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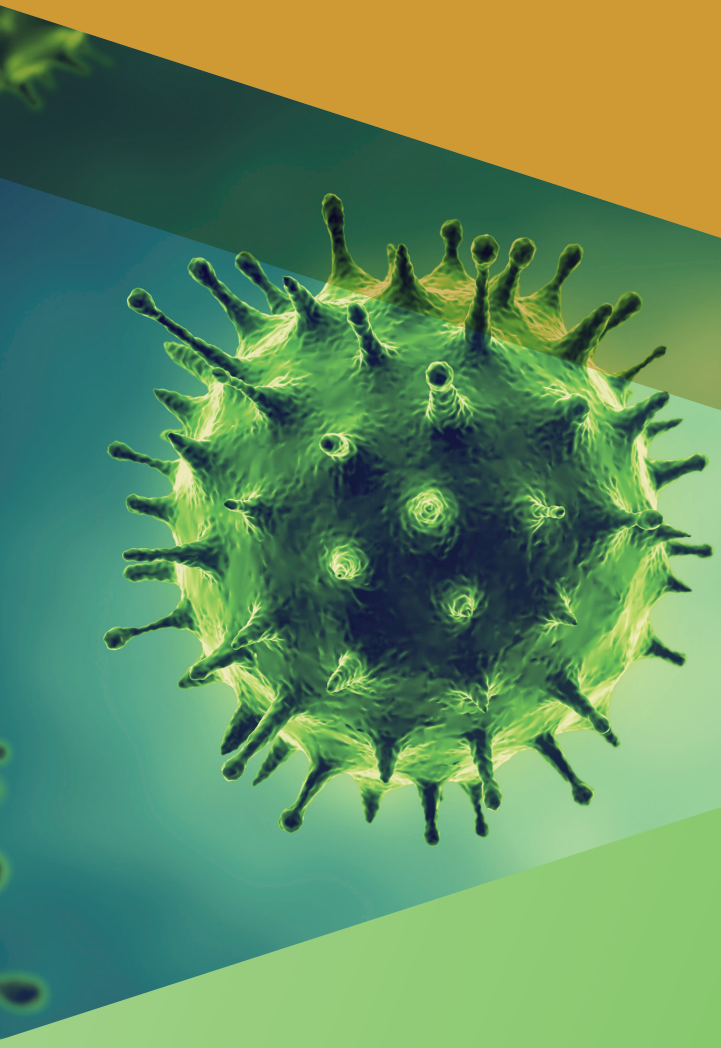

CAPACITY/CAPABILITY ASSESSMENT

After-action review of the Finnish advice-making process for school interventions during the COVID-19 pandemic

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This report was commissioned by the European Centre for Disease Prevention and Control (ECDC), coordinated by Jonathan Suk. The report was produced by Erik Baekkeskov, Danny de Vries, Olivier Rubin and Wesal Zaman in collaboration with the Finnish Institute for Health and Welfare (THL) under contract ECD.12898.

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Abbreviations

AAR	After-action review
AIGHD	Amsterdam Institute for Global Health and Development
AVI	Regional State Administrative Agency
ECDC	European Centre for Disease Prevention and Control
EBPH	Evidence-based public health
ICU	Intensive care unit
HUS	Hospital District of Helsinki and Uusimaa
NPI	Non-pharmaceutical intervention
OAJ	Trade Union of Education in Finland
OKM	Ministry of Education and Culture
OPH	Finnish National Agency for Education
RCG	Regional Coordination Group
STM	Ministry of Social Affairs and Health
THL	Finnish Institute for Health and Welfare
WHO	World Health Organization

Executive summary

Background

This focused after-action review (AAR), conducted by ECDC in collaboration with the Finnish Institute for Health and Welfare (THL), investigated the use of evidence in the Finnish advice-making process for school interventions from December 2021 to January 2022, when the SARS-CoV-2 Omicron variant was circulating and schools remained open.

From March to May 2021, the SARS-CoV-2 Alpha variant was circulating, and school closures were implemented in some areas for children over 12 years old. The Omicron variant reintroduced consideration of the policy option of closing schools for physical attendance at the beginning of 2022.

The purpose of this AAR was to shed light on the advice-making processes during these vital weeks, when varying perspectives on school interventions were considered, by asking the question: How did the different key actors use evidence to inform advice on school interventions during these periods?

Methods

The core methodology of this focused AAR was a process-driven learning exercise that built on a qualitative review of a delimitated case: the advice-making process for school interventions during the beginning of the Omicron wave (December 2021 to January 2022). Data were gathered through a two-day workshop with key stakeholders identified by THL, alongside semi-structured online interviews conducted separately from the workshop.

Stakeholders that participated in the workshop included employees from THL, the Ministry of Education and Culture (OKM), the City of Helsinki, and the Hospital District of Helsinki and Uusimaa (HUS), as well as representatives from the Regional Coordination Groups (RGCs). Representatives from the Ministry of Social Affairs and Health (STM) and the Trade Union of Education (OAJ) were interviewed, as they were not able to attend the workshop. Primary and secondary documents (e.g. international reports, peer-reviewed articles, risk assessments, etc.) were used to facilitate the workshop, as well as to triangulate the qualitative findings obtained within the country.

Results

Although school closures were implemented during the two national states of emergency (16 March to 16 June 2020 and March to May 2021), THL was critical of school closures from the summer of 2020. Prior to the Omicron wave in late 2021, THL's position on nationwide mandatory school closures was that they constituted an ineffective non-pharmaceutical intervention (NPI) for two reasons:

- they were not needed to protect children against the virus;
- they did not have any demonstrable impact on the spread of the virus.

Despite introducing new uncertainties to the advice-making process, the Omicron wave did not challenge this basic position. THL based its advice on several types of evidence that were mainly epidemiological in nature:

- experience-based evidence from Norway and Denmark, which suggested high transmissibility but less severe symptoms (the Omicron wave occurred later in Finland);
- daily information from the centralised paediatric units in Finland, which reported few hospitalised patients from the outbreak;
- daily and disaggregated epidemiological data that suggested that schools were usually not hotspots for transmission; and
- extensive experience from the previous school closure during the Alpha variant wave, where THL evaluations suggested that they were largely ineffective in reducing transmission.

THL did not systematically gather data on adverse effects of school closures (e.g. negative impacts on mental health, well-being, physical health, learning and learning gaps, domestic abuse/violence, increased inequity) because THL found school closures to be inadvisable from a purely epidemiological perspective.

However, other stakeholders had suggested school closures after the winter break in 2022, most notably the STM, the OAJ and some infectious disease experts that had national visibility in the media. For some weeks in December and January, there was discussion between THL and the STM about whether school closures were necessary to contain the Omicron wave. Part of the need for deliberation can be explained by different points of departure: where the THL focused solely on epidemiologically informed public health perspectives, the STM had

multiple additional concerns, including uncertainties around the development of the Omicron epidemic, the rights of children and teachers to be protected against illness and issues related to constitutional rights and legal compliance. Suboptimal communication between the advice-making bodies also contributed to this disagreement. Ultimately, the government decided to keep schools open at the national level during the Omicron wave. This aligned with the recommendations from most of the key advice-making bodies at regional and national levels, such as RCGs, THL and the OKM.

Conclusions

Participants in the AAR process identified several lessons learned and examples of good practice from the Finnish experience with advice-making on school interventions during the Omicron wave. These included the following:

- Access to regularly updated national epidemiological data was considered key in advice-making.
- Cross-sectoral and interdisciplinary collaborations, particularly with the regions and the OKM, were integral to the advice-making process.
- From an organisational perspective, having institutionalised processes in place for dealing with external requests was considered good practice. This alleviated some of the pressures and uncertainties for key infectious disease experts, allowing them to engage more proactively in the advice-making process.
- Integrating behavioural science and communications considerations into the advice-making process from the beginning was considered good practice.
- A multifaceted crisis communication strategy where crisis communication specialists have the resources to engage on many different platforms and levels was emphasised as good practice.
- The establishment and operation of RCGs should be continued as a good practice for related public health challenges, perhaps with some flexibility to include other types of expertise when needed.

Lessons learned from suboptimal processes and practices were also compiled to improve the advice-making processes for future health emergencies. These included:

- THL and the STM had overlapping areas of authority and a perceived lack of transparency, both in the advice-making process and with respect to the evidence that recommended interventions were based on.
- It was not always clear what THL's role was in terms of making recommendations for pandemic response. THL was to collect and analyse data as well as give scientific advice, whereas the government could make decisions based on not just the epidemiological data, but also wider societal and legal perspectives.
- Good practice would include making epidemiological evidence and other factors used in the advice- and decision-making processes explicit and subject to scrutiny. Similarly, the rationale underlying a decision should be made explicit together with a clear articulation of when the objective of the decision has been reached.
- Clear procedures for how and when crisis measures should be scaled down and ended – not just legally or organisationally, but also in managerial practices – were highlighted as good practice. It was deemed important to return to more standard management procedures characterised by less urgency and more reliance on empirically proven or evidence-informed advice as soon as possible.
- As it is very difficult to adjust pandemic preparedness capacity up and down according to short-term needs, effective pandemic preparedness and response requires long-term investments. These include continued training, improved disease surveillance, regularly updating pandemic plans, and regularly conducting interdisciplinary evaluations of crisis management processes and interventions to prepare for future public health crises.

1 Introduction

1.1 The purpose of an after-action review

An after-action review (AAR) is a qualitative review of the actions taken to respond to a public health emergency. The country-led and country-owned initiative is conducted with the purpose of identifying examples of best practice, areas for improvement and lessons learned [1].

An AAR takes place after the emergency event or situation has been resolved. It seeks to identify what worked well and what did not and how these practices can be maintained, improved, institutionalised and shared with relevant stakeholders. AARs typically encompass a broad number of response dimensions that are investigated in a series of facilitated meetings with key stakeholders. Importantly, AARs are not evaluations and they do not seek to assign blame for suboptimal responses. Neither are they intended to assess individual performance or competence. Instead, they seek to identify learning opportunities at the institutional level and to contribute to the cycle of continuous quality improvement in emergency preparedness and response planning.

The World Health Organization (WHO) and the European Centre for Disease Prevention and Control (ECDC) have developed guidance and methods for AARs across many different aspects of health emergencies [2,3]. As COVID-19 has developed into a prolonged (or even endemic) health emergency, ECDC and WHO have developed intra-action reviews (WHO) and in-action reviews (ECDC) to ensure that important lessons learned can be captured and reflection can be undertaken while the emergency is still ongoing [4,5]. An alternative approach to these interim AARs is to conduct an AAR on a particular aspect of the emergency that is delimited temporally and thematically. ECDC refers to this as a 'focused AAR' [5].

1.2 The purpose of a focused after-action review on evidence-based advice-making

One important area of inquiry for a focused AAR is the role of evidence in the advice-making process [6]. The advice-making process has encountered challenges with the interpretation and integration of evidence into the advice-making process, primarily due to uncertainty, time pressure and suboptimal guidelines or organisational structures [7-10]. Scientific evidence pertaining to COVID-19 also went from being almost non-existent in the initial phase of the pandemic to becoming so abundant that just one year later agencies risked being overburdened with contradictory, non-contextual evidence of varying scientific quality [9,11]. An investigation of the intricacies of the advice-making process during such a complex and prolonged period demands a focused approach. Therefore, in 2021, ECDC commissioned and published a protocol for focused AARs on evidence-based decision-making for selected COVID-19 response measures [5].

The central question of this focused AAR is to determine the role of scientific evidence in the deliberations and decisions made by public health authorities in the process of informing policy during the COVID-19 pandemic. What types of evidence were available to public health experts when advising policymakers? What value and weight did public health experts place on different types of evidence? How did they adapt evidence to be applied to their own context? And, what happened when there was no conclusive scientific evidence available? Based on the ECDC model AARs [2], the findings of this focused AAR will be structured around three main areas:

- What happened and who was involved?
- What influenced the advice-making process? And why did the advice-making process turn out as it did?
- What should change and how can it be implemented?

To facilitate the use of AARs in European Union and European Economic Area (EU/EEA) countries, ECDC entered a specific contract to conduct focused AARs on the advice-making process for school interventions during different stages of the pandemic in Finland, Sweden and Norway (this work is complemented by similar focused AARs on long-term care facilities in Norway and Georgia).

1.3 The context of this focused after-action review

In Finland, the Omicron variant initially introduced a renewed sense of scientific uncertainty and general anxiety, which put pressure on THL's advice to continue with physical attendance at schools during a period of surging COVID-19 cases. For example, at the start of 2022, the STM strongly considered closing schools for physical attendance for an undetermined period. Eventually, the government decided that school closures were not recommended.

THL thought it would be interesting to focus the AAR on the advice-making process leading up to that decision, as there were clearly different and changing interpretations of evidence across different key actors. Therefore, it was decided that this AAR should focus on the use of scientific evidence in the advice-making process for school interventions during the Omicron wave (from December 2021 to January 2022). To facilitate the discussion, it was further decided to reference the period dominated by the Alpha variant (March to May 2021), when schools were closed, as a comparison.

Several arguments were raised while organising the AAR that pointed to the merits of focusing on the decision to keep school open after the winter break at the beginning of 2022. These included the following:

- The advice-making process would still be relatively fresh in participants' minds and there would be a high likelihood that key actors would still be accessible and in the same positions as during the Omicron wave.
- Analysing the advice-making process during the Omicron wave would showcase how, two years into the pandemic, more institutionalised preparedness and response systems were in place to deal with new uncertainties and translate emerging evidence into advice.
- The interpretation of evidence appeared to play a key role in a very compressed time period (from the end of December 2021 to the beginning of January 2022).

