and changes in health-seeking behaviours. In addition, there can be interconnections between the different pathways. For example, containment measures may lead to a diminished availability of public transport, making it more difficult for people to seek care or for health care workers to get to work, thus affecting access to health care. Stress caused by the fear of getting infected may result in increased alcohol or tobacco use, thus affecting risk factors. For interpreting monitoring results, it is important to be aware of all the various pathways that may lead to changes in indicator values.
In the conceptual framework described in the previous paragraph, five main pathways through which the COVID-19 pandemic affects population health have been identified. In Table 1 below, for each of these pathways, the related underlying mechanisms are described, together with relevant indicator areas for keeping track of these developments. Next to the five pathways, the conceptual framework includes a domain to capture the actual effects of all the influences of the COVID-19 pandemic on population health. Table 2 lists relevant indicators for monitoring these health outcomes. Table 1 and 2 together form the longlist of underlying mechanisms and indicator areas.

Table 1. Mechanisms underlying the main pathways of the wider effects of the COVID-19 pandemic and related indicator areas

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Underlying mechanism</th>
<th>Indicator areas</th>
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</thead>
<tbody>
<tr>
<td>1. Fear of getting infected or spreading infection</td>
<td>Fear causes elevated rates of stress and anxiety (Douglas et al. (2020); IASC (2020); OECD and European Union (2020); World Health Organization (no date e)).</td>
<td>• Psychological distress</td>
</tr>
<tr>
<td></td>
<td>Social stigma and discrimination against infected persons, health care professionals, people from certain ethnic communities and those who have travelled to affected countries (CDC (2020); World Health Organization (2020d)).</td>
<td>• Health literacy • Discrimination</td>
</tr>
<tr>
<td></td>
<td>An increase in poisonings due to:</td>
<td>• Poisoning incidents</td>
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<tr>
<td></td>
<td>• Stockpiling of disinfectants and cleaners, resulting in people being more exposed to dangerous substances. This applies to children in particular and this effect is enlarged by school closings;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Using too much disinfectant or applying disinfectants improperly;</td>
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<tr>
<td></td>
<td>• Hazardous self-medication attempts.</td>
<td></td>
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<td></td>
<td>(Collie (no date); World Health Organization (no date f); Chang et al. (2020); Le Roux, Sinno-Tellier and Descatha (2020); Pan American Health Organization (2020)).</td>
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<tr>
<td></td>
<td>• Misinformation on the alleged protective effect of alcohol when ingested (Alekperova (2020); Farmer (2020); Regnum (2020); World Health Organization (2020b)).</td>
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</tbody>
</table>
1. Longlist of mechanisms and indicator areas

<table>
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<tr>
<th>Pathway</th>
<th>Underlying mechanism</th>
<th>Indicator areas</th>
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</thead>
</table>
|         | Inappropriate use of antibiotics during the pandemic contributes to a further increase in antimicrobial resistance (Arshad et al. (2020); World Health Organization (2020g); World Health Organization (no date g)). | • Antibiotics prescription and consumption patterns  
• Emergence and spread of drug-resistant pathogens |
|         | People avoid seeking care for non-COVID-19 conditions (Czeisler et al. (2020); Douglas et al. (2020)), including long-term residential care (Cripps et al. (2020)). Next to fear of infection, people also avoid seeking care based on the assumption that care will not be available for them because the system is overwhelmed and because they were instructed by the government only to seek care when absolutely necessary. These mechanisms can be found under Pathway 2: Impaired health care for non-COVID-19 conditions (access). | See access-related indicator areas below |

2. Impaired health care for non-COVID-19 conditions: access

**Overarching mechanism:** During the COVID-19 pandemic, there has been widespread disruption of regular health care services, leading to missed or postponed care for non-COVID-19 conditions. This disruption is caused both by developments that affect the supply of services and the demand for services. These underlying mechanisms are described in the table below. When health systems are overwhelmed, morbidity is exacerbated, disability intensifies, and both mortality from the outbreak (direct) and mortality from vaccine-preventable and treatable conditions (avoidable) increase (World Health Organization (2020i)). At the end of spring/beginning of summer 2020, about 40% of essential health care services had been at least partially disrupted in the European Region (World Health Organization (2020i)). Disruption of regular service delivery is seen throughout the health care system:

• Primary health care (OECD and European Union (2020); Rawaf et al. (2020))
• Emergency care (Mulholland et al. (2020); OECD and European Union (2020); Rausa et al. (2020))
• Perinatal / maternity care (Coxon et al. (2020)), including breastfeeding support (Vazquez-Vazquez et al. (2021))
• Sexual and reproductive health care services (Endler et al. (2020); IPPF (2020); Wenham (2020))
• Mental health services (European Parliament (2020); OECD and European Union (2020))
• Drug services, including opioid substitution therapy and clean drug-using equipment (EMCDDA (2020a); EMCDDA (2020b))
• Outpatient care (Mehrotra et al. (2020); OECD and European Union (2020); World Health Organization (2020))
• Hospital care (Mulholland et al. (2020); Panteli (2020); RIVM (2020a))
• Preventive services:
  • Vaccination (World Health Organization (no date h); Santoli et al. (2020))
  • Screening (Dinmohamed et al. (2020); World Health Organization (2020))
  • Rehabilitation (World Health Organization (2020))
  • Palliative care (World Health Organization (2020))
  • Surveillance (World Health Organization (2020e))
• Social care (Cripps et al. (2020); Giebel et al. (2020))

