# Finland´s Pandemic Preparedness Plan for Healthcare and Social Welfare

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# Finland´s Pandemic Preparedness Plan for Healthcare and Social Welfare

Advisory Board on Communicable Diseases, Pandemic division

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# Finland´s Pandemic Preparedness Plan for Healthcare and Social Welfare

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**Abstract**

Finland's Pandemic Preparedness Plan for Healthcare and Social Welfare guides contingency planning, pandemic management and recovery in healthcare and social welfare, both nationally and regionally. The plan describes the tasks of different actors in various areas of pandemic preparedness. The areas of pandemic management it covers include funding, management, coordination and cooperation, situation picture and risk assessment, enhanced communication, material preparedness, microbiological diagnostics, non-pharmaceutical interventions, medicines and vaccines, as well as human resources and securing system capacity. The cross-cutting themes of the plan include pandemic phases, consideration of special groups, One Health approach, shared situation picture and effectiveness.

The plan complements the Security Strategy for Society. A pandemic is one of the risks which are identified in the National risk assessment and for which actors must prepare. While this plan focuses on social welfare and healthcare, it should be noted that pandemic preparedness also requires measures in other administrative branches.

When applying the plan, any changes having taken place in the legal basis since the date of its publication must be taken into account. Essential and proportionate measures for managing a pandemic must be assessed in relation to situation picture information on the current pandemic.

**Keywords** pandemics, communicable diseases, emergency planning, precautionary measures, national planning, internal security

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# Sosiaali- ja terveydenhuollon valtakunnallinen pandemiavalmiussuunnitelma


**Sosiaali- ja terveysministeriön julkaisuja 2024:20**

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**Tiivistelmä**

Sosiaali- ja terveydenhuollon valtakunnallinen pandemiavalmiussuunnitelma ohjaa valmiussuunnittelua, pandemian hallintaa ja siitä toipumista sosiaali- ja terveydenhuollossa sekä valtakunnallisesti että alueellisesti. Suunnitelmassa kuvataan eri toimijoiden tehtävät pandemiavarautumisen eri osa-alueilla. Käsiteltyjä pandemian hallinnan osa-alueita ovat rahoitus, johtaminen, koordinaatio ja yhteistyö, tilannekuva ja riskinarviointi, tehostettu viestintä, materiaalinen varautuminen, mikrobiologinen diagnostiikka, lääkkeettömät torjuntakeinot, lääkkeet ja rokotteet, sekä henkilöstövoimavarat ja kantokyvyn turvaaminen. Suunnitelman läpileikkaavia teemoja ovat pandemiavaiheet, erityisryhmien huomioiminen, Yhteinen terveys -lähestymistapa, yhteinen tilannekuva sekä vaikuttavuus.

Suunnitelma täydentää yhteiskunnan turvallisuusstrategiaa. Pandemia on yksi kansallisessa riskiarviossa tunnistetuista riskeistä, joihin toimijoiden pitää varautua. Suunnitelma keskittyy sosiaali- ja terveydenhuoltoon, mutta on huomioitava, että pandemiavarautuminen edellyttää toimia myös muilla hallinnonaloilla.

Suunnitelmaa sovellettaessa pitää huomioida mahdolliset säädöspohjassa julkaisuhetken jälkeen tapahtuneet muutokset. Pandemian hallinnan välttämättömiä ja oikeasuhtaisia toimia pitää arvioida suhteessa tilannekuvatietoon käsillä olevasta pandemiasta.



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|---|---|---|---|
| **Asiasanat** | pandemiat, tartuntataudit, valmiussuunnittelu, varautuminen, valtakunnallinen suunnittelu, sisäinen turvallisuus | | |
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# Riksomfattande plan för pandemiberedskap inom social- och hälsovården


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**Referat**

Den riksomfattande planen för pandemiberedskap inom social- och hälsovården styr beredskapsplaneringen, hanteringen och återhämtningen i fråga om en pandemi inom social- och hälsovården på både nationellt och regionalt plan. I planen beskrivs olika aktörers uppgifter inom de olika delområdena för pandemiberedskap. De delområden för pandemihantering som behandlas är finansiering, ledning, koordinering och samarbete, lägesbild och riskbedömning, intensifierad kommunikation, materiell beredskap, mikrobiologisk diagnostik, icke-medicinska bekämpningsåtgärder, läkemedel och vacciner samt personalresurser och tryggandet av bärförmågan. Övergripande teman i planen är pandemifaser, beaktande av grupper med särskilda behov, En hälsa-konceptet, gemensam lägesbild och genomslagskraft.

Planen kompletterar säkerhetsstrategin för samhället. En pandemi är en av de risker som identifierats i den nationella riskbedömningen och som förvaltningsområdena och andra aktörer måste förbereda sig på. Planen fokuserar på social- och hälsovården, men det bör noteras att pandemiberedskapen förutsätter ändringar också på andra förvaltningsområden.

När planen tillämpas bör man beakta eventuella ändringar i författningsgrunden som skett efter publiceringen. Nödvändiga och proportionerliga åtgärder för pandemihantering bör bedömas i relation till information om lägesbilden för den aktuella pandemin.



**Nyckelord** pandemier, smittsamma sjukdomar, beredskapsplanering, föregripande, riksplanering, inre säkerhet

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# Contents

## FOR THE READER

Finland´s Pandemic Preparedness Plan for Healthcare and Social Welfare was drawn up to support preparedness and contingency planning in healthcare and social welfare. The plan is based on the legislation in force at the time of its publication, and the special features of the pandemic at hand and changes in the operating environment must be taken into account when applying it. In particular, the plan serves persons whose work involves prevention of communicable diseases, preparedness and contingency planning or occupational health and safety in the healthcare and social welfare sector as well as those in management and leadership roles. The target group extends to the local, regional and national levels of the healthcare and social welfare system, the public and private sector and NGO actors.

The plan can also be used by those working with society's safety and security and pandemic preparedness in other administrative branches. Finland's Pandemic Preparedness plan for Healthcare and Social Welfare builds an overall picture of pandemic preparedness in Finland and can consequently also be used by other potential target groups, including students, researchers, the media and the general public.

Ministry of Social Affairs and Health
12 April 2024

## Glossary and abbreviations

| | |
|---|---|
| AVI | Regional State Administrative Agency |
| close contact | a physical meeting with a risk of infection |
| contingency planning | preparedness planning in normal conditions[1] |
| crisis | a situation requiring intensified action that is hazardous, difficult, confusing or exceptional[1] |
| ECDC | European Centre for Disease Prevention and Control |
| emergency conditions | a state referred to in the Emergency Powers Act, in which such a high number of incidents, or incidents of such a serious nature, occur that it is necessary to allow the authorities to exercise emergency powers[1] |
| emergency preparedness | activities ensuring that all tasks can continue with minimum disruption and that the required exceptional measures can be taken during incidents and emergencies. Preparedness measures include contingency planning, continuity management, advance preparations, training and preparedness exercises.[1] |
| epidemic | 1. outbreak of an infectious disease; a disease (originating outside the country) that infects a large proportion of the population in a region; 2. significant spread of a disease; 3. exceptional prevalence of (any) disease or phenomenon in a community[2] |
| EWRS | Early Warning and Response System of the EU |
| exposure | a situation in which a person comes across an environmental hazard, such as a pathogen |
| FFP mask | filtering facepiece |
| Fimea | Finnish Medicines Agency |
| HVK | National Emergency Supply Agency |
| IHR | International Health Regulations |
| incident | a threat or event which puts society's vital functions or strategic tasks at risk and the management of which requires wider or closer than normal cooperation and communication between the authorities and other actors[1] |
| normal conditions | the usual state of society in which functions vital to society can be secured without a need to allow the authorities to exercise emergency powers[1] |
| pandemic | an epidemic that has spread across several continents[2]; global spread of a pathogen that infects human populations with limited or no immunity, overwhelming health systems with severe morbidity and high mortality, and causing social and economic disruptions, all of which require effective national and global collaboration and coordination for its control[3] |
| PCR | polymerase chain reaction, a diagnostic method |
| situation picture | an overview of the prevailing circumstances, the events that triggered the current situation, background information on the situation and assessments of how the situation will develop as well as what the capabilities of the various actors are[1] |
| threat | a harmful event or development that may materialise[1] |
| preparedness | state reached as a result of emergency planning in which various threats can be responded to[1] |
| preparedness plan | a plan produced as a result of contingency planning[1] |
| virulence | pathogen's ability to cause disease[2] |
| WHO | World Health Organization |
| YTA area | collaborative area |
| zoonosis | a disease that can be transmitted from animals to humans (and vice versa)[2] |

1 Security Committee and Finnish Terminology Centre. Vocabulary of Comprehensive security. ISBN 978-952-9794-36-2 (PDF). Available at: https://turvallisuuskomitea.fi/viestinta/kokonaisturvallisuuden-sanasto/

2 Kustannus Oy Duodecim (2016). Terveyskirjasto. Lääketieteen sanasto. Available at: https://www.terveyskirjasto.fi/sisalto/laaketieteen-sanasto.

3 World Health Organization (2023). Zero draft of the WHO convention, agreement or other international instrument on pandemic prevention, preparedness and response. Available at: https://apps.who.int/gb/inb/pdf_files/inb4/A_INB4_3-en.pdf.

# 1 Foreword

The COVID-19 pandemic highlighted the significant adverse effects a pandemic can have on the health and safety of the population and the functioning of society in a broader sense. A pandemic pathogen increases morbidity among the population and the need for healthcare services and may cause significant mortality. On the other hand, measures aimed at preventing the spread of infections have negative effects on everyday life, social interaction, business activities and security of supply. The human and economic costs of a pandemic and the actions taken to control it can be significant. A pandemic tests the crisis resilience of society, and its ability to respond to any coinciding incidents may be undermined.

The threat of new pandemic pathogens emerging is real and maintained by diverse global megatrends. Preparedness for pandemics can help prevent their harmful effects, and an effort can be made to adapt to changing circumstances as rapidly as possible.

Finland´s Pandemic Preparedness Plan for Healthcare and Social Welfare replaces an earlier plan drawn up in 2012[4]. The starting points for updating the plan included changes in the national and international legislative basis and operating environment and, in particular, experiences gathered during the COVID-19 pandemic. Guidelines and recommendations issued by the WHO and the ECDC have been incorporated in the updated plan[5,6,7].

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4 Advisory Board on Communicable Diseases, Pandemic Division. Kansallinen varautumissuunnitelma influenssapandemiaa varten. Ministry of Social Affairs and Health publications 2012:9. ISBN 978-952-00-3347-7 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-00-3347-7.

5 World Health Organization (2017). Pandemic influenza risk management: a WHO guide to inform and harmonize national and international pandemic preparedness and response. Available at: https://apps.who.int/iris/handle/10665/259893.

6 European Centre for Disease Prevention and Control (2017). Guide to revising the influenza pandemic preparedness plan – Lessons learned from the 2009 A(H1N1) pan-demic. ISBN 978-92-9498-091-5 (PDF). Available at: https://www.ecdc.europa.eu/en/publications-data/guide-revision-national-pandemic-influenza-preparedness-plans-lessons-learned.

7 World Health Organization (2023). A checklist for respiratory pathogen pandemic preparedness planning. ISBN 978-92-4-008451-3 (PDF). Available at: https://www.who.int/publications/i/item/9789240084513.

Experts representing several different authorities participated in drawing up Finland's Pandemic Preparedness plan for Healthcare and Social Welfare. The draft plan was circulated for comments, and the feedback received was used to finalise the plan.

Finland´s Pandemic Preparedness Plan for Healthcare and Social Welfare is based on the legislation in force at the time of its publication. The development of preparedness requires continuous monitoring of the operating environment and reviews of practices. Work on drafting amendments to both national and international legislation was launched due to the COVID-19 pandemic. When applying the plan, any amendments to the legal basis made since the plan's publication date must be taken into account. Essential and proportionate measures for managing a pandemic must be assessed in relation to information on the situation picture of the pandemic in question.

Finland's Pandemic Preparedness plan for Healthcare and Social Welfare is intended as a dynamic document that will be updated as necessary. The Ministry of Social Affairs and Health guides and supervises the implementation of the plan and is responsible for keeping it up to date.

# 2 Introduction

**A pandemic has wide-ranging impacts on the health and safety of individuals and the population. In keeping with the Security Strategy for Society, the aim of preparedness planning in healthcare and social welfare is to ensure adequate services also in the event of a pandemic.**

A pandemic refers to a new communicable disease spreading across a wide area, such as several countries or continents, over a certain period of time. The pathogen often spreads rapidly in a pandemic, causes significant morbidity, and strains the healthcare system's capacity. The WHO can declare an epidemic an international public health threat even before it is regarded as a pandemic.

New pandemic pathogens may arise through spillover from animals to humans or as a result of pathogen mutation. Population growth, urbanisation, poverty, climate change, loss of natural environment, biodiversity loss, increased size of livestock production units and international travel are global megatrends that contribute to the emergence and spread of pandemics.

Finland´s Pandemic Preparedness Plan for Healthcare and Social Welfare complements the Security Strategy for Society, which harmonises the principles guiding national preparedness and directs preparedness work in individual administrative branches. One of the objectives of the Security Strategy for Society is to secure the population's functional capacity and wellbeing during incidents and emergencies affecting society. This is achieved by ensuring adequate health and social services for the population.[8] A pandemic is one of the risks identified in the National Risk Assessment that the administrative branches and other actors must prepare[9].

8 Government Resolution 2 November 2017. Security Strategy for Society. ISBN 978-951-25-2959-9 (PDF). Available at: https://turvallisuuskomitea.fi/wp-content/uploads/2018/04/YTS_2017_english.pdf.

9 Working group appointed to revise the National risk assessment. National risk assessment 2023. Ministry of the Interior publications 2023:4. ISBN 978-952-324-602-7 (PDF). Available at: https://julkaisut.valtioneuvosto.fi/handle/10024/164629.

## 2.1 Objective and purpose

The aim of Finland's Pandemic Preparedness plan for Healthcare and Social Welfare is to promote health security and to prevent the adverse effects of pandemics on people and society. The purpose of the plan is to offer an overview of the various themes, actors and tasks associated with pandemic preparedness. It supports national and regional as well as organisation-specific and operational activities and promotes cooperation between different actors.

The plan guides preparedness planning, pandemic management and recovery in healthcare and social welfare, both nationally and regionally. Finland's Pandemic Preparedness plan for Healthcare and Social Welfare can be used when preparing plans for individual sectors, regions and organisations. The aim is that contingency plans add up to an effective whole at the national level, enabling efficient operation. Where possible, Finland's Pandemic Preparedness plan for Healthcare and Social Welfare can also be used to prepare for other threat scenarios affecting the healthcare and social welfare sector.

A pandemic is one of the threat scenarios identified in the National Risk Assessment for which it is the duty of each authority to prepare[10]. Pandemics threaten the health and safety of the population and, above all, disrupt healthcare and social welfare. While measures in other administrative branches may also be necessary to manage a pandemic, Finland's Pandemic Preparedness plan for Healthcare and Social Welfare focuses on healthcare and social welfare.

Finland´s Pandemic Preparedness Plan for Healthcare and Social Welfare is intended as a recommendation whose application must be assessed in relation to the characteristics of the pandemic pathogen, legislation in force, strategic objectives set for managing the pandemic, and the available resources.

## 2.2 Cross-cutting themes

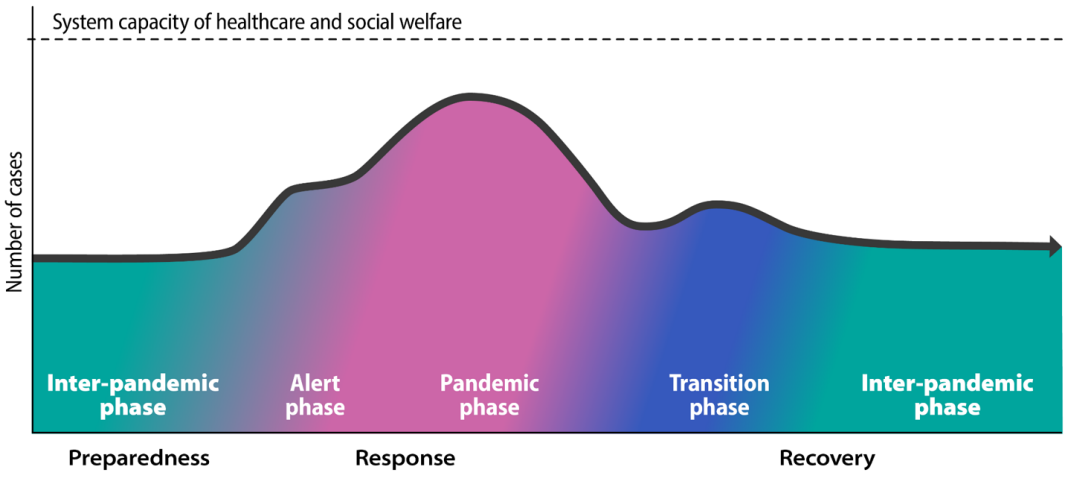
The implementation of the cross-cutting themes of Finland's Pandemic Preparedness plan for Healthcare and Social Welfare must be assessed for each area of pandemic management.

10 Section 12 of the Emergency Powers Act (1552/2011).

### 2.2.1 Pandemic phases

Four phases can be identified in a pandemic: the inter-pandemic, alert, pandemic, and transition phases (Figure 1). The measures taken to manage a pandemic, on the other hand, can be divided into the preparedness, response and recovery phases[5]. Pandemic management can also be seen as a cyclical process in which the strategic and operational planning of measures is followed by their implementation and later evaluation, which is used in the further planning of measures[6]. The factors that determine the need for measures include research evidence available on the pathogen, the population's immunity, and the available medical prevention measures.

**Figure 1.** Phases and management of a pandemic (adapted from WHO 2017[5]).




### 2.2.2 Attention to special groups

The population will always contain groups of people for whom a pandemic poses a greater threat than other groups. The greater threat may affect high-risk groups that are more susceptible to serious illnesses. Population groups with barriers in access to health services or poorer possibilities to prevent infections may also be at a greater risk. On the other hand, the negative impacts of pandemic management may affect population groups in different ways. People who need a large volume of healthcare and social welfare services may be in a vulnerable position, especially if services have to be adapted. The diversity of the population, equity, gender equality

and the best interests of children must be taken into account in all decision-making related to pandemic management[11,12]. Services for persons with disabilities must be accessible[13]. The role of special groups in pandemic preparedness can be strengthened by using previously developed operating models[14].

### 2.2.3 One Health

The One Health approach strives to understand interrelationships between the health of humans, animals and the environment and to promote their One Health in a balanced manner[15]. Prevention of and preparedness for pandemics as well as successful management of a pandemic alike require cooperation between healthcare, animal health authorities and environmental healthcare services in situations where pathogens can spread between humans, animals or the environment.

### 2.2.4 Shared situation picture

Situation picture refers to a dynamic overview based on different types of information on a topical phenomenon, such as a pandemic. A precondition for simultaneous, coordinated, efficient and impactful management of a pandemic is that various actors and different branches of administration build and share a common situation picture. Open access to the situation picture of the pandemic promotes the population's trust in authorities and commitment to measures taken to manage the pandemic. Organisations' internal pandemic communication enhances the management of disruptions and supports the coping of personnel.

11 United Nations Convention on the Rights of the Child (Finnish Treaty Series 60/1991).

12 Act on Supporting the Functional Capacity of the Older Population and on Social and Health Care Services for Older Persons (980/2012).

13 United Nations Convention on the Rights of Persons with Disabilities (Finnish Treaty Series 27/2016).

14 Rieppo S et al. The coping of persons with disabilities and migrant origin populations in serious disruptions and emergencies. Emergency action plans supporting preparedness. Finnish Institute for Health and Welfare/ AVTK. THL Guidelines 7/2023. ISBN 978-952-408-063-7 (PDF). Available at: https://urn.fi/URN:ISBN:978-952-408-063-7.

15 World Health Organization (2023). One Health High Level Expert Panel. One Health definitions and principles. Available at: https://www.who.int/publications/m/item/one-health-definitions-and-principles.

### 2.2.5 Effectiveness

Pandemic management measures must be targeted to maximise the health benefits gained from using the limited resources available. Effectiveness is one of the aspects considered when evaluating the necessity and proportionality of official decisions. Effectiveness refers to the benefits achieved through the measures. Cost-effectiveness is part of the overall effectiveness. Effectiveness may vary depending on the circumstances and, for example, in different regions or pandemic phases. As the pandemic pathogen is always new to the population, decisions on pandemic management measures must be made on the basis of the existing knowledge until evidence-based findings on the effectiveness of different measures are available.

A precondition for evaluating effectiveness is having information on different pandemic management measures, their broad societal advantages and disadvantages, and the resources used[16]. Information necessary for evaluating effectiveness can be collected from different sources as elements of the situation picture of the pandemic. Information collection for the situation picture can be complemented with separate effectiveness evaluations, in which a phenomenon may also be examined within the framework of qualitative research designs. The evaluation of effectiveness is hampered by the fact that pandemic management measures are often carried out simultaneously, which may make it difficult to observe the effectiveness of an individual action. Sometimes impacts can only be evaluated in the recovery phase of a pandemic. By developing the situation picture and creating research plans that can be introduced quickly if necessary, it is possible to prepare for evaluating the impact of a pandemic and its management.

16 Heliskoski J et al. Vaikuttavuuden askelmerkit. Työkaluja ja esimerkkejä palveluntuottajille. Sitra reports (2018). ISBN 978-952-347-040-8 (PDF). Available at: https://www.sitra.fi/app/uploads/2018/03/vaikuttavuuden-askelmerkit.pdf.

# 3 Effects of a pandemic

**Information on previous pandemics and the potential effects of the next pandemic may be used to prepare for a pandemic. These effects are determined by the properties of the pandemic pathogen, the characteristics of the population and society, and the measures taken to prevent the pandemic.**

The effects of a pandemic can be caused either directly by the pathogen or indirectly by efforts to manage the pandemic. Direct effects of a pathogen include the morbidity and mortality rates, while disruptions to society's functioning are some of the indirect impacts of pandemic management. The effects of a pandemic are determined by the properties of the pathogen, including its mode of transmission, virulence, incubation period, mutations of its genome and potential zoonotic nature (ability to be transmitted from animals to humans or vice versa). Other factors determining the effects include the severity of the illness caused, demographic structure and immunity of the population, efficacy and availability of medicines and vaccines, use of prevention measures, and the structure of the healthcare and social welfare system and society.

It is impossible to predict the timing, cause, severity, or effects on the healthcare system and other functions of society of the next pandemic. However, an assessment of the effects it might have is necessary to support contingency planning, investments and other preparedness. The potential effects can be assessed either by examining past pandemics or in the light of different pandemic scenarios.

## 3.1 Previous pandemics

The largest volume of available research evidence regarding the effects of pandemics concerns the COVID-19 pandemic, influenza pandemics having occurred since the beginning of the 20th century and seasonal influenza. The effects of the Spanish flu (1918), Asian (1957) and Hong Kong (1968) influenzas, swine flu (2009), the COVID-19 pandemic and seasonal influenzas differ significantly, especially in terms of their case fatality rates (Table 1). When comparing previous pandemics and

their effects, we should remember that such factors as the number of inhabitants and the population's age structure, previous immunity, general nutritional and health status, and population density as well as the quality of medical care and availability of medicines and vaccines have changed significantly over the centuries. In the early phase of a pandemic, its effects tend to appear more severe than in the light of later assessments, as cases with severe symptoms are identified first.

**Table 1.** Estimates of the disease burden caused by previous pandemics and seasonal influenza. The disease burden depends on the period under review.

| Pandemic, start year | Estimated mortality worldwide | Estimated proportion of infected persons (of Finnish population)* | Mortality among the infected (case fatality) |
|---|---|---|---|
| Spanish flu, 1918 | 50 million | 25% | 1.9% |
| Asian flu, 1957 | 1.5 million | 30% | 0.14% |
| Hong Kong flu, 1968 | 0.7 million | 25% | 0.07% |
| swine flu, 2009 | 0.12 to 0.20 million[17] | 4% | 0.02% |
| COVID-19, 2019 | 15 million[18] | >50 % | 1%[19] |
| seasonal influenza, annually | 0.25 to 0.5 million | 5% to 15% | < 0.1% |

*The proportion of infected persons has been underestimated, as it does not take into account asymptomatic carriers.

17 Simonsen et al. Global Mortality Estimates for the 2009 Influenza Pandemic from the GLaMOR Project: A Modeling Study. PLOS Medicine 10(11): e1001558. https://doi.org/10.1371/journal.pmed.1001558.

18 Msemburi et al. The WHO estimates of excess mortality associated with the COVID-19 pandemic. Nature 613, 130–137 (2023). Available at: https://doi.org/10.1038/s41586-022-05522-2.

19 Alimohamadi et al. Case fatality rate of COVID-19: a systematic review and meta-analysis. J Prev Med Hyg 2021; 62: E311-E320. Available at: https://doi.org/10.15167/2421-4248/jpmh2021.62.2.1627.

## 3.2 Pandemic scenarios

'Disease X' is one of the potential pandemic pathogens listed by WHO[20]. This term reflects the major uncertainties associated with anticipating the next pandemic. This Chapter discusses three pandemic scenarios: mild, moderate and severe (Table 2). The morbidity and mortality rates in each scenario are assumptions made to support preparedness rather than predictions. As the presented scenarios are static, they do not account for changes in pathogen evolution, the population's immunity or measures taken to prevent the pandemic. An actual dynamic pandemic scenario can only be prepared once the pathogen has already caused large epidemics and there is sufficient information on its properties. The dynamic scenario is updated as the pandemic progresses.

**Table 2.** Presumed metrics for a mild, moderate and severe pandemic scenario. Assumed population of 5.56 million people.

| Scenario | Share of symptomatic carriers in the population (%) | Hospitalisations 1% to 5% of carriers (n) | Intensive care periods 30% of hospital care periods (n) | Mortality 0.2% to 0.6% of carriers (n) |
|---|---|---|---|---|
| mild | 15 | 8,300–42,000 | 2,500–12,500 | 1,700–5,000 |
| moderate | 25 | 14,000–69,000 | 4,200–20,800 | 2,800–8,300 |
| severe | 50 | 28,000–139,000 | 8,300–42,000 | 5,600–16,700 |

In the mild scenario, the pathogen has high infectiousness but low virulence. The spread of the outbreak is rapid but varies regionally. Hospitalisations are mainly limited to high-risk groups. The case fatality rate and need for intensive care are low. The population has partial previous immunity. No vaccines are available during the first wave. The swine flu pandemic of 2009 can be likened to the mild scenario.

20 World Health Organization (2024). R&D Blueprint for Epidemics. Targeting research on diseases of greatest epidemic and pandemic threat. Available at: https://www.who.int/teams/blueprint/who-r-and-d-blueprint-for-epidemics.

In the moderate scenario, both the infectiousness and virulence of the pathogen are greater than in the mild scenario. Carriers are infectious before displaying clinical symptoms. There is a significant need for inpatient and intensive care, especially among high-risk groups. The case fatality rate is higher. The population has no previous immunity. There is no antiviral medicine, and a vaccine only becomes available later. The COVID-19 pandemic had features of the moderate scenario.