During the period in question, the STM, the OAJ and some communicable disease experts external to THL leaned towards school closures, while THL recommended keeping schools open for physical attendance. Reviewing the use of evidence in this advice-making process – where different key actors reached different conclusions – would therefore provide insight into how different types of evidence were used as well as the lessons learned.

1.4 Key definitions

This focused AAR makes use of three key concepts that require some clarification:

- school closures;
- the advice-making process;
- evidence-based advice-making.

These terms are defined further below.

1.4.1 School closures

In this AAR, 'school closures' is understood as a nationwide closure of schools for in-person teaching for most classes, with possible exceptions for students with special needs or whose parents worked in critical infrastructure. It does not refer to discontinuing teaching or completely closing school premises for all students. In Finland, students in pre-primary education (aged one to six years) and basic education (aged seven to nine years), as well as students who required special support and those preparing for primary education always had the right to in-person teaching (except for 17–23 March 2021, when in-person teaching for these groups was restricted to those whose parents worked in areas critical to the functioning of society).

1.4.2 Advice-making process

National public health institutes provide advice so that policymakers have an evidence base to support decision-making about potential courses of action. This advice is the result of a deliberative decision-making process among a team of people who gather and analyse information about potential responses and then recommend and communicate a subset of these responses to policymakers. In this AAR, this process is referred to as the 'advice-making process'.

Formalised advice-making processes build on organisational structures and practices that shape deliberations and influence what advice is considered and how it is addressed [12-14]. Advice-making also encompasses decisions relating to internal resource allocations, staff management, communication, implementation considerations and so forth.

During the COVID-19 pandemic, experts from national and international public health agencies were typically highly involved in the deliberative advice-making processes that inform policy. However, advice-making is different from policymaking in that it only constitutes the first stage of the decision-making process that ultimately results in policy.

1.4.3 Evidence-based advice-making

One of the key properties of advice-making is that it should be evidence based [15]. In this context, 'evidence' refers to scientific evidence that adheres to a set of academic standards. These standards might vary according to the field of inquiry, but will usually encompass the collection and testing of empirical data according to scientific methods and models that have been validated by peers [16]. The body of scientific evidence, therefore, will mostly consist of

systematically gathered data, reports produced and validated by national and international expert agencies and peer-reviewed scholarly publications. During emergencies in particular, there is often an elusive element to scientific evidence because it is constantly evolving and being reinterpreted, as scientists continuously work to affirm or refute existing evidence, which could be clearly observed during the COVID-19 pandemic [17,18].

In addition to using scientific evidence, the advice-making process can also draw on experience-based evidence [19], sometimes referred to as 'implementation-based evidence' [20] or 'ecological evidence' [21]. Experience-based evidence can be subject to scientific inquiries and interpretations but is not necessarily subject to the scientific process of setting up a specific research design and submitting to peer review. Experience-based evidence could come from implementing agencies that would be able to provide an assessment of the current situation and feedback on how the given advice works in practice. The advantage of making decisions using experience-based evidence during health emergencies is the faster pace that evidence can be collected and interpreted.

What constitutes pertinent scientific evidence changes and shifts over time and is shaped by relationships between experts and their social, economic, organisational and political environments. Experts are faced with a host of cognitive and institutional factors that influence interpretations of scientific evidence [14,22-24]. The interpretation of evidence is not only inherent to the scientific process, but also to the advice-making process, as identical pieces of scientific evidence in similar contexts can result in very different advice [12,14]. For example, underlying ideational and bureaucratic differences created variations in how health experts produced advice during the COVID-19 pandemic [25-28]. Therefore, even the highest quality evidence can produce suboptimal advice under flawed advice-making processes.

2 Methods

2.1 Process and data sources

The primary component of the AAR was a two-day workshop with key participants identified by THL. These individuals were from THL, the OKM, HUS and the City of Helsinki (Epidemiological Operations Unit). Complementary interviews were also conducted with other key stakeholders, including communication specialists within THL, a representative from the OAJ and employees at the STM and the Regional State Administrative Agency (AVI). All participants were informed of the AAR's purpose, and they all signed informed consent forms (see ethical considerations).

2.2 Preparation

2.2.1 Ongoing consultations with THL staff

In preparation for the workshop, key representatives from THL, ECDC staff and consultants had online meetings on 5 April 2022, 28 April 2022, 25 May 2022, 29 June 2022 and 30 August 2022. These meetings were held to discuss the purpose and focus of the AAR, to schedule the country visit, to agree on the format and scope of the workshop and to exchange key documents relevant to the advice-giving process concerning the operation of schools during the initial phase of the Omicron wave.

2.2.2 Primary and secondary documents

THL shared a detailed timeline of the two pandemic phases, with links to the relevant documents (Annex 4). These documents were consulted in preparation for the country visit. Documents in Finnish were translated to English using Google Translate. Altogether, the AAR drew on the documents listed below.

Primary documents (n = 42), such as:

- THL COVID-19 risk assessments and other relevant publications;
- OKM and OPH's evaluation of distance learning during COVID-19;
- Newspaper articles.

Secondary documents (n = 11), such as the following academic articles:

- Haapanen M, Renko M, Artama M, Kuitunen I. The impact of the lockdown and the re-opening of schools and day cares on the epidemiology of SARS-CoV-2 and other respiratory infections in children–a nationwide register study in Finland. EClinicalMedicin. 2021;34:100807.
- Hellman M, Salmivaara S, Stoneham J. Calm chess player or self-aware administrator? How the Finnish and Swedish public health agencies addressed the public during the corona outbreak. In Governing Human Lives and Health in Pandemic Times. Routledge; 2022.
- Parviainen J, Koski A, Torkkola S. Building a Ship while Sailing It. Epistemic Humility and the Temporality of Non-knowledge in Political Decision-making on COVID-19. Social Epistemology. 2021;35(3):232-244.
- Juutinen A, Sarvikivi E, Laukkanen-Nevala P, Helve O. Closing lower secondary schools had no impact on COVID-19 incidence in 13–15-year-olds in Finland. Epidemiology & Infection. 2021;Oct 26;149e233.

2.3 Country visit

2.3.1 After-action review workshop

The core activity of the AAR is a two-day workshop aimed at discussing the use of evidence in the advice-making process with key staff of the agencies who were involved in the recommendations relevant to the operation of schools during the Omicron wave. THL was a main actor in the advice-making process surrounding school interventions. THL was also the main driver behind this AAR and handled all the logistics, such as sending out invitations and hosting the workshop at the agency. The two-day workshop took place on 14 and 15 September 2022, with participation from key THL staff and representatives from HUS, the municipalities (Helsinki) and the OKM. Two consultants from Amsterdam Institute for Global Health and Development (AIGHD) facilitated the workshop and two ECDC staff attended. A third consultant from the AIGHD took notes. The consultants and the ECDC staff are referred to herein as 'the AAR team'.

The agenda for the workshop is presented in Annex 3. The first day of the workshop focused on agreeing on a timeline of events, mapping out who was involved in the advice-making process and in what capacity, and discussing why the advice-making processes unfolded as they did, with a focus on the use of evidence. The purpose was to reflect on how evidence influenced the advice-giving/decision-making process, as well as what evidence was available and how it was

used (or not used). The second day focused on reflecting on how participants made sense of the situation and identifying and discussing major lessons learned about the use of evidence during key advice-making processes relevant to school interventions. What were the challenges in the advice-making process? What worked well and what didn't? And what can be done to improve the process going forward? The workshop was guided by specific theoretical tools and methods, most notably the evidence-based public health (EBPH) framework and the bounded rationality/sense-making literature (see Analytical approach). On 16 September 2022, the consultants hosted a hot debrief with broad-based participation from all relevant stakeholders, including municipal authorities as well as Swedish colleagues working in the Swedish Health Agency.

2.3.2 Interviews

After the workshop, the team conducted four online interviews with key stakeholders. On 16 September 2022, the AAR team interviewed two employees from THL's Communications and Influencing Unit. On 20 September, the AAR team conducted an interview with a representative from the OAJ that had a managerial role with respect to education policies. On 23 September, the AAR team interviewed a senior official at the STM to include the ministry's perspective in the report. On 27 September, the team concluded the final interview with the Head of Education Development Services at the City of Helsinki.

2.4 Analytical approach

The data collected through the workshop and interviews sought to illuminate the advice-making process surrounding school interventions during the Omicron wave and to identify lessons learned. Some key theoretical and methodological tools and techniques were used when gathering and interpreting the data. The interviews were semi-structured and relied on an interview guide (Annex 2). The workshop made use of a combination of written questions, as well as select statements from academic papers, guidelines or risk assessments that were used to facilitate the discussions.

The AAR team presented tentative timelines that were subsequently discussed and augmented. This established a common understanding of key events and opened up for alternative interpretations of events. Participants were also asked to draw ego-centric stakeholder maps illustrating the most important actors in the advice-given process on school interventions during the Omicron wave. They drew these maps freehand with their organisation in the centre to provide individualised perspectives of the advice-making process. The exercise also included reflecting on actors that they thought had been missing in the process. This exercise helped to visualise important interrelationships and contributed to a more thorough aggregate mapping exercise that is presented in this report (see Section 3.3).

The discussion of evidence was guided by a simplified version of the evidence-based public health (EBPH) framework [12] illustrated in Figure 1. The advice-making process is assumed to be shaped by:

- the availability of best available scientific evidence (what type of evidence is used and how is it interpreted?);
- the organisational resources of advice-making bodies and implementing bodies;
- the state of crisis communication internally in the emergency management system and externally towards the general public.

The framework was useful in encouraging participants to think of the advice-giving process as dependent not only on evidence, but also on other important external factors. In short, the framework embeds the advice-making process in a larger socio-political environment. The framework, with its three overlapping factors, is used to structure the section on the advice-making process (see Section 1.4.2).

Figure 1. Evidence-based public health (EBPH) framework

Source: Satterfield et al., 2009

2.5 Reporting

Reporting on key preliminary findings was done on a continuous basis during the visit, especially through the hot debrief on 16 September. This report has been subject to feedback and approval from ECDC and THL. THL provided stakeholders that participated in the AAR with the opportunity to read the report and provide feedback.

2.6 Ethical considerations

Informed consent was obtained from all respondents. The consent form is included in Annex 1. The objective of the AAR was explained to the interviewees and workshop participants, and they were assured of their right to withdraw from the interview/workshop discussion at any time. Unless respondents explicitly confirmed in writing that they were willing to go on record, they remained anonymous in the reporting. Anonymity was pursued for all interviewees, and where it was not possible (due to easily identifying traits) the interviewees were explicitly made aware of this. All interview and field note materials were stored securely in AIGHD in compliance with Regulation (EU) 2018/1725 on the storage of personal data and ensuring citizens' privacy. Only the AAR team had access to it and any recordings were deleted prior to the publication of this report.

3 Context in Finland during the COVID-19 pandemic

As school interventions intersect with both public health and educational decisions, this section describes Finland's health and educational management structures. The next section presents a timeline of events during the two periods. The third section presents a stakeholder map based on information provided by the AAR workshop participants.

3.1 Finland's health and educational governance structures

3.1.1 Health governance structure

In Finland, the health system is centralised and governed at the national level and local levels. At the national level, the STM is responsible for steering, developing and implementing health reforms and policies [29]. There are six departments in the STM that are in charge of the preparation and development of central tasks in healthcare and social welfare, social security, gender equality and occupational health and safety, as well as for the supervision and coordination of the implementation of these tasks. The STM is led by two ministers: the Minister of Social Affairs and Health and the Minister of Family Affairs and Social Services. The latter minister was mainly involved in the decision-making processes regarding school interventions during the COVID-19 pandemic. However, Finland's decentralised administrative structure provided a lot of autonomy to the more than 300 municipalities. They were responsible for offering primary healthcare to their residents and they were free to decide how local services should be provided. Usually, the services are provided through municipal healthcare centres and/or municipal hospitals.

This decentralised system was largely kept during the COVID-19 pandemic (except for during two brief periods when states of emergency were declared (16 March to 16 June 2020 and March to May 2021). Quite early in the pandemic, the STM proposed that Regional Coordination Groups (RCGs) be formed to function as coordinating bodies in each of Finland's 21 healthcare districts. The goal of RCGs was to strengthen the formation of a common situational assessment and the coordination and preparation of local and regional measures. RCGs consisted of top management representatives from the regions, THL and the Regional State Administrative Agency (AVI). They were often chaired by the central medical hospital of the region and built on consensus decisions that were made based on a shared assessment of the situation.

THL is another important actor in public health management in Finland. It is an independent, state-owned, expert and research institute that promotes the welfare, health and safety of the population. It operates in the administrative branch of the STM and supports the STM in the control of communicable diseases. THL's key function is to carry out research and expert work to prevent illnesses and social problems, develop the welfare of society, and support citizens' social welfare, the healthcare system and the social security system. The Act on the Finnish Institute for Health and Welfare states that the institute monitors, evaluates and guides social and healthcare activities and provides expert support for the implementation of policies, procedures and practices that promote well-being and health [30]. Under the Communicable Diseases Act [31], THL is the national expert institution in control of communicable diseases, with key responsibilities including:

- to supervise and support the control of communicable diseases;
- to implement epidemiological surveillance;
- to disseminate information and provide the population with recommendations for preventing infection and spread of disease;
- to follow a defined role in the provision of the national vaccination programme.

However, during the COVID-19 pandemic, THL carried out direct operational activities related to testing for SARS-CoV-2 infection, advising government institutions, and procuring and distributing vaccines.