• Unmet health care needs  
• Waiting times  
• Coverage of health care services for non-COVID-19 conditions (number of consultations, number of interventions)  
• Patient-Reported Experience Measures (PREMs)
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| **Developments influencing supply (services)** | • Health care services are being confronted with increased demand generated by the COVID-19 outbreak, which results in cancellation of non-urgent care not related to COVID-19 and repurposing of staff. See references above (overarching mechanism).  
• As the COVID-19 pandemic progresses, staffing shortages will likely occur due to health care staff exposures, illness, or need to care for family members at home. This may result in a serious weakening of the health service provided and a much greater workload and stress for those left in the health care (CDC (2020); Sim (2020))  
• The pandemic has led to an unprecedented adoption and use of telemedicine, which has helped preserve continuity of care (OECD and European Union (2020); Panteli (2020); Rawaf et al. (2020)) | See indicator areas above (overarching mechanism). And:  
• Human resources for health / workload  
• COVID-19 infections and quarantines among health care staff  
• Stress / well-being among health care staff  
• Telemedicine consults |
| **Developments influencing supply (medical products)** | • Containment measures such as lockdowns, shutting countries down or reducing transport within and between them has affected the manufacturing, supply and distribution of medicines, leading to constraints in the global medicines supply chain. Demand also increased for some medicines used in patients with COVID-19. In addition, decreased manufacturing capacity and increased purchasing costs have contributed to shortages (European Medicines Agency (no date)).  
• Severe and mounting disruption to the global supply of personal protective equipment (PPE) – caused by rising demand, panic buying, hoarding and misuse – is putting lives at risk from the new coronavirus and other infectious diseases (World Health Organization (2020k); Paton (2021)).  
• Increased demand and problems in the supply chain also cause shortages of other critical medical equipment, such as ventilators and dialysis materials (Mahase (2020); Miller et al. (2020); Ranney, Griffeth and Jha (2020)). | • Supply of and demand for (essential) medicines  
• Supply of and demand for PPE  
• Supply of and demand for other critical medical equipment (ventilators, dialysis materials) |
| **Developments influencing demand** | • Governments instructed the population to relieve pressure on services by staying away from primary care unless absolutely necessary (Rawaf et al. (2020)).  
• Government or public transport lockdowns hinder access to health facilities (Douglas et al. (2020); World Health Organization (2020))).  
• People avoid seeking care because they assume care will not be available for them / the doctor will be too busy (Rubin (2020); Sarwari and Goode (2020)).  
Another important reason why patients avoid seeking care is fear of infection. This mechanism can be found under Pathway 1: Fear of getting infected or spreading infection. | See indicator areas above (overarching mechanism) |
### 1. Longlist of Mechanisms and Indicator Areas

<table>
<thead>
<tr>
<th>Pathway</th>
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<th>Indicator areas</th>
</tr>
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<tbody>
<tr>
<td>2. Impaired health care for non-COVID-19 conditions: quality</td>
<td>Balancing care provision for COVID-19 patients and catching up with delayed care needs for non-COVID-19 patients increases the pressure on health care systems to such an extent that quality of service delivery is compromised (Coma et al. (2020); World Health Organization (2020)).</td>
<td></td>
</tr>
</tbody>
</table>
• Health care quality in various settings (for example, primary care, hospital care, acute care)  
• Patient safety / adverse effects  
• Average length of stay in hospital for (specific) non-COVID-19 conditions  
• Patient-Reported Experience Measures (PREMs)  
• Adherence to medical guidelines  
• Timeliness of quality control measures |
| 2. Impaired health care for non-COVID-19 conditions: financial protection | The economic recession that has arisen due to the consequences of nationwide stay-at-home orders and business closures may result in diminished government spending on health and social protection (Douglas et al. (2020)). This was the case during the previous financial crisis, when public spending on health per person fell or slowed in many countries between 2007 and 2012 (Thomson et al. (2014)). |  
• Public spending on health (by function, provision, illness)  
• Public spending on social services  
• Out-of-pocket payments  
• Catastrophic and impoverishing health spending  
• Unmet needs |
| 3. Direct effects of containment measures | Essential quarantine, isolation and social distancing interventions risk serious social and psychological harm, and can lead to an acute, severe sense of social isolation and loneliness with potentially serious mental and physical health consequences (Douglas et al. (2020); Hwang et al. (2020)). |  
• Household size  
• Social support  
• Loneliness  
• Psychological distress  
• Work-life balance  
• Time spent on unpaid domestic and care work  
• Time spent outside / time for leisure activities |

Note: Indicator areas for health outcomes, that is, measures capturing the actual effects on health status, can be found in Table 2.
### Pathway: Underlying mechanism