In the severe scenario, the pathogen mainly spreads through droplet transmission, the disease has a short incubation period, and transmission is effective before symptoms occur. The outbreak spreads rapidly across the country. Almost everyone is infected, and approx. one half of those infected have symptoms. The need for hospitalisation and intensive care increases dramatically among all population groups. The case fatality rate is high, especially in high-risk groups. The population has no previous immunity, and no vaccines are available.

# 4 Legislative basis, actors and funding

**The management of pandemics is underpinned by legislation that defines the authorities in charge, their powers and their practices and secures adequate funding for prevention measures and recovery from the pandemic.**

## 4.1 Legislative basis of pandemic management

The right to safety, life, health and adequate healthcare and social welfare services are fundamental rights enshrined in the Constitution and human rights safeguarded by international treaties[21,22]. Action taken by the public authorities is often required to realise fundamental and human rights. Public authorities must promote the realisation of fundamental and human rights and prevent their violations. [23]

Fundamental rights are not absolute, however, and they can be restricted if necessary. For example, the exercise of an individual's fundamental rights may be restricted by the realisation of other people's fundamental rights. Even so, it should be noted that the fundamental rights are enshrined in the Constitution, which imposes significant conditions for and limitations to how and to what extent these rights can be restricted.[24]

Public authorities must safeguard the realisation of fundamental and human rights in all situations. The authorities must manage immediate threats and prepare for different potential threats, including pandemics. In a state governed by the rule of law, all exercise of public power must be based on legislation. This makes it possible

21 Constitution of Finland (731/1999).

22 Decree on the Enactment of the International Covenant on Economic, Social and Cultural Rights (6/1976).

23 Government proposal to Parliament on amending the fundamental rights provisions of the Constitution (HE 309/1993 vp), p. 75.

24 Government proposal to Parliament on amending the fundamental rights provisions of the Constitution (HE 309/1993 vp), p. 29.

to ensure that measures required to manage a pandemic are e.g. acceptable, necessary and proportionate. Acceptability means that restrictions must be acceptable from the perspective of the fundamental rights regime and necessary due to a pressing societal need. According to the requirement of proportionality, any restrictions of fundamental rights must be proportionate to the societal interest with which they are associated. A restriction of fundamental rights may not be stricter than what is essential in order to achieve the objective of the restriction.

Realisation of fundamental rights is assessed both as an act is passed and when it is applied. When the act is applied, the fulfilment of the requirements concerning proportionality is secured by assessing if the restrictions and other measures are necessary and proportionate in each individual situation. For example, if powers to order a person to quarantine in a certain situation are granted in the Communicable Diseases Act, a quarantine decision must always be subject to case-by-case discretion.

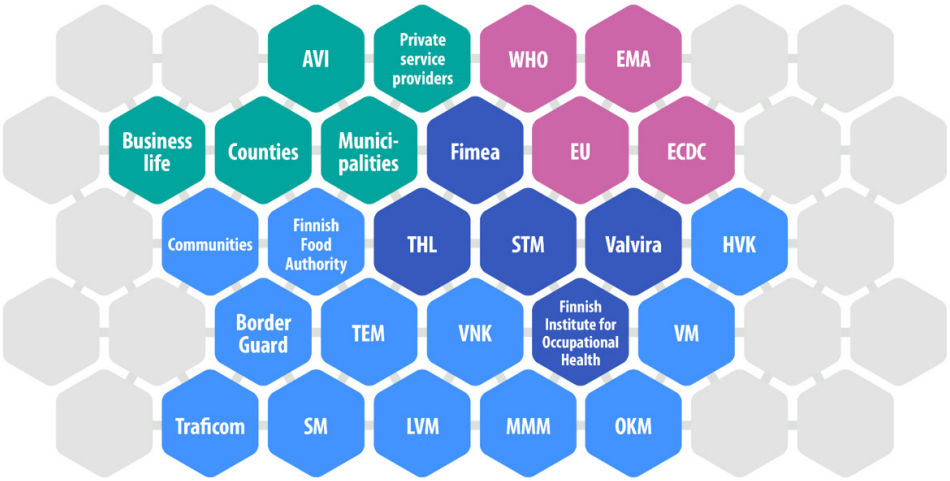
The legal basis for pandemic management consists of national and EU legislation as well as international treaties (Appendix 1). The key piece of legislation on the prevention of infectious diseases in Finland is the Communicable Diseases Act (1227/2016). The Communicable Diseases Act is applied in conjunction with other social welfare and healthcare legislation. The Communicable Diseases Act is a special act that contains more detailed provisions on the prevention of communicable diseases than general acts. Its objective is preventing communicable diseases and their spread, as well as the adverse effects they cause to people and society. An extremely widespread hazardous communicable disease, which is similar in its effects to a particularly serious major accident, is one of the emergency conditions identified in the Emergency Powers Act (1552/2011).

The management of the COVID-19 pandemic was underpinned by the Communicable Diseases Act and the decrees issued by virtue of it. When the WHO had declared COVID-19 an international public health threat on 30 January 2020 by virtue of the International Health Regulations (IHR 2005), the Government adopted a decree declaring COVID-19 a generally hazardous communicable disease as of 14 February 2020. For the first time while the current legislation has been in force, the COVID-19 pandemic led to the declaring of emergency conditions and the introduction of additional powers under the Emergency Powers Act. However, the Communicable Diseases Act did not meet the needs of pandemic management in all respects, which is why it was amended 18 times in total during the pandemic, mainly through statutes with a limited period of validity. Amendments were also made to other acts. Motivated by the pandemic, EU legislation was also updated, and needs to amendment international treaties were identified.

## 4.2 Actors

The government, national and regional authorities as well as central government agencies have a duty to prepare for optimal performance of their tasks both during incidents under normal conditions and in emergency conditions. In keeping with the operating principle of comprehensive security, the network of pandemic management actors consists of authorities, business life, non-governmental organisations (NGOs) and the population (Figure 2). Each actor's expertise and resources are used in the collaboration as appropriate.

**Figure 2.** Regional, national and international actors and those in different administrative branches involved in pandemic management. European Centre for Disease Prevention and Control (ECDC), European Medicines Agency (EMA), European Union (EU), Finnish Institute for Health and Welfare (THL), Finnish Medicines Agency (Fimea), Finnish Transport and Communications Agency Traficom, Ministry of Agriculture and Forestry (MMM), Ministry of Economic Affairs and Employment (TEM), Ministry of Education and Culture (OKM), Ministry of Finance (VM), Ministry of the Interior (SM), Ministry of Social Affairs and Health (STM), Ministry of Transport and Communications (LVM), National Supervisory Authority for Welfare and Health Valvira, National Emergency Supply Agency (HVK), Prime Minister's Office (VNK), Regional State Administrative Agency (AVI), wellbeing services county (HVA), World Health Organization (WHO).




## 4.2.1 Regional authorities

### 4.2.1.1 Wellbeing services counties, City of Helsinki and HUS Group

The wellbeing services counties, the City of Helsinki and the HUS Group (later in this document, all of these are referred to as 'wellbeing services counties' or 'counties') see to the prevention of communicable diseases in their regions and work together with other counties. The work aiming to control infectious diseases encompasses the prevention, early detection and monitoring of diseases, measures needed to investigate or prevent an outbreak, the examination, treatment and medical rehabilitation of persons who have, or are suspected of having, contracted an infectious disease, as well

as the prevention of healthcare-associated infections.[25] A wellbeing services county can provide the services it is responsible for organising itself or in cooperation with other counties, or outsource them to other service providers under a contract.

The wellbeing services county maintains a situation picture of healthcare and social welfare in its region. The body responsible for infectious diseases control in the wellbeing services county may make decisions on measures relating to a widespread risk of infection in its operating area. The county supports healthcare and social welfare units and municipalities in the prevention of communicable diseases. The wellbeing services counties form joint collaborative areas (YTA areas), in which the county that maintains a university hospital supports others with its expertise. A county must prepare for incidents and emergencies, for example by drawing up preparedness plans[26,27]. The wellbeing services county of North Ostrobothnia has been assigned the task of maintaining the national preparedness planning portal (VALSU).

#### 4.2.1.2 Regional State Administrative Agencies

The Regional State Administrative Agencies coordinate and monitor the prevention of infectious diseases in their areas. They ensure that the wellbeing services counties are prepared for incidents affecting healthcare. The Regional State Administrative Agencies are competent to make certain administrative decisions laid down in the Communicable Diseases Act. Their duties also include organising preparedness exercises, in which the effectiveness of preparedness plans is tested.

The Regional State Administrative Agencies are responsible for maintaining preparedness for animal diseases in their operating areas, drawing up a regional animal disease preparedness plan, taking charge of animal disease control in their areas, and guiding the municipal veterinary health authorities. They also take care of controlling serious animal diseases and investigating disease situations outside office hours. The Regional State Administrative Agencies also oversee the preparedness of municipal environmental healthcare services. The Regional State Administrative Agencies' Occupational Safety and Health Divisions supervise, advise and instruct employers in complying with occupational safety and health legislation. If necessary, the occupational safety and health authority targets supervision and communication at workplaces and jobs where contracting an

25 Section 9 of the Communicable Diseases Act (1227/2016).

26 Act on Organising Healthcare and Social Welfare Services (612/2021).

27 Government Decree on the Wellbeing Services Counties' Preparedness for Incidents Affecting Healthcare and Social Welfare (308/2023).

infection due to the working conditions is possible. If necessary, the Ministry of Social Affairs and Health instructs the occupational safety and health authority in addressing the infection risk in occupational safety and health enforcement.[28]

#### 4.2.1.3 Municipalities

The municipalities are responsible for tasks relating to education and cultural services, early childhood education and care services, and environmental healthcare services as well as preparedness and contingency planning related to these services. As part of their environmental healthcare services, the municipalities see to health protection, prevention of animal diseases and food control. The municipalities organise environmental healthcare tasks either individually or together with other municipalities. Each environmental healthcare unit has an outbreak investigation working group tasked with making preparations for food and waterborne outbreaks and investigating them together with the communicable disease authority of the wellbeing services county. [29,30,31] Municipal veterinarians examine animals, take samples and carry out other tasks related to preventing and controlling the spread of diseases. Municipalities are responsible for part of critical infrastructure and they own or manage properties, which is crucial in terms of pandemic preparedness. Various municipal authorities must work together with the counties to prevent communicable diseases.

#### 4.2.1.4 Provincial Government of Åland

The Province of Åland has legislative powers in healthcare and social welfare matters, with certain exceptions[32]. Communicable diseases legislation as well as national legislation on infectious diseases and preparedness are also applied in Åland. Healthcare in Åland is provided by Ålands hälso- och sjukvård, which is subordinate to the provincial government. Social welfare services are provided by Kommunernas socialtjänst (KST), which operates as a joint municipal authority, with the exception of services for older people and child home care allowance, which

28 Act on Regional State Administrative Agencies (896/2009).

29 Health Protection Act (763/1994).

30 Food Act (297/2021).

31 Government Decree on the Investigation of Food and Waterborne Outbreaks (1365/2011).

32 Act on the Autonomy of Åland (1144/1991).

remain the responsibility of the municipalities. The State Department of Åland is responsible for the Regional State Administrative Agency's health and medical care tasks in Åland[33,34].

## 4.2.2 National authorities and agencies

### 4.2.2.1 Ministry of Social Affairs and Health

The general planning, steering and monitoring of the prevention of infectious diseases fall within the remit of the Ministry of Social Affairs and Health. The Ministry of Social Affairs and Health is responsible for preparing for incidents affecting healthcare or the threat of such incidents on a national scale and assumes leadership in such situations. Provisions on vaccinations included in the national vaccination programme and the administration of these vaccinations are laid down in a Ministry of Social Affairs and Health Decree. In a pandemic, the Ministry of Social Affairs and Health may decide on derogations made by virtue of certain provisions of the Medicines Act. The Ministry of Social Affairs and Health coordinates the work within its administrative branch and cooperation between different ministries. The ministry may order a county to take command of and coordinate an incident affecting healthcare and social welfare. The Ministry of Social Affairs and Health may make decisions on the division of labour between preparedness centres. It maintains a situation picture of healthcare and social welfare at the national level in cooperation with the preparedness centres. The ministry is responsible for developing security of supply in its branch.

### 4.2.2.2 Finnish Institute for Health and Welfare

The Finnish Institute for Health and Welfare (THL) serves as the national expert institution in the prevention of communicable diseases. It monitors and investigates the occurrence of infectious diseases, develops their diagnostics and issues instructions for preventing infections to the population. THL directs the implementation of the national vaccination programme and the administration of other general vaccinations, monitors the effects of vaccines, and supports Fimea in investigating their adverse effects. The National Advisory Committee on Vaccines appointed by the Finnish Institute for Health and Welfare supports THL in vaccine development. THL's pharmaceutical wholesaler sees to the purchasing, storage and distribution of vaccines and certain medicines.

33 Decree of the President of the Republic on the Administration of Certain Health and Medical Care Tasks in the Province of Åland (1179/2009).

34 Act on Regional State Administrative Agencies (896/2009).

THL's laboratory serves as the national expert laboratory for microbiological diagnostics. THL maintains the national Communicable Diseases Register and other statutory registers[35]. THL produces information for the national situational picture of social welfare and healthcare. THL is the National Focal Point referred to in the International Health Regulations (IHR), which requires 24/7 preparedness, and the competent authority responsible for reporting communicable diseases to the EU in Finland.

The THL and the Finnish Food Authority work together under the umbrella of the Zoonosis Centre, whose task is to ensure effective and continuous cooperation in the surveillance and control of zoonoses (diseases transmitted from animals to humans and vice versa). The Centre for Biothreat Preparedness (BUOS) is a joint project of the THL, the Finnish Defence Forces and the Finnish Food Authority. Its aim is to promote national expertise and cooperation in the field, assess risks and draw up policies related to biosecurity as well as to coordinate laboratory diagnostics of biological threats.

#### 4.2.2.3 Finnish Medicines Agency

The Finnish Medicines Agency (Fimea) supervises and guides operators to ensure that pharmaceutical services work efficiently and to secure the availability and adequacy of medicines and vaccines. It is the competent authority responsible for the marketing authorisation procedures and pharmacovigilance of medicines. Fimea maintains the national situation picture of the stockpiling of medicines and substances of human origin, and evaluates its development. Fimea provides individual guidance and advice in administrative and scientific questions related to medicine development. It also controls the compliance of medicines and medical devices. Fimea supervises and directs the quality, safety and traceability of blood, tissue and organ transplants of human origin intended for therapeutic use and inspects the contained use of genetically modified organisms under the Gene Technology Act. Fimea issues certificates of free sale for medical devices to be exported to non-EU countries. It also grants research permits and exemptions as well as maintains a register of manufacturers and importers of medical devices.

35 Act on the Finnish Institute for Health and Welfare (668/2008).

#### 4.2.2.4 Finnish Institute of Occupational Health

The Finnish Institute of Occupational Health is the national expert institution responsible for conducting research and providing services in the field of occupational safety and health[36]. The Finnish Institute of Occupational Health guides employers in conducting risk assessments of pandemics and other biological factors. Additionally, the Finnish Institute of Occupational Health together with the occupational safety and health authorities provide instructions for measures aiming to prevent communicable diseases at work. If necessary, the Finnish Institute of Occupational Health provides instructions for selecting and using personal protective equipment. The Finnish Institute of Occupational Health supports the Ministry of Social Affairs and Health in coordinating the role of occupational healthcare with other areas of healthcare in pandemic management.

#### 4.2.2.5 National Supervisory Authority for Welfare and Health

The National Supervisory Authority for Welfare and Health (Valvira) is the national licensing and supervisory authority in the healthcare and social welfare sector[37]. Valvira guides the Regional State Administrative Agencies in the implementation, coordination and harmonisation of the supervisory work and guidance associated with it. Valvira directs the implementation and supervision of the Health Protection Act at the national level in cooperation with the Regional State Administrative Agencies, which direct health protection in their regions. In its role as the supervisory authority, Valvira produces the national situation picture of supervision in its sector.

#### 4.2.2.6 Finnish Food Authority

The Finnish Food Authority's duties include promoting food safety as well as animal and plant health, and safeguarding the prerequisites for food production[38]. It operates in the administrative branch of the Ministry of Agriculture and Forestry. The Finnish Food Authority directs and controls food safety. It is responsible for national preparedness for animal diseases as well as guiding and supervising the Regional State Administrative Agencies in preparedness for and prevention of animal diseases. The Finnish Food Authority draws up the national preparedness plan for animal diseases and risk assessments relating to food safety and animal

36 Act on the Operation and Financing of the Finnish Institute of Occupational Health (159/1978).

37 Act on the National Supervisory Authority for Welfare and Health (669/2008).

38 Act on the Finnish Food Authority (371/2018).

health. The Finnish Food Authority's laboratory also investigates the causes of outbreaks among animals outside office hours if necessary. In the prevention of zoonotic pathogens (which are transmitted between humans and animals) and investigations of food poisoning cases, the Finnish Food Authority works with THL.

#### 4.2.2.7 National Emergency Supply Agency

The security of supply organisation consists of the National Emergency Supply Agency, the National Emergency Supply Council that operates in conjunction with it, the security of supply sectors, and cooperation groups of authorities and business life known as security of supply pools. Public, private and third sector operators have their representatives in the security of supply organisation. The National Emergency Supply Agency operates in the administrative branch of the Ministry of Economic Affairs and Employment. The National Emergency Supply Agency analyses risks and threats to security of supply, develops security of supply, forms the national situation picture of emergency stockpiling and maintains state emergency stockpiling. State emergency stockpiling administered by the National Emergency Supply Agency complements the day-to-day and preparedness stocks of public and private healthcare and social welfare actors[39]. With the help of the National Emergency Supply Fund, the Agency maintains liquidity and capacity for financial measures needed to safeguard security of supply in the face of pandemics and other sudden and unexpected situations.

### 4.2.3 International actors

#### 4.2.3.1 European Union

The legislative and executive bodies, decentralised agencies and independent court of law and central bank of the European Union (EU) are important actors in preparation for and management of cross-border health threats. EU directives and regulations harmonise legislation in EU Member States within the EU's competence.

The European Commission's Directorate-General for Health and Food Safety (DG Sante) supports the Member States' efforts to protect and improve the population's health and to ensure the accessibility, efficiency and sustainability of healthcare systems. The Health Security Committee (HSC), which operates under DG Sante, coordinates the Commission's and the Member States' activities in the context of implementing the legislation on cross-border health threats. The European Health

39 Act on the Measures Necessary to Secure Security of Supply (1390/1992).

Emergency Preparedness and Response Authority (HERA) is tasked with preventing, detecting and rapidly responding to health emergencies by safeguarding the availability of medicines and medical devices. The European Medicines Agency (EMA) is a decentralised EU agency responsible for the scientific evaluation, control and safety monitoring of medicinal products for human and veterinary use. The European Agency for Safety and Health at Work (EU-OSHA) gathers, analyses and disseminates information on occupational health and safety issues. The European Food Safety Authority (EFSA) produces independent scientific evidence to ensure the safety of the food chain. The European Chemicals Agency (ECHA) has duties stemming from the EU chemicals regulations, which include tasks related to approvals, risk assessment and risk management of chemicals (including biocidal active substances).

The European Centre for Disease Prevention and Control (ECDC) is a decentralised EU agency dedicated to supporting European countries in the prevention of communicable diseases. The ECDC maintains an Early Warning and Response System (EWRS), through which the Commission, the Member States and the ECDC receive up-to-date information on outbreaks, significant cases and control measures in the EU. It also maintains other epidemiological information systems. The ECDC monitors the occurrence of communicable diseases and produces risk assessments of different epidemic situations and may issue recommendations to the European Union and the Member States. [40]

#### 4.2.3.2 World Health Organization.

The World Health Organization (WHO) has a leading role in the development and coordination of global health policy. The WHO may propose treaties and guidelines and give recommendations on health issues. It monitors the global health situation, regularly produces global health statistics, and keeps the disease classification system up to date. It also points the direction for international health sector research and supports the practical application of research findings. On request, the WHO provides expert support to its member states, in instances such as health emergencies. The WHO's International Health Regulations (IHR) contain provisions on preparedness, contingency planning and management relating to cross-border health threats. The WHO is also negotiating on an international pandemic preparedness treaty.

40 Regulation (EU) 2022/2370 of the European Parliament and of the Council amending Regulation (EC) No 851/2004 establishing a European centre for disease prevention and control.

### 4.2.4 Other actors

#### 4.2.4.1 Other authorities

The government manages, supervises and coordinates efforts to safeguard society's vital functions. It is also responsible for coordinating the measures taken by different ministries. The Prime Minister's Office maintains a national situation picture that covers the different administrative branches. It is additionally responsible for overall coordination of managing the situation and intensified government communications. The Prime Minister's Office supports the Prime Minister and safeguards the government's operating conditions and security.

Each ministry is responsible for general preparedness in its administrative branch regarding threats identified in the National risk assessment, including pandemics. The Ministry of Agriculture and Forestry is responsible for legislation on controlling animal diseases and safeguarding other primary production connected to the food supply, water supply, and ensuring the quality and safety of food. The Ministry of Agriculture and Forestry's responsibilities also include steering the Regional State Administrative Agencies and the Finnish Food Authority as well as cooperation with the EU and the World Organisation for Animal Health (WOAH).

The Ministry of Economic Affairs and Employment is responsible for matters associated with the operating conditions of businesses regarding competitiveness, sustainable growth, employment, development of security of supply and regional development. In emergency conditions, the Ministry of Economic Affairs and Employment additionally directs the production of commodities and the introduction of a special work obligation. The Ministry of Transport and Communications' task is to secure information flows and the movement of goods and people. It directs the Finnish Transport and Communications Agency (Traficom).

The Ministry of the Interior is responsible for internal security and immigration issues. It directs the National Police Board, the Finnish Immigration Service and the Border Guard. The Ministry of the Interior is the national contact point for the EU Civil Protection Mechanism. The registration and reception centres and detention units subordinate to the Finnish Immigration Service organise health and social services for those applying for international protection as well as victims of trafficking in human beings. The work of the Ministry for Foreign Affairs focuses on foreign and security policy, trade and development policy as well as international relations. The Ministry for Foreign Affairs is responsible for consular and immigration services, in addition to which its foreign missions assist Finnish citizens abroad.

The Police, rescue authorities, Finnish Defence Forces, Border Guard and Customs are authorities which have a duty to provide the executive assistance referred to in the Communicable Diseases Act. The Defence Forces, Finnish Border Guard, Prisoners' Health Care Unit, state mental hospitals and state residential schools as well as the Police are in charge of preventing infectious diseases as part of the healthcare services which they are responsible for organising.

The Finnish Safety and Chemicals Agency (Tukes) monitors and promotes the safety and compliance of products and chemicals, among other things, and is the competent authority regarding EU chemicals regulation. For example, personal protective equipment intended for consumers and biocides – such as disinfectant products for skin, rooms and drinking water – are controlled by Tukes. Products intended for caring for animal hygiene and disinfection of animal housing facilities as well as disinfectants for premises containing food or feed are also biocidal products for which authorisation is required. In the event of a public health hazard such as a pandemic, Tukes may also allow the use of biocidal products that do not meet the regulatory requirements to a limited extent and under supervision. The Ministry of Social Affairs and Health is responsible for Tukes' performance guidance regarding chemical and biocide regulation.

The Board for Gene Technology is responsible for national permit procedures for the development or production of pandemic medicines or vaccines containing genetically modified organisms (GMOs). Fimea also bears some of the responsibility for these permit procedures. The permit procedures have been laid down at EU level, which is why a separate EU regulation is required for any derogations from them[41]. The Board for Gene Technology evaluates incidents relating to genetically modified organisms and the risks to the population and the environment they present. The Board informs the population, the European Commission and the other Member States of any significant incidents. It operates in conjunction with the Ministry of Social Affairs and Health.[42]

41 Regulation (EU) 2020/1043 of the European Parliament and of the Council on the conduct of clinical trials with and supply of medicinal products for human use containing or consisting of genetically modified organisms intended to treat or prevent coronavirus disease (COVID-19).

42 Gene Technology Act (377/1995).

#### 4.2.4.2 Private service providers and other businesses

Healthcare and social welfare sector companies produce a significant share of the services that the wellbeing services counties are responsible for organising. Provisions on the responsibilities of private service providers in the event of a pandemic and the continuation of operations in emergency conditions must be laid down in advance in service outsourcing contracts. Private service providers must, by means of self-monitoring, also ensure that preparedness has been addressed proactively in their operations. The county must also direct and supervise the pandemic preparedness of service production for whose organisation it is responsible. In connection with registrations, the Regional State Administrative Agency and the National Supervisory Authority for Welfare and Health Valvira may require a private healthcare and social welfare service provider to be able to prepare for possible epidemics[43]. Additional procurements from private service providers can be resorted to in order to manage a pandemic.

In addition to private social welfare and healthcare service providers, other business operators also play an important role in preparedness for, management of and recovery from a pandemic. Companies develop, manufacture and import medicines and medical devices required for social welfare and healthcare activities and, among other things, are responsible for logistics services and other infrastructure critical to security of supply. Burial services are also provided by private actors. The national and international networks of companies are important in pandemic situations.

#### 4.2.4.3 Universities and universities of applied sciences

Universities and universities of applied sciences play a key role in developing preparedness for pandemics and evidence-based pandemic management. The universities' mission is to promote research, provide instruction and enhance the societal impact of research results[44]. The universities of applied sciences provide undergraduate education and continuing education for professional expert tasks and engage in applied research and development[45]. The expertise of universities and universities of applied sciences can be tapped for assessing the need for preparedness training and organising it.

43 Act on the Supervision of Healthcare and Social Welfare (741/2023).

44 Universities Act (558/2009).

45 University of Applied Sciences Act (932/2014).

#### 4.2.4.4 NGOs, communities and the population

The special expertise of voluntary organisations as well as trained volunteers are an important resource for preparedness in health and social services. NGOs undertake complementary and supportive tasks which may be related to such things as guidance, psychosocial support or accommodation. More than 11,000 healthcare and social welfare organisations operate in Finland. For example, NGOs support preparedness and contingency planning as well as the smooth running of people's everyday lives.

The Finnish Red Cross (SPR) is a statutory disaster preparedness organisation that supports and complements the authorities' work in the event of sudden accidents and incidents[46,47]. The Finnish Red Cross Blood Service is responsible for blood services[48]. The Voluntary Rescue Service (Vapepa) is a network of volunteers consisting of 50 NGOs and partners. SOSTE Finnish Federation for Social Affairs and Health is a Finnish umbrella organisation of more than 300 directly affiliated member organisations.

Religious communities play an important role in comprehensive security tasks. Various target group organisations represent special groups or people with, for instance, a specific illness. Lobbying organisations promote the interests of the actors they represent. The Evangelical Lutheran Church of Finland and the Orthodox Church of Finland have a statutory duty to prepare for incidents and, in particular, offer mental support. Both churches have properties and other facilities that can be used for temporary accommodation and other similar purposes. They also maintain public cemeteries.

In addition to registered associations, the expertise of different non-organised communities can be drawn on for planning pandemic management and conveying operating instructions to the population. Communities may, for example, be regional, virtual or epistemic (based on sharing information).