3.1.2 Educational governance structure

The OKM is the highest authority in Finland's educational governance structure and is responsible for all publicly funded education in the country. As with primary healthcare, however, the educational system is highly decentralised and most education-related decisions are taken at the municipal or institutional level, with strong stakeholder participation. Educational autonomy is pervasive across the administrative system, where local authorities determine class sizes, staff recruitment, teacher evaluations and the allocation of state subsidies. Much of this autonomy is passed on to schools, where teachers – as a general rule – enjoy a high degree of freedom. However, the OKM maintains responsibility for core decisions pertaining to educational legislation and

aggregate budget decisions. Finnish basic educational law works with an 'obligation to learn' rather than a 'school obligation'. This means that home-schooling is legally accepted, though only a small number of students were taught at home prior to the pandemic.

During the two periods when a state of emergency was declared, power was centralised with the government and authorities were granted additional powers, primarily those laid down in in the Emergency Powers Act [31]. Many of the pandemic response decisions were implemented by government decree or temporary provisions to the Communicable Diseases Act [32]. However, most of Finland's response to the COVID-19 pandemic, including during the Omicron wave, was based on the legal measures in the Communicable Diseases Act rather than the Emergency Powers Act. The Communicable Diseases Act places the main decision-making power for school measures during a pandemic with the AVI and the municipalities.

The Communicable Diseases Act specifies that municipalities are responsible for organising the control of communicable diseases within their area as part of public health activities. The AVI are tasked with making the necessary administrative decisions and coordinating and monitoring interventions, utilising the expertise of the joint municipal authority for the hospital district, the relevant university hospital district and THL.

When it comes to school interventions, THL and RCGs primarily have an advice-giving role. While pandemic interventions under the Communicable Diseases Act are primarily based on local and regional decisions, the OKM and the Finnish National Agency for Education (OPH) did help to monitor the situation and produce support material for education and training providers in Finland on how to organise teaching under exceptional conditions.

As became apparent during the workshop, members of the OKM also participated actively in advice-making via the cross-sectoral working groups hosted at THL. At the national level, the general planning, steering and monitoring of communicable disease control is the responsibility of the STM. Therefore, the STM produces public health guidelines and recommendations that regional decision-makers often follow, even though doing so is optional. A few instances when such guidelines were not followed are highlighted in this AAR.

In December 2021, the government decided to create a ministerial working group to coordinate COVID-19 response, ensure efficient exchange of information across branches of government and decide on matters that crossed administrative boundaries. This working group, consisting of eleven ministers and the prime minister, played an important role in making government decisions on school interventions during the Omicron wave. Prior to this, there were weekly pandemic negotiation sessions that the full national cabinet participated in, together with expert representatives from THL.

3.2 Timeline of events

From an advice-making perspective, the period with most relevance for an insightful AAR was when THL advised that schools should be kept open for physical attendance at the start of the Omicron wave in December 2021. This advice was given despite high prevalence rates of both Delta and Omicron variants in the population, as well as strong opposing views in favour of closing schools for physical attendance both inside the government (most notably at the STM) but also among key stakeholders and other health experts.

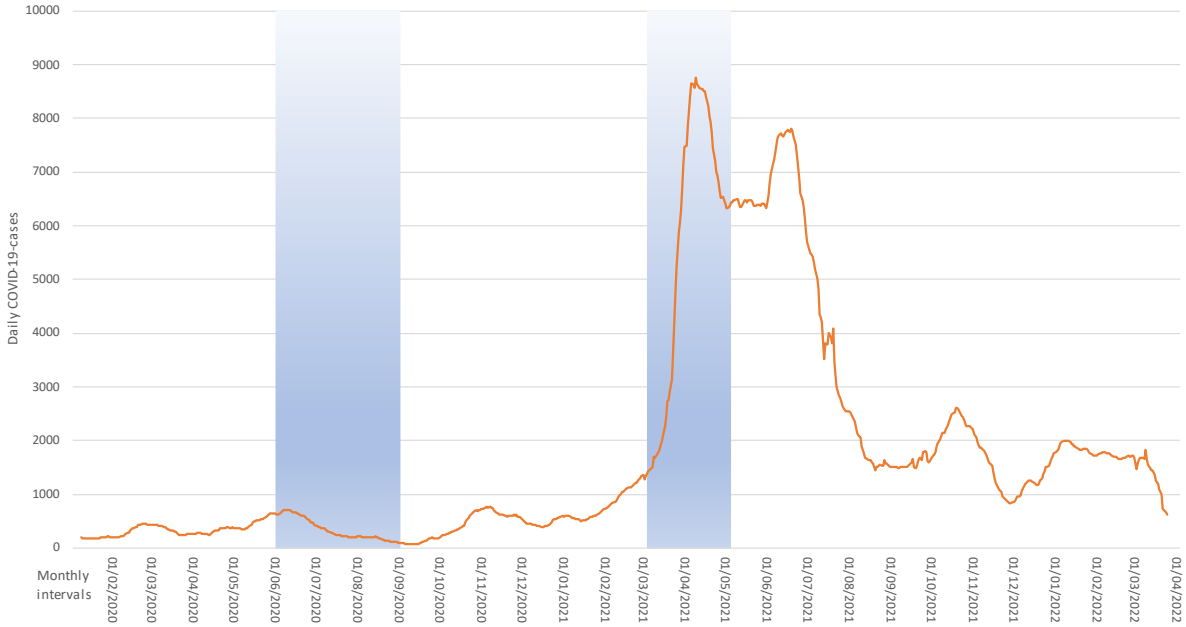
However, the government's hybrid strategy, accepted by all cabinet members, included the 'children first' policy, which stated that children should be targeted by mitigation measures only as a last resort after all other measures were taken and if these measures were considered effective in clearly reducing mortality and severe disease [33]. This section introduces the key events that affected the advice-making process during two important periods for school interventions:

- March to May 2021 – school closures in basic education (17 March to 13 May; weeks 12–20).
- December 2021 to February 2022 (initial Omicron phase) – no mandatory school closures

These periods have been illustrated in Figure 2, together with the number of COVID-19 cases in Finland. At first glance, it might seem counterintuitive to advise schools to remain open amid a surge of SARS-CoV-2 infections. The rate of infection was more moderate when the government decided to close schools for physical attendance in March 2021. However, some important factors make these two situations very different:

- More than 80% of citizens were vaccinated during the latter part of the Omicron wave, which made the outbreak less critical. At the beginning of the wave, the vaccination campaign was just starting up.
- The Omicron variant produced substantially milder symptoms compared with earlier variants.
- The Omicron variant was much more contagious than earlier variants, which meant that the NPIs used at the end of 2021 were insufficient and the rapid spread of SARS-CoV-2 in society seemed inevitable whether schools were closed or not.

Figure 2. The two periods included in the AAR juxtaposed with the number of daily COVID-19 cases in Finland



Source: WHO Coronavirus (COVID-19) Dashboard [34]

3.2.1 Period 1: March to May 2021, when schools were closed

March to May 2021 was the second time during the pandemic that a state of emergency was declared and schools were closed for physical attendance during a part of this period.

The first school closure decisions in Finland were taken during the initial phase of the pandemic, when Finland was in a state of emergency (16 March to 16 June 2020; weeks 12–25). For two months, as a general rule, schools were closed for physical attendance (17 March to 13 May; weeks 12–20). In the final months of Finland's first state of emergency, the government published its hybrid strategy that moved away from recommending indiscriminate lockdowns as it had in the initial phase of the pandemic (following the precautionary principle) and moved towards a controlled transition with increasingly targeted measures. The need for efficient management of the epidemic in accordance with the Communicable Disease Act, Emergency Power Act and any other statutes were highlighted. The explicit objective of the strategy was to provide protection from the pandemic with minimal negative consequences for the general public, companies, society and the fulfilment of fundamental freedoms and rights [35]. On 25 January 2021, this objective was reinforced in the Finnish National Action Plan [36]. The action plan stressed that the overall harms caused to society by restrictive measures must be assessed in relation to the benefits they achieve (proportionality principle). It also introduced the three tiers system presented in Table 1.

Table 1. Tiers of prevention measures during the COVID-19 pandemic, Finland

Tiers of prevention measures[a]	Phases of the epidemic[b]		
	Stable level	Acceleration phase	Community transmission phase
Tier 1	Restrictions in place according to the guidelines	Restrictions in place according to the guidelines	Restrictions in place according to the guidelines
Tier 2	Measures for the community transmission phase in place throughout the country or in specified areas		
Tier 3	Emergency conditions, necessary restrictions are increased in addition to the restrictions above		

Source: Ministry of Social Affairs and Health of Finland, 'Action plan for implementing the recommendations and restrictions under the hybrid strategy after first phase of the COVID-19 outbreak' [36]
[a] Move to the next tier if it is anticipated that the current measures will not be sufficient.
[b] Regional COVID-19 situation monitored using various indicators.

The pandemic situation started to deteriorate in February and March 2021. The number of COVID-19 cases almost tripled from around 200–250 new cases per day in the beginning of January to more than 600 per day in the beginning of March [34]. In addition, the vaccine rollout started in mid-January 2021, with around 50 000 people receiving a dose of the vaccine each week (scaled up to around 100 000 people by the end of March) [34]. The situation was therefore characterised by two opposing forces: an increasing pandemic threat and an extensive rollout of mitigation measures (vaccines) for curbing that threat.

In this context, on 25 February 2021, the Finnish government decided to impose more stringent measures to combat the COVID-19 pandemic and to transition to tier 2 of the National Pandemic Plan. The government initiated a three-week transition to distance learning for primary (only the upper grades), secondary and post-secondary educational levels in seven of the hospital districts, which were in the community transmission phase of the epidemic. The same measures were recommended for nine hospital districts in the acceleration phase. This was followed by a state of emergency for the second time in Finland on 1 March. On 5 March, THL published their risk assessment, which largely mirrored the concerns expressed by the government. The risk assessment argued that "both epidemiological scenarios and the experience of other countries show that the current epidemiological situation could become so serious in the coming weeks that healthcare will be overloaded in a very severe way, endangering the life and health of the population" [37]. Still, it retained the balanced perspective that was laid out in the hybrid strategy by emphasising that THL is "not in a position to comprehensively assess all the social, economic and welfare impacts on society and the population arising from the restrictive measures. The department considers it important to investigate these and to prevent their harmful effects through joint actions by society" [37].

The pandemic situation deteriorated further throughout March, and the responsible RCGs recommended that the AVI of Southern Finland physically close secondary schools from 29 March to 5 April. This was subsequently extended for an additional two weeks (until 11 April 2021). While THL was represented in the RCGs that recommended school closures and distance learning, THL refrained from giving region-specific recommendations, as it regarded the RCGs as best positioned to make decisions on their own situation even through certain regions pressed THL for a statement on the necessity of school closures. In addition, THL did not give explicit national advice regarding school closures, as they had not been asked to do so. In THL's overall statement regarding the transition to tier 2 measures, the agency merely pointed out that restrictions concerning children and youth should be a last resort in proportion to other measures.

On 1 April 2021, THL published another risk assessment based on the epidemiological data gathered so far. Here the conclusion was even clearer that children were not driving the outbreak. "Further infections related to early childhood education and care and the school environment have been detected in only a small proportion of those exposed. The risk of infection after exposure in school continues to be significantly lower than the risk of infection in other situations involving exposure" [38]. In mid-April, many regions began transitioning to a hybrid model for school attendance, alternating between distance and in-person learning in lower secondary schools (e.g. in the Helsinki metropolitan area). High schools and vocational schools continued with distance learning until about 15 April 2021. After that, half of the high school students could attend school at the same time. In its resolution on 6 May 2021, the government stated that the use of nationwide tiers of COVID-19 prevention measures would be discontinued. According to government: "Based on an epidemiological assessment, there are no longer grounds for extending the Decree on the Application of the Emergency Powers Act concerning early childhood education and care and primary and lower secondary education" [39]. The OKM appeared active in pushing for a return to physical attendance in schools. The Minister of Education, for example, tweeted that if the government extends emergency measures beyond 13 May 2021, it will have to demonstrate that this is unavoidable in the current situation. It is not a matter of opinion, the Minister tweeted, but rather a matter of weighing basic rights. The OKM had emphasised for a long time that "International and national experience show that the role of children in the dissemination of coronavirus infections is not similar to that of adults" [40]. THL and the OKM's push to open schools for physical attendance was opposed by the teacher's union and the OAJ, which called it a "human experiment" and referred to the fact that many of the NPIs required to reopen schools (washing hands at least five times per day, physical distancing and so forth) were impossible to implement in practice, especially in smaller classes [41].

3.2.2 Period 2: December 2021 to January 2022, when schools remained open

In autumn 2021, the Delta variant increased the number of COVID-19 cases from around 500–600 new cases per day in October 2021 to more than 1 000 cases per day in November 2021. The number of hospitalisations also doubled during this period. As one THL participant noted in the workshop, the situation was not going as expected, as more and more evidence pointed to the vaccines not being able to prevent transmission. Therefore, the testing regime was enhanced and booster shots were given to vulnerable groups and older adults.

In this already trying pandemic situation, the SARS-CoV-2 variant B.1.1.529 was first reported in South Africa and emerged globally by the end of November 2021. The WHO Technical Advisory Group designated it a variant of concern and named it 'Omicron' on 26 November. Initially, there was very limited information about the variant, although data from South Africa suggested that it was much more transmissible than the Delta variant. On 2 December, the first Omicron variant SARS-CoV-2 case was discovered in Finland. At the end of 2021, Finland experienced close to 5 000 new COVID-19 cases per day and more than 80% of these were the Omicron variant. In this way, the Omicron wave began during the ongoing Delta wave.