<table>
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<tr>
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</table>
|         | Working at home can affect mental health negatively (for example, through feelings of isolation and fatigue), but it can also have positive effects (for example, through decreased stress) (Franklin (2020); Oakman et al. (2020)). An increase in musculoskeletal complaints has also been reported (Franklin (2020); NOS (2020a)). | • Psychological distress  
• Home working conditions                                                                                                                                       |
|         | Measures such as stay-at-home orders and school closings have led to an increase in domestic violence, including child maltreatment and intimate partner violence, especially against women (OECD (2020a); World Health Organization (2020a)). | • Interpersonal violence (intimate partner violence, child maltreatment, elderly abuse)                                                                 |
|         | People relying on informal care may experience an increase in support provided, for example, shopping assistance, reflecting the rise of volunteering and community action that was sparked by the pandemic (Evandrou et al. (2020)). On the other hand, there have been disruptions in the provision of formal social care (see Pathway 2, access). | • (Unmet) need for informal care  
• Social support                                                                                                                                 |
|         | Measures such as increased promotion of hand hygiene and physical distancing do not only prevent the spread of COVID-19, but also of other infectious diseases (NOS (2020b); Olsen et al. (2020)). | • Adherence to containment measures such as hygiene and physical distancing measures                                                                 |
| 4. Indirect effects of containment measures through risk factors | Stress related to the COVID-19 pandemic appears to affect smokers in different ways, with some smokers increasing their smoking and others decreasing it. While boredom and restrictions in movement might have stimulated smoking, the threat of contracting COVID-19 (see Pathway 1) and becoming severely ill might have motivated others to improve their health by quitting smoking (Bommelé et al. (2020); Edmond (2020); Yach (2020)). | • Tobacco use                                                                                                                                           |
|         | On the one hand, alcohol use can go up as a result of an increase in psychological distress, especially in specific subgroups (Sallie et al. (2020)), and on the other hand, alcohol use may go down due to decreased physical availability of and financial means to procure alcohol, especially in the earlier phases of the pandemic (Rehm et al. (2020)). | • Alcohol use                                                                                                                                           |
|         | Containment measures such as stay-at-home orders and closures of places such as gyms, stadiums, pools, parks, and playgrounds have limited options for people to be physically active. This can lead to longer screen time, irregular sleep patterns and worse diets, resulting in weight gain and loss of physical fitness (UN DESA (2020)). On the other hand, taking a walk or a bike ride might be one of the few options for leisure left, and due to school closures, children may have more time to play outside. Fear of infection (see Pathway 1) may also motivate people to improve their health to be better protected against the virus, and to walk or bike instead of using public transport (Ding et al. (2020)). Studies on the effects of the COVID-19 pandemic on physical activity show mixed results (Huber et al. (2020); RIVM (2020b); Schmidt et al. (2020); Tornaghi et al. (2020)). | • Physical activity  
• Overweight/obesity  
• Hypertension  
• High cholesterol                                                                                                                                   |
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</tr>
</thead>
</table>
| 1. Longlist of mechanisms and indicator areas                                                                                                  | Stay-at-home orders and stockpiling food, due to the restriction in grocery shopping, influence food patterns. In addition, the interruption of the work routine could result in boredom, which in turn is associated with a greater energy intake. Stress caused by the pandemic can lead to overeating, especially of so-called comfort foods that are high in sugar. Unhealthy temptations at home, more free time and less social control can be other factors contributing to less healthy food intake. On the other hand, dietary patterns can also change for the better (for example, to boost one’s immune system (see Pathway 1), due to having fewer temptations at work during lockdown or more time to prepare healthy meals) (Beard-Knowland (2020); Di Renzo et al. (2020); Wageningen University & Research (2020)). | • Diet  
• Overweight/obesity  
• Hypertension  
• High cholesterol |
| 2. Changes in drug consumption patterns during the initial phases of the COVID-19 pandemic in Europe have been noted, mostly resulting from the implementation of confinement and social distancing measures. The use of cocaine and MDMA decreased, and local shortages of heroin were reported, resulting in an increase in the use of replacement substances and attempts to access opioid substitution treatment services in some countries (see Pathway 2, access). A more mixed picture is reported for cannabis, with some occasional users stopping or reducing its use, while more frequent users may have increased consumption, mainly to relieve boredom and anxiety (European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) (2020a); EMCDDA (2020)). | • Illicit drug use                                                                                                                                                                                                                                                                         |
Education and health and well-being are intrinsically linked. The evidence behind the importance of education as a determinant of health is amongst the most compelling (The Lancet Public Health (2020)). Most educational institutions around the world cancelled in-person instruction and moved to remote learning and teaching during the pandemic to contain the spread of COVID-19. A study carried out by the European Commission’s Joint Research Centre shows that estimates for a few selected EU countries consistently indicate that, on average, students will suffer a learning loss. It is also suggested that COVID-19 will not affect students equally, will negatively influence both cognitive and non-cognitive skill acquisition, and may have important long-term and short-term consequences (European Commission, Joint Research Centre (2020)).

The lockdown and related measures implemented by many European countries to stop the spread of COVID-19 have led to a sudden decrease in economic activities, including a drop in road transport in many cities. Concentrations of nitrogen dioxide ($\text{NO}_2$) – a pollutant mainly emitted by road transport – have decreased in many European cities where lockdown measures have been implemented. Although a decrease in concentrations of fine particulate matter (PM2.5) may also be expected, a consistent reduction cannot yet be seen across European cities. This is likely due to the fact that the main sources of this pollutant are more varied. Exposure to air pollution can lead to adverse health effects, including respiratory and cardiovascular diseases (EEA (2020)).