The population's trust in and commitment to official activities is a precondition for managing pandemics. The active personal preparedness of and community-based assistance provision by individuals help reduce the pressure on services organised by the authorities.

46 Act on the Finnish Red Cross (238/2000).

47 Decree of the President of the Republic on the Finnish Red Cross (827/2017).

48 Blood Services Act (197/2005).

## 4.3 Funding

Ensuring preparedness for incidents and emergencies is one of the duties assigned to healthcare and social welfare authorities and agencies. This is why preparedness is funded as part of normal operations. Central government funding for the counties is imputed and universal. The amount of funding needed is calculated based on such factors as the number of residents in a wellbeing services county and their service needs. The counties' needs-based funding model allocates funding based on the prevailing service needs and conditions. As the funding is universal, the county makes the decisions on allocating funding to different functions and agrees on its share of the costs incurred from joint activities with other counties in the collaborative area. [49] The central government may also participate in developing and maintaining preparedness and contingency planning by paying compensation for undertaking special duties[50]. Central government allocates funding to its agencies on the basis of the appropriations granted by Parliament to each agency in the Government Budget.

During a pandemic, the authorities' tasks and the service needs of residents in the wellbeing services county may differ from what they are in the inter-pandemic phase. Adequate funding is part of pandemic management and, like other prevention measures, it should be proportionate and timely. If the tasks of the wellbeing services counties change or expand, for example due to a pandemic, the level of universal funding may be adjusted.

If the efforts to manage a pandemic exceed the wellbeing services county's resources and this is appropriate for a special reason, the central government may provide discretionary government grants for financing the management of exceptional incidents. An authority may use government grants to fund a certain activity or project on a discretionary basis. Discretionary government grants may be given to e.g. all counties, some counties or a single county, depending on the activities to be funded. When considering the awarding of a grant, it must be noted that keeping the activity for which a grant is awarded separate from statutory activities and the funding allocated to them must be possible. This helps to ensure that the discretionary government grant does not affect the funding of statutory work.

49 Act on the Financing of the Wellbeing Services Counties (617/2021).

50 Section 52 of the Act on Organising Healthcare and Social Welfare Services (612/2021).

Municipalities and hospital districts as well as government agencies incurred additional costs and losses of income during the COVID-19 pandemic. The government undertook to reimburse the municipalities, hospital districts and Province of Åland for the costs directly incurred because of the COVID-19 pandemic. Central government transfers for basic municipal services were increased, and discretionary government transfers were granted for direct COVID-19 costs. Hospital districts were also given grants to cover additional costs and deficits. The grants for municipalities and hospital districts did not fully reflect the costs incurred and had longer-term impacts on the funding base. Additionally, the appropriations of such actors as the THL and the National Emergency Supply Agency were increased in the budget procedure. Research funding was channelled to understanding the pandemic pathogen, investigating its broad direct and indirect societal impacts, and developing prevention methods. Funding was also channelled as financial support to companies that were negatively affected by pandemic management measures.

In addition to increased costs, a pandemic and its management as well as the impacts resulting from them may cause losses of income and difficulties in making ends meet for individuals and businesses. The Social Insurance Institution of Finland handles social security also in exceptional circumstances. Key benefits paid by the Social Insurance Institution during a pandemic include communicable disease allowance paid while a person is in quarantine and isolation, and sickness allowance while a person is unable to work. The need for other benefits, including unemployment security, housing allowance and social assistance, may also increase as a result of losses in earnings indirectly caused by a pandemic. In exceptional circumstances, certain changes can be made to social security in order to safeguard livelihoods and essential solvency as well as the central government's liquidity.

During the COVID-19 pandemic, a temporary amendment was made to the Health Insurance Act (1224/2004), under which a person was eligible to a communicable disease allowance not only while an isolation or quarantine decision made by the physician responsible for infectious diseases was valid but also when another physician, nurse or public health nurse had diagnosed a laboratory-confirmed COVID-19 infection in the person and, due to the risk of spreading the disease, it was not advisable for the person to participate in gainful employment. The goal of this temporary provision was to improve the income security of those persons, in particular, who had not been ordered to isolate under the Communicable Diseases Act but who took unpaid leave due to a COVID-19 infection. The aim was also to compensate the employer for the costs arising from the employee's absence in situations where the employer paid wages during their absence.

When targeting research funding in a pandemic situation, it is important to work in close cooperation with ministries, funders of research and research organisations to identify research needs, expertise and resources.

Central government funding is allocated through the budget procedure. The government makes decisions on the central government spending limits and the rules of the spending limits procedure for each parliamentary term. The spending limits are adjusted annually as the General Government Fiscal Plan and the Budget for the following year are prepared. Any changes to the Budget during the budget year are made in the supplementary budget procedure. The decision to approve the Budget and any supplementary budgets is made by Parliament.

The European Union is a significant provider of public funding for research, development and innovation activities. The European Union's financing instruments can grant funding to authorities, research institutes and business operators alike.

# 5 Leadership, coordination and cooperation

**In pandemic management, leadership is based on statutory tasks and the competent authority's responsibility. The authorities must respond to a threat of a pandemic by taking essential and proportionate measures in a timely manner and ensure that they can continue performing their tasks, also when resources are limited. Regional and national authorities, businesses, NGOs and other communities as well as the population engage in coordinated cooperation, which is directed towards jointly set objectives by a pandemic management strategy.**

Pandemics threaten the health and safety of the population and disrupt healthcare and social welfare. The significance of leadership is stressed during serious incidents, as they force authorities to make important decisions which may have far-reaching impacts, often based on inadequate information. Effective incident management requires a clear chain of command and operational responsibilities, decision-making capacity of the competent authority, coordination and continuity management, cooperation, smooth information exchanges and intensified communication.

While leadership in an incident under normal conditions is based on the authorities' ordinary statutory powers, in emergency conditions the statutory powers may be different than in a normal situation. Coordination and interplay of actions are stressed especially where competences overlap. Cooperation, joint activities and coordination are forms of doing things together in which resources are shared and activities are modified in order to achieve a common goal.

## 5.1 Cooperation structures

### 5.1.1 Comprehensive security cooperation model

Comprehensive security is a cooperation model of national preparedness for securing the vital functions of society during various incidents, including pandemics. Cooperation refers to planning, exercises and activities and as to cooperation that is as extensive as possible between the authorities, local

government, different administrative branches, businesses, research organisations, NGOs and the population, based on a shared situation picture. This cooperation model is based on statutory tasks, cooperation agreements and the Security Strategy for Society drawn up by the Security Committee. [51] The Security Committee is a permanent cooperation body which operates in conjunction with the Ministry of Defence and which consists of the representatives of different ministries and central government authorities[52].

As a basic premise, the chain of command, organisation and division of responsibilities implemented in normal conditions are also implemented during an incident. The competent ministry leads the activities and, if necessary, the ministries' cooperation at government level. Leadership models planned in advance at both regional and national level as well as the authorities' clear leadership responsibilities are a prerequisite for efficient operation during incidents. The responsibility for leadership may shift in different phases of incidents.

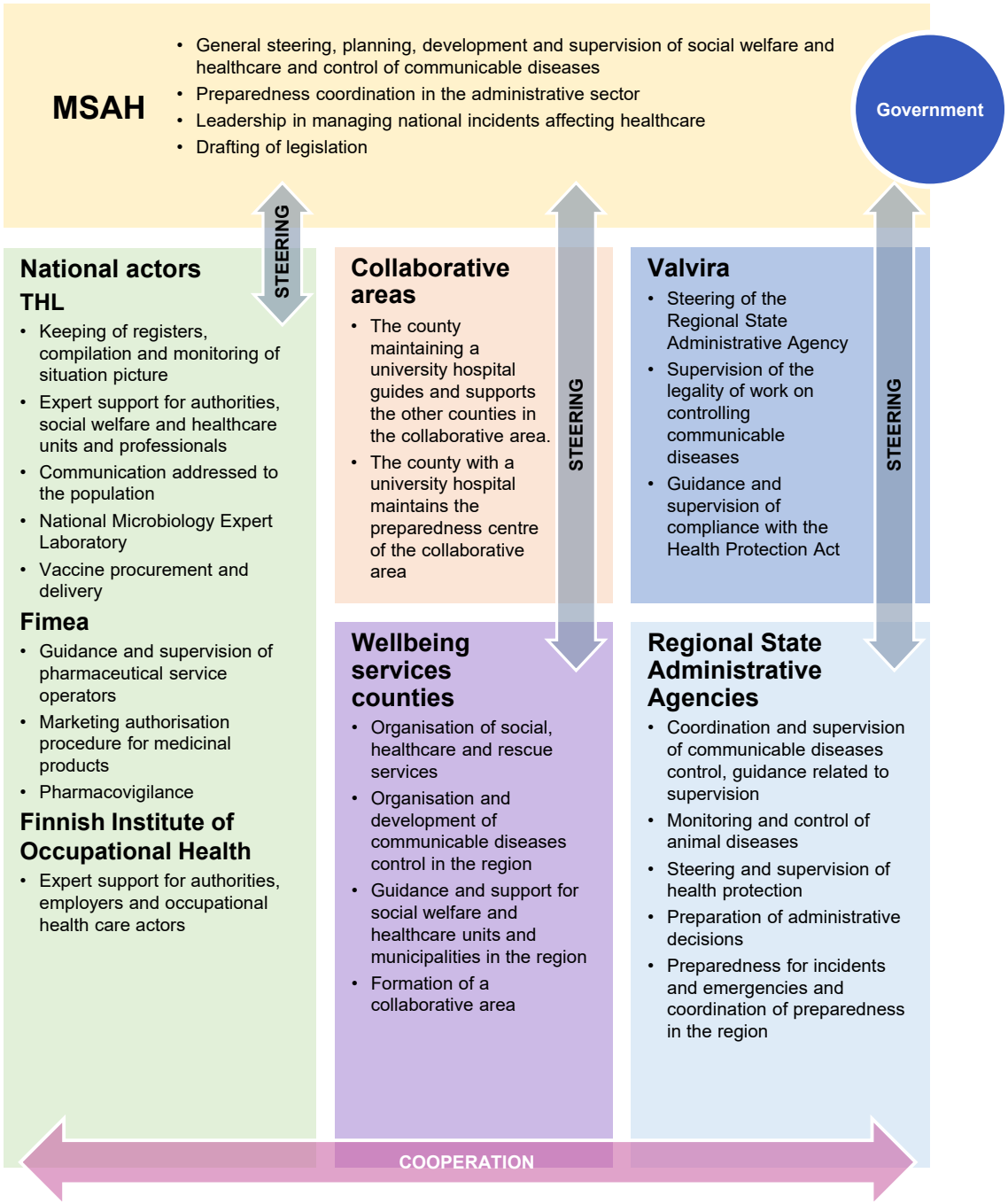
### 5.1.2 Coordination obligation

The government leads and oversees efforts to safeguard society's vital functions and coordinates the measures taken by different ministries. The Prime Minister's Office is responsible for coordinating overall pandemic management and intensified government communications. If necessary, the government may appoint cabinet committees, for example on cross-administrative management of significant incidents affecting society. The Ministry of Social Affairs and Health is responsible for preparing for incidents, and threat of incidents, affecting healthcare and social welfare at the national level as well as leadership in such situations. It also coordinates the required collaboration between the ministries. The guidance provided by the Ministry of Social Affairs and Health may be either normative, information based or resource based (Figure 3).

51 Government Resolution 2 November 2017. Security Strategy for Society. ISBN 978-951-25-2959-9 (PDF). Available at: https://turvallisuuskomitea.fi/wp-content/uploads/2018/04/YTS_2017_english.pdf.

52 Government Decree on the Security Committee (77/2013).

**Figure 3.** Competences and steering in the administrative branch of the Ministry of Social Affairs and Health.



The Regional State Administrative Agency is tasked with coordinating the prevention of communicable diseases, partly under the guidance of the National Supervisory Authority for Welfare and Health. Guided by the Finnish Food Authority, the Regional State Administrative Agency also coordinates the prevention of animal diseases in its region. The counties have a duty to coordinate the prevention of communicable diseases and preparedness for incidents in their areas and to work together with other counties. The wellbeing services county that maintains a university hospital directs and supports other counties with its expertise. The county's administrative regulations contain provisions on the organisation of its administration and work.

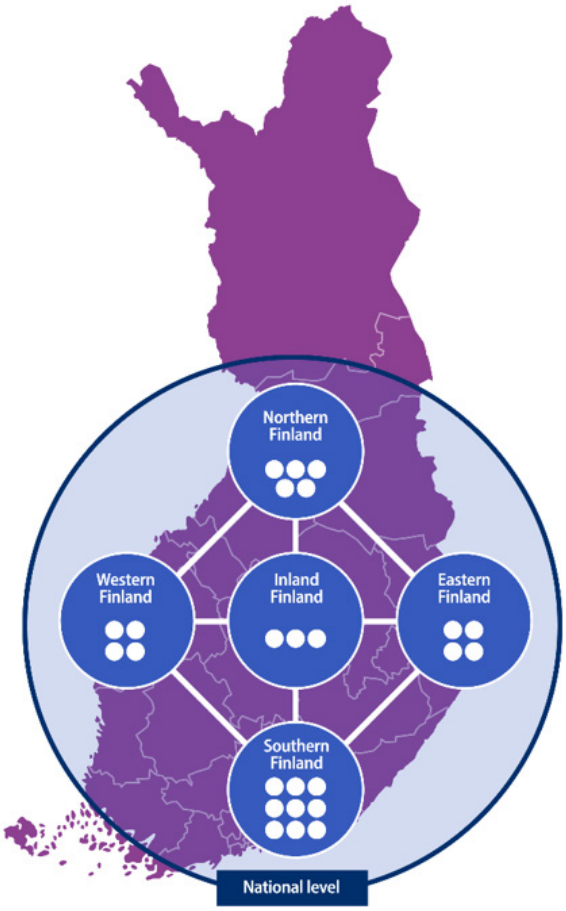
The county must organise and direct the prevention of communicable diseases in its region. It must also be prepared to assume tasks associated with this work in the services it is responsible for organising in all situations. The municipality and the county must collaborate in the prevention of communicable diseases in different sectors of the municipality. For example, the municipality's environmental healthcare services work together with the county if the pandemic affects food safety, or the pandemic pathogen is a zoonosis (a disease that can be transmitted between humans and animals). Healthcare and social welfare units must coordinate their measures aimed at preventing healthcare-associated infections with the actions of the county and national prevention programmes.

### 5.1.3 Collaborative area

The purpose of the counties' collaborative areas (YTA areas) formed under an agreement is to ensure regional coordination, development and cooperation in the healthcare and social welfare sector[53]. Each collaborative area has a university hospital. The county with a university hospital directs the preparedness planning in healthcare and social welfare in its collaborative area following uniform national principles. The county with a university hospital operates a healthcare and social welfare preparedness centre, whose task is to maintain a situation picture that describes the preparedness of the healthcare and social welfare service system in the collaborative area. It also relays situation picture information to other preparedness centres and the Ministry of Social Affairs and Health (Figure 4). The wellbeing services counties may agree that the preparedness centre will also handle centrally other tasks in the collaborative area.

53 Government Decree on Collaborative Areas for Social Welfare and Healthcare (91/2022).

**Figure 4.** Network of preparedness centres. The Preparedness Centre of Western Finland Collaborative Area also works together with the Provincial Government of Åland to build a situation picture.




### 5.1.4 Advisory boards and coordination groups

The meetings of the Permanent Secretaries and Heads of Preparedness support the government and the competent ministry as set out in the central government's incident management model. Separate coordination groups may need to be set up to ensure smooth cooperation between different authorities and the sharing of up-to-date situation picture information as well as communication. The coordination of work during incidents can be facilitated by also maintaining networks of authorities and experts during periods between pandemics.

Advisory boards appointed by the government operate in conjunction with the Ministry of Social Affairs and Health. The task of the Advisory Board on Communicable Diseases is to monitor the general development of the communicable disease situation and the implementation of the work to prevent communicable diseases It also makes proposals for developing the prevention of communicable diseases and the legislation relevant to it where necessary and provides expert support to the Ministry of Social Affairs and Health in the prevention of exceptional epidemics. The task of the Advisory Board for Health and Welfare in Emergency Conditions is to promote preparedness in healthcare and social welfare and the national and international cooperation between the authorities it requires.

In the early stages of the COVID-19 pandemic, the government appointed a national COVID-19 coordination group consisting of the Permanent Secretaries and Heads of Preparedness in the responsible ministries. This facilitated cooperation between the ministries. The government later appointed a ministerial working group on cross-administrative coordination of COVID-19 measures. The Ministry of Social Affairs and Health as the competent ministry led the activities and appointed a coordination group for preparedness in healthcare and social welfare and an operational group under it, both of which had representatives from the national expert institutions, hospital districts, Regional State Administrative Agencies and large municipalities. Later on, the Ministry of Social Affairs and Health appointed a national coordination group for COVID-19 testing preparedness (LAB7), a national coordination group for material preparedness (LOG5), a cooperation group on health security at border crossings, and a situation picture and modelling group. In addition, the ministry organised regular meetings with senior physicians in hospital districts. The Advisory Board on Communicable Diseases and the Advisory Board for Health and Welfare in Emergency Conditions met more frequently than usual and focused on pandemic management. THL regularly convened national coordination meetings. In regional COVID-19 coordination groups municipalities, hospital districts, the Regional State Administrative Agencies and THL examined the regional situation picture and coordinated their measures. Various cooperation groups were additionally established in other administrative branches.

## 5.2 Strategic leadership

Strategic leadership of a pandemic refers to defining the goal and objectives of managing the incident. The strategy provides outlines for operative leadership decisions and the authorities' decisions. The strategy also serves businesses as well as communities and the population, whose commitment to the authorities' decisions is a prerequisite for managing a pandemic successfully. The strategy is drawn up relying on the available situation picture information regarding the pandemic pathogen, its spread, the conditions, and the effectiveness of the available measures.

Adopting a strategy is a key measure for the prevention and management of and recovery from a pandemic. In addition to benefits, pandemic management measures always also have disadvantages with extremely broad effects on society. Not only the interests of the individual and the community but also the different fundamental rights of the individual are often at odds with each other. This is why an ethical, open and inclusive societal debate based on information and values is a precondition for adopting a strategy. Defining a strategy is particularly important in a situation where activities must be prioritised. Openness and inclusiveness in the preparation of the strategy can, for example, be promoted by consulting stakeholders at different stages of the process. Special groups, such as children, must be given an opportunity to be heard in matters concerning them.

A pandemic management strategy can be prepared to broadly direct the activities of society at large, or it can be targeted at a specific sector, including healthcare and social welfare, a specific pandemic management measure, or a certain high-risk group or vulnerable population group. The national strategy is complemented by regional ones. International organisations develop global or multi-country strategies that guide international pandemic management cooperation.

The strategic goals of pandemic management may include protecting the wellbeing, health and lives of the population, preventing infections, controlling the spread of infections, reducing morbidity, reducing excess mortality and protecting high-risk groups. Other strategic goals may be safeguarding the availability of health and social services, protecting the individual's fundamental rights, restoring the normal functioning of society, preventing direct and indirect harms caused by the pandemic, and following the precautionary principle, according to which incomplete information should not prevent measures aiming to combat a threat where the consequences are serious. In the case of zoonoses (diseases transmitted between humans and animals), the strategy must also address animal health and the role of animals in the pandemic as well as possible foodborne spread.

The different strategies for managing a pandemic are determined by their goals. Examples of different approaches include a strategy aimed at preventing the overburdening of the healthcare and social welfare system by limiting the spread of infections, and a strategy that aims for a high level of natural immunity among the population. The feasibility of the strategy depends, among other things, on the characteristics of the pathogen and the epidemiological situation as well as the resources, medicines and vaccines that are available. When preparing the strategy, particular attention should be paid to safeguarding the wellbeing and functional capacity of vulnerable population groups.

During the COVID-19 pandemic, the government adopted a resolution on a hybrid strategy for managing the COVID-19 crisis at its plenary session of 6 May 2020. As the goal was set containing the pandemic effectively in ways that would cause as little harm as possible to people, companies, society and the realisation of fundamental rights. The strategic goal was preventing the spread of the virus in society, safeguarding the capacity of the healthcare system, and shielding and protecting people, especially those who are most at risk. Decisions on restrictive measures would be based on overall consideration, maximising the benefits of the measures compared to their adverse social and economic effects. The government later decided on a national COVID-19 testing and tracing strategy, which complemented the hybrid strategy, and on Finland's coronavirus vaccination strategy. These strategies were updated several times as the epidemic situation changed.

If necessary, the strategy must be updated as required by changing circumstances or updated knowledge base. The need to update the strategy may also arise from viewpoints put forward in societal debate. For example, a strategy for pandemic preparedness may address general hygiene awareness and skills, development of the national vaccination programme, maintenance of the population's high vaccination coverage, use of antimicrobials, surveillance systems, or the availability of healthcare and social welfare personnel, diagnostics and supplies.

A pandemic management strategy may, for example, concern diagnostics and contact tracing, the use of restrictive measures, pharmacotherapy and vaccinations, or communication. The post-pandemic recovery strategy, on the other hand, may concern various measures that can be used to clear a treatment backlog, remedy

the adverse social, societal or economic impacts caused by pandemic management, adapt to new circumstances, or evaluate and draw on the accumulated experiences for improving preparedness. To ensure that the changes to the strategy are predictable, the document may include a plan for evaluating the strategy.

In addition to the goal and objectives, the strategy describes the actors and means by which these objectives can be achieved. The means may include not only various recommendations and restrictions but also human and financial resources. A diagnostic strategy may, for example, define the use of different diagnostic methods.

A national strategy is drawn up by the Ministry of Social Affairs and Health or, in a situation significant for society, by the government. In addition to national strategies, strategies for individual regions or organisations can be drawn up. The pandemic management strategy must be clear and comprehensive for different user groups. If necessary, a separate strategy implementation plan can be drawn up to clarify operative measures.

> During the COVID-19 pandemic, the Ministry of Social Affairs and Health prepared an action plan to support the implementation of the hybrid strategy for managing the COVID-19 crisis. This plan guided the competent authorities at practical level in using the appropriately recommendations and restrictions adopted pursuant to the Communicable Diseases Act. According to the plan, decisions on restrictions were made in three tiers as indicated by the severity of the pandemic situation. The focus of the implementation was on the 'test, trace, isolate and treat' operating model, which aimed at early laboratory-confirmed diagnosis of disease cases, effective contact tracing, quarantining of those who had been exposed and isolating infected persons as well as good treatment of those with severe symptoms.

In terms of the effectiveness of the strategy, it is important that the steps towards achieving its objectives are monitored and, if necessary, their direction is adjusted. The effectiveness of the strategy can be monitored based on the pandemic situation picture. The strategy must set out indicators to be monitored and specify how often, in what ways and by whom they are monitored. In addition to monitoring its implementation, the strategy should also be evaluated as a whole at a later date.

During the COVID-19 pandemic, studies evaluating pandemic management and decision-making were completed in Finland. These examined both government actions as well as activities and collaboration at different levels of administration[54,55]. Some of the reports produced were summaries, others strategic and proactive reports[56,57]. As part of the Academy of Finland's strategic research programmes, the wide-ranging impacts of the pandemic were studied, and evidence-based policy recommendations were issued to support decision-making[58,59]. The studies brought up both strengths and development areas and highlighted the need for a comprehensive study covering a longer period.

54 Deloitte. Selvitys koronakriisin aikana toteutetun valtioneuvoston kriisijohtamisen ja valmiuslain käyttöönoton kokemuksista. Government reports 2021:1. Available at: http://urn.fi/URN:NBN:fi-fe202101212316.

55 Stenvall J et al. Koronajohtaminen Suomessa: Arvio covid-19-pandemian johtamisesta ja hallinnosta syksystä 2020 syksyyn 2021. Publications of the Government's analysis, assessment and research activities 2022:34. ISBN 978-952-383-003-5 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-383-003-5.

56 Varanka J et al. COVID-19 -kriisin yhteiskunnalliset vaikutukset Suomessa: Keskipitkän aikavälin arvioita. Government publications 2022:14. ISBN 978-952-383-708-9 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-383-708-9.

57 Ihalainen R et al. Sosiaali- ja terveydenhuollon palvelujärjestelmän varautuminen mahdolliseen seuraavaan epidemia-aaltoon: Selvitysryhmän raportti. Reports and memorandums of the Ministry of Social Affairs and Health 2022:11. ISBN: 978-952-00-9696-0 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-00-9696-0.

58 Janhonen K et al. Varautuminen ja kriisinhallinta edellyttävät yhteistyön ja inhimillisten voimavarojen johtamista. Hyvinvoinnin turvaaminen pandemia-aikoina: kohti yhteistyöhön perustuvaa syndemioiden hallintaa (WELGO) -ohjelma. Strategic research policy briefs 6/2023. Available at: https://www.aka.fi/strateginen-tutkimus/strateginen-tutkimus/tutkimusta-tiedon-kayttajalle/politiikkasuositukset/.

59 Sorsa V-P, Jalonen H, Uusikylä P. Informaatioresilienssi kriisitilanteiden päätöksenteossa – koronapandemian opetukset. Hyvinvoinnin turvaaminen pandemia-aikoina: kohti yhteistyöhön perustuvaa syndemioiden hallintaa (WELGO) -ohjelma. Strategic research policy briefs 6/2023. Available at: https://www.aka.fi/strateginen-tutkimus/strateginen-tutkimus/tutkimusta-tiedon-kayttajalle/politiikkasuositukset/.

## 5.3 Leadership of implementation

The competent authority leads the operational activities in accordance with the strategy and is responsible for communications concerning them, both in normal conditions and during incidents. The main responsibility for the actual pandemic management rests with the regional authorities. The Ministry of Social Affairs and Health leads the implementation of the pandemic management strategy at the national level. Other authorities participate in the activities and provide executive assistance to the extent that this is necessary in order to manage the situation.

The necessity, proportionality and timeliness of measures must be assessed in proportion to the local situation picture and circumstances. Coordination between the counties and the Regional State Administrative Agencies in carrying out management measures is needed, especially when their decisions have an impact on the possibilities of another county or Regional State Administrative Agency to carry out their tasks. The principle of regional equality should also not be forgotten. In addition, cooperation with other authorities must also be accounted for in the regional cooperation groups.

Healthcare and social welfare actors must be able to adapt their practices and channel resources to respond to new needs if necessary. At the same time, they must safeguard the performance of their statutory tasks. Pandemic management may necessitate the introduction of leadership arrangements that differ from those in normal conditions to secure effective decision-making and operational activities. In emergency conditions, it may be possible to introduce some of the additional powers referred to in the Emergency Powers Act where necessary to safeguard health and social services.

# 6 Situation picture and risk assessment

**The planning and decision-making related to pandemic management are based on the situation picture and a risk assessment based on this. The situation picture is an overview of the prevailing circumstances, the events that triggered the current situation, background information on the situation and assessments of how the situation will develop as well as what the capabilities of the various actors are, produced by the competent authorities.**

The situation picture of the pandemic is put together based on different themes and information sources and by different authorities. The situation picture can be either specific to an organisation, local area or region, or it can be national or international. Information needs change in different phases of the pandemic, which is why the situation picture must be dynamic. The need for a situation picture of prevention and preparedness is emphasised in the inter-pandemic phase. While the situation picture in the pandemic phase is based on the situation picture of normal conditions, a larger volume of information is needed, and it must be strictly up to date. For example, information is needed on the pathogen and its spread, burdening of services and the more extensive effects of the pandemic. In the recovery phase of the pandemic, such aspects as the indirect social and economic consequences of the pandemic may be emphasised in the situation picture.