On 20 December 2021, the STM asked THL to answer four specific questions pertaining to the emergency brake mechanism following the Omicron wave. THL answered these questions but added a fifth item that specifically provided information about children and schools: "THL regards school closure as an ineffective measure. Reducing contacts of children and youth, for example through school closures or extending the holiday period will have no remarkable effect on the course of the epidemic, and therefore is not justifiable in the light of epidemiological data. What socially active adults do, holds the largest significance" [42]. On 22 December 2021, the government issued a resolution on the adoption of the national emergency brake mechanism, which required legislative amendments.

In the days that followed, the government proposed many stricter measures in response to the Omicron variant. The government decided that COVID-19 passport use was to be restricted for a period of three weeks (from 28 December 2021) and that vaccination should be accelerated further. With regards to school closures, the OKM also forwarded recommendations [43]:

- Large gatherings and joint events should not be organised if social distancing cannot be maintained and sufficient hygiene measures cannot be ensured.
- In primary schools, classes should be kept separate throughout the school day to keep group sizes smaller.
- Regional and local authorities may recommend that younger children should also use masks.
- For upper secondary education, distance learning should be organised under certain conditions, e.g. if there is a large number of students.

However, there were no decisions to recommend full or partial distance learning for children in lower secondary education or below. This appears to have changed over the winter break, when there were clear indications that the STM intended to propose school closures from 10 January 2022 onwards. These intentions were communicated openly inside the health management system and publicly through media reports [44,45]. On 5 January 2022, for example, the STM posed the following leading question to the Ministerial Working Group on Health and Social Services: "Should distance learning at schools still be considered, so that we could still promote the vaccination coverage a bit (with third doses to the elderly being underway)?" [45]. It appeared that the STM was very worried about the impact that opening schools could have on disease burden and mortality, as well as core functions of society. Children accounted for a large proportion of infections at the time (unlike during previous pandemic waves). The assumption was that if schools were kept open, transmission from children to parents could cause widespread workplace absenteeism (including for teachers) and increase the risk of severe disease in older adults and risk groups. There was uncertainty about how much the number of infections would increase when schools reopened after the holidays, and a preference towards keeping schools closed was publicly stated by the STM. The opposing position at THL was that "children are not the engine of the pandemic" and that school closures would likely be a counterproductive NPI for the overall health of children.

The STM's openly expressed preference for school closures led several key researchers and practitioners (both within and outside the government agencies) to publish an open letter on 5 January 2022, where they expressed their disagreement with the plans to transfer children to distance learning. The letter concluded that "even if schools were closed, infections would not stop. Even if the whole of Finland were to be closed, even if a curfew was imposed, the coronavirus would be waiting for contacts to return" [46]. A rights-based approach was also highlighted in the letter but based on social rights: "the child has the right to contact teaching and meeting friends. Young people have the right to study, create and maintain social networks, the absence or disintegration of which, at worst, causes serious problems" [46]. There was also opposition from within the government. The Minister of Finance wrote an email to the media where she highlighted that the government must exhaust all other options, such as masks and systematic self-testing, before formally recommending distance learning [47]. On 7 January, the Ministerial Working Group recommended testing twice a week for primary and secondary school students. They also recommended intensified masking and quarantine practices, and that exceptional teaching arrangements should be introduced according to the regional epidemic situation (e.g. hybrid teaching or, if the situation required, transition to distance learning through local decisions) [48,49]. However, no nationwide recommendation to transition to distance learning was issued.

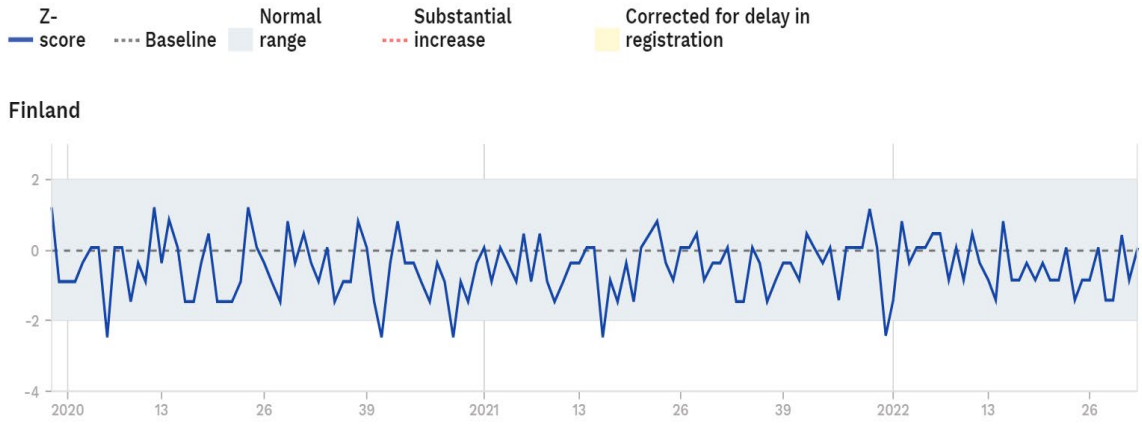
The OAJ was also opposed to reopening schools for physical attendance after the holidays. They feared that COVID-19 cases would surge in schools to a point where there would be so many "teachers crashing that schools can't be kept afloat" [50]. It was not that the OAJ disregarded the epidemiological evidence that had been

produced by THL. The opposition stemmed more from the fact that the NPI prerequisites for opening schools for physical attendance (distancing, screening, non-mixing of groups, improved ventilation and so forth) were thought to be impossible to effectively implement in most school settings. Earlier, on 7 January (prior to the Ministerial Working Group meeting), the Minister of Family Affairs and Social Services once again argued against reopening schools, citing the risk of post COVID-19 condition for children and the broader population. At the press conference, she explicitly referred to a Finnish expert panel's summary of more than 4 000 international studies that showed one in two adults and around 2% of children may in future experience prolonged symptoms connected to COVID-19 [51]. The expert panel was appointed by the STM and included one representative from THL; the others were mostly from the universities of Turku, Oulu and Tampere, as well as from the HUS [52] . The AAR team was not able to find the review of the 4 000 international studies on post COVID-19 condition. It does not appear to have been published in a peer-reviewed outlet. The AAR team did find a shorter five-page review from the panel, focusing on post COVID-19 condition in children and adolescents. The review also referred to the 2% prevalence rate of post COVID-19 condition in children but with an important qualifier: "Studies have shown long-term symptoms in about 1–2% of patients, but such symptoms can also be observed in children who have not had a coronavirus infection" [53].

In the end, it appears that THL and other key stakeholders succeeded in convincing the Ministerial Working Group to recommend keeping schools open and instead implement widespread NPIs at school premises to limit spread. Despite the recommendation by the Ministerial Working Group, the Minister of Health and Social Affairs continued to argue that returning to school was not safe. She encouraged local authorities to implement strict quarantines at schools so that one student's SARS-CoV-2 infection would result in quarantine for the entire class [54]. In a media interview right after the Ministerial Working Group meeting on 7 January, she presented the idea of whole-class quarantine as part of "a health security package" for schools. However, in the Ministerial Working Group press release such a measure was not mentioned. Instead, the press release stated that: "If several COVID-19 infections are identified in a teaching group, a physician in charge of communicable diseases may issue a decision to increase the testing interval to 3–5 times a week, for example" [49]. However, the advice was not followed by the regions. Instead, the Metropolitan Area RCG recommended that "supervised recreational activities for children and young people should continue in accordance with the previous guidelines" based on the principle of "children and young people first" [55].

Many people across all age groups were infected with SARS-CoV-2 during the Omicron wave. There was also an increase in the hospitalisation of children with COVID-19. Few children, however, were admitted to ICUs because of complications stemming from COVID-19. In fact, during both periods reviewed in this AAR, it appears that there was no excess mortality among Finnish children (Figure 3). Rather, child mortality (among children aged 0–14 years) was slightly lower than the baseline estimate during the two periods. It remains to be seen whether post COVID-19 condition will constitute a public health concern for children that were infected by the virus, but so far there is nothing to suggest that this will be the case [56,57].

Figure 3. Excess mortality for Finnish children (aged 0–14 years), January 2020 to August 2022



Source: EuroMOMO (euromomo.eu), 2022
Z-scores are used to standardise a series and enable comparison of the mortality pattern in different time periods.

3.3 Stakeholder mapping

Gephi software was used to create a combined stakeholder social network for analysis and visualisation, based on workshop participants' individually drawn ego networks. The undirected network visualisation represents an approximation of the interactions among different actors. In this context, the 'importance' of a node is determined based on the number of connections it has (i.e. a higher number of connections means greater importance). The name of the organisation an individual belonged to was used in the visualisation instead of the person's name or title.

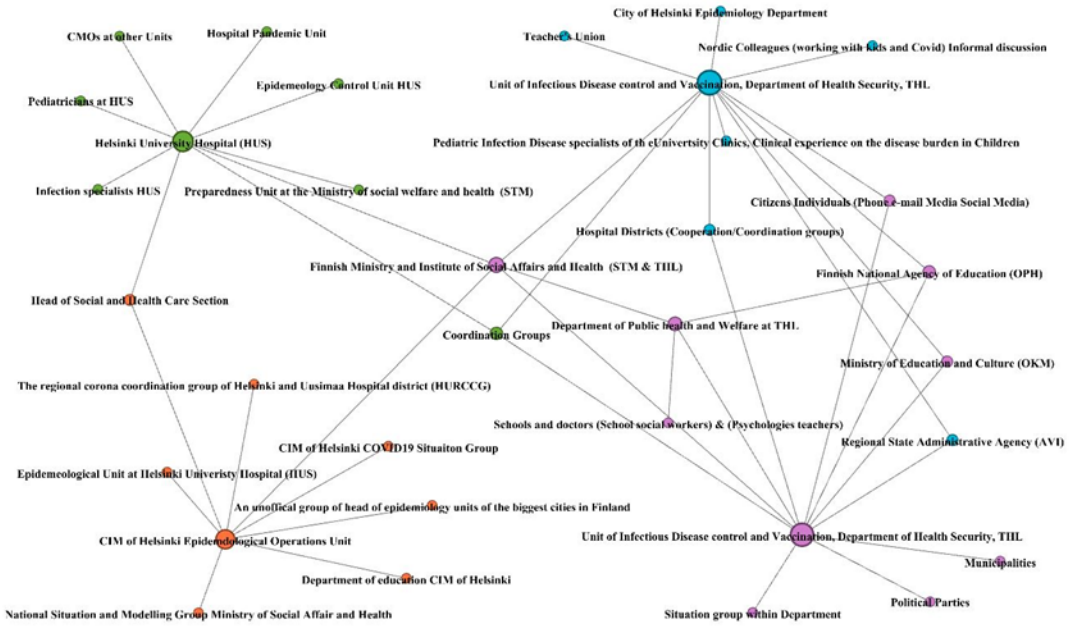
The different departments within THL were all represented as simply THL in the visualisation here. A more detailed analysis of how each department is connected to external organisations and individuals can be seen in Annex 5. Two network analyses were carried out to analyse the interactions among the nodes:

- **Degree centrality measures** were carried out to identify the importance of nodes within the network.
- **Modularity class analysis** was carried out to identify the importance and characteristics of different clusters and communities.

3.3.1 Degree of importance

THL was identified as the most important node in the network with the highest number of connections, followed by the HUS and the City of Helsinki, respectively (Figure 4). These three nodes are well connected both directly and indirectly through the STM and coordination groups. THL is also the only node that extends beyond the national boundaries of Finland to other Nordic countries.

Figure 4. Visual representation of the network based on the reported importance of the nodes

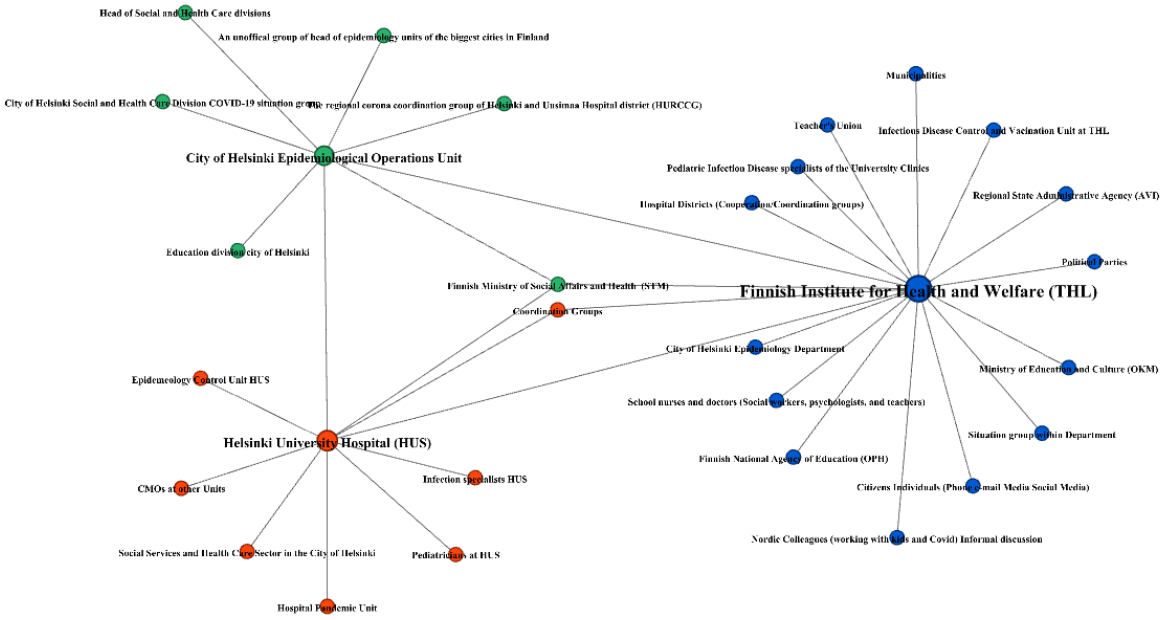


The visual representation shows the connections between 30 nodes that were drawn by five individuals during the AAR workshop. The size of a nodes denotes the importance of the network, as indicated by participants. The colours represent the number of connections each node has: green = highest, blue = second highest, red = third highest, yellow = fourth highest and light blue = fifth highest.