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<thead>
<tr>
<th>Pathway</th>
<th>Underlying mechanism</th>
<th>Indicator areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education and health and well-being are intrinsically linked. The evidence behind the importance of education as a determinant of health is amongst the most compelling (The Lancet Public Health (2020)). Most educational institutions around the world cancelled in-person instruction and moved to remote learning and teaching during the pandemic to contain the spread of COVID-19. A study carried out by the European Commission’s Joint Research Centre shows that estimates for a few selected EU countries consistently indicate that, on average, students will suffer a learning loss. It is also suggested that COVID-19 will not affect students equally, will negatively influence both cognitive and non-cognitive skill acquisition, and may have important long-term and short-term consequences (European Commission, Joint Research Centre (2020)).</td>
<td>Education</td>
<td>Education, Childhood development</td>
</tr>
<tr>
<td>The lockdown and related measures implemented by many European countries to stop the spread of COVID-19 have led to a sudden decrease in economic activities, including a drop in road transport in many cities. Concentrations of nitrogen dioxide ($\text{NO}_2$) – a pollutant mainly emitted by road transport – have decreased in many European cities where lockdown measures have been implemented. Although a decrease in concentrations of fine particulate matter (PM2.5) may also be expected, a consistent reduction cannot yet be seen across European cities. This is likely due to the fact that the main sources of this pollutant are more varied. Exposure to air pollution can lead to adverse health effects, including respiratory and cardiovascular diseases (EEA (2020)).</td>
<td>Air quality, Transport behaviour</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2. Indicator areas for monitoring health outcomes

<table>
<thead>
<tr>
<th>Health outcomes</th>
<th>Indicator areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>General health and well-being</td>
<td>Self-perceived (mental) health</td>
</tr>
<tr>
<td></td>
<td>Quality of life</td>
</tr>
<tr>
<td></td>
<td>Well-being</td>
</tr>
<tr>
<td></td>
<td>Sleep</td>
</tr>
<tr>
<td></td>
<td>Patient-Reported Outcome Measures (PROMs)</td>
</tr>
<tr>
<td>Morbidity</td>
<td>Occurrence of chronic diseases</td>
</tr>
<tr>
<td></td>
<td>Occurrence of mental disorders</td>
</tr>
<tr>
<td></td>
<td>Occurrence of (vaccine-preventable) infectious diseases</td>
</tr>
<tr>
<td></td>
<td>Occurrence of non-fatal injuries</td>
</tr>
<tr>
<td>Mortality</td>
<td>All-cause mortality</td>
</tr>
<tr>
<td></td>
<td>Excess mortality</td>
</tr>
<tr>
<td></td>
<td>Mortality from chronic diseases</td>
</tr>
<tr>
<td></td>
<td>Mortality from infectious diseases other than COVID-19</td>
</tr>
<tr>
<td></td>
<td>Fatal injuries (including suicide)</td>
</tr>
<tr>
<td></td>
<td>Maternal mortality</td>
</tr>
<tr>
<td></td>
<td>Neonatal mortality</td>
</tr>
<tr>
<td></td>
<td>Under-five mortality</td>
</tr>
<tr>
<td></td>
<td>Avoidable mortality(^1)</td>
</tr>
</tbody>
</table>

1 Avoidable mortality can be split up into amenable and preventable mortality. A death is amenable if, in the light of medical knowledge and technology, at the time of death, all or most deaths from that cause could be avoided through optimal quality health care. A death is preventable if, in the light of understanding of the determinants of health at the time of death, all or most deaths from that cause could be avoided by public health interventions in the broadest sense (Eurostat, [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Amenable_and_preventable_deaths_statistics&oldid=337528](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Amenable_and_preventable_deaths_statistics&oldid=337528)).
2. Important considerations for monitoring the wider effects of COVID-19

2.1. Indicator disaggregations for identifying health inequalities and vulnerable groups

The wider effects of the COVID-19 pandemic are having an impact across the whole of society, but some groups are more heavily affected than others. It is important to take these inequalities into account when monitoring the wider effects to gain insight into who is impacted the most by the outbreak, supporting targeted actions and deployment of resources where they are needed most. Basic disaggregations of indicators by age groups and gender are highly relevant in this respect, but other vulnerable groups can be discerned as well, demanding additional, more sophisticated stratifications of the data. The most relevant disaggregations are listed and explained below.

Several of these groups are not only more vulnerable to the secondary effects of the pandemic, but also at increased risk of being exposed to the virus and getting infected, for example, because they live in cramped housing conditions or have a job that cannot be done from home. This aspect is not taken into account here, as the focus of this tool is on the wider effects of the pandemic.

It should be noted that certain vulnerable groups may be underrepresented in or excluded from regular data collections used for population health monitoring. This implies that to obtain a good picture of the impact of the COVID-19 pandemic on these subpopulations, additional targeted data collection efforts may be needed (for example, for people experiencing homelessness, prisoners, older people in institutionalized care, refugees).

Age groups

Older people – Since the virus has largely affected the elderly, lockdown measures for older individuals have been stricter, increasing the risk for social isolation. In addition, older people are more likely to live alone and less likely to use digital tools and online communications, adding to this risk. Stricter lockdowns in combination with higher threat of illness and loss of social support may result in higher levels of anxiety and depression among the older population (Douglas et al. (2020); Martins Van Jaarsveld (2020)).