The situation picture has many uses, users and purposes. It is up to political decision-makers and competent authorities to make the necessary and proportionate pandemic management decisions based on the situation picture. Healthcare and social welfare service providers use it to plan service availability, resources and actions. Many other parties, including businesses, the media and the population, also need the situation picture.

The information on the situation picture must be accessible, usable, coherent, comprehensive and up to date. Decision-makers and the population must be able to trust the quality of the situation picture information. As a basic premise, information on the situation picture is public unless there are special grounds for keeping it secret.

## 6.1 Indicators

An unambiguous case definition is a prerequisite for building a situation picture regarding the pathogen. A case definition is drawn up for both suspected and confirmed cases, and it must be internationally uniform. A case definition may be prepared separately for an infectious case, one requiring hospitalisation, or a fatality. In practice, diagnosis based on a laboratory test is always required for a confirmed case. Once the case definition has a disease classification, register data can be used.

The metrics of the situation picture are key indicators describing the pandemic, and a change in an indicator may trigger measures. The indicators to be monitored are selected separately in each pandemic situation and can be changed during the pandemic if necessary. Factors affecting the choice of indicators include the availability, reliability and usability of data. The indicators for the situation picture can be divided as follows:

1. indicators for the spread of the pandemic (Table 3)
2. indicators for the burden on healthcare and social welfare (Table 4)
3. indicators describing the impacts of the pandemic (Table 5).

In a pandemic, a situation picture is needed that covers the operation of the entire service chain, including specialised medical care, primary healthcare and social welfare (Table 4). In addition, NGOs may produce situation awareness that is useful for evaluating the service system. At the regional level, the examination may focus on different units, service forms or specialisations. It is particularly important to collect information on services for vulnerable groups. They may include housing services and home care for older people, substitute care provided by child welfare services, and institutional care for persons with intellectual disabilities.

The indicator can be examined by age group or region, for example. When different information sources are combined at the individual level, such variables as testing rate, disease incidence, need for hospitalisation and intensive care and duration of the care period, or mortality in different age groups or in persons with chronic illnesses can be examined. This way, risk factors can be identified. Where possible, the metrics of the situation picture should contain information on the effects of the pandemic on vulnerable persons.

**Table 3.** Examples of indicators that describe the spread of a disease among the population.

| Indicator | Interpretation | Advantages and limitations |
|---|---|---|
| Self-reported infections (participatory monitoring) | Number of cases reported by the population based on positive home test results or self-assessment of symptoms. | The shortest delay compared to the actual epidemic situation. Sources of error include inaccuracies of home tests and the case definition. |
| Infections diagnosed based on symptoms (symptom-based monitoring) | Cases meeting the clinical case definition reported by healthcare. | Moderate delay compared to the actual epidemic situation due to delays in patients seeking healthcare. Inaccuracy of the case definition as a source of error. |
| Infections diagnosed by laboratory testing | Number of persons excreting the pathogen at the time of testing. | Moderate delay compared to the actual epidemic situation due to patients' decisions to get tested and the analysis and reporting of results. Reliability and availability of diagnostics as a limitation. The number of diagnosed infections is always lower than actual situation. |
| Infections detected in wastewater | Quantity and quality of the pathogen or its component in wastewater | A delay compared to the actual epidemic situation. Challenges of analysing wastewater. |
| Laboratory tests performed | The number of laboratory tests performed describes the population's testing activity. | Makes it possible to assess the proportion of positive tests. |
| Proportion of positive tests | The lower the proportion of positives tests, the larger the proportion of infections diagnosed by a laboratory test. | Targeting of testing and a low testing activity rate of the population increase the proportion of positive tests. |
| Proportion of seropositive subjects | Proportion of infected persons who have formed antibodies against the pathogen in the population. | A reliable indicator for the occurrence of the disease in the population as asymptomatic infections are also detected. Serological sampling tests at population level require resources, and there are delays in the availability of data. Reliability reduced by possible cross-reactive antibodies. |
| Pathogen mutation | Mutation of the microbe and occurrence of resistance properties in random sampling from positive human or animal tests or wastewater. | Supports the use of medicines, vaccines and non-pharmaceutical interventions. A delay compared to the actual epidemic situation and assessing the significance of findings as limitations. |
| Fatalities | Fatalities directly (principal cause of death) or indirectly caused by the pathogen. | Delays are associated with cause of death investigations by a physician. Determination of cause of death based on a temporal link may result in overestimation of fatalities. |

**Table 4.** Examples of indicators for the burden on health and social services.

| Indicator | Interpretation | Advantages and limitations |
|---|---|---|
| Number of care contacts | Number of different visits to primary healthcare, specialised medical care or emergency clinics with infectious disease as the main diagnosis. | Also accounts for digital care contacts and telephone visits. |
| Started treatment periods | New patients registered in inpatient wards (including intensive care) over a certain period diagnosed with an infectious disease or a specific set of symptoms and a positive laboratory test result. | Rather than the reason for the treatment, an infectious disease is an auxiliary finding made during treatment in some patients, in which case the indicator does not describe the burden caused by the infectious disease. |
| Patients in inpatient wards | Number of patients treated in inpatient wards (including intensive care) at a specific point of time diagnosed with an infectious disease or a specific set of symptoms and a positive laboratory test result. | A reliable indicator for spread as it is not affected by any limitations in diagnostic capacity or changes in population's testing activity. A lack of further treatment places may increase the number of patients in the inpatient ward. |
| Number of healthcare-associated infections | Effectiveness of infection control measures in social welfare and healthcare. | Enables the identification of exposure situations and the promotion of client and patient safety. |
| Contact tracing volume | The numbers of completed and incomplete contact tracing processes describe the burdening of contact tracing. | Contact tracing can provide qualitative information on the infection risk associated with exposure situations and the population's behaviour. |
| Number of vaccinations | Performance of vaccination activities and the population's vaccine coverage. | Enables strategic and operational planning of pandemic management. |
| Number of employees | The employee numbers and absences affect the total capacity of the service system. | Enables service process continuity and personnel planning. |

**Table 5.** Examples of indicators for the effects of a pandemic and its management.

| Indicator | Interpretation | Advantages and limitations |
|---|---|---|
| Basic reproduction number R | The effective reproduction number R describes the average number of new cases infected by a carrier in a certain population at a given moment. R>1 means that the epidemic is intensifying, R<1 that it is subsiding. | The R number can be used to estimate the rate at which the epidemic is changing. It is calculated with the help of the so-called SIR model, using age-specific incidence data concerning infections and/or hospitalisations and information on the population's immunity. |
| Restrictions in force | Authorities' actions deemed necessary and proportionate due to the pandemic situation. | The factors affecting the assessment of necessity and proportionality may vary regionally. |
| Morbidity indirectly related to the pandemic | The pandemic and its management may increase or reduce wellbeing and morbidity caused by other diseases, such as the experience of loneliness or mental health problems. | Enables overall assessment of the impacts of the pandemic on wellbeing and health. |
| Other societal impacts | The direct and indirect impacts of a pandemic and its management on the behaviour of the population, public services, business life and the environment. | Requires data collection in various administrative branches and from a number of different data sources. |

Each indicator has its limitations, and only by examining several different indicators simultaneously can an overall picture be built of the pandemic. For example, information on cases reported by the population (participatory monitoring) complements the monitoring of laboratory-confirmed infections. The reliability of the information can be improved by taking into account the prior probability of infection based on other data sources.

## 6.2 Modelling of the pandemic

Modelling can be used to estimate the possible course of the pandemic: in the absence of reliable monitoring data, the current situation can be estimated (nowcasting), or the burden on medical care in the near future can be anticipated (forecasting). Additionally, scenarios can be created for studying the effects of different assumptions on the disease burden in the near future. By using modelling, advance estimates can be made of the impact of various pandemic management

measures on trends in case numbers, need for hospitalisation or mortality. The information for the situation picture obtained through modelling supports leadership and decision-making in pandemic management.

In order to produce scenarios concerning the future burden on hospitals or mortality, assumptions must be made of the infection's basic reproduction number, incubation time, delay before infectiousness, generation time, duration of exposure, proportion of people with immunity in the population, case fatality rate, and proportion of people needing hospital or intensive care. The scenarios are dynamic; in other words, they change as the knowledge base of the pandemic builds up and the characteristics of the pathogen and population change. Infectious disease models rely on information about average contacts among the population. However, the behaviour of the population may change during the pandemic, for example due to restrictions.

## 6.3 Building the situation picture

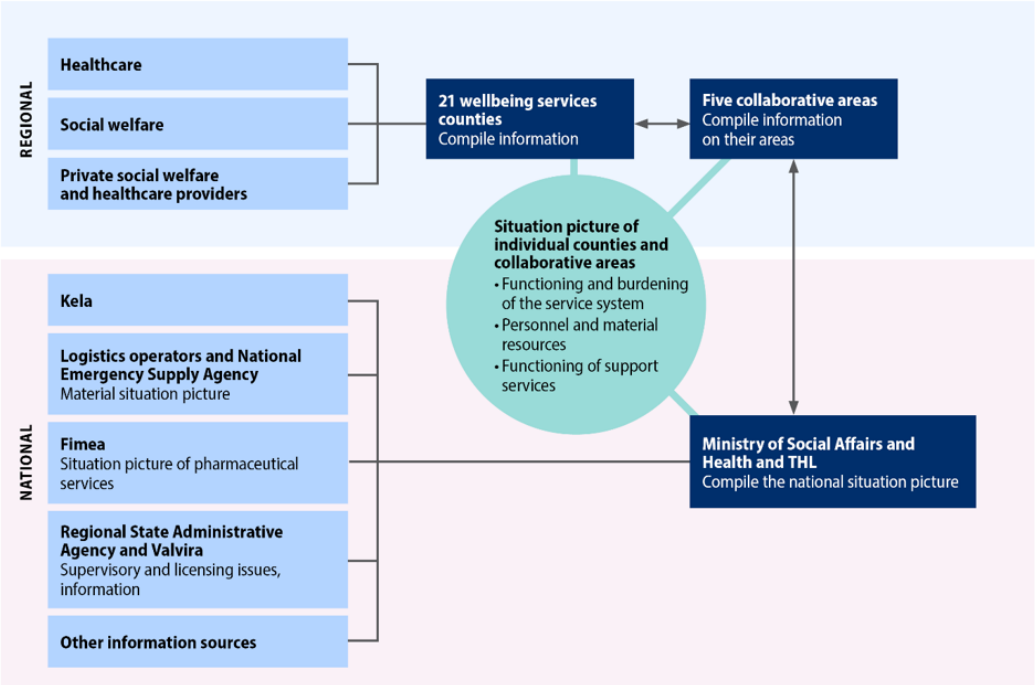
The first observations of a potential pandemic abroad are transmitted either through the WHO's system or the EWRS to the Finnish Institute for Health and Welfare (THL). THL passes on the information to both the Ministry of Social Affairs and Health and its other stakeholders, making it possible for them to undertake immediate preparedness measures.

It is important that the situation picture is available to all authorities and other actors that need it without delay. As a rule, the situation picture composed by the authorities is public unless there are special grounds for keeping it secret. The grounds for secrecy must be stated in the document setting out the situation picture. The indicators and data collection for the situation picture of a pandemic are based on data collection in normal conditions as the basic premise. New indicators may also be needed in a pandemic situation, however, and it may be necessary to collect information using a new procedure or from new sources.

Each authority has a duty to form a situation picture regarding its remit. Regional authorities are responsible for forming the regional situation picture. The county maintains a situation picture of its healthcare and social welfare activities and relays it to the preparedness centre in its area (Figure 5). The preparedness centres form the situation picture for the collaborative area, which includes information on the operation and burden of the service system, human and material resources, and the operation of support services. The preparedness centres communicate the situation picture for their areas to the counties, Regional State Administrative Agencies and

other key actors. The Regional State Administrative Agency prepares a situation picture of zoonotic animal diseases and relays the information to the Finnish Food Authority. A municipality's environmental healthcare services maintain and analyse the situation picture in their field of responsibility and operating area and relay it to the Regional State Administrative Agency or the central agencies of their administrative branch, following instructions received.

**Figure 5.** Building of the national situation picture for social welfare and healthcare (adapted from THL 2021[60]).




The Ministry of Social Affairs and Health and five preparedness centres build a national situation picture of healthcare and social welfare, which is based on THL's national data collection and production. Each national authority and agency forms a national situation picture concerning its remit, also including international information essential for national preparedness. Information received from other

60 Lukka L, Saarenpää T. Esiselvitys sosiaali- ja terveydenhuollon valtakunnallisen tilannekuvan ja valmiussuunnittelun jatkokehittämisestä. Finnish Institute for Health and Welfare (THL) Working papers 25/2021. ISBN 978-952-343-752-4 (PDF). Available at: https://urn.fi/URN:ISBN:978-952-343-752-4.

administrative branches complements the situation picture of healthcare and social welfare. The Finnish Food Authority forms a national situation picture in its sector together with the municipalities and the Regional State Administrative Agencies, sharing it primarily with the Ministry of Agriculture and Forestry and, in the case of zoonoses (diseases transmitted between animals and humans), also with THL and other authorities and stakeholders affected by the incident. The task of the Government Situation Centre (VNTIKE) at the Prime Minister's Office is to maintain a situation picture that supports decision-making and work by the President of the Republic and the government. Ministries, agencies and institutions must notify the Government Situation Centre of any incident or threat of an incident in their sectors that may have significance in forming the situation picture[61].

During the COVID-19 pandemic, the Ministry of Social Affairs and Health appointed a situation awareness and modelling group whose task was to produce monitoring information on the achievement of the objectives set in the government's hybrid strategy. Situation awareness reports were published regularly, totalling more than 90. The indicators for situation awareness were defined in the action plan for the hybrid strategy. They consisted of the number of tests conducted, proportion of positives tests, incidence, effective basic reproductive rate, volume of coronavirus in wastewater, traceability of infection sources, number of hospitalised patients and vaccination coverage. The indicators were examined regionally and by cohort. Additionally, separate reports were published from time to time that focused on certain themes, including mutation of the virus and the epidemic situation among children and young people. The situation pictures were published at press conferences.

Monitoring refers to the collection, compilation and analysis of situation picture information. Data collection for the situation picture can take place through different monitoring systems.

61 Act on the Government Situation Centre (300/2017).

### 6.3.1 Surveillance sampling

The objective of laboratory-based surveillance sampling is to detect a new microbe posing a threat of a pandemic as early as possible and to obtain up-to-date information on the occurrence of the disease as well as the mutations, severity and spread of the pathogen. Surveillance sampling is carried out for blood-borne and sexually transmitted diseases, drug-related infections, respiratory tract infections, and infections affecting foetal development during pregnancy[62].

For the purposes of the sample surveillance of respiratory tract infections, healthcare testing points regularly collect respiratory secretions from patients with a clinical diagnosis of acute respiratory infection (ARI), influenza-like illness (ILI) or severe acute respiratory infection (SARI). These samples are submitted to THL for analysis. The surveillance should cover a wide geographic area and a broad range of different population groups. During a pandemic, the surveillance system makes it possible to monitor the distribution of the pathogen.

In Europe, influenza surveillance takes place in collaboration by the ECDC and the WHO Regional Office for Europe. The European Influenza Surveillance Network (EISN) collects virological and epidemiological information on influenza from Member States on a weekly basis for the TESSy information system maintained by the ECDC. The ECDC and the WHO's Regional Office for Europe publish a joint weekly FluNewsEurope bulletin on the influenza situation in Europe.

The aim of the WHO's Global Influenza Surveillance and Response System (GISRS) is to detect new, virulent virus strains early and to step up information exchanges between countries. National Influenza Centres (NICs, in Finland THL) report their influenza findings weekly to the WHO's FluNet database. The WHO issues its recommendations on viruses to be included in vaccines twice a year based on virological and epidemiological data from National Influenza Centres. Separate recommendations are issued for the northern and the southern hemisphere.

Wastewater monitoring provides a method for examining the occurrence of microbes independently of the extent to which people come in for testing and the targeting of the tests. Depending on the location of the sampling point in the wastewater network, monitoring can be targeted locally if necessary.

62 Section 12 of Government Decree on Communicable Diseases (146/2017).

### 6.3.2 Register-based surveillance

Laboratories conducting microbiological diagnostics report their findings of approx. 100 designated pathogenic microbes to the national Communicable diseases register. In the case of certain microbes, a sample is attached to the report for further tests. Using the Communicable diseases register, epidemics can be identified and their spread can be monitored. The register may give alerts of outbreak signal detection. By combining data in the Communicable diseases register and in the Care Register for Health Care, the severity of the symptoms caused by infections can be investigated. Information from other national registers can also be used for forming the situation picture.

### 6.3.3 Surveillance of animal diseases

Responsibility for the surveillance of animal diseases and zoonoses (diseases transmitted between humans and animals) rests with the animal health authorities. This surveillance is based on an annual monitoring plan drawn up by the Finnish Food Authority and other samples sent to the authority for testing. If necessary, surveillance and sampling are targeted at new threats or at monitoring the mutation of pathogens. The samples are examined in the Finnish Food Authority's laboratory. The Finnish Food Authority reports to THL any suspected or identified serious zoonoses that pose a risk to human health.

## 6.4 Risk assessment

The purpose of risk assessment is to gauge the severity and likelihood of harms caused by a hazard. In a risk assessment concerning a pandemic, factors to be taken into account include the properties of the pathogen, morbidity and mortality caused by it, the population's susceptibility to serious symptoms, and the available prevention methods. The risk assessment can be used to support decision-making on pandemic management. In this case it must, however, be noted that a risk assessment often focuses on the risks caused by the hazard and does not necessarily take into account the wide-ranging impacts of a pandemic or its management measures.

Looking at exposure and the factors affecting it is an essential part of the risk assessment. A person's exposure to the pathogen is affected by such factors as the infectiousness of the pathogen, the frequency of and changes in the population's social contacts, use of personal protective equipment as well as disinfection of surfaces and purification of air.

Especially in the case of previously unknown pathogens, the factors affecting the risk are not yet known. In this case, the risk assessment must rely on existing data on the properties of other similar pathogens, or historical data on previous epidemics. Once information on a new pathogen's properties and their transformation begins to accumulate, the risk assessment must be updated. Changes in vaccination protection, the population's natural immunity, contacts among the population and the use of various protective equipment also affect risk assessment models.

A national or regional risk assessment takes into account the characteristics of the national and local operating environment and population. The ECDC prepares Rapid Risk Assessments (RRAs) for the EU area. The WHO also produces country-specific, regional and global risk assessments.

# 7 Intensified communication

**Pandemic management requires intensified communication, and this communication must be systematic, open and comprehensible and use multiple channels. Accessibility and using multiple languages must be addressed in communication. A clear division of responsibilities between the authorities lays the foundation for all communication. In addition to the authorities' active role, good communication during a pandemic requires an active media provided with solid background information as well as close cooperation between the authorities and various stakeholders.**

Intensified communication is based on communication in normal conditions. The threshold for intensifying communication should be kept low, and communication can be stepped up gradually, starting from the first indications of a pandemic. Intensified communication means that the authorities' communication networks work more closely together, and information flows and division of labour between different actors are ensured. Maintaining trust in the authorities' functional capacity and managing the expectations set for communication as well as possible are in key role. The aim of communication is to provide sufficient information and instructions to all those concerned.[63]

Communication has two roles in a pandemic:

1. Communication is an essential part of leading pandemic management. A continuous link must be ensured between communication, leadership and the situation picture. The expert(s) responsible for communication must be involved in all compositions for managing and discussing the pandemic. In addition, communication must be part of the organisation's alert system. The communication unit must have access to all relevant information needed to manage

63 Tampere P et al. Kriisitilanteita koskevan kansalaisviestinnän kehittäminen: Final report of the working group. Prime Minister's Office Publications 2023:1. ISBN 978-952-383-301-2 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-383-301-2.

the communications required by the situation. Planned, proactive, open and timely communication can respond to the increased need for information, mitigate the effects of the pandemic and promote recovery from it. Communication can be used to provide the population with information and instructions and to maintain a sense of security.

2. A pandemic also drives people's need for and interest in information when the crisis does not affect them personally. The information needs of the population, the media and various stakeholders must be met efficiently and regularly.

In their communication, the authorities must take into account the values guiding central government communications: openness, reliability, fairness, comprehensibility, interaction and service-mindedness[64].

## 7.1 Responsibilities for communication

Each competent authority communicates as indicated by its responsibilities. Different authorities support the communications of the authority with the overall responsibility through their messages on their own channels. In order for official communications to be as consistent as possible, such actors as wellbeing services counties and municipalities should be informed in advance of instructions to be issued, or changes to them, as well as the communication measures associated with them.

The Ministry of Social Affairs and Health is responsible for planning and directing national communications concerning the pandemic and its alert phase in cooperation with agencies in its administrative branch, especially the Finnish Institute for Health and Welfare (THL), and other ministries. The communication policies must address changes in the threat scenario, operating environment and prevention measures. The Ministry of Social Affairs and Health communicates about legislative amendments and provides guidance relating to the implementation of legislation directly to the counties, Regional State Administrative Agencies, municipalities and the Province Åland as well as other actors and the media.

64 Prime Minister's Office Publications 2023:11. Avoimesti ajassa: Valtionhallinnon viestintäsuositus 2023. ISBN 978-952-383-373-9 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-383-373-9.

THL supports other authorities with its expertise and prepares guidelines and recommendations for social welfare and healthcare professionals. In its communication, THL informs the population about the occurrence of communicable diseases and how to protect against them. The Finnish Food Authority is responsible for communication related to food safety as well as animal diseases and their control. The Regional State Administrative Agencies and municipal environmental healthcare units supplement this communication if necessary. The Finnish Medicines Agency (Fimea) produces and disseminates information on medicines and medical devices.

The wellbeing services counties communicate about the epidemic situation in their regions and provide instructions for their residents. They can use materials produced by THL in their communications and supplement them with their local instructions if necessary. The counties and the Regional State Administrative Agencies are responsible for ensuring that regional contingency plans include pandemic communication plans and that responsibilities for communication have been decided.

Each ministry is responsible for pandemic communications in its administrative branch. When the situation concerns several administrative branches, the management and coordination of joint communications can also be transferred to the Government Communications Department by a separate decision. In emergency conditions, communication is managed and coordinated in compliance with the emergency conditions legislation.

The management of each organisation determines who coordinates its communication in a pandemic situation. This person is a member of their organisation's management group for pandemic situations and other groups relevant to the situation picture and communication. Similarly, the management of each organisation designates the person who makes public statements at the very beginning of the crisis. The aim of this is to ensure consistent communication and to give the persons dealing with the crisis an opportunity to do their work without disruptions. As the situation changes, the persons responsible for communications may be replaced. It is essential that these persons have not only expertise but also time to participate in public debate. In a serious crisis, such as a pandemic, not only experts but also a person who carries political responsibility are needed. Media contacts should be centralised to the communications unit.

## 7.2 Target groups of communications

The target groups of communications during a pandemic are:

- citizens in Finland and abroad
- diverse population groups, including children, older people, those who speak other than Finland's official languages as their mother tongue, and persons with disabilities
- social welfare, healthcare and rescue sector professionals
- social welfare and healthcare authorities
- authorities in other administrative branches
- Finnish and international media
- an organisation's in-house personnel (internal communications)
- various stakeholders, including businesses and NGOs.

In a pandemic situation, the population must receive highly detailed information and instructions on what the pandemic means locally and how it affects their daily lives. It may be necessary to target national communications intended for the general public at the entire population, a specific region or certain population groups, such as different language groups, persons with disabilities or, for example, travellers. Multilingual communication is restricted by the availability of translation and interpretation services, which stresses the importance of national multilingual communication. In regional communication, local conditions can be taken into account, and regional instructions can be provided. Information must be accessible, and it must also be available in simple language and sign languages.

Persons travelling to Finland from abroad can be reached through the Ministry of the Interior, the Finnish Border Guard and embassies located in Finland. Finns travelling and residing abroad can be reached through the Ministry for Foreign Affairs and Finnish missions abroad. Persons travelling both to and from Finland can be reached through providers of tourism and cross-border transport services. The health guide for tourists maintained by THL provides information on health risks affecting tourists and how to prevent them.

By monitoring the conventional and social media, it is possible to find out what kind of information about the pandemic users seek and share as well as what kind of perceptions are associated with it. This monitoring can help to correct false information, revise core messages and offer information on topics that elicit large volumes of questions and discussion. The population's awareness, attitudes and behaviour as well as the effectiveness of communication can be investigated through surveys. Surveys addressed at target groups can be used to examine the

population's trust in authorities and policy-makers as well as their commitment to the pandemic management strategy and measures, which is essential for the realisation of measures.

## 7.3 Communication contents

Communication contents change in different phases of the pandemic. A pandemic typically unfolds in unpredictable ways. This is why communication about the risks is needed, in addition to information about the situation picture, prevention measures and operating instructions. This means that the authorities must also cover uncertainties and issues on which accurate information is not available. Media monitoring and behavioural science expertise can be used when developing the contents of communication.

The development of the pandemic situation affects the key contents of communications, which can be categorised as follows:

- specific properties and transmission mechanisms of the pathogen
- symptoms and self-care, seeking treatment, pharmacotherapy
- health threat caused by the situation, pandemic development scenarios
- slowing down the spread of the epidemic, hygiene and restrictions
- vaccinations
- wide-ranging societal impacts of the pandemic and their management
- correcting misinformation and rumours as well as tackling disinformation
- monitoring the population's moods and strengthening resilience.

Attention must be paid to the comprehensibility, clarity, consistency and legal meaning of concepts. The obliging nature of instructions and various actors' roles and responsibilities in different matters should be clearly stated. Communication must be accessible to all population groups, which means that such groups as people with disabilities, including those with hearing and visual impairments and sign language users, must be taken into consideration. Material must also be produced in simple languages.

The authorities' activities must be transparent and enable individuals and communities to keep an eye on and influence the exercise of public authority. The authorities' documents and other records are basically public unless their publication has been specifically restricted for compelling reasons. This must also be remembered in pandemic communications. [65,66]

## 7.4 Multiple channels

In a pandemic situation, multiple channels must be used in communication, ensuring that information can be offered to the entire population and that the needs of different population groups and various target groups can be met. In multi-channel communication, different channels complement each other (Table 6). Diverse communication channels also improve the potential for communicating in situations where the channels themselves are affected by incidents. The communication channels and operating methods within and between organisations are determined in contingency plans.