3.3.2 Interaction within and among communities

Three communities or clusters (also called 'modularity classes') were automatically and inductively identified, with each community represented by a separate colour (blue, green and red, where blue represents the largest community) (Figure 5). The communities were identified based on how interactions grouped to the three most important nodes.

Figure 5. Modularity class visualisation representing three identified communities of networks



While each of the three most important nodes has their own community that they interact with, they also interact with each other through shared nodes, such as the RCGs and the STM. Two departments at THL (namely the Department of Health and Welfare and the Department of Health Security) have their own unique communities they interact with, despite being within THL.

The three communities are different in terms of characteristics and formation. The blue community is the largest and most heterogeneous, with the most diverse connections – ranging from different national ministries and Nordic-level connections to direct connections with citizens. This diversity of interactions makes the THL one of the most unique in this analysis. In contrast, the other two are more homogenous: the red community mostly consists of health experts, departments and organisations, while the City of Helsinki's community is mostly at the city level.

THL has interacted with the most diverse nodes at the national and Nordic levels and can be characterized as a heterogeneous community while the two other most important nodes – namely, City of Helsinki and HUS have their own homogenous communities.

4 The advice-making process

This section discusses the major factors that shaped the advice-making process. It is structured around three main categories (more detail given in Annex 6):

- **Gathering and interpretation of evidence** – what evidence was used, what evidence was lacking and how was evidence integrated into the advice-making process?
- **Evidence and practices** – what kind of evidence and practices should have been more prominent in the advice-making process?
- **Communication and coordination** – how was advice communicated internally and between agencies, to the relevant ministries, to practitioners at the local level and to the public?
- **Institutional capacity** – what capacity was available at all levels of the advice-making process and what consequences did this have for the implementation of advice?

4.1 Gathering and interpretation of evidence

As indicated in the timeline, the emergence of the Omicron variant led to a surge in cases in all age groups and generated new uncertainties and stresses in the advice-making process during a rather short period. Still, the advice from THL was that the government should not mandate schools to close for physical teaching.

THL drew upon many different sources of evidence, which allowed the agency to make several evidence-informed arguments as to why schools could remain open despite the surge of cases. During the workshop, the following seven distinct types of evidence were identified in the advice-making process, although the last two were thought to be limited:

- epidemiological surveillance and contact tracing data;
- information from paediatric units;
- evidence from other countries;
- reports and experience from other Nordic countries;
- information from international organisations;
- peer-reviewed evidence;
- data on secondary consequences.

Evidence and practices that participants thought should have been used more in the advice-making process were:

- more social and behavioural data;
- more data on social issues in schools.

4.1.1 Epidemiological surveillance and contact tracing data

Epidemiological surveillance and contact tracing data were essential in generating advice for school interventions. In the initial stage of the pandemic in 2020, THL did not have much access to data on transmissions in children. However, as is apparent from the timeline, THL had gathered more epidemiological evidence when the second round of school closures took place in March and April 2021. This led them to be more vocal about the lack of effectiveness of this NPI. Already in July 2020, the Director of the Health Security Department in THL told reporters that he did not think that THL could recommend school closures as a control measure anymore [58].

At the time of the Omicron wave, THL benefited from a widespread national monitoring system that had been put in place during the initial stages of the pandemic. The monitoring system comprised laboratory-based surveillance, where the vast majority of symptomatic people were regularly tested, and extensive contact tracing, which was discontinued during the Omicron wave due to the surge in cases. In general, THL relied on very good data from hospitals, although in the initial stages of the pandemic the data collection process relied on manual input into Excel sheets. Later on in the pandemic, hospital discharge data became automated and was updated every 24 hours, which gave advice-makers access to real-time data along key epidemiological dimensions.

The contact tracing data collected prior to the Omicron wave made it possible to conclude that the SARS-CoV-2 transmission that did occur on school grounds was primarily introduced by asymptomatic teachers rather than students. In short, contact tracing helped dispel the myth that attending school increased children's risk of infection. On the contrary, THL believed that schools represented a controlled environment where other NPIs could be implemented so that transmission rates would be lower than in other settings that remained open (e.g. cafes, shops, sport clubs, etc.).

Based on the epidemiological evidence available at the time of the Omicron wave, the THL concluded that the basic epidemiological situation had not changed, even if Omicron had a higher transmissibility than previous

variants. During the Omicron wave, it became clear that children were transmitting the disease to a greater extent than during previous waves, but these higher transmission rates could be observed across all age groups. In addition, the government's stated objective in January was not to avoid transmission – because the spread was considered inevitable – but to avoid stress on the healthcare system due to a surge in hospitalisations and sickness among key personnel.

A representative from the City of Helsinki mentioned that, based on the analysis of contact tracing data since autumn 2020, she did not consider school closures to be an effective measure to control the epidemic compared with other possible actions. However, there was such a strong pressure from the national government and the STM to close schools that it was difficult to resist. She and colleagues from eight different cities or hospital districts published a joint statement on 5 January 2022, where they stated that due to the rapid spread of the Omicron variant contact tracing was no longer effective to control the epidemic and was to be targeted only to the most vulnerable populations (e.g. those living in long-term care facilities). Thus, the City of Helsinki and another 11 municipalities in the Helsinki Metropolitan Area refrained from quarantining the whole class if one student tested positive. Similarly, a representative from THL recounted how they presented surveillance data in a roundtable meeting with the OKM and the STM, showing that there were no differences between the incidence rates in areas where schools had been closed compared to other areas; however, participants also voiced frustration that these types of analyses were disregarded.

4.1.2 Information from paediatric units

Although the healthcare system is decentralised in Finland, paediatric patients have a low threshold for being transferred to centralised paediatric emergency units to receive more specialised treatment. This was also the case during the COVID-19 pandemic.

For THL, this meant easy access very early on to data on the severity of COVID-19 among children. Because there are only five university hospitals with paediatric intensive care units and because there were few patients with respiratory complications caused by COVID-19 at these units (even during the Omicron wave), the monitoring and surveillance could easily be handheld by THL through personal communication and bilateral exchange of data.

As the paediatric hospital in Helsinki is one of the biggest in Europe, a large amount of data was concentrated and easily available. This meant that THL and other advice-making bodies had robust data very early on in the pandemic that suggested that Finnish children did not get severe complications from the disease and that this picture did not change much regardless of the variant.

4.1.3 Evidence from other countries

Very early in the pandemic, THL got indications from other countries that the pandemic would probably not cause severe complications in children. Workshop participants from THL recounted how when the pandemic hit northern Italy in February 2020, evidence quickly suggested that while adult intensive care units were full, the paediatric intensive care units were not burdened with children with COVID-19. Reports of lower transmission rates among children also emerged from other countries, such as the United Kingdom (UK), France and Spain. Thus, early on THL already had some evidence that school closures might not be an effective NPI, and from May 2020 onwards they aimed to limit school closures.

THL had the advantage of getting data about the Omicron wave from both South Africa and the UK before it really peaked in Finland. THL closely monitored the situation in South Africa and the preliminary experience in this country informed the advice-making process but did not alter the recommendation to keep schools open at the national level. While South Africa and Finland have very different demographic and epidemiological profiles, the data that emerged strongly suggested that the variant might be more contagious but that hospitalisations were low across all age groups. This was also demonstrated by data from the UK, which suggested that the Omicron wave prompted an increased number of cases but did not lead to a noticeable increase in ICU admissions with respiratory complications from COVID-19.

Overall, evidence from other countries supported the THL's position that the new variant did not change the epidemiological rationale for keeping schools open. If anything, the high transmission rates made school closures an even less effective measure to reduce the spread of SARS-CoV-2, as proliferation of the virus to large parts of the population would be inevitable.

4.1.4 Reports and experience from other Nordic countries

The COVID-19 outbreak in Finland occurred slightly after the outbreaks in Norway and Denmark. The advantage of having access to Nordic countries' data and experiences was that the results were more transferable to a Finnish context than those from South Africa or the UK.

THL noted that they were very attentive to papers and experiences coming out of other Nordic countries. During the Omicron wave, Danish data and scenarios were applied to the Finnish context to approximate the expected impact of the Omicron wave. THL also had weekly or biweekly meetings with the public health agencies in Norway, Sweden, Denmark and Iceland. Through these meetings, it quickly became clear to THL that the risk of severe disease from the Omicron variant was very low and that this was also the case in children. These meetings reassured THL that other Nordic health agencies had given the same advice on school closures. Earlier in the pandemic, the Swedish Health Agency and THL had also cooperated on a study that measured the impact of school closures on the spread of the pandemic, taking advantage of the differences in school closure measures in the two countries. The study demonstrated no difference in the overall incidence of laboratory-confirmed COVID-19 cases in the two countries and concluded that school closures did not affect the overall incidence of cases in those aged 1–19 years old [59] .

The STM referred to Estonian data when arguing for the benefits of a strict screening regime at schools to limit the spread of COVID-19.

4.1.5 Information from international organisations

THL also relied on surveillance data from ECDC and the WHO Regional Office for Europe (WHO/Europe), as well as their literature reviews and guidelines. However, materials from ECDC and WHO/Europe were used as direct evidence less often than country-based experiences and national data, which constituted the most important input in the advice-making process for THL. This is partly because ECDC and WHO/Europe have broader audiences and mandates, which means that data might not always be relevant to the Finnish context.

In response to the Omicron wave, ECDC published a Threat Assessment Brief on 2 December 2021 and a Rapid Risk Assessment on 15 December 2021. THL staff expressed that the ECDC reports were out of sync with the advice-making process, in that they were often published too late when the important decisions had already been taken. ECDC guidelines on school interventions were also used by the STM to justify school closures, even though ECDC consistently concluded that school closures should only be used as a last resort measure. Participants noted that ECDC guidelines contained statements that could be interpreted as if school closures were an effective way of limiting the spread of COVID-19 (see Section 3.4.4). For example, ECDC reported on the topic of COVID-19 in children and the role of school settings from many angles, including through summarising studies that appraised the effectiveness of school closures; modelling studies cited by ECDC in a report from July 2021 estimated a 10% reduction of community transmission for secondary school closures, with smaller estimated effects for the closure of primary schools and preschools [60].

THL participants expressed the view that it would have been beneficial if ECDC had helped national health agencies stay up-to-date on relevant studies in the different areas of pandemic management. ECDC and other health agencies struggled to keep up with the surge in scientific literature on the subject (much of which was published in pre-print journals).

Workshop participants suggested that literature reviews may also be valuable in the aftermath of the pandemic (e.g. in possible future legal processes associated with the secondary impact of mitigation measures). More generally, participants noted that literature reviews by neutral parties can be very useful for the government to provide an independent overview of what was known at the time and to outline the scientific basis for different NPIs.

4.1.6 Peer-reviewed evidence

Workshop participants felt that there was limited peer-reviewed evidence to support the effectiveness of school closures as an NPI to prevent the spread of COVID-19. THL also consulted the peer-reviewed evidence on the impact of school closures on transmissibility of influenza and considered it weak.

In Finland, peer-reviewed evidence on the effect of school closures was contradictory [61,62]. One study found that school closures (as part of the larger initial lockdown in March 2020) were "effective in reducing the spread of all respiratory pathogens, although the reduction of COVID-19 cases began later than for other respiratory pathogens" [61]. However, the subsequent reopening of schools and daycare centres seemed "to have had no immediate impact on the incidences of any respiratory pathogens" [61]. Another study, authored by THL staff, compared differences in trends between areas with both restaurant and lower secondary school closures and areas with only restaurant closures. It found that "closing lower secondary schools and effectively prohibiting contacts in teenagers at schools was not associated with a larger proportional decrease in the incidence in lower secondary school-aged children, nor in the incidence in any other age groups" [62]. The peer-reviewed studies and reports that THL produced further cemented their position that school closures in Finland, as a stand-alone intervention, did not have any measurable impact on transmission rates.

THL interpreted the international peer-reviewed evidence produced during the pandemic as supporting their position that closing schools would have no discernable impact on the pandemic's effect on children's health and

negligible impacts on SARS-CoV-2 transmission. Workshop participants from THL noted that one of the methodological challenges in many peer-reviewed studies was that they analysed the impact of school closures during a general lockdown where most other key venues (workplaces, restaurants, sports clubs, bars, movie theatres and so forth) were also closed. Thus, it was difficult to isolate the impact of school closures from all the other measures that were implemented simultaneously. Methodologically, identifying how keeping schools open affects community transmission rates when everything else is closed is very different from when the rest of society is open (as was largely the case during the Omicron wave). If everything else is closed, then schools could act as an incubator of transmissions; however, THL interpreted the peer-reviewed evidence as suggesting that closing schools would not have the intended effect if the rest of society was kept open.