Children – School closures, physical distancing and confinement increase the risk of poor nutrition among children, their exposure to domestic violence, increase their anxiety and stress, and reduce access to vital family and care services, such as immunization, school feeding, and mental health and psychosocial support. Furthermore, increased unsupervised online internet use has magnified issues around sexual exploitation and cyberbullying (OECD (2020a); UNICEF (2020)).
Young adults – The mental health impact of the COVID-19 pandemic has been significantly greater in young adults than the rest of the adult population and is associated with increased loneliness and lower positive mood (Jia et al. (2020); RIVM (2021)). Moreover, young people are disproportionately affected by the COVID-19 crisis, with multiple shocks, including disruption to education and training, employment and income losses, and greater difficulties in finding a job (ILO (2020)).

Gender

Women – Women are more at risk in an economic downturn because they are more often engaged in short-term, part-time, or informal employment. The closure of schools to control COVID-19 might have a differential effect on women, who provide most of the informal care within families, with the consequence of limiting their work and economic opportunities or causing increased levels of stress if homeschooling and working from home need to be combined. Women may be less likely than men to have power in decision-making related to the outbreak, and consequently, their sexual and reproductive health needs may go unmet. Women are at increased risk of intimate partner violence during lockdown measures and during the recovery phase due to potential cuts in services (United Nations Europe and Central Asia Issue-Based Coalition (no date); Douglas et al. (2020); United Nations (2020); Wenham (2020); World Health Organization and Human Reproduction Programme (2020)).

Men – Evidence from earlier economic crises suggests that men are at increased risk of suicide in times of economic downturn (Chang et al. (2013); Coope et al. (2014)).

Socioeconomic status (income, education, occupation)

People on low income – Effects of the pandemic will be particularly severe as they already tend to have poorer health and are more likely to be in insecure work without financial reserves. Such financial uncertainty disproportionately harms the mental health of those in low socioeconomic groups and exacerbates their stress (Douglas et al. (2020); Patel et al. (2020)).

Workers on precarious contracts, informal workers or self-employed – High risk of adverse effects from loss of work and lack of income. Although the COVID-19 pandemic appears to disproportionately affect those in informal employment, they often receive less government support than the formally employed (Douglas et al. (2020); Webb, McQuaid and Rand (2020)).

Place of residence / living situation

People living in more deprived areas – Affected by multiple factors that put them at increased risk of being impacted by the wider effects of the COVID-19 pandemic, such as low income, poor/crowded housing, precarious work, migrant status, and barriers to accessing health services (Bambra et al. (2020); Patel et al. (2020)).

People living alone – At increased risk of isolation and loneliness during self-isolation and quarantine (Bu, Steptoe and Fancourt (2020); Groarke et al. (2020)).
People living in prisons/detention centres – People in prisons and other places of detention are already deprived of their liberty and may react differently to having further restrictive measures imposed upon them. Children in detention centres are particularly vulnerable to the negative effects of restrictions on activities and social/family contacts. Control measures restricting social interaction may aggravate behavioural problems (Savage (2020); World Health Organization (2020f); World Health Organization (2020c)).

People living in residential care facilities – At increased risk of isolation and loneliness due to lockdown measures completely or severely limiting social interaction with other residents and access for visitors, including family and informal caregivers (Simard and Volicer (2020); Verbeek et al. (2020)).

People experiencing homelessness – May be affected by disrupted support services, as organizations that typically provide assistance for those experiencing homelessness appear to be struggling to meet the immediate needs of this group in light of the COVID-19 outbreak (Clark-Ginsberg, Hunter and Henwood (2020); Douglas et al. (2020)).

People with chronic condition or disability

People with chronic conditions – Affected by disrupted care and support services ((Douglas et al. (2020)), see Table 1).

People with a disability – People with disabilities are facing isolation and exclusion as social support services and networks – including personal assistance like caregivers – are disrupted. They may have difficulties carrying out daily activities such as showering and using the restroom without assistance (Douglas et al. (2020); Reliefweb (2020)).

Refugee or migrant status

Migrants – May experience health vulnerabilities due to socioeconomic status, being in crowded or otherwise suboptimal environments, restriction to eligibility or access to health and other services, or cultural-linguistic barriers to health information (IOM (no date)). Migrants also have an unfavourable position on the labour market, among other reasons, because they are strongly overrepresented in the sectors most affected by the pandemic and because of their generally less stable employment conditions. At risk of stigma and discrimination due to misinformation regarding the role of immigrants in the spread of the virus (OECD (2020b); World Health Organization (2020h)).

Refugees – People in refugee camps suffer cramped living conditions, weak or non-existent health care systems, and lack of access to clean water (USGLC (2020)). They may experience limited access to health care, which some may even avoid out of fear of deportation. This situation is aggravated by language barriers. Overwhelmed medical services in refugee camps could lead to an increase in mortality from infectious diseases (other than COVID-19) and socioeconomic hardship can exacerbate mental health problems (Alemi et al. (2020)).
**The need to look beyond simple disaggregations**

The most important stratifiers for identifying those who are the most vulnerable to the wider effects of the COVID-19 pandemic have been listed above. It should be noted, however, that in order to identify the most disadvantaged groups, it may be necessary to combine several of these disaggregating factors. For example, all children will be impacted by school closures, but the poorest children are the least likely to benefit from the widespread digitalization that was deployed to mitigate education loss, because they are the least likely to live in good home-learning environments with internet connection (OECD (2020a)). And while all people living in care homes are at increased risk of isolation and loneliness due to lockdown measures, the impacts will be especially burdensome for residents with cognitive impairment and dementia (Simard and Volicer (2020)). These examples illustrate the need to look beyond simple disaggregations to get a good picture of the inequalities related to the COVID-19 pandemic.