65 Section 12 of the Constitution of Finland (731/1999).

66 Act on the Openness of Government Activities (621/1999).

**Table 6.** Communication channels that support pandemic management.

| Communication channel | |
|---|---|
| Online communication | Up-to-date websites serve all those looking for information. The authorities maintain web content as indicated by their duties. Content must be available in Swedish and the Sámi languages, and also in English and other languages if necessary. If necessary, it must be possible to rapidly launch a crisis website with the most basic information. |
| Bulletins | Bulletins can be used to communicate with multiple target groups at once. They must be comprehensible and available in different languages. Bulletins must always indicate where or from whom additional information can be obtained. |
| Press conferences | Press conferences are organised as necessary and, if the need for information is great, on a regular basis. To calm the situation, a press conference may also be organised when there is no news. Events that provide background for the media may also be needed. |
| Printed communication material | Printed instructions can be distributed to homes, schools, tourists, clients or workplaces. Printed materials may be either national or regional. |
| Communication campaigns, paid advertisements | A communication campaign and paid advertisements may, for example, be considered when detailed instructions on what to do must be given to the population. Such campaigns are designed to be flexible, making it possible to update their contents as the situation changes. |
| Social media | Social media channels are fast and can complement other communications. On social media, attempts can be made to correct misinformation and direct users to reliable information sources. Monitoring social media and other public discussions may help to redirect communication. |
| Printed and online media, radio and television | Printed and online media as well as the national television and radio channels are important sources of information for many. The information needs of the media are met as quickly as possible, even if there were no particular news. Media contacts should be centralised to the communications unit and responded to by designated persons. |
| Emergency alert | Emergency alerts may be issued by several different authorities. Emergency alerts are published on radio channels, on the websites of the Finnish Broadcasting Company and the Emergency Response Centre, in Finnish Broadcasting Company's teletext and app, 112 Suomi app and, if necessary, also on television channels. |
| Teletext | Teletext can be used to transmit information if internet connections are down. Teletext is used subject to separate agreement with the Finnish Broadcasting Company. |
| Text message | Text messages can be sent to different operators' subscribers with the assistance of the Emergency Response Centre Administration. The message has a limited number of characters and is expensive to send. |
| Telephone advisory service | Some members of the public wish to ask for instructions by telephone. The service can provide general information about the pandemic and direct callers to the appropriate party. Communication on other channels can be developed based on these calls. Appropriate training for the advisory service personnel must be ensured as the epidemic situation, instructions and prevention measures change. |
| Target group specific communication | Various target groups for communication can be reached through different channels. For example, social welfare and healthcare professionals can be reached through scientific media. |
| Contacts by private individuals | During a pandemic, the number of private individuals contacting the authorities by letter multiplies. Issues raised in these contacts can be addressed as part of the authorities' decision-making and communications. The practices of responding to these contacts are agreed upon separately in each organisation. |

# 8 Microbiological diagnostics

**Laboratory diagnostics of infections promotes the good care of patients while it helps to prevent the spread of the disease and build a situation picture, especially when the diagnosis cannot be made based on symptoms. A precondition for pandemic preparedness is maintaining the capacity for microbiological diagnostics, making a diagnostic test that identifies a new pathogen available as quickly as possible and to a sufficient extent if necessary. Microbiological diagnostics plays a key role in all stages of pandemic management.**

## 8.1 Diagnostic methods

The laboratory diagnostics of an infection is based on the direct or indirect detection of the pathogen in a patient sample (Table 7). The methods for diagnosing an acute infection include nucleic acid detection, antigen detection and viral, bacterial or fungal culture. An earlier infection can be diagnosed by detecting antibodies.

The choice of diagnostic method depends on the aim of the diagnostics, the method's performance (sensitivity and accuracy), usability (sample numbers and throughput time) and the costs. The nucleic acid detection test generally offers better performance than antigen detection methods. Both rapid PCR and antigen detection tests are suitable for point-of-care (POC) testing. Antibody tests can, for example, be used to assess vaccination response and in seroepidemiological studies, which seek to determine the number of infections in the population. If necessary, different methods can be used in parallel to complement each other.

**Table 7.** Microbiological laboratory methods for diagnosing an infection.

| Method | Description | Advantages and limitations |
|---|---|---|
| **Nucleic acid detection** | The microbial genome (nucleic acid) is detected in a sample using molecular methods (nucleic acid amplification test (NAAT). The most common one of these is the polymerase chain reaction (PCR) test. The method can detect either a single microbe or several different ones (multi-analytical multiplex test). | Requires information on the genome of the microbe as well as special facilities and expertise. Does not detect a living microbe. When automated, enables the processing of a large number of samples, fast throughput and uploading of test results to the patient information system. The throughput time of the rapid PCR test is shorter but the number of samples processed is lower. |
| **Antigen detection** | Microbial antigens are detected in a sample using monoclonal or polyclonal antibodies. Several methods, including immunofluorescence staining, immunochromatography and the enzyme immunoassay (EIA) technique. | The tests are easy to use and quick, and they may be commercially available. Test performance varies. While a positive test result is quite reliable, a negative result does not exclude infection. The method is not suitable for testing large numbers of samples. |
| **Bacterial, fungal or viral culture** | Bacteria and fungi are grown in a medium, while viruses are grown in cell cultures.<br>Methods of detecting bacterial or fungal growth include various staining techniques. Viral proliferation is detected by a change in the cell culture. A cultivated virus is identified either by means of viral antibodies or nucleic acid techniques. | Cultivation may be necessary for microbe identification and further research. A labour-intensive method that requires specialised facilities and expertise. The method is slow: a negative result from a bacterial culture is obtained in days, whereas the result of extensive viral culture takes two weeks. Sampling and storage conditions affect the reliability of the cultivation result. |
| **Antibody detection** | The immune response triggered by a microbe is measured by determining IgG, IgM and/or IgA antibodies to different microbial proteins.<br>The most commonly used methods are enzyme immunoassay and immunochromatography techniques. | The performance of these methods varies. Antibodies can usually only be detected approx. 2 to 3 weeks after infection. |

Laboratory methods exist for analysing the antigenic and genetic properties of microbes (Table 8).

**Table 8.** Microbiological methods for analysing microbial properties.

| Method | Description | Advantages and limitations |
|---|---|---|
| **Sequencing** | Indicates the genomic base composition of the microbe. Massive parallel sequencing simultaneously duplicates millions of short portions of the genome. | Enables the analysis of resistance and virulence factors, detection of changes in the microbial genome, assessment of the evolutionary kinship of microbes and monitoring of circulating virus strains. May also support epidemic investigations. Requires expertise in bioinformatics, comprehensive reference databases and large computing capacity. A slow (3 days to 2 weeks) and expensive method. |
| **Neutralisation** | Indicates the microbe's antigenic properties. Immunological reaction between the microbe and a reference serum is compared to the reaction between a reference strain and the reference serum. | Enables the identification of antigenically deviant microbial strains. Requires special expertise and possibly specialised facilities. Requires a large volume of the microbe. A slow method. |

To prepare for pandemics, clinical microbiology laboratories need the capability for adopting new methods. A precondition for developing a PCR test that identifies a new pathogen is isolating the microbe and sequencing its genome. Using the genome, microbiologically specific PCR test components can be manufactured, based on which an 'in-house PCR test' can be produced in a clinical microbiology laboratory. Producing a clinical laboratory's in-house test requires special expertise and equipment, instruments and facilities. Laboratories must register their in-house tests with the Finnish Medicines Agency Fimea. These tests may not be manufactured on an industrial scale or handed over to parties outside the unit that produced them, such as laboratories. In-house tests become available within a few months, while commercial tests take longer. With commercial tests, diagnostic capacity can be increased. Early introduction of commercial tests may require an exemption granted by Fimea if the compliance of a new test considered useful has not yet been proven in all respects. The use of several different methods improves the reliability of diagnostics.

## 8.2 Laboratory network

Microbiological diagnostics is a healthcare support service and part of the efforts to prevent infectious diseases. The counties are responsible for organising this work, also in a pandemic situation. Microbiological diagnostics may only be conducted by healthcare units with a specific licence for this. Licences for clinical microbiology laboratories are always specific to a test name, and they are granted by the Regional State Administrative Agency. The purpose of the licensing procedure is to ensure that microbiological diagnostics in Finland is carried out by competent personnel in appropriate facilities using methods that are fit for purpose.

Finland has a network of clinical microbiology laboratories with a wide geographic coverage. The largest laboratories operating in connection with university hospitals are able to analyse thousands of samples a day. Regional coverage is expanded by smaller laboratory units. The counties may organise microbiological diagnostics in cooperation. Centralising diagnostics requiring special expertise to certain laboratories, for example in the collaborative area, may also make sense. Microbiological diagnostics is additionally carried out in universities' laboratories, for example, but these actors do not usually have a licence for clinical analytics.

The national central and expert laboratory of the Finnish Institute for Health and Welfare (THL) provides support in the development and introduction of new methods, supplies the reagents (substances needed to perform tests), and provides a verification service. THL has a level BSL 3 containment laboratory. There are also private laboratory operators in Finland. Clinical microbiology laboratories may also use foreign reference laboratories.

The Finnish Food Authority is responsible for the diagnostics of serious animal diseases and serves as the national reference laboratory for serious animal diseases as well as food and feed safety tests. The Finnish Food Authority also has a level BSL 3 containment laboratory. If necessary, the Finnish Food Authority can send samples for further analysis to EU reference laboratories. The animal health authorities organise the collection of necessary samples from animals, while other environmental healthcare services take samples from foodstuffs and water.

Clinical microbiology laboratory facilities are classified into four containment levels (BSL 1 to 4) depending on the risk that the microbes handled in them may pose[67,68]. The definition of the special containment level is based on a risk assessment that accounts for both the risks associated with the microbe and factors related to working in the laboratory[69]. Good laboratory practices (GLP) must be followed in this work.

Laboratories operating at different containment levels differ from each other in their structure and operating methods. Biosafety levels suitable for pathogens posing a threat of a pandemic are BSL2–BSL4. Clinical microbiology laboratories typically have biosafety level BSL2. Diagnostics requiring level BSL3 is centralised to laboratories with special facilities. BSL4 level diagnostics relies on cooperation with the Swedish Public Health Agency (Folkhälsomyndigheten). The containment classification must also be observed in packaging and transport.

## 8.3 Organisation of diagnostics

When planning and organising microbiological diagnostics, the diagnostic process and the factors, delays and resources affecting it must be addressed (Figure 6). The diagnostic process starts with a need for testing and ends with using the result in the planning of patient care, contact tracing or pandemic management measures.

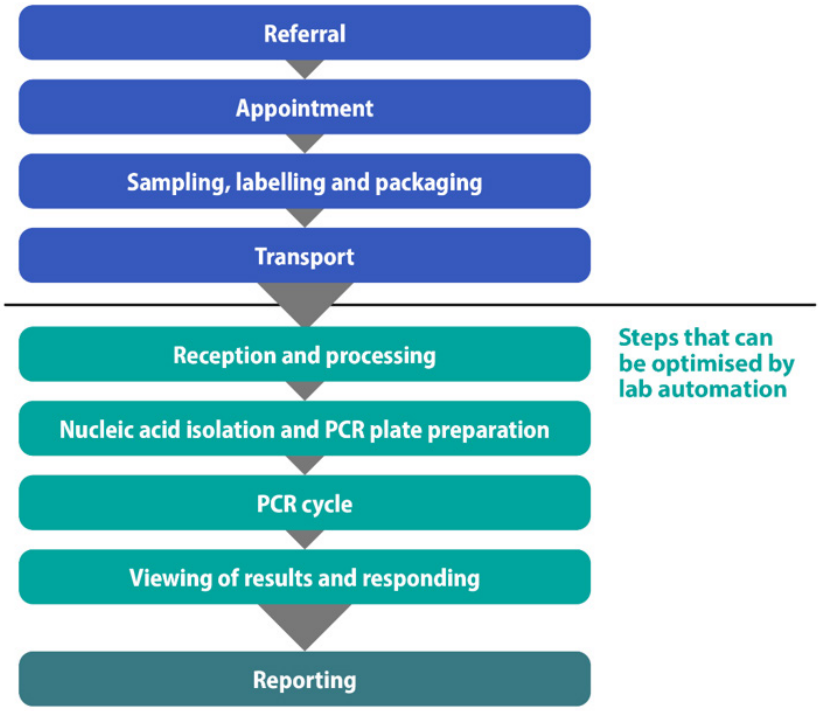
The organisation and use of diagnostics is guided by a diagnostics strategy. The needs for microbiological diagnostics differ in each phase of the pandemic. During the inter-pandemic period, surveillance and preparedness are emphasised; setting up the diagnostics system is important in the alert phase; ensuring sufficient capacity and resource allocation are highlighted in the pandemic phase; and the transition phase is characterised by re-introducing surveillance. When planning microbiological diagnostics, the fitness for purpose and effectiveness of the diagnostics must be accounted for.

67 Government Decree on Protecting Workers from Risks Arising from Biological Agents (933/2017).

68 Decree of the Ministry of Social Affairs and Health on the Classification of Biological Agents (748/2020).

69 World Health Organization (2020). Laboratory biosafety manual, fourth edition. ISBN 978-92-9-49001131-1 (PDF). Available at: https://www.who.int/publications/i/item/9789240011311.https://www.who.int/publications/i/item/9789240011311.

**Figure 6.** The process of PCR diagnostics.




### 8.3.1 Sampling

The sampling method varies depending on the diagnostic method. In the early stages of a respiratory tract infection, the pathogen is excreted into the upper respiratory tract, which is why the primary diagnostic sample is a nasopharyngeal swab or, as diagnostics advances, other upper respiratory tract samples. If necessary, the sample can also be taken from the pharynx or, in patients susceptible to haemorrhaging, from the nostrils. Aspirate, saliva and gargle samples may also be used. If the patient's symptoms indicate a lower respiratory tract infection, a sputum sample or a lavage sample taken in connection with bronchoscopy may be more representative. A skin swab is suitable for testing for diseases that spread through contact. A blood sample can be used to detect pathogens or antibodies in the blood.

Microbiological diagnostics starts with a referral made by a healthcare professional, which is based on an individual assessment of the need for diagnostics, the appropriate method, and the benefits and risks of the test. As the number of cases grows in a pandemic, it may be justified to switch to screening. In this case, the sampling is based on general criteria, such as belonging to a high-risk group, rather than individual assessment. The person making appointments for screening tests need not be a healthcare professional, and clients can also make their own appointments using an online application.

High-quality and safe sampling requires special expertise, however not a specific professional title, and sampling is not subject to a licence. The initial handling of the samples (packaging, storage and dispatch) must also be carried out carefully to protect the sample quality and personnel safety. If a high number of samples needs to be taken, the efficiency of the sampling process can be enhanced by dividing tasks. Testing by appointment and fast service as well as facility arrangements prevent congestion and infections related to sampling.

During the COVID-19 pandemic, a centralised self-service appointment system for testing was introduced in the Omaolo service. If the symptom checker service indicated that the testing criteria were met, the service directed the person to identify themselves and make an appointment for testing. Appointments could also be made by phone. The appointment system automatically generated a test request in the service provider's laboratory information system. The test result was sent to the client as a text message from the laboratory information system. The physician responsible for the prevention of infectious diseases was informed of positive test results. A large number of testing points was set up, for example in tents, outdoors and drive-in facilities. Preliminary information needed for contact tracing could be collected on the Omaolo service.

### 8.3.2 Diagnostic capacity

The capacity of each step of the diagnostic process affects the total diagnostic capacity. Setting a target for diagnostic capacity is part of the pandemic management strategy: increasing capacity ties up resources, and the targeted capacity must be appropriate and effective. The capacity can be increased by obtaining more facilities and human resources as well as stockpiling and additional

purchases of equipment and supplies. The process can be made more efficient through division of labour, automation and clients' independent activity. It may also be possible to acquire additional capacity abroad. Capacity building may, however, be restricted by the limited availability of personnel, testing and analytics supplies as well as personal protective equipment. Commercial tests, in particular, are subject to global competition. In a pandemic situation, supplies and personnel may be available in non-clinical microbiology laboratories. The Finnish Food Authority can also test human samples, and THL can test samples sent by the Finnish Food Authority if this can be done without putting the agencies' usual critical tasks at risk. For this, however, a separate agreement and applying for the required licences is needed. In a difficult situation, prioritisation of different diagnostic tests may be necessary.

> During the COVID-19 pandemic, the coronavirus testing capacity was increased significantly. Whereas diagnostics of respiratory tract infections was previously mainly offered to hospitalised patients, asymptomatic patients and those with mild symptoms were also tested during the COVID-19 pandemic to identify infections early and to break infection chains. At its highest, the daily testing capacity was approximately 3,600 tests per one million inhabitants a day – in practice, around 40,000 PCR tests and 8,000 antigen tests a day. The single largest constraint on capacity was sample taking.

In the transition phase of a pandemic, diagnostic capacity can be released, but preparedness to increase it once again must be maintained. The reincrease of capacity is challenged, in particular, by the availability of facilities and human resources.

Home sampling or home testing can complement healthcare services' testing activities. Preconditions for successful home testing include issuing instructions for the population, appropriate sampling and methods that make the sample easy to handle as well as sufficient performance of the test.

# 9 Material preparedness

**The availability medical devices is a prerequisite for the continuity of the core and support functions of healthcare and social welfare, both in normal conditions and during a pandemic. Actions taken to manage a pandemic may increase the consumption of supplies, or require different supplies from those normally used. Availability of materials may also become scarcer. Material preparedness in healthcare and social welfare relies on monitoring the situation picture, stockpiling, procurement and securing production.**

Material preparedness in a pandemic refers to the security of supply of medical devices used for extracorporeal diagnostics, other medical devices, other supplies used in social welfare and healthcare as well as facilities. The availability of supplies is a key question for occupational, client and patient safety. A shortage of the necessary supplies may limit the production capacity of the service system.

A pandemic poses a threat to the reliability of society's functional capacity and the realisation of security of supply across a broad front. A number of actions are needed to ensure the availability, sanitation and maintenance of the material and facilities needed for pandemic management. They include forming a situation picture of material preparedness in social welfare and healthcare, monitoring and planning. A precondition for the availability of materials also is that the wellbeing services county's and national stockpiles are sufficient. If necessary, additional procurements are made and production is promoted. Specific provisions have been laid down on the compulsory stockpiling of medicines[70].

## 9.1 Parties responsible for security of supply

The county is responsible for planning and securing material preparedness regarding the services it is responsible for organising, also when it outsources services to a private provider. In cooperation with the National Emergency Supply

70 Act on Mandatory Reserve Supplies (979/2008).

Agency, the Ministry of Social Affairs and Health evaluates and develops material preparedness in its administrative branch. The Advisory Board for Health and Welfare in Emergency Conditions plans and anticipates material preparedness at the national level. The EU Health Emergency Preparedness and Response Authority (HERA) develops the security of supply in healthcare at the European Union level by producing a situation picture, financing emergency stockpiling and improving production possibilities.

An employer has a duty to take care of their employees' safety and health at work[71]. Employees are protected by technical measures and administrative arrangements, as well as by training them to follow correct procedures. If this is not enough, protective equipment must be purchased for the employees. Under the law, the prevention of infectious diseases and the selection, procurement and use of protective equipment are based on a risk assessment conducted by the employer.

## 9.2 Level of preparedness

The objectives of material preparedness that guide healthcare and social welfare actors are defined at a general level in a government decision on the goals of security of supply[72]. Healthcare and social welfare actors ensure the continuity of their work both during incidents under normal conditions and in emergency conditions. The level of material preparedness is based on a risk assessment that factors in the needs to ensure the continuity of operations, number and special needs of the inhabitants, and threat scenarios. To determine an adequate level of material preparedness, the procurement competence of the counties' logistics services and the National Emergency Supply Agency can be relied on.

Supplies needed in healthcare and social welfare may also be used in other sectors critical to security of supply, which includes food supply. In addition to the system capacity of healthcare and social welfare, disruptions in the availability of supplies may also limit the performance of other task significant for society.

When striving to maintain the security of supply in a pandemic, it is important to monitor market trends and technical development of the required products. Material security of supply must be able to flexibly adopt different solutions, and during a pandemic, provision must be made for introducing other than standard

71 Section 8 of the Occupational Safety and Health Act (738/2002).

72 Government Decision on Safeguarding the Security of Supply (1048/2018).

procedures, such as modifying treatment practices and guidelines. As a rule, the products to be procured must be of the quality referred to in EU directives and regulations. In a severe pandemic, however, procuring supplies fully compliant with standards may be difficult as global demand increases. In this case, special attention should be paid to the uses of medical devices specified by the manufacturers and to the instructions for use of devices and other equipment. This will ensure their safe use, storage and transport.

## 9.3 Procurement, stockpiling and production

Finland depends on imports for its security of supply of medicines, vaccines, medical devices and personal protective equipment. Special expertise and networking are required to procure them in the global market. An eye must also be kept on international supply as well as manufacturers' supply capacity, quality and product development regarding those suppliers that do not operate in the Finnish market. Procurements made in normal conditions and during a pandemic should be decentralised across several continents and countries. Joint EU procurements are attractive for manufacturers and reduce competition between EU countries. Consequently, they can help to procure materials at a reasonable cost. On the other hand, EU and other international cooperation on material security of supply may also reduce hoarding, which disrupts the market.

A pandemic disrupts not only production but also international logistics. Imports of goods and services essential for security of supply must be secured by ensuring their importation without delays. If necessary, the transport of supplies from the country of manufacture to Finland may be arranged separately. Particular attention must be paid to the security of transport and stockpiling during incidents.

Stockpiling includes commercial stocks, users' stocks, users' security stockpiling, state emergency stockpiling, mandatory reserve supply of medicines and production reservations. Security stockpiling refers to the quantity of stock held by each operator in addition to the stocks required for normal operation. State emergency stockpiling complements other primary stock types. The state emergency stockpiles are the property of the National Emergency Supply Agency, while other stock types are the property of the party maintaining them.

In a pandemic, healthcare and social welfare actors must be prepared to receive and stockpile significantly larger consignments of goods. The counties' material preparedness decentralises storage risks and maintains regional preparedness.

Storage costs consist of capital costs, costs of the storage space, recycling costs and losses. Stockpiling of materials can also bring cost benefits, as the price of supplies procured proactively during normal times is low compared to those purchased during a pandemic.

Security of supply during a pandemic can also be safeguarded by supporting domestic production of materials. The National Emergency Supply Agency makes production capacity reservations with the domestic industry. This means that the manufacturer is compensated for maintaining capacity, competence and raw materials as agreed. The aim of this model is to minimise losses of material due to expiry and to save storage costs. If domestic production is interrupted between pandemics, delays in the relaunch of manufacturing due to product conformity testing and inspections must be taken into account.

In a severe pandemic, it may be justified to develop alternatives for procurement and storage, including safe use of materials with out-of-date labelling, reuse of single-use supplies, and the introduction of reusable materials. This requires compliance with the requirements laid down in the Medicines Act and statutes on medical devices, which concern such aspects as labelling and reuse of single-use devices. Liability issues must also be investigated in such situations.

## 9.4 Use and situation picture of stocks

The use of stocks in a pandemic situation and the means of safeguarding the security of supply differ according to the phase of the pandemic and depend on its severity. In the early stages of a pandemic, commercial and user stocks are relied on, and procurement volumes are increased. As the consumption of pandemic prevention supplies increases, the procurement channels are widened, domestic production is activated and other preparedness measures are taken. As the consumption of supplies continues to grow, emergency stockpiles are used. If the situation deteriorates further, products can be released from state emergency stockpiles with the permission of the Ministry of Social Affairs and Health. The reuse of single-use supplies may also be considered.

The cornerstone of leadership in terms of material preparedness is awareness of the volumes in stock and those consumed, the quantities ordered and their delivery times, and the domestic and international market situation. Up-to-date monitoring is essential. The preparedness centres of the counties' collaborative areas compile a regional situation picture of material preparedness. Based on regional data, the Ministry of Social Affairs and Health collates a situation picture of national material preparedness, also accounting for state emergency stockpiling.

During the COVID-19 pandemic, an up-to-date situation picture was developed for managing material preparedness, in which the hospital districts' and counties' stock situation, orders, delivery times and consumption volumes by product were accounted for. The situation picture of material preparedness was collated by the logistics centres of the specific catchment areas (LOG5 group) and the seven largest laboratories (LAB7).

# 10 Non-pharmaceutical interventions

**Non-pharmaceutical interventions pandemic management comprises various measures aiming to prevent the spread of infections from carriers to those susceptible to infection. The usefulness of non-pharmaceutical interventions depends on the properties of the pathogen. Non-pharmaceutical interventions may focus on an individual, a specific population group or the entire population and, if necessary, the environment or animals.**

The most effective means of controlling infections depend on the pathogen. The spread of droplet and airborne infections can be prevented by reducing either close contacts between people or the risk of infection associated with contacts. In case of a zoonotic pathogen (that is transmitted between humans and animals), similar measures are applied to species sensitive to the pathogen. Contact transmission or food or waterborne infections can be prevented by taking care of hygiene and food safety. Infections carried by a vector organism can be prevented by controlling insects and other arthropods that spread them.

Non-pharmaceutical interventions can be used both for changing behaviour on a voluntary basis and based on the authorities' decisions on mandatory restrictive measures (Appendix 2). Voluntary compliance with recommendations is particularly important in the prevention of infections. As restrictions are mandatory, they may be more effective than recommendations. Non-pharmaceutical interventions are necessary in a situation where effective medicines or vaccines against the pandemic pathogen are not widely available. Prevention methods that restrict an individual's or the population's fundamental rights are the last resort, and they must be essential and proportionate to the benefit aimed for. When considering restrictions, the epidemiological situation and its anticipated development, high-risk groups and the negative effects of restrictions must be factored in. Timeliness of restrictions refers to both preparedness for their proactive introduction and planned lifting of restrictions.

## 10.1 Interventions focusing on the population

Non-pharmaceutical interventions that focus on the population include recommendations and restrictions intended to prevent exposure to pathogens and, consequently, the spread of infections. Recommendations should always be the preferred option over restrictions. Recommendations for infection prevention may, for example, be related to awareness of your personal risk, hygiene measures, avoiding close contacts, wearing masks, controlling vectors and knowing what to do if symptoms occur. Hygiene measures can be associated with cleaning hands, surfaces, food or drink as well as coughing and sneezing etiquette. Recommendations on appropriate ventilation may also be issued[73]. Restrictions targeting the entire population include closures of healthcare and social welfare units, educational institutions, early childhood education and care units, dormitories and similar facilities as well as prohibiting public meetings or events. Decisions on restrictions imposed to prevent the spread of a generally hazardous infectious disease are made either by the body responsible for infectious diseases in the county or the Regional State Administrative Agency.

Wearing face masks may be a complementary method of preventing community transmission. Face masks refer to surgical face masks, filtering facepieces (FFPs) and similar. If a face mask is worn correctly, it reduces the risk of a respiratory tract virus carrier infecting others and also protects the wearer. Wearing face masks may be appropriate in situations where avoiding close contacts is not possible. Respiratory protective devices reduce the wearer's exposure to droplet transmission and airborne pathogens.

73 Kosonen R et al. Ilmanvaihto- ja jäähdytysjärjestelmien resilienssi lämpöaaltojen ja hengitystieinfektioiden suhteen: Uudis- ja korjausrakennusten teknisten ratkaisujen toiminta muuttuvissa olosuhteissa. Publications of the Government's analysis, assessment and research activities 2023:56. ISBN 978-952-383-007-3 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-383-007-3.

During the COVID-19 pandemic, universal wearing of face masks reduced the number of respiratory tract infections in the population[74,75]. THL recommended the use of face masks, and people commonly wore them on public transport and in public spaces, such as shops, schools, workplaces or various mass events.