4.1.7 Data on secondary consequences

THL considered evidence on the secondary consequences of school closures on an ad hoc basis, as additional evidence to support not closing schools for physical attendance. However, it appears that this type of evidence was not gathered in a sufficiently systematic way to be incorporated into THL's central advice-making processes.

THL did not produce much data on the secondary consequences of school closures because, according to workshop participants from THL, it was not considered part of their core mandate. The agency relied on studies on the secondary consequences of distance learning produced by Tampere University and Helsinki University [62,63], as well as the OKM and the Finnish National Agency for Education [64].

THL did compile a brief publication on the state of youth mental health during the pandemic based on the OKM survey [65]. Early in the pandemic, the STM appointed a working group to strengthen children's rights and the well-being of children and families during the pandemic [66]. The working group published a report summarising many of the secondary consequences of school closures. Notably, the report identified increased inequity among children, as long-term absence from schools and recreational activities particularly affected disadvantaged children who need more services and special support [67].

The majority of this evidence was collected on a decentralised basis. A representative from the Education Development Services in the City of Helsinki recounted how they collected secondary data on school children's well-being, educational attainment and mental health. The City of Helsinki gained an overview of the challenges and benefits of distance learning, over time, through online questionnaires sent to students, teachers and parents. The City also interviewed social workers and psychologists in schools after extended periods of distance learning to gather information about mental health issues and social problems.

Due to the relatively high quality of teachers and educational resources, distance learning did appear to function rather well. One study concluded that "regardless of confusions, the nuclear schoolwork – meaningful learning – wasn't interrupted" [68]. While most students did well academically, workshop participants highlighted that a lot of data suggested a substantial drop in their well-being during distance learning. Even well-functioning students felt lonelier and around 60% of students reported finding distance learning mentally difficult during the second school closure in 2021 [69]. Data on absenteeism from distance learning were also collected, and it was clear that vulnerable children (often with a migrant background) had much higher absentee levels.

At the national level, there were also experts from OKM and the Finnish National Agency for Education that were doing similar research on students and teachers' well-being. Despite not being a research institution, OAJ also commissioned several surveys of their members to get quick data on how both teachers and students were coping with distance learning or learning in-person with many restrictions.

4.2 Evidence and practices

During the AAR workshop, key experts involved in the advice-making process pointed to two additional types of evidence that would have been beneficial to the advice-making process:

- more social and behavioural data;
- more data on social issues in schools.

4.2.1 More social and behavioural data

While THL did include ethical concerns in their advice, it was acknowledged that a better integration of social and behavioural science in the generation of evidence would have been beneficial. Some workshop participants noted that they would have liked to include social and behavioural evidence, as well as environmental health evidence, more directly in the advice-making process. Several participants also noted how experts from the educational sector were lacking in their advice-making networks, despite quite extensive cooperation between THL and OKM (see Section 3.3).

Members of the RCGs also noted that having more behavioural or educational experts at certain discussions could have provided a more complete picture of the implications of closing schools. As mentioned, the advice not to close schools during the Omicron wave was made purely on epidemiological grounds. If THL had access to more social and behavioural evidence, their case would likely have been even stronger.

THL did not have the capacity to systematically collect (let alone produce) social and behavioural data for proactive use in the advice-making process. There are obvious resource limitations, both with respect to the urgency of the advice and the in-house capacity to produce behavioural evidence. There are some behaviour experts at THL, but behavioural science is one part of the work undertaken by the Communications and Influencing Unit.

4.2.2 More data on social issues in schools

Due to the decentralised educational system, it was difficult to collect and survey national data on the negative impacts of school closures (e.g. absenteeism, social issues, inequity along socio-economic lines). OKM and AVI conducted regular surveys to collect situational information related to COVID-19 (e.g. the number of students in distance learning) from providers of basic and early childhood education throughout the pandemic [70]. One challenge was that there is no national system responsible for collecting these kinds of data. While data were collected at the local level, it was very difficult to aggregate and compare data, as regions and schools used different definitions, methods and techniques to measure and collect data (e.g. on absenteeism).

Another problem was that school settings were where teachers had been most able to monitor children's social issues or mental health problems, such as family violence, bullying, sexual abuse, depression or anorexia/bulimia. However, during the pandemic these reports to social welfare authorities dropped substantially. Workshop participants suspected that this was not because these issues had been resolved but was because teachers had a harder time identifying them, as the daily contact between teachers and students had been interrupted. In a survey from OAJ, 70% of teachers said they had students aged 13–16 years that they had lost contact with for at least some time during lockdown [71].

The STM did appoint a multisectoral and interdisciplinary working group tasked with strengthening the rights and well-being of children and families during the pandemic [66]. They believed that the pandemic would worsen inequality and increase marginalisation, but the evidence at the time appears to have been circumstantial.

While some of these data are difficult to collect, workshop participants noted that a national system for collecting and streamlining quantitative data (supplemented with qualitative social studies, as needed) would be useful for future pandemic response.

4.3 Communication and coordination

One important dimension of the advice-making process is being able to effectively communicate advice to relevant stakeholders. It is important to share evidence both horizontally (between the OKM, RCGs, THL and the STM) and vertically (with the municipalities and individual schools). This AAR focused on four important dimensions of communication:

- how communication was integrated into the advice-making process;
- how advice-makers interacted with the media and the public;
- coordination between THL and the STM.

4.3.1 How communication was integrated into the advice-making process

The Communications and Influencing Unit at THL reported that they were involved in the advice-making process from the beginning. Communication considerations were not restricted to the final phase, when the advice was announced to the public. Instead, they were seen as an integral and crucial part of the advice-making process.

At THL, communication experts had daily meetings with the epidemiological experts to discuss what findings to communicate and how to communicate. Behavioural experts at THL strengthened knowledge around how the public changes behaviour following the communication of new measures.

Internally in THL, emails were the primary form of communication. These were supplemented by voice and video calls and instant messaging (via Signal and Microsoft Teams), as well as internal online meetings. Emails were considered a somewhat cumbersome channel of communication, whereas Signal and Teams provided a more flexible form of communication in times of stress. The challenge with communication via Signal and Teams was how to effectively retain and archive these more informal interactions and deliberations.

The AAR workshop participants characterised the communication between THL and the RCGs as good. A participant from the HUS praised the open communication channels and their inclusion in the THL advice-making process. The communication between THL and the OKM also appears to have worked well, with multiple cross-sectoral meetings and effective exchange of information.

Some frustration was expressed about the mixed messages created by the contrasting positions of THL and the STM regarding school closures. The difference in opinion undermined effective communication to the regions and municipalities on what measures to implement. At the individual school level, there was also criticism that both THL and the STM would provide advice and guidelines that were not mandatory but school administrators still felt that they were expected to follow them. Teachers were stressed by these extensive guidelines that they were not really able to follow in practice.

4.3.2 How advice-makers interacted with the media and the public

Communication on a massive scale – directly to citizens – had not previously been a core responsibility of THL. Prior to the pandemic, THL communication mainly targeted healthcare practitioners at various levels of the health sector. Broad-based communication to the public had previously only consisted of rather simple communication in the form of flyers or infographics. Thus, the massive public demand for information on complex issues during the COVID-19 pandemic was an area that THL lacked experience in.

During the pandemic, THL very quickly became a vital resource for information. The agency played a key role in communicating to the public and convincing them of the rationale and merits of key NPIs. THL had to build websites and develop new routines to serve this new demand. Just dealing technically with the surge in traffic to THL websites became an issue. The agency got thousands of daily phone calls and emails from ordinary citizens. Communication experts described it as a tsunami of inquiries. Eventually, THL had to restrict citizens from sending emails and calling the agency, as the Communication and Influencing Unit did not have the capacity to handle them.

For the health experts at THL, interactions with the public and media were time-consuming and were sometimes perceived as stressful. An expert mentioned that he could not get through his emails the day after a media interview on COVID-19. Some reportedly received hundreds of emails per hour on the worst days. Another expert reported receiving as many as 500–600 emails per day in peak periods. Legally, public agencies are obligated to answer inquiries from the public. For the first couple of months, experts were advised to answer every single email they got, even if they were anonymous and consisted mostly of accusations rather than questions. Eventually, however, THL came up with a system where experts could forward these types of emails to the communications unit. The unit would then forward a standard response that depended on the type of inquiry. The department also started implementing automated responses to email during the pandemic, once it was confirmed that it was legal to answer public inquiries this way. Another challenge with the legal system was that threats or defamatory remarks towards THL staff were considered an issue for the individual to handle, rather than the agency. It was up to the individual staff member to start a legal procedure against the person that made the threats or derogatory remarks, if they could be identified at all. Initially screening emails through the communications unit mitigated some of the problems.

Relationships with the press were described as constructive and mutually beneficial for the most part. When THL had new data, they gave press conferences that were covered extensively in the media. Often, press conferences on school interventions were held together with the OKM or the Finnish National Agency for Education. The press conferences were not only used to disseminate information, but also to educate the public (teachers, parents and students) on how to behave during the pandemic to stop the spread of the virus. However, THL communication representatives emphasised that a press release or press conference are not going to fundamentally alter people's behaviour; to do that, measures such as social media, information campaigns, bringing influencers on board and so forth needed to be activated. The STM and THL's weekly live press conferences also became the leading channel to convey the situational picture of the pandemic.

Participants stated that one of the main communication challenges was that THL was tasked with providing advice but did not have decision-making power. It was perceived that there was a common misunderstanding that THL was responsible for decisions relating to school closures. THL had to communicate that they were not responsible for the decisions, and they were careful to only communicate advice-making documents.

Another communication challenge was that school closures were a highly contested issue. Some parents and teachers wanted to close schools while others wanted them open. Any THL advice was bound to receive criticism and scrutiny, which meant that the communication not only had to be very precise and factual but also explicitly address some of the concerns that stakeholders held on both sides of the issue.

Another communication issue was that NPIs related to children received disproportionate attention in the media throughout the pandemic. One reason for this could have been the pandemic preparedness plans where school closures (modelled over influenza outbreaks) were formulated as a key NPI for limiting the spread of the virus.

One participant from THL stated that the influenza pandemic had been used as a model for how the next pandemic should be handled. It demanded a conscious effort to examine the evidence and get out of an influenza frame of mind. Another reason for the focus on children was the fact that the hybrid strategy included many considerations of the role of children in the pandemic. Even if the point of these considerations was to take the interests of children into account, some argued that this attention might have inadvertently created a frame of mind where NPIs for children were routinely considered in all cases, although the evidence for their effectiveness was limited at best. While children surely played a role in transmission of the virus, workshop participants felt that among both the public and politicians there was an excessive focus on interventions affecting children in the form of restrictions on recreational activities and schools.

Social media was one of the main channels for communication with the general public. Because social media is interactive, it was also one of the main ways to find out what people needed and what they thought about different interventions. The Communications and Influencing Unit at THL used this feedback to improve their website content and optimise the communication of guidelines and advice. However, social media also presented many challenges for THL, because it provided a voice and a platform to experts who believed that every COVID-19 case should be avoided (referred to as 'zero-covid experts' by several workshop participants).

Social media presented a unique opportunity to communicate directly with the public and for the public to engage with THL. However, there was also a feeling that social media engagement was difficult and stressful for the advice-making infectious disease experts and that they were at a disadvantage when it came to countering opposing viewpoints due to the restrictive format of social media platforms and the limited resources they had available. Thus, some participants felt that their authority and position were undermined by social media debates. For most workshop participants, social media platforms did not facilitate deeper scientific discussions over evidence. Instead, engaging with and rebutting all opposing views on social media appeared to be an unrelenting task for individual advice-giving experts.

4.3.3 Coordination between THL and the STM

In the first few weeks of the pandemic, THL managed Finland's pandemic response. As soon as it became clear that the pandemic would affect all levels of Finnish society, the management was moved from THL to the government. The assignment of advice-making and decision-making authority came from the Communicable Disease Act that was renewed in 2016. The Act states that the general planning, steering and monitoring of the control of communicable diseases are the responsibility of the STM; the THL, as the national expert institution in the control of communicable diseases, supports the STM with its expertise [31]. The pandemic, therefore, was the first time that the responsibility for advice-making regarding school closures was shifted to the STM from THL (the latter of which had more analytical and operational experience with communicable diseases).

The Act also states that further provisions on the tasks of the STM and THL are to be laid down by government decree, but it is unclear how explicit these provisions were in terms of assigning clearly defined roles and responsibilities to the two advice-making bodies [32]. Workshop participants agreed that the roles and responsibilities between THL and the STM overlapped more than necessary. Participants from THL stated that the STM took on a very operational role and that THL was only tasked with providing raw data that might or might not have fed into the advice-making process.

Overlapping authority would have mattered less if the parties largely agreed on the pandemic response strategy and interventions. However, there appears to have been disagreements about the fundamental strategy behind school closures. THL stated that the STM was in a 'zero COVID-19' state of mind, where the overriding priority was to limit any transmission. The STM, on the other hand, appear to view THL as too lenient in its advice, considering the surge of cases during the Omicron wave and the uncertainties surrounding children's health (with respect to post COVID-19 condition and the role of schools in the transmission of the disease, especially in older adults and other vulnerable groups). There was thus a strong sense among workshop participants that the STM consulted outside experts because of their stricter positions on school closures or COVID-19 management more generally.

This reported tension between THL and the STM appears to be rooted in the differing organisational mandates and suboptimal communication between the two organisations. There appears to have been substantive disagreements about the extent to which THL should engage in operational advice. A representative from THL described how it was never clear to them where the evidence underlying the idea of school closures in 2022 came from. If the Minister of Family Affairs and Social Services recommended certain interventions or guidelines that ran counter to the position of THL, workshop participants from THL stated that they did not get a chance to access the evidence used or discuss them with the experts behind the advice.