**2.2. Data sources**

As can be seen in Table 1, the wider effects of the COVID-19 pandemic are very diverse in nature. This implies that for a comprehensive monitoring of these effects, data from many different sources are needed, including, for example, cause-of-death statistics, surveys, disease registries, data from health care services, police records, social benefits data, and sales statistics. In addition to these more commonly used data sources, alternative sources can be considered to meet the information needs for monitoring the wider effects. For example, data on usage of mental health helplines could be a good way of gaining insight into the burden of mental health problems. Helpline usage data can also be a useful source of information on the occurrence of interpersonal violence, as can shelter utilization records and police crime data. Data from consumer panels can provide insight into risk factors such as alcohol and tobacco use and diet. Such alternative data sources can serve as a pragmatic proxy when the commonly used data sources are not available or cannot provide data with the desired frequency (see below), but they can also complement regular sources and thus contribute to a richer evidence base for policy-making. Big data, such as data from online platforms, social media and apps, could be a useful complementary source of information about how people respond to the pandemic and the measures taken to contain it. If quantitative data are lacking or insufficient, using expert opinion as a source of information could also be considered.

Another aspect to take into account when looking for suitable data sources is the desired frequency of data collection and reporting. Some of the wider effects of the COVID-19 pandemic will emerge quickly, and related indicator values may change rapidly. This implies that regular data collection routines may not be flexible and timely enough to accurately capture these developments. For example, containment measures can have an immediate impact on risk factors like tobacco use and physical activity. However, data on these risk factors are usually collected once a year or once every few years. Therefore, relying on the regular survey schedule will not suffice and including additional (online and/or telephonic) waves/modules in the schedule could be considered to ensure timely data. Indeed, several countries have set up dedicated survey schemes to capture how COVID-19 and the measures being used to prevent its spread are affecting the physical, mental,
and social well-being of people. In some countries, regular interview surveys are being conducted on a continuous basis. If this is the case, preliminary data could be reported on a quarterly basis, for example. Likewise, preliminary data from various registries in which data are being collected on a continuous basis could be reported on a monthly or quarterly basis to provide insight into quickly changing indicator values. However, caution should be exercised when communicating about such data because time lags can occur between the timing of events and their recording in registries, and often it will not have yet been possible to carry out all the required quality checks. Therefore, it should be stressed that these data can provide a preliminary indication of how the situation is developing, but they are not yet complete and fully validated. Finally, alternative data sources such as use of helplines or police records can be relied upon to obtain more frequent data than regular sources would be able to provide (see above).

2.3. Working with time trends

When looking at the wider effects COVID-19, the main goal will be to learn whether a certain indicator value has changed compared to the situation prior to the COVID-19 pandemic, that is, determine whether there is a disruption in the time trend. This implies that, where possible, a baseline needs to be set. For example, a relevant indicator could be the number of life-saving medical interventions performed. To determine to what extent the indicator values for the current situation are divergent from what is to be expected under normal circumstances, the values can be compared, for example, to the average value for the same month for several preceding years. The most appropriate baseline may differ per indicator. In addition, the required granularity and duration for follow-up needs to be defined for each indicator, considering the time lag between the concerned determinant and its effects and what is necessary for optimally informing policy-making. For example, missed urgent care for non-COVID-19 conditions is likely to result in an increase in morbidity and mortality in the short term. Capturing the relevant trends here and providing timely evidence for policy-making will require indicators to be measured at relatively short intervals (for example, once a month). However, it may take many years for the effects of changes in risk factors or vaccination rates to become visible in morbidity and mortality data. To capture these effects, longer-term follow-up is necessary, and a regular reporting frequency of once a year will suffice. On the other hand, as addressed in the previous paragraph, the actual changes in underlying risk factors (for example, tobacco use, alcohol use) are expected to occur quickly and will be measurable in the short term, which indicates that shorter periods of follow-up are again necessary for capturing these changes.

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2 For example, Public Health Wales is conducting weekly interviews with hundreds of people aged 18 or over across Wales, and in December 2020, Belgian Public Health Institute Sciensano was conducting a fifth online COVID-19 health interview survey since the start of the pandemic.
3. List of core indicators

Based on the indicator areas in Tables 1 and 2, a concise set of indicators that are well-established and already in regular use in many countries was developed to reflect the most important wider effects of the COVID-19 pandemic across the different pathways (see Fig. 1). This list of core indicators is presented in Table 3. It can serve as a practical starting point for Member States for monitoring the wider effects of the COVID-19 pandemic. Table 3 for each indicator lists the indicator name, a metadata source where more information can be found on, for example, the precise indicator definition and calculation, the relevant disaggregations (see Section 2.1), and the recommended frequency of data collection and data source type (see Section 2.2). Information about the recommended baseline for comparison changes over time is also provided (see Section 2.3). It is noted that in practice, not all the recommendations in the table may be feasible. For example, it may not be possible to disaggregate the data according to all the recommended stratifiers, or only an alternative type of data source may be available that is different from the recommended type, or only a shorter time trend may be available for calculating the baseline value. However, this does not mean that the indicator will not be useful and should not be used, only that one should be aware of such limitations and take them into account when interpreting and working with the indicator values.
Table 3. List of core indicators

For all the indicators in the list, the recommended baseline is the average value for the same period (that is, month, quarter, or year) over the 4 years prior to the onset of the pandemic (2016–2019).