The spread of droplet and contact transmission can be prevented by protecting the mucous membranes of the eyes by wearing a face shield (visor). Face shields can, for example, be used by persons who cannot wear face masks for health reasons. Wearing a face shield and a mask together can enhance the prevention of infections further.

When implementing population-level recommendations and restrictions, it is important to account for their impacts on different population groups, special groups and vulnerable groups. Information about recommendations and restrictions reaches different population groups in different ways, and the population groups' possibilities of following recommendations and restrictions may be dissimilar. The population's trust in the authorities and commitment to following instructions are a prerequisite for effective population-level measures.

During the COVID-19 pandemic, a 'COVID passport' was introduced in Finland under a temporary amendment to the Communicable Diseases Act. By requiring customers to have a COVID-19 passport, restaurants and other traders could operate without restrictions on the numbers of customers or participants. As the COVID-19 passport, a digital EU COVID-19 certificate was used, and the passport was checked using a dedicated mobile application available free of charge.

74 Bagheri G. An upper bound on one-to-one exposure to infectious human respiratory particles. Proc Natl Acad Sci U S A. 2021 Dec 7;118(49):e2110117118. Available at: https://doi.org/10.1073/pnas.2110117118.

75 Boulos L et al. Effectiveness of face masks for reducing transmission of SARS-CoV-2: a rapid systematic review. Philos Trans A Math Phys Eng Sci. 2023 Oct 9;381(2257):20230133. Available at: https://doi.org/10.1098/rsta.2023.0133.

## 10.2 Prevention of infections in the workplace

Occupational safety must be accounted for at workplaces. It improves the working environment and working conditions in order to ensure and maintain the employees' work ability. It additionally prevents occupational accidents and diseases and eliminates other adverse effects associated with work and the working environment on the physical and mental health of employees.

Employers have a duty to take care of the safety and health of their employees while at work[76]. The employer must assess the health risks the work poses to the employees as well as the probability and severity of these risks. Any exceptional situations and their impacts on the health and safety of work should be addressed in the risk assessment. Employers must keep a list of workers exposed to hazardous biological agents, including pathogens, at work[77]. In workplaces shared by the employees of several employers or self-employed persons, the employers must work together to ensure that the employees' health and safety are not put at risk. The risk of work-related infections is affected by the pathogen properties as well as the number and nature of close contacts between clients, patients and colleagues or between animals and humans. The risk of contracting a work-related infection is also affected by the epidemic situation in the area where the work is carried out.

During the COVID-19 pandemic, certain occupational groups faced a higher infection risk. More infections were diagnosed in practical nurses and nurses, for example, than among other workers in the healthcare and social welfare sector[78]. Construction, food service and childcare workers were also found to have an increased infection risk[79].

76 Section 8 of the Occupational Safety and Health Act (738/2002).

77 Government Decree on Protecting Workers from Risks Arising from Biological Agents (933/2017).

78 Kääriäinen S et al. Koronavirusinfektiot (COVID-19) terveyden- ja sosiaalihuollon työntekijöillä Suomessa 1.2.2020-30.6.2021: Rekisteripohjainen kohorttitutkimus. Finnish Institute for Health and Welfare (THL) Working papers 28/2022. Available at: https://urn.fi/URN:ISBN:978-952-343-879-8.

79 Kortelainen M et al. Koronatartuntojen ja sairaalahoidon riskien arviointi ammatti- ja tuloryhmissä Helsinki GSE Tilannehuone 1.4.2021.

To safeguard employees' health in workplaces, measures to prevent infections must be taken as indicated by the risk assessment. Preventive measures may include issuing instructions to employees, more effective cleaning and ventilation of the premises, measures to improve hand and coughing hygiene, and work arrangements that reduce the number and duration of close contacts, such as screens, remote work, and working in small groups or pairs. Screening for employees' infections can be useful action taken by the authorities in certain situations. When the conclusion of the risk assessment is that other measures alone are insufficient, the employer must oblige the employees to wear personal protective equipment (Appendix 3)[80]. The protective equipment must be sufficiently effective and suitable for wearing while working[81]. The employees must also be provided with instructions for using the equipment.

The employer may oblige their employees to comply with the prevention measures. Some workers may belong to high-risk groups, and special actions may be necessary to protect their health. Occupational healthcare services can help identify people in high-risk groups and ensure their health and safety at work. Prevention of infectious diseases in the workplace should also be accounted for when building and renovating working facilities and ventilation systems[82]. When planning prevention measures for the workplace, drawing on the expertise of the Finnish Institute of Occupational Health and the occupational healthcare services would be a good idea.

If an employee is diagnosed with a work-related infection, the employer must support the contact tracing authorities. For example, they can do this by informing, instructing and reaching employees or by making staff or facilities available for contact tracing or administration of vaccinations.

80 Regulation (EU) 2016/425 of the European Parliament and of the Council on personal protective equipment and repealing Council Directive 89/686/EEC.

81 Government Decree on the Selection and Use of Personal Protective Equipment at Work (427/2021).

82 Decree of the Ministry of the Environment on the Indoor Climate and Ventilation of New buildings (1009/2017).

## 10.3 Prevention of infections in healthcare and social welfare units

Prevention of infections in healthcare and social welfare sector workplaces is based on the employer's occupational safety and health duties on the one hand, and the obligation to safeguard client and patient safety and ensure the continuity of services for the population on the other. Healthcare and social welfare activities cannot usually be organised without close contacts, and where infected patients are cared for, close contacts are associated with an increased infection risk.

Healthcare and social welfare units must monitor and systematically prevent infections associated with treatment and service delivery. If infections are diagnosed in an operating unit, the fitness for purpose of protective equipment practices and other control measures must be reviewed. In the planning of both facilities and resources, units must prepare for identifying, treating, isolating and cohorting (placing patients with the same disease together) infected persons. The need for facilities for quarantining exposed persons must also be accounted for. For example, the following may be taken into consideration in the preparedness:

- reorganisation of work and facilities use as well as safe access routes
- use of remote services and remote appointments
- planning of patient transport and transfers, places of further care, discharges and an overflow hospital
- identification of infected and exposed persons (symptom monitoring, diagnostic methods, referral to treatment, cohorting, contact tracing)
- provision of instructions and training for staff (identification of symptoms, patient care, prevention measures, protection)
- shift arrangements (cohorting, personnel transfers, recruitment of additional labour, rest periods, reducing close contacts)
- planning and organising occupational healthcare
- material preparedness
- providing for an increasing need for waste management and cleaning
- planning of the monitoring and reporting system.

## 10.4 Contact tracing

Contact tracing refers to investigating infection chains. In practice, this is about finding answers to the questions of 'who was the infection contracted from' and 'whom could the carrier have exposed to the infection?' Contact tracing makes it possible to

- reach infected and exposed persons
- assess the need for treatment and provide advice
- if necessary, decide on involuntary measures targeted at an individual to prevent further infections (breaking the chain of infection).

The physician responsible for infectious diseases in the county is in charge of contact tracing. If the epidemic has spread to several counties, the physician responsible for infectious diseases in the county with a university hospital supports the other counties in their collaborative area. The Finnish Institute for Health and Welfare supports contact tracing in the county if necessary and is responsible for contact tracing that requires international cooperation. The Regional State Administrative Agencies are responsible for tracing infections in animals, with the assistance of municipal veterinarians if necessary.

In the case of a generally hazardous or controlled disease, an infected person is obliged to inform the professional in charge of contact tracing of the details of the infection and to provide their contact details. In case of such diseases, the physician responsible for infectious diseases may contact persons who, in connection with contact tracing, are assessed to have been exposed. In order to investigate infections, a health examination may be arranged, and participation in it may be made compulsory in case of a generally hazardous infectious disease. The physician responsible for infectious diseases assesses if the infected person must be ordered to be absent from work, early childhood education and care or an educational institution, or if they should be quarantined or isolated.

Prevention of zoonoses (diseases transmitted between humans and animals) requires cooperation between healthcare and animal health authorities and, if necessary, food control authorities in contact tracing. Animal health authorities are responsible for contact tracing in animals and food control authorities in food of animal origin and their production chains. The Regional State Administrative Agency or municipal veterinarian must inform the physician responsible for infectious diseases in the relevant county of any animal diseases that may pose a risk to human health. Similarly, the physician responsible for infectious diseases in the county must notify the municipal veterinarian of a zoonosis they suspect, have diagnosed or have been informed of. The food control authority must additionally notify the authorities referred to in the Communicable Diseases Act of matters that have emerged in the course of their control activities that may be significant for protecting the population from communicable diseases. At the national level, THL must notify the Finnish Food Authority of a suspected or diagnosed zoonosis, and vice versa.

During the COVID-19 pandemic, the volume of contact tracing increased significantly. Separate units responsible for contact tracing were established in municipalities and hospital districts, where both healthcare professionals and other staff were employed. National training in contact tracing helped to recruit new personnel. New physicians responsible for infectious diseases were appointed to make quarantine and isolation decisions. Contact tracing and population-level restrictive measures were dropped in early 2022 due to the emergence of increasingly infectious variants, extensive transmission of the infection among the population, and the protection afforded by vaccinations. A temporary amendment was made to the Health Insurance Act concerning the granting of communicable disease allowances with the aim of facilitating the work of communicable disease authorities and reducing the risk of transmission in workplaces.

The performance of contact tracing can be examined using such process indicators as the response time of testing and contact tracing, proportion of traced infections among all infections, and the proportion of people who became ill while in quarantine. The tracing process can be enhanced by improving work methods and centralising the work. On the other hand, local knowledge is important, particularly regarding the foreign-language population. Digital tools can also facilitate tracing. A digital preliminary information form can be used to collect information on the start of symptoms and close contacts. An information system for managing infection tracing makes it possible to maintain a situation picture of infection tracing and exchange information between different regions and national authorities responsible for contact tracing. Contact tracing applications may improve the efficiency of efforts to prevent infections.

During the COVID-19 pandemic, an application named Koronavilkku was introduced to provide information on potential exposure. It was based on data collected by mobile devices on close contacts using the Bluetooth feature. Similar applications were introduced in several other countries, and they also relayed information on cross-border exposure between EU countries. The utilisation rate of Koronavilkku in Finland was one of the highest by international standards. The application was used by 2.5 million people at the height of its popularity, and more than 80% of those who were infected reported their infection on the application. The benefits created by Koronavilkku for contact tracing remained minor, however, as conveying accurate information on the location or time of exposure to those who received an exposure alert was not possible for data protection reasons[83]. Use of the application may nevertheless have modified the behaviour of those who received the exposure notification and reduced infections.

In order for contact tracing to be effective, it should make breaking infection chains possible. In practice, the exposed and infected person should be reached before they become infectious, or as soon as possible afterwards. Key factors influencing the effectiveness of contact tracing include the properties of the pathogen: mode of transmission, level and duration of infectiousness, and the timing of infectiousness in relation to the onset of symptoms. Tracing can be effective even if not all further infections can be prevented. The effectiveness of contact tracing must be monitored during a pandemic, and resources must be reallocated if necessary.

## 10.5 Health security on borders

In cross-border traffic, non-pharmaceutical interventions for preventing infections include traffic restrictions and measures targeted at passengers or baggage. The factors influencing the effectiveness of infection control in cross-border traffic include at least the characteristics of the pathogen and the volume of traffic.

83 Rannikko J et al. Effectiveness of COVID-19 digital proximity tracing app in Finland. Clin Microbiol Infect. 2022 Jun;28(6):903-904. Available at: https://doi.org/10.1016/j.cmi.2022.03.002.

Each country is responsible for controlling infections in its territory, and the control measures are based on its national legislation. Control of infections in cross-border traffic requires both cooperation between neighbouring countries and wider international coordination. Control measures hamper the smooth running of cross-border traffic, which may have negative impacts on security of supply, for instance. The WHO may issue to Member States recommendations on measures targeting passengers leaving or arriving in the country.

In 2019, an average of 93,000 passengers a day arrived in Finland across internal and external borders. Helsinki-Vantaa International Airport is an important border crossing point in terms of controlling infections, as air traffic spreads them rapidly over long distances. In 2019, more than 27,000 air passengers arrived in Finland each day. Approx. 42,000 people arrived across the land borders and 24,000 by sea each day. All border crossing points have their special features and infrastructure, which means that the counties with border crossing points must address this issue in their preparedness planning. Health security measures at border crossings must be planned together with other authorities and operators active on the borders.

### 10.5.1 Guidance of travellers

During a pandemic, travellers arriving in Finland must be provided with instructions on entry requirements, recommendations and restrictions in force in the country, and measures to be taken when symptoms occur during the trip. The Border Guard issues instructions for entry and controls the entry requirements. General instructions for travellers arriving in Finland can be issued by THL, the counties and the municipalities, embassies located in Finland, private cross-border transport service providers and other actors. The Finnish Transport and Communications Agency Traficom can issue instructions and orders to transport operators. It is also important to provide instructions on the travel-related infection risk and how to find information on official instructions in the destination country for those travelling abroad from Finland. The Ministry for Foreign Affairs prepares country-specific risk assessments and issues travel advice[84]. THL maintains a health guide for tourists[85].

84 Ministry for Foreign Affairs. Matkustustiedotteet A-Ö. Available at: https://um.fi/matkustustiedotteet-a-o

85 Kustannus Oy Duodecim. Terveyskirjasto. Matkailijan terveysopas. Ed. Finnish Institute for Health and Welfare. Available at: https://www.terveyskirjasto.fi/sisalto/matkailijan-terveysopas.

During the COVID-19 pandemic, Finentry and Laplandentry services directed passengers to COVID-19 tests at entry points based on the risk they represented. A healthcare user interface enabled municipalities and hospital districts to monitor participation in the tests. The use of these services was voluntary.

### 10.5.2 Restrictions on passenger traffic

If the aim is to prevent all spread of pathogens to Finland from other countries, cross-border passenger traffic must be stopped before infectious persons can enter the country. Due to legal, economic and social reasons as well as those related to security of supply, however, closing the borders completely is impossible. Under the Constitution of Finland, a Finnish citizen and a person permanently resident in Finland always have the right to enter the country. Preconditions laid down separately apply to foreigners' entry[86]. Partial traffic restrictions may reduce the number of passengers arriving as asymptomatic carriers and make it possible to take measures targeted at passengers that would not be possible with a higher number of travellers.

Under the Schengen Borders Code, a Member State may temporarily reintroduce border control at its internal borders in certain exceptional circumstances[87]. Decisions on the temporary reintroduction of border control at internal borders are made by the government. In external border traffic, border crossing points may be temporarily closed and traffic across the border restricted.[88] When deciding on traffic restrictions, it must be noted that passenger flows at different entry points are closely connected, and restrictions on one route may increase the passenger numbers on another.

86 Aliens Act (301/2004).

87 Regulation of the European Parliament and of the Council (EU) 2016/399 on the rules governing the movement of persons across borders (Schengen Borders Code).

88 Border Guard Act (578/2005).

During the COVID-19 pandemic, passenger traffic was restricted at both internal and external borders. The restrictions applied to non-essential passenger traffic. Under a temporary amendment to the Communicable Diseases Act, people arriving in Finland were required to have a COVID-19 certificate of a recent negative test result or vaccination, or of having had the disease recently. Travellers arriving without a certificate were directed to a free test at the border crossing point. Those who had taken the test before entry or at the border crossing point were additionally directed to a second test after entry. Digital COVID-19 certificates of the EU and some non-EU countries could be read using an application developed specifically for official use. Executive assistance provided by the Border Guard, the Customs and the Police at the entry points was essential for guiding passenger flows and checking COVID-19 certificates.

### 10.5.3 Health examinations of persons entering the country

Health examinations of persons entering the country refer to a risk assessment conducted by a healthcare professional of the person entering the country and any further infections caused by them as well as preventive measures taken on the basis of the risk assessment. Health examinations of passengers may include an interview, a clinical health examination, or laboratory screening. The counties are responsible for preventing infections at border crossing points in their areas and for organising health examinations. The Regional State Administrative Agency may order targeted health examinations to be arranged in its area. In case of a generally hazardous infectious disease, an order on mandatory health examinations may be issued. A decision on a mandatory health examination for an individual is made by the physician responsible for infectious diseases in the county, and for one or more persons by the Regional State Administrative Agency. Attending the health examination is free of charge for those arriving in the country, including foreigners[89].

Conducting health examinations requires a great deal of human resources, which is why only a small number of travellers can be examined in practice. The adequacy of resources can be ensured by targeting health examinations at travellers who are

89 Act on Client Fees in Social Welfare and Health Care (734/1992).

at the greatest risk of causing further infections. They may include those who have visited areas with a high incidence of the disease. Passenger locator forms can be used to collect preliminary information.

Laboratory screening of persons entering the country is inefficient and a large proportion of infections go undetected, as a significant part of the infections are still in the incubation phase at the time of testing[90]. Based on experiences gained of previous pandemics and epidemics, screening tests on exit and entry have not achieved significant benefits in terms of limiting the spread of the pathogen or epidemic[91]. If a person travelling abroad from Finland needs a certificate of a negative laboratory test result to enter another country or for other similar purposes, the traveller is responsible for obtaining the certificate and its costs, unless otherwise provided.

At designated border control points, the Finnish Food Authority inspects consignments of animals and foods and by-products of animal origin arriving from non-EU countries as well as the health certificates required for them, with the exception of presents and pets carried by passengers. In the EU internal market, responsibility for this control rests with local healthcare authorities.

### 10.5.4 Cross-border contact tracing

The precondition for cross-border contact tracing is that information on infected and exposed persons is passed on to the authorities responsible for contact tracing in different countries, enabling each authority to take the necessary action in its country. The Early Warning and Response System (EWRS) enables secure exchanges of information between EU countries. The need to ensure the highest possible integrity of passenger data in transmissions between the information systems of different states and authorities is, in particular, emphasised in situations where a large number of cross-border infections are detected.

90 Gostic KM, Kucharski AJ, Lloyd-Smith JO. Effectiveness of traveller screening for emerging pathogens is shaped by epidemiology and natural history of infection. Elife. 2015 Feb 19;4:e05564. Available at: https://doi.org/10.7554/elife.05564.

91 Mouchtouri VA. Exit and Entry Screening Practices for Infectious Diseases among Travelers at Points of Entry: Looking for Evidence on Public Health Impact. Int J Environ Res Public Health. 2019 Nov 21;16(23):4638. doi: Available at: https://doi.org/10.3390/ijerph16234638.

In Finland, THL is responsible for cross-border contact tracing. THL and the physician responsible for infectious diseases in the county have the right to obtain passengers' contact details from cross-border transport service providers. A Passenger Locator Form (PLF) is a printed or digital form filled in by passengers in which they can, for example, provide their contact details and their area of residence in their countries of origin and destination. A uniform digital PLF was created for the EU area, which the Member States can introduce, should they choose to do so[92]. THL or a county may establish a case-specific register for cross-border contact tracing.

92 EU Digital Passenger Locator Form. Available at: https://app.euplf.eu/#/.

# 11 Medicines and vaccines

**Medicines and vaccines play a crucial role in pandemic management if they can help reduce morbidity and mortality caused by the pandemic. In pharmaceutical services, preparedness for changes in consumption caused by incidents must be prepared for. The availability of medicines and vaccines intended to control the pathogen is limited by the slowness of research and development, production upscaling and distribution.**

## 11.1 Medicine and vaccine development

The development of new medicines and vaccines is strongly underpinned by public funding, academic research, and innovation in small and medium-sized pharmaceutical companies. Large-scale clinical research required to develop new vaccines and medicines is very expensive. As a rule, only major pharmaceutical companies have sufficient resources for this. They buy candidates that show promise in invention stage research from smaller competitors and strive to develop potential medicines and vaccines further to obtain products with marketing authorisation. Vaccine production, in particular, is in the hands of a small number of large and significant operators. The development of antiviral medicines is difficult and their efficacy is limited. In many cases, a vaccine is the only way to control viral infections effectively.

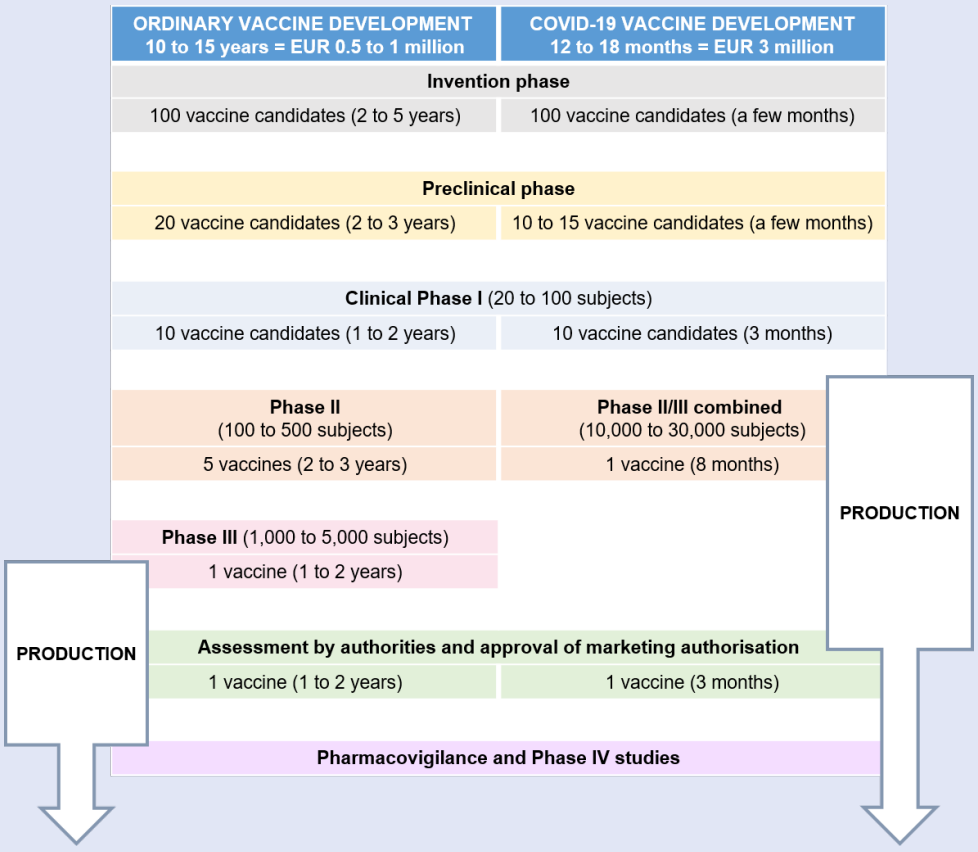
The authorities have several different official channels for making medicines and vaccines available in Finland. Medicinal products used in Finland must have a marketing authorisation granted either by the European Medicines Agency (EMA) based on a recommendation or by the Finnish Medicines Agency (Fimea). In addition, medicines may be used to treat patients if Fimea has granted them a special permit or exemption. In an incident affecting healthcare and social welfare, such as a pandemic, the Ministry of Social Affairs and Health may by its decision authorise the use of a medicine which does not have a marketing authorisation granted by Fimea.

The quality of medicines and vaccines with a marketing authorisation is assured by European independent official laboratories before they are released for consumption. The marketing authorisation holder of a medicine or vaccine has a

duty to report on its safety monitoring to the authority. In addition, the authorities in each EU country (in Finland, Fimea) receive and assess adverse reaction reports and report them to the centralised European EudraVigilance register. Fimea and THL work together to monitor and evaluate the adverse effects of vaccines.

During the COVID-19 pandemic, massive financial investments, more effective and modified practices, and global cooperation succeeded in significantly speeding up vaccine development and the schedules for conducting evaluations for marketing authorisations (Figure 7). For example, risk investments were made in the vaccine production chain even before there was any certainty of the efficacy and safety of the product. The streamlining of official processes and legislative reforms also promoted the availability of medicines and vaccines.

**Figure 7.** Conventional and accelerated vaccine development.
MEUR = EUR billion.



## 11.2 Deployment of medicines and vaccines in a pandemic

Pandemic-induced changes in the population's morbidity and behaviour affect the consumption of medicines: the demand for certain products may increase, while the demand for some may decrease and others remain unchanged. The greatest need focuses on medicines and vaccines intended to combat the pandemic pathogen. The demand for medicines used to alleviate symptoms and treat sequelae also goes up. Hoarding of medicines results in consumption peaks that are difficult to anticipate. The sufficiency, sensible allocation and appropriate use of medicines can be promoted by timely communication and, if necessary, restrictive measures that can be targeted at both the healthcare system and the population.

**Table 9.** Classification of alternative medicine groups during a pandemic

| | |
|---|---|
| Existing products | Pandemic-specific products<br>• Effective vaccines against the pathogen<br>• Effective antimicrobials against the pathogen<br>• Supportive therapies, including infusion fluids, antibiotics for treating secondary infections, and medicines used in intensive care |
| | Other than pandemic-specific products<br>• Products for treating chronic illnesses<br>• Other medicinal products |
| New products | New indications for existing medicinal products<br>• Use of existing medicinal products for new, pandemic-specific purposes (so-called repurposing) |
| | New pandemic-specific medicines and vaccines |

In order to ensure the availability of medicines and vaccines during a pandemic, the medicinal products that are critical for managing the pandemic, whose demand may increase, and which may be less readily available due to the pandemic must be determined as early as possible (Table 9). The EMA assesses and determines medicine groups critical in a health crisis that should be accounted for in national specifications. The EMA's Emergency Task Force (ETF) may also issue recommendations on the use of vaccines and other medicinal products during a pandemic. In order to ensure appropriate and equal use of medicines, the Ministry of Social Affairs and Health may restrict or grant rights concerning the prescribing and delivery of certain medicines in a pandemic situation. In addition, the Ministry

of Social Affairs and Health may make a decision to derogate from other provisions of the Medicines Act if this is necessary when faced with a threat of a generally hazardous infectious disease.[93]

Pharmaceutical Injury Insurance provides compensation for unexpected adverse reactions caused by the use of medicines and vaccines. The insurer is an insurance company established by the Finnish Co-operative for Pharmaceutical Injury Indemnities. The pharmaceutical injuries insurance covers medicinal products and vaccines whose manufacturer, importer or marketer is a member of the co-operative. The co-operative members are medicine manufacturers, importers, marketers and research companies operating in Finland. THL is also a member of the co-operative.

During the COVID-19 pandemic, the Ministry of Social Affairs and Health appointed a clinical expert group to support national procurements and use of medicines. Its task was to produce a knowledge base in support of the ministry's national medicine procurements. It also produced a system-level situation picture to assist the ministry in monitoring the epidemic, especially in the context of developing pharmacotherapy practices. A central government guarantee was provided for to cover any personal injuries caused by COVID-19 vaccinations in a situation where reinsurance is not otherwise available on the market[94].