Concerning school closures, workshop participants suggested that one of the main pieces of evidence used by the STM in favour of closing schools was an ECDC report on school interventions [60]. The second update of this report came out in July 2021 and stated that "children and adolescents will likely represent an increasing share of new SARS-CoV-2 cases during the upcoming school year" [60]. The report acknowledged that high levels of

community transmission might necessitate considering all possible NPIs measures, including school closures. However, it also stated that while school closures could contribute to a reduction in transmission, they were insufficient to prevent community transmission of SARS-CoV-2 in the absence of other NPIs. The report also clearly stated that school closures should be a last resort measure. While workshop participants expressed an appreciation of the ECDC risk assessments and reports published during the pandemic (see Section 4.1.5), they were less enthusiastic about some of the conclusions that they presented. This example demonstrates the challenge of converting scientific advice into concrete decisions, as what is deemed cause to implement a last resort measure will inevitably be open to some degree of interpretation, particularly if varying types of evidence were appraised through different organisational lenses.

Following the workshop, it was important to interview a representative from the STM to get their perspective. The representative acknowledged some of THL's account of the situation and noted that, in hindsight, keeping schools open was the right decision. But they also emphasised the differing organisational contexts and mandates, suggesting that the decision-making situation for the STM was more complex than just focusing exclusively on public health. There were other concerns that needed to be considered. In particular, they highlighted the trade-off between protecting individual rights (prominently featured in the Finnish constitution) and maximising public health for the population as a whole. The STM is, by law, obliged to provide the best possible health protection for individuals, and the right to life supersedes the right to education and keeping businesses open. Whereas THL looked at school closures solely from an epidemiological point of view, the STM had to apply an individual rights perspective as well, where the starting point and overarching objective of interventions was to protect the right to life. There was also a perception in the STM that THL's position conflicted with ECDC's position on school interventions, which was that they should be considered as a last resort measure [60]. According to one STM interviewee, distance learning was also working better than in many other countries – strictly from an educational perspective – and by the time of the Omicron wave teachers were well-versed in online teaching formats.

Communication also seemed suboptimal regarding the fundamental perspectives and objectives of the different stakeholders. Workshop participants mentioned that the individual rights perspective could also have dictated keeping schools open, as children are not severely affected by COVID-19 and closing schools would primarily be to reduce transmission to the rest of society (the public health perspective). However, to the STM, the individual perspective meant closing schools in order to avoid hospitalisations and fatalities among children. This view was shared by the Finnish Ombudsman for Children, the highest legal authority for children's rights, who had previously clashed with THL when it came to vaccination of children [72]. The Ombudsman believed it was wrong to leave children unvaccinated and hence unprotected. She held the view that precaution must be proportionate to the risk when the full impact of COVID-19 on children was still unknown [73]. With regard to the more restrictive measures (e.g. school closures), the Ombudsman considered these measures to be fundamentally worthy of support in terms of preventing the uncontrolled spread of SARS-CoV-2. In the beginning of December 2021, the Ombudsman found it essential that, when vaccination protection was still lacking for a significant number of children under the age of 12 years, the necessary restrictive measures (including school closures) should be implemented to curb the spread of the virus and protect children in risk groups [74].

Interestingly, this perspective was in opposition to that of the Swedish Ombudsman for Children, who thought that the secondary adverse impacts of school closures clearly outweighed the epidemiological benefits of closing schools [75]. The Finnish Ombudsman's position was also in opposition to the HUS representative at the workshop who agreed with the principle that children deserve protection from the virus but also protection from the adverse social, emotional and equity consequences of closing schools for physical attendance – which were thought to be more serious than the virus.

The same position was also explicitly expressed by several of the regional infectious disease experts in an open letter to the government published on the City of Helsinki website on 5 January 2022 [46]. The letter, signed by 10 infectious disease experts from several regions, expressed disagreement with the government's plans to transfer children and young people to distance learning (see Section 2). The letter expressed rights-based arguments for keeping schools open, namely that children have the right to in-person teaching, to meet friends, to study and to create and maintain social networks. On 7 January, after it was clear that THL and the STM would not issue a national distance education recommendation, the Finnish Ombudsman published a joint statement together with the Eurochild Children's Council representative that emphasised the proportionality principle by which children and young people should not have to transfer to distance learning while adults responsible for the majority of community transmission were still able to hang out in bars and other restaurants.

The STM interviewee acknowledged that it might appear absurd to consider closing schools while keeping bars and restaurants open. However, they reiterated that the situation was more complex. It was not legally possible to close restaurants at the time of the Omicron wave. It would effectively demand that a third state of emergency be declared, and both the Finnish Constitution (§23) and the Emergency Power Act (§6) dictate that parliament must approve the validity of the government decrees in this regard, which did not appear to be

politically feasible at the time [31,76]. From the perspective of the STM, there were no ideal tools available to manage the pandemic at this stage, and they had to make both political and legal compromises that THL did not have to consider in their advice. In fact, the STM interviewee saw it as his primary function to prevent open fighting in the media, to retain public trust in both experts and politicians, and to ensure that the advice-making system did not break down.

4.4 Institutional capacity

This AAR focuses on five key aspects of capacity during the Omicron wave that impacted the advice-making process:

- capacities at the regional level;
- the capacity to engage proactively in advice-making;
- short-staffed advice-making bodies;
- increased staff vulnerability due to pandemic fatigue.

4.4.1 Capacities at the regional level

Both THL and the STM primarily had advice-giving roles when it came to school interventions. The real decision-making power rested with the regions, which appear to have had the capacity to make independent and informed decisions. While the regions did consult and discuss with THL, they mostly relied on their own epidemiological units at the regional level when deciding whether to close schools at the local level. Representatives from the regions descried the advice-making process as an interactive process where they consulted with a wide range of stakeholders (the OKM, THL, the STM, etc.) but where the final decisions were made at the municipal level. Sometimes these decisions went against the advice from THL or the STM, as was the case with quarantine regulations in schools and contact tracing practices during the Omicron wave.

Throughout the pandemic, there were extensive internal discussions in many regions as to whether to keep schools open or closed. They needed to balance two concerns: the health of children (because, legally, the school premises needed to be a safe environment for children) and the well-being of children, which encompassed all the potential adverse effects of closing schools for physical attendance. The regional representatives felt that they were able to reflect on each decision and think through the different scenarios, weighing the pros and cons of the individual decisions. This was even more the case at the time of the Omicron wave, when regions had established procedures and had more experience. As one representative expressed it: "As time went on, we realised and understood the nature of the virus more and more."

4.4.2 The capacity to engage proactively in advice-making

Many workshop participants had a general feeling that they had to engage reactively rather than proactively in the advice-making process. One issue was that it was difficult for staff to find the resources to engage with the advice-making process in a more proactive way due to other obligations (meetings, freedom of information requests, email requests from the public and so forth). Another issue was that there was limited administrative room for THL staff to engage proactively in the advice-making process. THL's input to the process was mostly driven by explicit requests from the STM, statements from the Minister of Health and Social Affairs, or stories in the news or on social media. Participants noted that this more reactive role for THL was already defined at the beginning of the pandemic, and that it was difficult to transition into a more proactive role of discussing different interventions, advising on policy or conducting research on new developments. There were examples of advice-making experts that tried to engage more proactively with school interventions during the Omicron wave. However, it appears that the existing channels of communication within the system did not facilitate this type of proactive engagement, as staff felt the need to bypass the system rather than work through it. One example put forward by participants was when the STM asked THL to provide their expert opinion on four predefined questions pertaining to the national emergency brake mechanism in December 2021; however, they went beyond answering these questions by adding a fifth statement (that they were never asked for) advising against school closures [42]. Another example was the previously mentioned open letter in support of keeping schools open that was signed by infectious disease experts from the regions [45]. The need to write an open letter through the media suggests that the existing administrative system was not sufficiently accommodating these kinds of input from THL and the regions.

4.4.3 Short-staffed advice-making bodies

THL was downsized several years before the COVID-19 pandemic, so there was a sense that the organisation entered the pandemic short-handed. Some participants mentioned a 60% reduction in personal resources in the Department of Health Security leading up to the pandemic. However, funding was greatly increased for pandemic response both nationally (THL and the STM) and in the regions. In the City of Helsinki, for example, the staff assigned for contact tracing quickly ballooned from 7 to 700 people. The challenge with increasing capacity was

that the organisations had to recruit and train many new people with the right expertise during a time of crisis, which placed further strain on the organisations in the short run. For the new employees, starting up in the stressful environment of crisis management was also difficult. THL participants also lamented the fact that they did not have the resources to have a dedicated group to do literature reviews and data analyses of more behavioural data. Adjusting and reallocating resources in a crisis is often necessary. However, it was seen as disadvantageous to dial pandemic preparedness capacity up and down according to short-term needs. Participants expressed the view that effective pandemic preparedness and response demands long-term investments that include continued training, improved surveillance, updating of pandemic plans and retaining a level of competencies and qualifications.

4.4.4 Increased staff vulnerability due to pandemic fatigue

Dealing with the COVID-19 outbreak for two years put a strain on staff at the advice-making bodies. THL staff worked very long hours and new employees were thrust into the organisation in chaotic times and had to find their own footing. At times staff felt they were drowning – not so much in their core assignments of producing and interpreting evidence, but in coordinating meetings, engaging in public debate, fulfilling freedom-of-information requests and taking voice and video calls. With a prolonged crisis such as the COVID-19 pandemic, clearer organisational routines and practices could have helped to achieve some kind of normalcy in the daily work of core personnel.

Repeated attacks on social media and difficult relationships within the advice-making system also took a toll on staff. In the regions, participants described being held individually accountable for actions they did not always agree with personally. Key personnel had to legally sign papers for quarantine and isolation, which were severe measures that restricted individual freedoms and rights. This alone was sometimes perceived as stressful. This tension was heightened in cases where individuals fundamentally disagreed with the decisions they were tasked with implementing (e.g. quarantining a whole class because of one student testing positive).

Fatigue was also prevalent in schools, among teachers and headmasters. The OAJ noted how teachers were overwhelmed with public health tasks (e.g. physical distancing, masking, hygiene measures, testing regimes, etc.) on top of their core responsibilities of teaching (whether in person or distance). In addition, teachers also faced internal division (some preferred to teach in person while others strongly favoured distance teaching due to the risk of infection). Teachers who were older adults were often concerned with going back to in-person teaching. A representative from the OAJ recounted that inquiries from teachers quadrupled during the pandemic. Another source of stress was that the national authorities gave instructions and guidelines that were not mandatory (i.e. schools were supposed to follow them, but they were not strict or enforceable rules) and that were often in conflict with what would be feasible for individual teachers to implement in practice.

Fatigue and stress were unavoidable consequences of the 'response marathon' that advice-making staff experienced during the pandemic. However, participants reported that part of the strain on staff was rooted in suboptimal organisational structures that were slow to address and mitigate multiple stressors for staff, such as engaging in public debates, responding to public inquiries and freedom of information requests, challenging coordination with the STM, threats on social media, etc.

4.5 Summing up the advice-making process

During the Omicron wave, the advice-making process seems to have benefitted from the ability and capacity to gather and interpret relevant evidence within a short time span. Prior to the Omicron wave, a lot of evidence had been gathered and produced that suggested that closing schools for physical teaching would have negligible effects on children's health or further spread of the virus. In addition, Finnish schools and teachers perform crucial social roles in students' lives that were hampered by distance learning, such as early detection of domestic or mental health issues. Hence, from the perspective of most participants in the workshop, closing schools was not a viable NPI during the Omicron wave.

Even though the Omicron variant injected greater uncertainty into the advice-making process, THL retained the position that schools should only be closed individually in local outbreak situations. This decision to not alter the existing advice when faced with the new variant appears to have been based on:

- the experiences of countries hit by the Omicron wave before Finland, where there was no discernible increase in severe complications or fatalities;
- Finland's own experience from paediatric units in hospitals, where no increases in patient numbers were indicated;
- the peer-reviewed literature suggesting that closing schools had a limited impact on the spread of the pandemic, if any;
- epidemiological data from the previous waves, which supported the basic proposition that children in general are not getting seriously ill from COVID-19, and that school environments are not incubators of transmission.

The Communicable Diseases Act explicitly required measures to "be essential for preventing the spread of a generally hazardous communicable disease" [32]. According to THL, the evidence clearly suggested that school closures could not be deemed an essential intervention.

Worth underscoring is that THL's advice was primarily developed on epidemiological grounds. Evidence pointing to the potential adverse secondary impacts of distance learning (mental health, well-being, physical health, learning gaps, family abuse, increased inequity, etc.) did not play a substantial role as evidence in the agency's advice-making process. These social aspects were voiced as general concerns by THL, but related evidence was not available in real time or early enough to be systematically used or analysed as a substantial part of the advice-making process. Hence, closing schools was deemed an ineffective NPI as a purely epidemiological intervention with limited regard for the adverse secondary effects. Indeed, several workshop participants described the decision as "simple" and "straightforward". Other NPIs were more complex. One example raised in the workshop was border closures. The government wanted stricter border closures, while THL argued against closing borders completely. According to THL, epidemiological evidence about the effects of border interventions was ambiguous and there was no optimal decision.