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Indicator</th>
<th>Metadata</th>
<th>Relevant disaggregations</th>
<th>Recommended data source type</th>
<th>Recommended frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fear of getting infected or spreading infection</td>
<td>Psychological distress</td>
<td>Currently not included in regular international data collections. However, well-established tools do exist; see, for example, MHI-5 or SF-12, both based on the RAND Short Form Survey (SF-36) (RAND (no date)). It is recommended that Member States use existing national tools, if available.</td>
<td>• Age • Gender • Socioeconomic status (SES) • Refugee or migrant status</td>
<td>Population-based health survey</td>
<td>• If continuous data collection: report on a quarterly basis • If no continuous data collection: consider collecting and reporting on survey data twice a year • Otherwise: annual survey schedule</td>
</tr>
<tr>
<td>Consumption of antimicrobial medicines (with relative use of Access and Watch group antibiotics)</td>
<td>WHO Regional Office for Europe Antimicrobial Medicines Consumption (AMC) Network: AMC data 2011–2017 (World Health Organization (2020m))</td>
<td>• Import / wholesaler data or health insurance data</td>
<td>• If health insurance registry available based on continuously collected data: report on a monthly or quarterly basis • Otherwise: annual reporting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Impaired health care for non-COVID-19 conditions: access</td>
<td>Outpatient contacts for non-COVID-19-related conditions</td>
<td>Global Reference List of 100 Core Health Indicators (World Health Organization (2018)) Note: the name of the relevant indicator in the Global Reference list is Outpatient service utilization (Also: inpatient admissions and surgical volume). This indicator would need to be broken down into outpatient contacts for COVID-19 and for other conditions. This requires data on service utilization by diagnosis (ICD).</td>
<td>• Age • Gender</td>
<td>Health care facility registers or health insurance data</td>
<td>• If health care facility registry available based on continuously collected data: report on a monthly or quarterly basis • Otherwise: annual reporting</td>
</tr>
</tbody>
</table>

3 Here we focus on those stratifications that can be obtained from the primary data source directly. For example, looking at the indicator on outpatient contacts for non-COVID-19-related conditions, it could also be relevant to look at SES and refugee or migrant status. In most Member States, however, obtaining such disaggregations would require linkage of health care facility data with other data sources. Therefore, for the purpose of this document, we consider this to fall outside the scope of regular population health monitoring. Nevertheless, such linkage exercise could be performed for more in-depth analyses of the data, if countries want more comprehensive information on potential health inequalities.

4 MHI-5 was used in the first wave of the European Health Interview Survey (EHIS) (but not in later waves): How much of the time, during the past 4 weeks: Have you been very nervous? Have you felt so down in the dumps that nothing could cheer you up? Have you felt calm and peaceful? Have you felt downhearted and depressed? Have you been happy? The five response categories were: 1. All of the time; 2. Most of the time; 3. Some of the time; 4. A little of the time; 5. None of the time. See https://www.volksgezondheidenzorg.info/sites/default/files/38__psychological_distress_20120525.pdf.


<table>
<thead>
<tr>
<th>Pathway</th>
<th>Indicator</th>
<th>Metadata</th>
<th>Relevant disaggregations</th>
<th>Recommended data source type</th>
<th>Recommended frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital admissions for non-COVID-19-related conditions</td>
<td>See Outpatient contacts for non-COVID-19-related conditions</td>
<td>• Age</td>
<td>Health care facility registers or health insurance data</td>
<td>• If health care facility registry available based on continuously collected data: report on a monthly or quarterly basis • Otherwise: annual reporting</td>
<td></td>
</tr>
<tr>
<td>Immunization coverage rate by vaccine for each vaccine in the national programme [SDG 3.b.1]</td>
<td>Global Reference List of 100 Core Health Indicators (World Health Organization (2018))</td>
<td>• Gender</td>
<td>Immunization registries</td>
<td>• If immunization registry available based on continuously collected data: report on a monthly or quarterly basis • Otherwise: annual reporting</td>
<td></td>
</tr>
<tr>
<td>Self-reported unmet needs for medical examination by reason</td>
<td>EU-SILC (Eurostat (no date))</td>
<td>• Age</td>
<td>Population-based health survey</td>
<td>• If continuous data collection: report on a quarterly basis • If no continuous data collection: consider collecting and reporting on survey data twice a year • Otherwise: annual survey schedule</td>
<td></td>
</tr>
<tr>
<td>2. Impaired health care for non-COVID-19 conditions: quality of care</td>
<td>Perioperative mortality rate</td>
<td>Global Reference List of 100 Core Health Indicators (World Health Organization (2018))</td>
<td>• Age</td>
<td>Health care quality registers</td>
<td>• If health care quality registry available based on continuously collected data: report on a monthly or quarterly basis • Otherwise: annual reporting</td>
</tr>
<tr>
<td>2. Impaired health care for non-COVID-19 conditions: financial protection</td>
<td>Proportion of the population with large household expenditure on health as a share of total household expenditure or income [SDG 3.8.2] Note: complementary regional indicators are used by WHO'</td>
<td>Global Reference List of 100 Core Health Indicators (World Health Organization (2018))</td>
<td>• SES</td>
<td>Household survey</td>
<td>• If continuous data collection: report on a quarterly basis • If no continuous data collection: consider collecting and reporting on survey data twice a year • Otherwise: annual survey schedule</td>
</tr>
</tbody>
</table>