## 11.3 Procurement and stockpiling of medicines and vaccines

An efficient and balanced pharmaceutical market where several operators offer the same medicines is the most desirable and optimal starting point for national security of supply. This means that the effects of temporary shortages of individual medicinal products are usually minor. The usual procurement procedure for medicinal products subject to a marketing authorisation is normally also the most effective during a pandemic. In normal conditions, the counties purchase their medicines as public procurements through open tendering processes. Wellbeing services counties can also make procurements together. The reimbursements and reasonable prices of medicines sold at pharmacies for outpatient care are

93 Sections 72 and 74 of the Communicable Diseases Act (1227/2016).

94 Act on Central Government Guarantee for Insuring COVID-19 vaccine (1058/2020)

assessed by the Pharmaceuticals Pricing Board, Hila. THL sees to the procurement of the vaccines included in the national vaccination programme and other common voluntary vaccines, antibodies and research substances as decided by the government. In national procurements, either a tendering process or a negotiated procedure can be used.

Finland is prepared to purchase pandemic vaccines for anyone who can and will accept them. Advance Purchase Agreements (APAs) can promote the rapid availability of pandemic vaccines during a pandemic. The benefit of EU joint procurements is that Finland can obtain vaccines or medicines on the same terms and at the same time as other EU member states involved in the procurement. Especially when there is a shortage of products, a joint procurement may improve the availability of medicines compared to national procurements or those of individual operators.

A pandemic may cause large-scale disruptions in the availability of medicines, as pharmaceutical manufacturers cannot usually respond immediately to a sudden spike in global demand. A pandemic may disrupt global medicine manufacturing chains: production may slow down or stop due to absences, problems obtaining ingredients or packaging materials, transport problems and restrictions on exporting medicines. The pharmaceutical industry depends on other industries for many of its ingredients or materials, which means that disruptions in these sectors also have knock-on effects on the pharmaceutical industry. The aim of restricting the export of medicines or pharmaceutical ingredients is securing their national availability, but due to the global nature of the pharmaceutical market, export restrictions may significantly reduce the availability of medicines elsewhere. A sudden increase in demand for medicines and oversized procurements may paralyse the operation of distribution chains, putting the availability of a single medicine or multiple products at risk.

The primary task of the pharmaceutical services' national preparedness is to ensure the availability and adequacy of medicines in normal conditions and during incidents. Medicine groups that present particular challenges in terms of pandemic preparedness include products

1. whose national consumption is very low in normal conditions but increases significantly as the pandemic breaks out,
2. where only a single product, or the products of a single manufacturer, are available on the market in Finland, or
3. no products with a marketing authorisation are on the market in Finland and the patients' needs are met with products that have special permits.

Finland depends on imports of medicines and vaccines, which is why decentralised storage is the cornerstone of pharmaceutical services. It includes the mandatory reserve supplies system of medicines, stockpiling obligations imposed on pharmacies, and national emergency stockpiling of medicines.

The mandatory reserve supplies system of medicinal products can be regarded as the primary supply mechanism of medicinal products associated with preparedness. The mandatory reserve supplies of medicines refer to the obligation to stock medicines and vaccines in Finland. It applies to importers and manufacturers of certain medicines and excipients as well as healthcare units and THL. [95,96] The purpose of the mandatory reserve supplies is to ensure the availability of medicines in situations where they are not as readily available as usual. The level of mandatory reserve supplies corresponds to the usual consumption of either three, six or ten months, depending on the group of medicines. The mandatory reserve supplies double as an additional operational stock which is constantly supplemented by parties subject to this obligation. However, the mandatory reserve supplies alone cannot secure the availability of medicines as the system does not cover all medicinal products. A significant increase in demand would also mean that the volumes of mandatory reserve supplies are not sufficient for longer lasting incidents.

A pharmacy must stock a volume of medicines, the devices and supplies needed for their use as well as bandages to meet at least two weeks' average need[97]. The pharmacies' two-week stocks work as a buffer in sudden situations of high demand. Their stockpiling obligation does not apply to extremely expensive medicinal products or rare medicines for which there is no regular demand. However, pharmacies also have a duty to ensure the availability of such medicines in their areas.

In a pandemic situation, medicines can also be purchased for state emergency stockpiling[98]. For example, emergency stockpiling can be used to ensure the availability of medicines of which only small quantities are used in normal conditions, or a larger batch of products can be purchased quickly. The greatest

95 Act on Mandatory Reserve Supplies (979/2008).

96 Government Decree on Mandatory Reserve Supplies (1114/2008).

97 Section 55 of the Medicines Act (395/1987).

98 Act on the Measures Necessary to Secure Security of Supply (1390/1992).

challenge to emergency stockpiling of medicines is ensuring stock turnover and minimising losses, which are extremely difficult within the framework of the current pharmaceutical and competition legislation, among other things.

## 11.4 Substances of human origin

Substances of human origin include blood donated for treatment use and its components or tissues, cells and organs. Donated blood is used not only in preparations needed for blood transfusions but also in plasma-based medicines, including immunoglobulins. In addition to organ or tissue transplants, organs, tissues or cells can also be used in medicinal products for advanced therapies.

During a pandemic, the consumption of certain substances of human origin, such as red blood cell products, may decrease. A pandemic may also affect the availability of plasma-based medicines. A precondition for the availability of these substances is a sufficient number of suitable voluntary donors. In a pandemic situation, donors contracting the infection may reduce the number of suitable donors. Restrictions on movement may prevent donors from attending blood donation clinics. The short shelf life of blood products, the availability of supplies needed for manufacturing them, and the requirements of their distribution also pose their own challenges to a well-functioning blood supply. Blood bank activities and the special expertise required for them are strongly concentrated, which makes the sector vulnerable.

## 11.5 Situation picture of pharmaceutical services

Having an up-to-date idea of the need for and availability of medicines, stock situation, and the adequacy of stocks is important for the preparedness of pharmaceutical services. Key information regarding the stock situation includes the location, capacity and content of the stocks and the quantity of medicines in them. Fimea maintains the national situation picture of the stockpiling of medicines and substances of human origin, and evaluates its development.

Anticipating the sufficiency of stocks is important not only for securing the availability of products but also for optimising the use of storage space and minimising medicine losses. In a normal situation, anticipation is based on the average consumption during normal conditions, information on the indications of a medicine, the number of patients and, for example, seasonal variations. During a pandemic, the demand for medicines is different from a normal situation. In this

case, anticipation is based on not only the situation picture of normal conditions but also information on medicines critical to managing the pandemic, average medicine consumption per patient, and the estimated development of the pandemic and trend in patient numbers.

Indicators describing the availability of medicines include notifications of shortages, exemptions to maintain lower stock levels issued, as well as special permits and exemptions. The first signals of potential shortages are obtained through active dialogue with pharmaceutical sector actors and stakeholders as well as the official networks.

## 11.6 Effects of vaccinations

Vaccinations are the most effective way to protect the population and prevent the serious consequences of communicable diseases for individuals and society. Vaccinations can help reduce morbidity, need for health services and mortality as well as maintain the population's work ability and functional capacity. A high vaccination coverage of the population provides herd immunity for both those who have been vaccinated and those who have not yet received vaccinations or who obtain weaker protection from them than others. Vaccinations can also safeguard social welfare and healthcare system capacity and the availability of services. This is why vaccinations play a crucial role in managing a pandemic.

The efficacy of a vaccine refers to the difference in disease incidence in vaccinated and unvaccinated persons observed in clinical vaccine studies over a certain period of time. Vaccine efficacy can be examined in proportion to infections, infectiousness, need for outpatient care, need or duration of hospitalisation, or the risk of death. Information on the efficacy of vaccinations in preventing the need for medical care is more reliable than information on their efficacy in preventing infections. The effectiveness of the vaccine, on the other hand, refers to its efficacy and effects among the population. The effects of vaccinations among the population often differ from the efficacy observed in trials. This is due to the selection of trial participants and the multiple factors affecting real-life vaccination protection. The cost-effectiveness of vaccinations refers to the costs of vaccinations in relation to their health benefits. The national vaccination programme in Finland, for example, is cost-effective as the savings it generates exceed its costs[99].

99 Salo H et al. Suomen kansallinen rokotusohjelma perustuu tutkimustietoon. Lääketieteellinen aikakausikirja Duodecim. 2023;139(13):1119-26.

As in the case of other medicines, efficacy and safety demonstrated in extensive clinical trials are a condition for obtaining marketing authorisation for vaccines. Following large-scale administration of vaccines to the population, rare adverse events with a temporal link to the vaccination may sometimes occur, and their causal link with the vaccination must be investigated. Accurately recording and registering vaccinations is a precondition for monitoring their effectiveness and safety.

# 12 Human resources and securing system capacity

**A pandemic increases the need for healthcare and social welfare services. The adequacy of personnel is the key factor that can limit service system capacity. Ensuring the continuity and capacity of health and social services is part of preparedness for incidents, the responsibility for which rests with the competent authorities working together with stakeholders. By strengthening the population's crisis resilience, the impacts of a pandemic can be reduced, and recovery from it can be precipitated.**

In healthcare and social welfare, system capacity refers to the maximum capacity of the service system to provide services effectively while optimising the use of resources. In simple terms, healthcare system capacity can be described as the number of clients and patients that can be treated simultaneously. Exceeding the system capacity of healthcare and social welfare at the national level would mean that statutory services could not be provided to everyone who needs them. In the worst-case scenario, exceeding the system capacity could put lives, health and fundamental rights associated with adequate health and social services at risk.

The pandemic increases the need for treatment and care associated with the pathogen. Other factors determining the need for services remain unchanged, or their impact is increased or reduced. The increased need for services due to a pathogen affects different health and social services in different ways, and the need for services may vary in the successive phases of a pandemic. Healthcare and social welfare system capacity is determined by bottlenecks in the service path, in other words areas where capacity limits the total number of people being treated by the services. These services may include ones whose provision requires special expertise of the personnel, such as intensive care. A bottleneck is also created if patients cannot be discharged or moved on from specialised medical care to further treatment.

Balancing demand and supply is a precondition for safeguarding the system capacity of healthcare and social welfare. The demand for health and social services is reduced if infections can be prevented and the need for hospitalisations can be reduced. Issuing instructions, administration of medicines and vaccinations as well

as non-pharmaceutical interventions can help reduce the demand for services. While postponing non-urgent treatment also reduces the demand for services, it increases the treatment backlog and may exacerbate the need for a service. The offer of services can be increased through more efficient service provision and by increasing human and other resources. The system capacity is affected by a number of societal, political, economic, material, mental, social and labour dimensions. It is also influenced by the nature of the potential incident, such as the properties of the pandemic pathogen.

## 12.1 Securing the adequacy and competence of personnel

Healthcare and social welfare is the largest sector in Finland. Approx. 358,000 people in total worked in this sector in 2021. Of this workforce, approx. 226,000 people (63%) worked in the public sector.[100] In addition, some 100,000 people with no healthcare and social welfare training worked in the sector in 2018[101].

A lack of skilled and trained personnel may become a factor that limits the availability of social welfare and health care services and other pandemic management tasks. Pandemic management and the resulting changes in demand for healthcare and social welfare services increase the need for human resources in certain functions, whereas in others the need may remain unchanged or decrease. On the other hand, the pandemic increases absences due to illness among the personnel.

### 12.1.1 Situation picture of human resources

The task of healthcare and social welfare preparedness centres is to maintain a situation picture of human resources in this sector in their collaborative areas. The situation picture must include information necessary for leadership, including on the operation and burden of the service system, human and material resources

100 Palmgren S, Karvonen E. Terveys- ja sosiaalipalvelujen henkilöstö 2021: Lähes kolmannes terveys- ja sosiaalipalvelujen henkilöstöstä työskentelee yrityssektorilla. Finnish Institute for Health and Welfare (THL) Statistical report 67/2023. Available at: https://urn.fi/URN:NBN:fi-fe20231204151137.

101 Virtanen A. Terveys- ja sosiaalipalvelujen henkilöstö 2018: Tuleva sote-uudistus koskee 7,3 prosenttia työssäkäyvistä. Finnish Institute for Health and Welfare (THL) Statistical report 47/2021. Available at: https://urn.fi/URN:NBN:fi-fe2021121460373.

as well as the operation of support services[102]. In practice, what is needed is information on the number of personnel working in healthcare and social welfare tasks by role and personnel group as well as on their special skills. In addition to the personnel participating in patient and client work and support services, the administrative personnel essential for the smooth running of the operation should be taken into account. In a pandemic situation, the need for an up-to-date situation picture regarding human resources is emphasised.

### 12.1.2 Personnel adequacy

A pandemic creates additional tasks for regional as well as national authorities. These tasks may, for instance, be associated with contact tracing, diagnostics and treatment of patients, administration of vaccinations, administrative decisions and communication. The need for human resources may also increase in other sectors whose operation is central to managing a pandemic. Changes in the population's behaviour during the pandemic and non-pharmaceutical interventions can affect businesses and employees in many ways.

Ensuring the adequacy and availability of social welfare and healthcare personnel in normal conditions is a key factor that promotes contingency planning and preparedness. In order to secure them, attention must be paid to several different factors[103]. The contingency plans must include a plan for securing the availability and retention of personnel during incidents. Securing the adequacy of personnel may require outsourcing of services, recruitment of new personnel, modified working methods and job descriptions, or transfers of personnel within an organisation or group. The number of people working in other organisations who are available for pandemic period tasks should be determined, and the availability of personnel can be ensured by such means as agreements with municipalities. It is also important to remember retired professionals as a resource. In emergency conditions, extraordinary powers granted pursuant to the Emergency Powers Act may be exercised. These powers include restricting the right concerning dismissal as well as derogations from the terms and conditions of the employment relationships of personnel that are necessary for securing healthcare and

102 Act on Organising Healthcare and Social Welfare Services (612/2021).

103 Kirkonpelto T-M, Mäntyranta T. Roadmap for 2022–2027: Ensuring the sufficiency and availability of healthcare and social welfare personnel. Ministry of Social Affairs and Health publications 2023:8. ISBN 978-952-00-7178-3 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-00-7178-3.

livelihoods. There are also roles in social welfare and healthcare that do not require professional qualifications of this sector, which also leaves room for manoeuvre in a pandemic situation.

The availability of healthcare and social welfare personnel varies by region and occupational group. While recruitment and induction of new personnel takes time, these processes can be accelerated by preparedness, networking and agreements. As the total number of healthcare and social welfare personnel is limited, recruitment for pandemic management tasks may undermine the adequacy of personnel in other functions. Additional personnel for various supporting tasks in healthcare and social welfare can be found through municipalities, NGOs and other communities and similar.

During a pandemic employees may, within the limits of regulations and collective agreements, have to work in different operating units than they normally do or perform tasks in which they have no prior experience. Prior competence of personnel members and substitute arrangements can be used to facilitate personnel transfers. When personnel are transferred, the time it takes for them to adapt to a new working environment and to learn new tasks must be accounted for.

Preventing absences due to illness is part of the healthcare and social welfare sector employer's obligation to take care of the employee's health and safety at work. Preventing absences also helps to secure the system capacity of healthcare and social welfare. While sickness absences may be caused by illnesses directly related to the pandemic pathogen, they may also by the result of an increased workload during the pandemic. If persons close to staff members fall ill, this may also increase absenteeism.

Promoting staff retention is a key part of securing the adequacy of personnel, especially in the face of prolonged incidents. The foundation for retaining personnel and change flexibility is built in everyday work where employees feel valued and are engaged in planning the activities. Each person must understand their role as part of the whole, and everyone must have an opportunity to ask for and also receive support. Uncertainty associated with the pandemic, employees' fears of themselves or their loved ones falling ill, rush, exceptional tasks and other changes at work add to the stress. On the other hand, incidents can increase the meaningfulness and communality of work. Contingency plans must address safeguarding the personnel's coping and mental carrying capacity, maintaining motivation and provision of psychosocial support and services. Open and multi-channel communication within the organisation supports the personnel's wellbeing.

### 12.1.3 Competence development

Competence is a key factor that influences the adequacy and crisis resilience of personnel. Training that builds competence may be included in studies or take the form of continuing and in-service training as well as induction training. Job rotation, simulations and exercises also improve competence. Coping with crises may strengthen the resilience of both individuals and organisations. Resilience can be improved by evaluating different situations and the lessons learned from them at a later date. Competence development supports networking and, consequently, preparedness for pandemics.

It is important to know the basics of infection prevention, which also helps to prevent epidemics during a pandemic. Providing social welfare personnel induction in caring for clients during an epidemic, especially in 24-hour services and home care, is vital to ensure that those who become infected can be treated in the right place based on a medical assessment.

## 12.2 Securing continuity

### 12.2.1 Contingency planning

The objective of the work to control communicable diseases is to prevent communicable diseases and their spread, as well as to prevent adverse effects caused by these diseases to people and the society[104]. Efforts can be made to prevent pandemics by influencing their underlying factors in international cooperation. Contingency planning refers to preparations made during normal conditions for the threat posed by pandemics to people and society.

The government, central government administrative authorities, independent state-owned agencies governed by public law, other central government authorities and state enterprises must be prepared for managing their duties in the best possible way also in emergency conditions. This obligation also applies to the counties and joint county authorities for wellbeing services, municipalities, joint municipal authorities and other consortia of municipalities. [105] In keeping with the cooperation model for comprehensive security, preparedness is promoted together

104 Section 1 of the Communicable Diseases Act (1227/2016)

105 Section 12 of the Emergency Powers Act (1552/2011).

with business life, NGOs and the population[106]. To prepare for the threat posed by zoonoses (diseases transmitted between humans and animals), social welfare and healthcare actors work together with animal health, food safety and other environmental healthcare authorities.

Contingency and continuity planning is an essential part of being prepared for incidents and emergency conditions[107]. Healthcare and social welfare actors must determine their statutory tasks and critical functions whose performance must be ensured in all situations within the statutory deadlines. It is also important to identify which functions can be cut back on if necessary, and to plan the order in which the functions would be cut. Preparedness for incidents affecting healthcare and contingency planning in EU Member States and the EU territory are monitored and evaluated regularly.

The consolidated guidelines of a wellbeing services county contain provisions on contingency planning, preparedness and their coordination within the concern[108]. The counties must prepare for incidents and emergencies and ensure continuity management through their contingency plans and other measures. Work on preparedness takes place in regional and national cooperation.[109] The wellbeing services county's contingency plan describes, for example, the levels of regulating preparedness, alert arrangements and procedures for securing personnel, facilities and material resources[110]. The wellbeing services counties' collaboration agreement addresses preparedness for incidents and emergencies in the region and the organisation of the preparedness centre's activities[111]. The consistency of wellbeing services counties' preparedness plans is supported by the national preparedness planning portal (VALSU).

106 Government Resolution 2 November 2017. Security Strategy for Society. ISBN 978-951-25-2959-9 (PDF). Available at: https://turvallisuuskomitea.fi/wp-content/uploads/2018/02/YTS_2017_suomi.pdf.

107 Vuorinen S. Plan for preparedness and continuity management: Guidance for actors in the social welfare and healthcare sector (in Finnish). Ministry of Social Affairs and Health publications 2019:10. ISBN 978-952-00-4046-8 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-00-4046-8.

108 Section 150 of the Act on Wellbeing Services Counties (611/2021).

109 Section 50 of the Act on Organising Healthcare and Social Welfare Services (612/2021).

110 Government Decree on the Wellbeing Services Counties' Preparedness for Incidents Affecting Healthcare and Social Welfare (308/2023).

111 Government Decree on the Content and Preparation of Wellbeing Services Counties' Collaboration Agreements (309/2023).

Many persons using social welfare services rely on external assistance, which makes safeguarding the continuity of assistance vital. The counties are responsible for securing the services for persons with disabilities, home care clients, clients of housing services for older people, clients of housing services for substance abusers and child welfare clients, also during a pandemic. If this is not done, clients will seek help elsewhere. This may place an inappropriate burden on healthcare and social welfare emergency services, for instance. If they fall ill, clients of social welfare services may need more assistance than usual.

The counties must estimate the maximum number of patients and clients that can be managed with the available human resources, medicines, equipment, supplies and facilities. The plan must describe measures taken to achieve maximum capacity. Such measures may include deploying backup facilities, setting up additional beds and making changes in the organisation of services. The counties must identify the client and patient groups whose care and services it is particularly critical to safeguard. Essential support services and other activities must also be determined. The plans should be coordinated with the other counties in the collaborative area.

The county is responsible for securing the continuity of services also when it outsources services to a private provider[112]. Contracts on service provision must include references to preparedness for such incidents as pandemics, for example regarding material preparedness and operative changes[113]. The self-monitoring plan of a private service provider must address the continuity of operation, for example in situations where several employees fall ill at the same time. The county's expertise must be drawn on when producing the plan.

When the county is drawing up its preparedness and contingency plans, it must account for the possibilities of municipalities, NGOs, other communities, private service providers, occupational healthcare services and businesses to participate in maintaining the system capacity, for example by offering facilities, personnel and other resources.

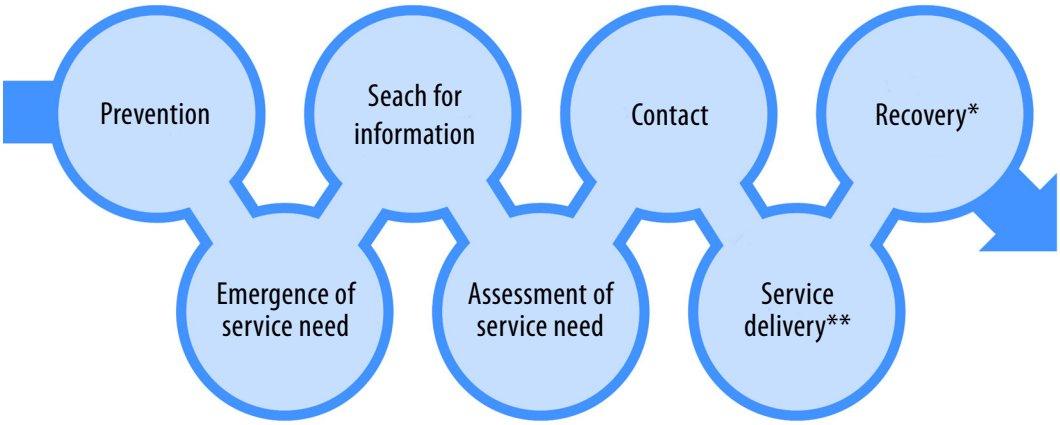
112 Section 15 of the Act on Organising Healthcare and Social Welfare Services (612/2021).

113 Savolainen M, Vuorinen S. Contractual preparedness: Guidance for actors in the social welfare and healthcare sector (in Finnish). Ministry of Social Affairs and Health publications 2019:9. ISBN 978-952-00-4068-0 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-00-4068-0.

### 12.2.2 Adaptation of services

A service path is a chronological description of the events that a client or patient encounters when using the services (Figure 8). From the client's perspective, understanding the service path helps to perceive the content of the service and anticipate the different steps of the path, despite the fact that an individual's service path always differs to some extent from the usual one. From the perspective of healthcare and social welfare actors, describing the service path makes it easier to see the different steps of the process as parts of the whole, identify interdependencies between different services and bottlenecks, and plan measures. The prevention of contagious diseases and the treatment service path are affected by the pathogen's properties, the available services, such as diagnostics, medicines and vaccines, as well as non-pharmaceutical interventions focusing on the individual alike. The service path may change during a pandemic.

**Figure 8.** The performance of each step of the service path affects the system capacity of healthcare and social welfare services. Any bottlenecks limit the total capacity.




* Home care, long-term housing service, quarantine or isolation, food supply.

** Pre-hospital emergency care, diagnostics, surgery, inpatient or intensive care, drug or vaccination, contact tracing.

The need for services is determined as the combined effect of the pathogen's properties and the characteristics of the population, and it may be driven directly by the pathogen or result indirectly from such factors as psychological stress caused by the pandemic or pandemic management measures. A pandemic increases the population's need for information. Clear instructions can promote appropriate service use by clients and patients. Multiple channels and reaching different population groups must be remembered when addressing communication to the population.

The increased demand for services is first seen in telephone and chat contacts and on other contact channels as well as in units providing urgent and emergency care. Digital services for assessing symptoms and, for example, self-service appointments for testing may improve the efficiency of the activities. Organising testing on separate premises reduces the burden on units offering emergency care.

For infected persons who do not need hospitalisation, clear instructions must be provided on what to do if their symptoms get worse. Efficiency in health and social services can be improved by centralising the examination and treatment of infected patients to certain units. The counties must issue instructions on where to place patients in need of inpatient care and on their transfers between treatment units or, if necessary, different counties.

In a pandemic, environmental healthcare services may focus supervision on high-risk sites for infections if necessary. In a pandemic situation, food control can be carried out or targeted differently from normal circumstances to ensure food safety.

If there is a risk of the system capacity of healthcare and social welfare services being exceeded or resources becoming exhausted, it may be necessary and proportionate to prioritise critical services or the most effective activities. In emergency conditions, the time limits for non-urgent care may be dropped if this is necessary in order to organise urgent care and the delay in non-urgent care does not put the patient's health at risk. In social welfare, assessment of service needs referred to in the Social Welfare Act may be waived[114].

In some patients, a pandemic pathogen may cause severe symptoms that require intensive or high-dependency care. As it spreads, the pandemic may significantly increase the number of patients in need of intensive care. Intensive care refers to care that maintains and improves the vital functions of a seriously ill patient. Intensive care requires special skills, human resources, as well as dedicated facilities and medical devices. The strategy for ensuring the adequacy of intensive care and high-dependency care published by the Ministry of Social Affairs and Health describes an escalation plan, the purpose of which is to secure the availability of care when the number of patients threatens to exceed the intensive care capacity[115].

114 Section 88 of the Emergency Powers Act (1552/2011).

115 Bendel S. Strategy for ensuring the sufficiency of intensive care and high-dependency care. Reports and memorandums of the Ministry of Social Affairs and Health 2023:8. ISBN 978-952-00-7174-5 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-00-7174-5.

During the COVID-19 pandemic, municipalities and hospital districts adapted their activities by such means as developing and expanding remote services. Separate infection clinics were set up to improve efficiency. Additional personnel were recruited, services were outsourced to private providers and occupational healthcare actors, and personnel were trained to take on new tasks. Vaccinations were administered as quickly as possible, and their aim was protecting the health of the population and safeguarding the system capacity of healthcare and social welfare. Non-pharmaceutical interventions targeting the population were introduced proactively in situations where the system capacity of healthcare and social welfare services was at risk. Due to the pandemic, emergency conditions were declared in Finland, and a derogation under the Emergency Powers Act was temporarily introduced by a Government Decree, which made it possible to waive the deadlines for non-urgent care and the assessment of the need for social welfare services. Fewer non-urgent surgical procedures were carried out, and human resources, facilities and supplies were reallocated to intensive care, which led to an increase in treatment backlog. The treatment backlog of other non-urgent treatment also increased.

## 12.3 Vaccinations

### 12.3.1 Vaccination programme

Provisions on the national vaccination programme are laid down in a Ministry of Social Affairs and Health decree[116]. Decisions on the administration of other general voluntary vaccinations are made by the government. Other general voluntary vaccinations may include pandemic vaccines before their inclusion in the national vaccination programme. The government may make a vaccination mandatory by its decision if vaccinations with a wide coverage are necessary to prevent the spread of a generally hazardous communicable disease. The national vaccination programme vaccines and other general vaccinations as decided by the government are paid for from state funds.