7 Regional indicators are used to complement SDG 3.8.2 in order to improve relevance to the European context and provide actionable evidence for policy. For recent analysis of catastrophic and impoverishing health spending across a wide range of Member States in the European Region, see https://www.euro.who.int/en/health-topics/Health-systems/health-systems-financing/universal-health-coverage-financial-protection
<table>
<thead>
<tr>
<th>Pathway</th>
<th>Indicator</th>
<th>Metadata</th>
<th>Relevant disaggregations*</th>
<th>Recommended data source type</th>
<th>Recommended frequency</th>
</tr>
</thead>
</table>
| 3. Direct effects of containment measures         | Overall perceived social support (close people to count on, concern shown by other people, practical help from neighbours if needed) | European Health Interview Survey (EHIS) – social environment (Eurostat (no date))          | • Age  
• Gender  
• SES  
• Refugee or migrant status  
• People with a chronic condition or disability                                           | Population-based health survey                 | • If continuous data collection: report on a quarterly basis  
• If no continuous data collection: consider collecting and reporting on survey data twice a year  
• Otherwise: annual survey schedule                                                                 |
|                                                  | Intimate partner violence prevalence [SDG 5.2.1]                           | Global Reference List of 100 Core Health Indicators (World Health Organization (2018)) | • Age  
• Gender  
• SES  
• Population-based surveys focused on partner violence or population-based surveys with special module on partner violence  
• Alternative sources such as data from police records, shelters, helplines.                     | Population-based health survey                 | • If based on regular population-based survey with continuous data collection: report on a quarterly basis  
• If based on special survey: consider collecting and reporting on survey data twice a year  
• If alternative sources available: monthly or quarterly reporting  
• Otherwise: annual survey schedule                                                                 |
| 4. Indirect effects of containment measures through risk factors | Age-standardized prevalence of current tobacco use among persons aged 15+ years | Global Reference List of 100 Core Health Indicators (World Health Organization (2018)) | • Age  
• Gender  
• SES  
• Population-based health survey                                                             | Population-based health survey                 | • If continuous data collection: report on a quarterly basis  
• If no continuous data collection: consider collecting and reporting on survey data twice a year  
• Otherwise: annual survey schedule                                                                 |
|                                                  | Prevalence of insufficient physical activity                               | Global Health Observatory (no date c)                                                      | • Age  
• Gender  
• SES  
• Population-based health survey                                                               | Population-based health survey                 | • If continuous data collection: report on a quarterly basis  
• If no continuous data collection: consider collecting and reporting on survey data twice a year  
• Otherwise: annual survey schedule                                                                 |
<table>
<thead>
<tr>
<th>Pathway</th>
<th>Indicator</th>
<th>Metadata</th>
<th>Relevant disaggregations</th>
<th>Recommended data source type</th>
<th>Recommended frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Indirect effects of containment measures through wider determinants of health</td>
<td>Unemployment rate [SDG 8.5.2]</td>
<td>SDG Indicators: Metadata repository (United Nations (no date b))</td>
<td>• Age</td>
<td>Administrative records such as employment office records and social insurance statistics 8</td>
<td>Monthly or quarterly</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Gender</td>
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<td></td>
<td></td>
<td></td>
<td>• SES</td>
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<td></td>
<td>• Refugee or migrant status</td>
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<td></td>
<td></td>
<td></td>
<td>• People with a chronic condition or disability</td>
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<td></td>
<td></td>
<td></td>
<td>• Place of residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health outcomes</td>
<td>Self-perceived health</td>
<td>EU-SILC (Eurostat (no date))</td>
<td>• Age</td>
<td>Population-based health survey</td>
<td>If continuous data collection: report on a quarterly basis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Gender</td>
<td></td>
<td>If no continuous data collection: consider collecting and reporting on survey data twice a year</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• SES</td>
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<td>Otherwise: annual survey schedule</td>
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<td></td>
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<td></td>
<td>• Refugee or migrant status</td>
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<td></td>
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<td></td>
<td>• People with a chronic condition or disability</td>
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<td></td>
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<td></td>
<td>• Place of residence</td>
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<tr>
<td>Prevalence of depression</td>
<td>European Health Interview Survey (EHIS) – Self-reported chronic morbidity (Eurostat (no date))</td>
<td>• Age</td>
<td>Population-based health survey</td>
<td>• If continuous data collection: report on a quarterly basis</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Gender</td>
<td></td>
<td>If no continuous data collection: consider collecting and reporting on survey data twice a year</td>
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<td>Otherwise: annual survey schedule</td>
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<td>• People with a chronic condition or disability</td>
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<td>Suicide mortality rate [SDG 3.4.2]</td>
<td>Global Reference List of 100 Core Health Indicators (World Health Organization (2018))</td>
<td>• Age</td>
<td>Civil registration and vital statistics system</td>
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<td>Excess mortality</td>
<td>Excess mortality – statistics (Eurostat (2021b))</td>
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8 The statistics derived from these administrative records refer to a narrower concept ("registered unemployment") than the statistics based on labour force surveys (ILO (no date)). However, they are the preferred source here, as they can provide more frequent updates.
References


The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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