116 Ministry of Social Affairs and Health Decree on Vaccinations (149/2017).

The THL is the national expert institute for the prevention of communicable diseases. It also supports and guides other authorities working to control these diseases. THL guides the implementation of the national vaccination programme, monitors the coverage and effects of the vaccinations, conducts research, and submits proposals to develop the national vaccination programme. The THL sees to the procurement and delivery of vaccines included in the national vaccination programme. [117] The National Advisory Committee on Vaccines appointed by the Finnish Institute for Health and Welfare is tasked with monitoring international development of the vaccine sector and vaccination programmes. The Committee also prepares THL's proposals to the Ministry of Social Affairs and Health on developing the national vaccination programme and THL's recommendations for the use of vaccines not included in the national vaccination programme.

### 12.3.2 Delivery of vaccinations

In a pandemic, there is a global shortage of vaccines at first, and they are not immediately available for the entire population. As the arrangements for vaccinating the population also take time, deciding the order in which vaccinations will be administered is necessary. The order of vaccinations is laid down in a government decree.

The factors influencing the vaccination order include the strategic goal of the vaccinations and information on groups at risk of serious illness as well as the efficacy of the vaccine against serious illness, need for hospitalisation, mortality or virulence in different population groups. The impact of optional vaccination orders on the development of the pandemic can be evaluated by modelling. If the aim is to reduce years of life lost, it is justified to prioritise the youngest high-risk groups. If the goal is to safeguard the system capacity of healthcare and social welfare services, the vaccinations of healthcare and social welfare personnel working in critical services and roles essential for the system capacity should be prioritised. If the vaccine is effective against infection, the vaccination of the population groups in which the highest number of infections occurs might be justified.

The wellbeing services county is responsible for organising vaccinations included in the national vaccination programme, other general vaccinations, and vaccinations given on a physician's order. Vaccinations can be administered at surgeries or inpatient wards, or by home nursing. Mobile vaccinations services can also

117 Communicable Diseases Act (1227/2016).

be organised, for example in sheltered housing units with 24-hour assistance. Services outsourced to private providers, the expertise of occupational healthcare services and, for example, the facilities of municipalities can be used when organising vaccinations. The wellbeing services county is responsible for regional communication concerning vaccinations. The Defence Forces and the Border Guard organise the vaccinations of the persons for whose healthcare they are responsible.

A physician takes charge of planning and carrying out vaccination activities. When planning vaccination activities, the skills of participating professionals, instructions and division of labour, appropriate facilities, distribution and correct handling of vaccines, vaccination safety and keeping records of vaccinations must be accounted for.

Vaccination activities can be sped up and their efficiency can be improved by organising mass vaccinations. This is necessary when organising e.g. pandemic vaccinations The wellbeing services county's preparedness plans must address the organisation of mass vaccinations. Special facilities and human resources are required to organise mass vaccinations. When organising mass vaccinations, particular attention must be paid to the correct storage and handling of vaccines and protecting the privacy of the person being vaccinated.

A high vaccination coverage among the population is promoted by a number of factors, including accessibility of the services, smooth administration of vaccines, education and building of trust[118]. In mild pandemics, the challenge of administering vaccinations may lie in the population's poor vaccine confidence, as a result of which sufficient immune protection at population level cannot be achieved with the vaccinations. Confidence in vaccines may, for example, be supported by making the vaccination easy to get and using vaccination campaigns, which focus on the population, the individual, or social welfare and healthcare actors.

118 Final report of the working group on improving vaccination activities Reports and memorandums of the Ministry of Social Affairs and Health 2019:39. ISBN 978-952-00-4074-1 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-00-4074-1.

# APPENDIX 1: Legislative basis of pandemic management

## National acts and decrees

**Table 10.** Table 10. Acts and decrees with key importance for pandemic management.

| Name | Description |
|---|---|
| Constitution of Finland (731/1999) | The Constitution lays the foundation for all national legislation and the exercise of public power. It contains provisions on the principles of the exercise of public power, form of government and the relations between the supreme state bodies. The Constitution contains provisions on individuals' fundamental rights, the consideration of which is essential in all official activities. Section 23 of the Constitution provides for the possibility of temporarily restricting fundamental rights during emergency conditions. While the grounds for derogations must always be laid down in an act, the restrictions themselves can be implemented either by an act or a government decree. |
| Communicable Diseases Act (1227/2016) | The objective of the Act is to prevent infectious diseases from occurring and spreading, as well as to prevent harmful effects caused by these diseases to people and society. The Act contains provisions on the actors, organisation, planning, guidance and supervision of the prevention of infectious diseases. It also contains provisions on powers to impose involuntary measures as well as, among other things, on reporting of infectious diseases, vaccinations, and clinical microbiology licences. The Communicable Diseases Act also applies in Åland. |
| Act on Organising Healthcare and Social Welfare Services (612/2021) | The Act contains provisions on the organisation, development, steering and supervision of healthcare and social welfare services that the wellbeing services county is responsible for organising. It lays down provisions on preparedness for incidents in a collaborative area and the central government's role in maintaining preparedness. |
| Act on the Autonomy of Åland (1144/1991) | The Act on the Autonomy of Åland, the Act on Regional State Administrative Agencies (896/2009) and the Decree of the President of the Republic on the Administration of Certain Health and Medical Care Tasks in the Province of Åland (1179/2009) define the authorities responsible for communicable disease matters in Åland. |

| Name | Description |
|---|---|
| Emergency Powers Act (1552/2011) | The Emergency Powers Act contains provisions on the authorities' preparedness for and powers during emergency conditions. The precondition for exercising certain powers laid down in the Emergency Powers Act is that the government together with the President of the Republic declares emergency conditions in the country, after which a government decree may be issued under which certain powers referred to the Emergency Powers Act may be exercised. The decrees on the use of powers under the Emergency Powers Act must immediately be submitted to Parliament, which decides if the decree may remain in force or if it should be repealed fully or in part. |
| Occupational Safety and Health Act (738/2002) | The Act defines minimum requirements for working conditions and good occupational safety activities in workplaces. Among other things, the Act contains provisions on biological agents, including communicable diseases. |
| Occupational Healthcare Act (1383/2001) | The Act contains provisions on health examinations carried out by occupational healthcare services, for example due to biological factors. |
| Medicines Act (395/1987) | Among other things, the Act contains provisions on securing the availability of medicines and the delivery to the patient of medicines needed to start treatment. |
| Health Protection Act (763/1994) | The purpose of the Act is to maintain and promote the health of the population and the individual and to prevent, reduce and eliminate factors in the living environment that may cause health hazards. The Act gives the health protection authority extensive powers. For example, international shipping and air traffic referred to in the International Health Regulations (IHR) are supervised by virtue of the Health Protection Act in Finland. |
| Act on Mandatory Reserve Supplies (979/2008) | The purpose of the Act is to secure the availability of and possibilities for using medicines by means of mandatory stockpiling in situations where their usual availability is hampered or prevented. |
| Medical Devices Act (719/2021) | The Act lays down provisions on the national implementation of EU law on medical devices and statutes applicable to them. |
| Act on Certain Medical Devices Specified in EU Directives (629/2010) | The Act lays down provisions on the manufacture and placing on the market of devices within the scope of directives on medical devices to the extent that, under the transitional provisions of the Medical Devices Regulation, such devices may be placed on the market and put into service. |
| Animal Diseases Act (76/2021) | The Act contains provisions on controlling animal diseases, national competence and certain other measures. These provisions also address animal diseases that can be transmitted from an animal to humans (zoonoses) and put human health at risk. The decrees issued by virtue of the Animal Diseases Act contain more detailed disease-specific provisions on controlling the diseases. |
| Food Act (297/2021) | The Act contains provisions on combating animal diseases that affect food safety. |
| Aviation Act (864/2014) | The Act contains provisions on measures that may be needed to prevent the spread of a generally hazardous communicable disease in air traffic. Under the Aviation Act, an aircraft may be ordered to land at an airport which has the capacity to carry out the measures in accordance with the International Health Regulations issued by the World Health Organization. |

| Name | Description |
|---|---|
| Government Decree on Communicable Diseases (146/2017) | This Decree issued by virtue of the Communicable Diseases Act contains more detailed provisions on the classification of infectious diseases, the tasks of different authorities and the Finnish Institute for Health and Welfare, notification of communicable diseases, healthcare-associated infections and screenings during pregnancy. |
| Government Decree on the Advisory Board on Communicable Diseases (78/2017) | This Decree issued by virtue of the Communicable Diseases Act contains provisions on the appointment, duties and composition of the Advisory Board on Communicable Diseases. |
| Ministry of Social Affairs and Health Decree on Vaccinations (149/2017) | This Decree issued by virtue of the Communicable Diseases Act contains provisions on vaccines included in the national vaccination programme, targeted vaccinations, administration of vaccinations, recording of vaccination information in patient documents, and rare vaccines, antibodies and testing substances. |
| Government Decree on the Wellbeing Services Counties' Preparedness for Incidents Affecting Healthcare and Social Welfare (308/2023) | This Decree issued by virtue of section 50, subsection 4 of the Act on Organising Healthcare and Social Welfare Services contains provisions on contingency planning, building a situation picture and guiding private service providers in the context of preparedness. |
| Government Decree on Protecting Employees from Work-related Hazards Caused by Biological Agents (933/2017) | The Decree contains provisions on the grouping and classification of biological agents, identification and assessment of biological hazards at work, prevention and reduction of exposure to biological agents, and personal protection. |
| Ministry of Social Affairs and Health Decree on the Classification of Biological Agents (748/2020) | The Annex to this Decree lays down further provisions on the classification of biological agents and properties of biological agents known to be harmful. |
| Government Decree on the Selection and Use of Personal Protective Equipment (427/2021) | The Decree lays down provisions on the properties, assessment and selection of personal protective equipment and safe use of personal protective equipment at work. |
| Government Decree on Medical Examinations in Work that Presents a Special Risk of Illness (1485/2001) | The Decree lays down provisions on the employer's obligation to organise at their expense health examinations for employees in work that presents a special risk of illness. Among other things, the Decree contains provisions on working conditions that may pose a special risk of illness to the employee as well as health examinations and their objectives. |
| Government Decree on Mandatory Reserve Supplies (1114/2008) | Among other things, this Decree contains provisions on medicine substances included in medicine groups that fall within the scope of mandatory reserves referred to in the Act on Mandatory Reserve Supplies. The Decree also lays down provisions on the organisation of the mandatory stockpiling obligation in special cases, exemption from the mandatory stockpiling obligation, applying for and payment of storage compensation, and control of compliance with the stockpiling obligation. |

# EU legislation and international treaties

**Table 11.** European Union and international law

| Name | Description |
|---|---|
| WHO's International Health Regulations, (IHR 2005) | A treaty on preparedness for and response to health emergencies. The objective of the treaty is to prevent, prepare for and respond to cross-border public health threats without causing unnecessary disruptions to international transport and trade. Finland has implemented the IHR in its national legislation. |
| Regulation (EU) 2022/2371 of the European Parliament and of the Council on serious cross-border threats to health | The Regulation defines the European Union's procedure for declaring a public health emergency. By virtue of this declaration, the Health Security Committee defined in the Regulation may issue recommendations on coordinating the responses of EU Member States. The Regulation additionally contains provisions on joint procurement of medical countermeasures and strives to harmonise preparedness and response planning in the Member States. The Regulation repealed Decision No 1082/2013/EU on serious cross-border threats to health. |
| Regulation (EU) 2022/123 of the European Parliament and of the Council on a reinforced role for the European Medicines Agency in crisis preparedness and management for medicinal products and medical devices | The Regulation contains provisions on the European Medicines Agency's (EMA) preparedness for threats to public health, monitoring and reporting on the availability of medicines and medical devices, as well as guidelines and expert support related to the use of medicines. |
| Regulation (EU) 2022/2370 of the European Parliament and of the Council amending Regulation (EC) No 851/2004 establishing a European centre for disease prevention and control | The Regulation states that the tasks of the European Centre for Disease Prevention and Control (ECDC) include the prevention of communicable diseases, preparedness planning and risk assessment. The Regulation also specifies the Member States' reporting and notification obligations to the ECDC. |
| Council Regulation (EU) 2022/2372 on a framework of measures for ensuring the supply of crisis-relevant medical countermeasures in the event of a public health emergency at Union level | The Regulation lays down provisions on the establishment of a Health Crisis Board, monitoring and safeguarding of the supply of crisis-relevant medical countermeasures as well as emergency financial support provided by the Union in the event of a public health threat. In addition to the Health Security Committee, ECDC and EMA, the implementation of the Regulation is coordinated by the Health Emergency Response Authority (HERA), established on 16 September 2021 by Commission Decision [COM (2021) 576 final]. |

| Name | Description |
|---|---|
| Regulation (EU) 2016/425 of the European Parliament and of the Council on personal protective equipment and repealing Council Directive 89/686/EEC | The Regulation lays down requirements for the design and manufacture of PPEs placed on the Union market. |
| Regulation (EU) 2016/429 of the European Parliament and of the Council on transmissible animal diseases and amending and repealing certain acts in the area of animal health ('Animal Health Law') | The Regulation adopts rules and measures for the prevention and control of animal diseases transmitted between animals and between animals and humans in the Member States. Further provisions have been adopted by virtue of this Regulation. |
| Regulation (EU) 2017/745 of the European Parliament and of the Council on medical devices, amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC | The Regulation lays down rules for the placing on the market, making available on the market or putting into service in the European Union of medical devices for human use and their accessories. The Regulation also applies to clinical trials of such medical devices and their accessories. |
| Regulation (EU) 2017/746 of the European Parliament and of the Council on in vitro diagnostic medical devices and repealing Directive 98/79/EC and Commission Decision 2010/227/EU | The Regulation lays down rules for the placing on the market, making available on the market or putting into service in the European Union of medical devices for human use intended for in vitro diagnostics and their accessories. It also applies to performance studies on in vitro diagnostic medical devices and their accessories. |
| Regulation of the European Parliament and of the Council (EU) 2016/399 on the rules governing the movement of persons across borders (Schengen Borders Code). | Under this Regulation, persons crossing internal borders between Member States of the Union are not subject to border controls. Among other things, it contains provisions on border control of persons crossing the external borders of the Member States of the Union, entry conditions and the temporary reintroduction of border control at internal borders. |
| Regulation (EU) No 528/2012 of the European Parliament and of the Council concerning the making available on the market and use of biocidal products | The Regulation lays down uniform rules for the placement on the market and use of biocidal products in the EU. |
| Proposal for a Directive of the European Parliament and of the Council on the resilience of critical entities (COM/2020/829 final) | The so-called CER Directive lays down obligations for Member States to take measures to ensure the provision of vital services for maintaining critical societal and economic activities in the internal market. The Member States must identify critical entities and enable them to fulfil their obligations under the Directive. The Directive also lays down rules on the supervision of critical entities. For example, the scope of the Directive includes EU reference laboratories as defined in Article 15 of Regulation (EU) 2022/2371. |

# APPENDIX 2: Non-pharmaceutical interventions

**Figure 7.** Table 12. Non-pharmaceutical interventions are based on maintaining a situation picture, conducting risk assessments and assessing the necessity and proportionality of restrictions. Obliging decisions are based on powers laid down in the legislation. Recommendations are not obliging.

| Measures | Comments |
|---|---|
| **Communications addressed at the public and preparedness – promote understanding and management of the situation.** | |
| Information about infection risks and how to avoid them, symptoms of the disease and how to recognise it [e.g. section 7 of the Communicable Diseases Act (1227/2016)] | Uniform communication addressed at the public in which special needs are taken into account, including language versions and difficult-to-reach population groups. |
| Information about the situation picture, risk assessment and planned further measures [e.g. section 7 of the Communicable Diseases Act, section 51 of the Act on Organising Healthcare and Social Welfare Services (612/2021)] | |
| Risk assessments and risk management measures in workplaces [e.g. section 8 of the Occupational Safety and Health Act (738/2002)] | Accounting for professionals and risk-prone work in different fields. The employer may oblige their employees to comply with the instructions. |
| Increasing organisations' level of preparedness. | Following contingency plans. |
| **Restricting close contacts at population level – reduces physical interaction as well as the risk of carriers spreading the infection and the population being exposed to it.** | |
| Closure of healthcare and social welfare units (section 58 of the Communicable Diseases Act) | |
| Closure of day-care centres and educational institutions (section 58 of the Communicable Diseases Act) | Risk assessments for different levels of education. Distance learning [Basic Education Act (628/1998)]. |
| Prohibiting public meetings and events (section 58 of the Communicable Diseases Act) | Risk assessments for different numbers of people and situations. |
| Recommendation to avoid close contacts and meetings | |

| Measures | Comments |
|---|---|
| Cohorting (e.g. section 17 of the Communicable Diseases Act) | In healthcare and social welfare units and workplaces. |
| Remote work (employer's right to direct work, Occupational Safety and Health Act) | |
| **Restricting close contacts at individual level – reduces the risk of infection carriers or exposed persons spreading the infection** | |
| Ordering those who have fallen ill to isolate (section 63 of the Communicable Diseases Act, also sections 62, 64, 65, and 67–69) or recommendation on voluntary isolation. | Ensuring access to medical treatment and other necessary support for isolating infection carriers. |
| Ordering those who have fallen ill to quarantine (section 60 of the Communicable Diseases Act, also sections 62 and 67–69) or recommendation on voluntary quarantine. | Instructions for monitoring state of health. Securing the necessary support for those in quarantine. |
| Contact tracing (sections 23, 24 and 39 as well as 26 of the Communicable Diseases Act) | Use of digital services. Also cross-border contact tracing. |
| Testing as part of general or targeted, voluntary or involuntary health examinations. (sections 14–17 of the Communicable Diseases Act) | Targeted testing, for example in workplaces or at airports. Facilities, supplies, personnel and other resources are needed to organise health examinations. |
| **Hygiene measures – reduce the risk of infected or exposed persons spreading the infection as well as the risk arising from contaminated materials or environments** | |
| Instructions for hand hygiene and coughing hygiene | |
| Intensified cleaning and disinfection of environments, disposal of items (e.g. sections 59 and 61 of the Communicable Diseases Act, sections 14, 32 and 41 of the Occupational Safety and Health Act) | |
| Improved ventilation (e.g. section 33 of the Occupational Safety and Health Act) | |
| Use of surgical masks or respiratory protective equipment [e.g. sections 5, 15 and 63 as well as 19, 20, 53, 55 and 56 of the Occupational Safety and Health Act, Government Decree on the Selection and Use of Personal Protective Equipment at Work (427/2021)] | The aim is protecting others (source control) and/or the person wearing the mask. |

| Measures | Comments |
|---|---|
| Use of other protective equipment [e.g. sections 5, 15 and 63 as well as 19, 20, 53, 55 and 56 of the Occupational Safety and Health Act, Government Decree on the Selection and Use of Personal Protective Equipment at Work) | Including protective clothing, visors, plexiglass screens, space dividers. For high-risk situations and jobs (including transport operators, employees in shops and restaurants, animal production sectors, veterinarians). |
| **Travel-related measures – reduce the risk of travel-related infections** | |
| Issuing instructions for passengers and transport operators on health security while travelling | Digital services can be used to provide instructions for those entering the country. |
| Health examinations of persons entering the country [e.g. sections 14–16 of the Communicable Diseases Act, section 11 of the Aliens Act (304/2004)] | Cooperation with other border authorities (executive assistance). |
| Stopping or restricting air traffic [section 168 of the Aviation Act (864/2014), section 126a of the Act on Transport Services (320/2017)] | For example, directing air traffic to selected airports. |
| Temporary reintroduction of border control at internal borders [section 15 of the Border Guard Act (578/2005)] | Assessing entry conditions. |
| Restricting or stopping road traffic [section 76 of the Emergency Powers Act (1552/2011)] | As part of emergency powers. |
| Imposing obligations or restrictions on passenger traffic subject to a licence (section 77 of the Emergency Powers Act) | As part of emergency powers. |
| Restricting access to and movements around a certain locality or area (section 118 of the Emergency Powers Act, also sections 122c and 133) | As part of emergency powers. |
| **Non-pharmaceutical interventions in zoonosis cases – reduce infection risk associated with animals and food** | |
| Restrictions on movements of animals and products, putting down and destruction of animals, cleaning and disinfection of the establishment, tracing chains of transmission, destruction of animal products. Recommendations and bans on importation of animals or animal products. [sections 17, 21, 25, 30–32, 35, 38, 49, 59, 60, 61, 82 as well as 22–24, 26, 34, 37, 46, 48 of the Animal Diseases Act (76/2021)] | |
| Instructions for handling foods | |

# APPENDIX 3: Personal protective equipment and other protective supplies

Together with other prevention measures, personal protective equipment and PPEs for healthcare are used to control the spread of infections. PPEs can be used to protect a person or to prevent transmission from an infected person.

Personal protective equipment must comply with health and safety requirements, both in the workplace and in consumer use. Healthcare PPEs in consumer use must comply with not only the legislation on healthcare supplies and equipment but also consumer protection legislation. Protective equipment compliant with the Personal Protective Equipment Regulation must always come with instructions for use in Finnish and Swedish. In a pandemic situation, masks that do not meet the requirements for personal protective equipment or healthcare PPEs may also be found, especially in consumer use.

## Selection and use of protective equipment at work

The selection and use of personal protective equipment in the workplace is based on the employer's risk assessment. When the conclusion of the risk assessment is that other measures are not sufficient, PPEs compliant with the Personal Protective Equipment Regulation must be selected for the work, and instructions must be provided for their use[119,120]. In addition to the reorganisation of work and technical measures, other measures may include surgical nose-mouth masks intended for healthcare and pandemic situations (Standard EN 14683). Employees have a duty to comply with safety instructions issued by the employer.

If the employer finds that normal working clothes or surgical gowns, surgical masks or examination gloves afford sufficient protection, no personal protective equipment is needed. However, if the conclusion of the risk assessment is that

119 Regulation (EU) 2016/425 of the European Parliament and of the Council on personal protective equipment and repealing Council Directive 89/686/EEC.

120 Government Decree on the Selection and Use of Personal Protective Equipment at Work (427/2021).

virus-proof protective clothing is needed, e.g. protective clothing proven virus-proof by testing and type-examined as protective clothing against biological hazards must be selected.

When PPEs are intended to protect patients from microbes secreted by employees, they must have a CE label and meet the requirements laid down on personal protective devices in healthcare[121,122]. If no medical devices complying with the requirements are available due to shortages, an exemption granted by Fimea may apply[123].

Personal protective equipment required in a pandemic situation compliant with the PPE Regulation are:

- clothing that protects against biological hazards, standard EN 14325
- clothing that protects against chemicals, standards EN 943, parts 1 and 2, EN 14605, EN 13982-1 and EN 13034
- respiratory protective equipment, including FFP masks, standard EN 149
- eye protection, standard EN 166
- gloves that protect against microbes, EN 374-5
- gloves that protect against chemicals, EN 374-1

PPEs for professional use in healthcare include:

- surgical and examination gloves, EN 455, parts 1, 2, 3 and 4
- surgical gown, EN 13795-1
- nose-mouth masks, EN 14683

When selecting PPEs, adequate effectiveness, the employee's state of health, and ergonomics must be accounted for. The PPEs must not be unnecessarily heavy. If necessary, the advice of occupational healthcare services must be relied on regarding the suitability of certain PPEs for an employee, considering their state of

121 Regulation (EU) 2017/745 of the European Parliament and of the Council on medical devices, amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC.

122 Regulation (EU) 2017/746 of the European Parliament and of the Council on in vitro diagnostic medical devices and repealing Directive 98/79/EC and Commission Decision 2010/227/EU.

123 Medical Devices Act (719/2021).

health. If suitable PPEs cannot be found, the occupational healthcare services may recommend that the employee be transferred to tasks where no PPEs are needed. The stress caused by PPEs can be reduced by taking breaks from the work.

If the risk to employees is not well known, highly effective PPEs must be selected. Such situations may occur e.g. when efforts are made to prevent a full-blown pandemic in the alert phase. In special situations, the assistance of rescue personnel or persons who have been trained in the use of effective protective equipment and whose state of health has been confirmed to be adequate for using the equipment may be relied on. Once more information on health hazards is available, protective measures can be reduced to an adequate level.[124]

Instructions must be issued for putting on, removing and using protective equipment. Employees must be able to put on the protective equipment in a safe place before they are exposed to a hazardous agent. PPEs must be taken off in facilities where this can be done safely. Such studies as those on protection against the Ebola virus have found that workers face the greatest risks when removing their protective equipment.[125] To protect against respiratory tract infections, using hand sanitiser is an essential part of the instructions for putting on and removing protective equipment.

Sufficient personnel, facilities and waste containers, safe and practised procedures and instructions must be provided for the safe handling of protective equipment waste. A significant amount of protective waste can be generated where disposable protective clothing is worn.

Where reusable protective equipment is selected, the possibility of cleaning it should be accounted for already in the selection phase. When cleaning personal protective equipment, only methods recommended by the manufacturer in the instructions for use must be employed. If no cleaning procedure has been set down in the instructions for use of the protective equipment, the equipment is not intended for cleaning (Regulation EU 425/2016).

124 Ministry of Social Affairs and Health. Ympäristöterveyden erityistilanteet: Opas ympäristöterveydenhuollon työntekijöille ja yhteistyötahoille. Ministry of Social Affairs and Health publications 2014:21. ISBN 978-952-00-3546-4 (PDF). Available at: http://urn.fi/URN:ISBN:978-952-00-3546-4.

125 Mäkelä E, Mäkinen H. Protective clothing against chemical and biological hazards. OSHwiki 2020. Available at: https://oshwiki.osha.europa.eu/en/themes/protective-clothing-against-chemical-and-biological-hazards.

Manufacturers' instructions contain restrictions on the time PPEs should be used. If they are contaminated by microbes, they cannot necessarily be used for the full time indicated in the manufacturer's instructions and, for instance, they must be replaced after each use. In this case, the safe period of use must be assessed by the employer.

## Sealing of protective masks

Microbes are particles that get caught in the particle filters of protective masks (P or FFP marked masks) as air passes through them, depending on the effectiveness of the protective equipment. Due to the air resistance of the filter, air passes around the filter at any points where the mask leaks. Employees often have a poor track record in detecting leaks around the edges of protective equipment[126]. Factors affecting the sealing of the mask around the face include the shapes of the protective device and the wearer's face[127,128]. If anything is caught underneath the edge of the protective mask, this may interfere with the sealing. A beard, for example, undermines the mask's protective performance, which is mentioned in the instructions for use of protective masks.

To ensure that the face mask is a good fit, the employer may have sealing tests performed. Ensuring the sealing and a good fit around the face of masks can be considered the employer's responsibility under the Occupational Safety and Health Act, according to which the employer must ensure that risk management measures in the workplace are sufficiently effective.

126 Frost S, Mogridge R, Roff M. Review of fit test pass criteria for Filtering Face-pieces Class 3 (FFP3) Respirators, Research Report RR1029, Health and Safety Executive 2015.

127 Duling MG et al. Simulated Workplace Protection Factors for Half-Facepiece Respiratory Protective Devices. J Occup Environ Hyg. 2007 Jun;4(6):420-31. Available at: https://doi.org/10.1080/15459620701346925.

128 Campbell DL, Coffey CC, Lenhart SW. Respiratory Protection as a Function of Respirator Fitting Characteristics and Fit-Test Accuracy. AIHAJ. 2001 Jan-Feb;62(1):36-44. Available at: https://doi.org/10.1080/15298660108984607.

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