While workshop participants (from THL, the HUS and the RCGs) agreed on the conclusion that schools should remain open, it is important to emphasise that not all stakeholders shared this view. There was debate over whether to close schools during the Omicron wave within the government and in public. THL and the RCGs came under pressure from two camps of parents and teachers: one that argued children/teachers should not be put in peril by opening schools because then they would be likely to catch the virus and another that argued keeping children away from schools would be irresponsible because catching the virus was a negligible risk. According to THL, the number of parents who wanted schools closed was small but vocal. There was also a clear tension with a small minority of infectious disease experts who were in favour of keeping schools closed for physical attendance after the winter holiday in January 2022 and voiced this opinion in the media. Even some paediatricians spoke out against opening schools. Thus, whether to keep schools closed after the holidays appears to have been a divisive issue. In this context, the government needed to make a decision on what should be the national advice. In addition to epidemiological evidence, it also considered the legal ramifications and input from the Children's Ombudsman, who favoured school closures at the time as a means to protect the individual rights of children in light of inadequate vaccination coverage.

From December 2021 to January 2022, Finland had two important advice-making bodies with openly opposing views on this key NPI as a response to the Omicron wave. In addition, there were diverging views about the roles and responsibilities of these two actors. THL believed that it should advise policy and not just produce and report data, and that its input into the advice-making process should carry more weight. While THL and the STM were in constant dialogue and contact, most workshop participants did not feel that they had insight into the STM's evidence or rationale for recommending school closures during the Omicron wave. Thus, the school closures advice-making process during the Omicron wave revealed problematic overlaps in authority between THL and the STM and lack of crucial openness between these key bodies. This is something that will be addressed in the lessons learned section of this AAR.

5 Lessons learned and good practice

The lessons learned and good practice portion of the AAR asks the question: What should change and how can it be implemented? Lessons learned shed light on broader issues, including processes or practices that might not have worked well. Examples of good practice provide insight into what worked well and are defined herein as "strategies, approaches and/or activities that have been shown through research and evaluation to be effective, efficient, sustainable and/or transferable, and to reliably lead to a desired result" [77].

Workshop participants and interviewees highlighted the following lessons learned and examples of good practice during the consultation processes. The AAR team gathered the suggestions and grouped them according to the following categories:

- evidence
- communication and coordination
- capacity
- roles and responsibilities.

Table 2 provides a summary of the 13 examples of good practice, each of which are explained in more detail to follow.

Table 2. Summary of good practice examples reported by AAR workshop participants and interviewees across four themes (evidence, communication, capacity, and roles and responsibilities) and related subtopics

Theme	Subtopic	Examples of good practice
Evidence	Reliance on national surveillance systems	Regular updates, links to central registers, sharing data internally and externally.
	Engage in cross-sectoral and interdisciplinary collaboration to gather evidence	Maintaining and institutionalising existing practices for cross-sectoral and interdisciplinary collaboration and learning.
	Inclusion of contrary viewpoints in the advice-making process	Including contrary viewpoints more formally in the advice-making process might constitute good practice).
	Systematic inclusion of evidence on secondary effects in the advice-making process	Systematically compiling and/or commissioning studies on secondary effects of measures. Integrating consideration of secondary effects in the advice-making process. Also considering qualitative evidence on social issues that are not easily quantifiable.
Communication and coordination	Institutionalised processes for handling public requests	Reducing technical experts' workload by reducing media and communication work via automated responses and lines to take, a strong communication unit or enhancing administrative support. Establishing a system to handle freedom of information requests.
	Include communication earlier in the advice-making process	Including communication and collaboration with technical experts as an integral and crucial part of the advice-making process.
	Multifaceted communication strategy	Maintaining a well-resourced communication unit that can effectively manage the many different channels of communication.
	Collaboration between key advice-making and decision-making bodies	Updating collaboration procedures and external contacts in peacetime.
Capacities	Establish Regional Coordination Groups (RCGs) and continue collaboration during peacetime	Continuing to work with RCGs in peacetime, branching out to other health challenges. Including relevant experts in the work when needed (educational specialists and paediatric experts were not always included in deliberations pertaining to school closures).
	Compile lessons learned and undertake training on pandemic response during peacetime	Pandemic plans and guidelines are necessary but not sufficient for effective pandemic response. Activating the knowledge in peacetime (through cross-departmental simulations, trainings and sharing lessons learned) to bolster organisational resilience.
Roles and responsibilities	Transparency in the advice-making process	Increasing transparency of how evidence was gathered and interpretated during the advice-making process. The public health perspectives and purposes of interventions should be clearly communicated.
	Transparency in decision-making	The rationale (whether value- or science-based) underlying a decision should be made explicit and should include clear articulation of how to know when the objectives motivating the decision have been met.
	Transition from emergency/crisis management to management under stress	In a prolongated crisis where the dynamics change over time, clear guidelines for how and when to scale down and return to more standard management procedures characterised by less urgency and more reliance on empirically proven or evidence-informed advice.

5.1 Evidence

5.1.1 Reliance on national surveillance systems

Finland benefitted from being a small country where it was easy for advice-making bodies to access crucial information through personal contacts. In the initial stages of the pandemic, the surveillance and response system relied on quick and available solutions, such as the use of Excel spreadsheets. By the Omicron wave, however, the surveillance system had developed tremendously with automated updates every 24 hours on key epidemiological indicators (in particular, hospital discharge data) that could be linked to data from central registries. This allowed for disaggregated analysis by age group, ethnicity, gender and geographical region. This ability to quickly access and interpret updated epidemiological data was considered good practice.

While international evidence and studies were used in the advice-making process, emphasis was clearly on using Finnish data as the foundation for advice. Aside from hospital discharge data, this required a regular testing regime, sequencing capacity and effective contact tracing. It also crucially depended on the advice-making bodies gaining easy access to these data and connecting them with relevant information from central registries. Setting up dashboards for easy access (both internally in the advice-making process and externally for media and the public) was also considered good practice. THL was able to provide the STM with detailed data in an easily digestible format in a dashboard. THL discontinued maintenance of this version of the dashboard by the end of 2021 and the data have now been moved to a dashboard with a slightly different interface and less frequent updates [78].

5.1.2 Engage in cross-sectoral and interdisciplinary collaboration to gather evidence

Participants generally felt that it was beneficial to work in multidisciplinary teams to gather and interpret evidence. They expressed that sustaining and institutionalising these forms of cooperation after the pandemic would be good practice. Internally, THL undertook many cross-unit and interdisciplinary collaborations to address various aspects of the pandemic. Externally, cross-sectoral cooperation with the OKM was highlighted as fruitful in the case of school interventions, with multiple cross-sectoral meetings and a continuous exchange of information. There were also strong interdisciplinary cooperations within the RCGs, where many different types of expertise were present. These collaborations allowed for different types of evidence and perspectives to be included in the advice-making process.

5.1.3 Inclusion of contrary viewpoints in the advice-making process

The inclusion of contrary viewpoints within THL was emphasised as good practice. Trying to include not only different disciplines but also different viewpoints serves several purposes. It offers a stress-test of the interpretation of evidence internally before making any advice public. Considering a devil's advocate argument and addressing internal scrutiny could strengthen the robustness and framing of the advice. Providing experts with opposing views with a forum (informal roundtable discussion or similar) where they can highlight grievances or multiple viewpoints in a controlled and safe environment is also strategic, as it moves disagreements out of environments that are not conducive to these kinds of scientific discussions, such as social media platforms. In this AAR, one lesson learned was that more openness and an inclusion of alternative viewpoints in formal settings might have facilitated a more fruitful discussion of alternative NPIs.

5.1.4 Systematic inclusion of evidence on secondary effects in the advice-making process

Systematic inclusion of evidence on secondary effects in the advice-making process was considered by participants to be good practice. Some of these data would still be health related (such as the impacts on mental health) but much would be rooted in educational and/or behavioural sciences (such educational attainment, social exclusion, and increasing inequities).

In Finland, many different actors appear to have been engaged in producing this type of evidence. The process of extracting, systematising and integrating this kind of data in advice-making is resource intensive and slow. THL staff was already strained during most of the pandemic, including during the Omicron wave, so it was impossible for key staff to devote the necessary time and resources to systematically gather this type of evidence in a timely way.

Good practice would be to ensure that procedures on how and when to include this type of data are established in peacetime. These studies could be commissioned at moderate costs to external actors, and could be performed by social scientists within academia or onsite practitioners with experience in qualitative, bottom-up studies. Alternatively, agencies could establish a working group explicitly tasked with collecting and categorising secondary evidence in an easily digestible format.

5.2 Communication and coordination

5.2.1 Institutionalised processes for handling public requests

Key experts handled many public inquires and freedom of information requests. Eventually, THL created a system where infectious disease experts could forward such emails to the communications unit. Many responses were automated after it became clear that there was a legal basis for this practice. It was perceived as suboptimal that highly specialised experts or managers in key positions serve as frontline caseworkers on these administrative tasks and public requests. A good practice to alleviate some of these administrative tasks would be hiring (temporary) administrative support to aid in the handling of freedom of information requests and other time-consuming tasks. Another solution, if legally feasible, would be to work with automated responses that direct the public to the relevant Q&A websites.

5.2.2 Include communication earlier in the advice-making process

Communication should not be restricted to the final phase when epidemiological advice is disseminated to the public. Instead, good practice includes communication as an integral and crucial part of the advice-making process from the beginning. Close cooperation between infectious disease experts and communication specialists is essential in any crisis communication but is even more essential during a prolonged pandemic where the public needs to be convinced to undertake behavioural changes and where advice might change according to the specific dominant variant, vaccine rollouts, and so forth.

5.2.3 Multifaceted communication strategy

Effective crisis communication often relies on multiple channels such as press releases, press conferences, social media posts, videos, infographics, engaging influencers, campaign websites, dashboards and so forth. These channels, of course, need to be aligned and complement each other. Good practice would include well-resourced communications units that are able to effectively provide outputs through these different communication channels but also to handle public input and feedback through these same channels. THL's communications unit appears to have been understaffed in the initial phases of the pandemic. By the Omicron wave, they had clearer procedures in place and well-functioning communication channels. A consistent challenge, however, was how and whether health experts should engage with dissenting views or misinformation on social media platforms. Training and guidelines should be available to guide staff on these matters during emergencies.

5.2.4 Collaboration between key advice-making and decision-making bodies

Most participants pointed to strong collaborations between the regional level (the AVI and RCGs), the educational advice-making institutions (the OKM and the Finnish National Agency for Education) and THL. Many of these cross-sectoral and cross-departmental cooperations were new and established during the pandemic to improve advice-making. THL held weekly meetings with regional experts and hospital districts, and cooperated closely with the OKM throughout the pandemic. While collaborative procedures can be time-consuming (setting up and participating in meetings, writing agendas and minutes, etc.), there was general agreement among participants that these interactions improved advice-making by bringing together different expertise and perspectives (including stakeholders responsible for implementation) and ensuring that key stakeholders supported advice prior to it being announced. The Finnish experience also showed how a suboptimal collaboration can undermine the quality of the advice-making process. It was felt that conflicting messages on school closures from official bodies caused confusion in the public and at the regional level, as the two key advice-making organisations openly held different positions. There was also a lack of clarity about the evidence underlying the two advice-making bodies' positions. This situation increased stress and caused resources to be diverted to defending specific positions rather than engaging constructively in the advice-making process.

5.3 Capacity

5.3.1 Establish Regional Coordination Groups and continue collaboration during peacetime

Participants considered the establishment and operation of RCGs a success. RCGs were very useful during the pandemic. Participants emphasised that there had always been fruitful discussions with RCGs for different NPIs, including for schools. Together with the hospital district meetings, consultations with RCGs provided the regions with the ability to comment on the advice and shape it to context-specific challenges. While RCGs are not scientific boards, workshop participants emphasised the importance of including the right expertise in these groups. It was noted that some of the RCGs did not include representatives from the department of education or paediatricians when discussing school closures. A suggested good practice was to adapt the composition of RCGs to the policy

area under discussion. For instance, RCGs could make sure to include educational specialists and paediatric experts when deliberating about school closure interventions.

Following the pandemic, the STM urged the AVI to ensure that momentum in institutional collaboration is retained going forward. The RCGs are now meeting once per month and have started to discuss several relevant health issues beyond COVID-19 pandemic response. Continued operation of RCGs in peacetime is therefore recommended as good practice.

5.3.2 Compile lessons learned and undertake training on pandemic response during peacetime

Resources for training and preparedness exercises were deemed somewhat limited prior to the pandemic. Key personnel responsible for training also left THL at the beginning of the pandemic, which further undermined efforts to conduct training (see Section 4.4.3). Thus, good practice would be to update national action plans, procedures, and practices during peacetime. However, preparing these plans might take years, and there was concern that many lessons learned would be lost if pandemic plans were not renewed in time. Good practice, therefore, is to not only have updated national action plans but also to make sure that these are integrated into routines and practices on all relevant levels. This is particularly important in a decentralised healthcare system (i.e. the Finnish one) where municipalities and regions play a key role in both advice-making and implementation.

Several participants thought it would be beneficial to conduct externally led inquiries into pandemic preparedness practices. However, necessary funding had not materialised at the time of this AAR. Updated action plans that are continually communicated to relevant stakeholders through training and information dissemination would constitute good practice in preparation for an unknown future health emergency. Interestingly, Finland's new membership in NATO was emphasised as a potential facilitator for simulation exercises in the health emergency area as well.

5.4 Roles and responsibilities

5.4.1 Transparency in the advice-making process

The first type of transparency that participants noted as good practice relates to internal communication between key advice-making bodies. Transparency is "the availability of information about an organisation's or actor's internal processes and decisions" [79]. Transparent advice-making, therefore, is explicit about how and why particular advice has been developed. It should be clear what evidence was used and how it was interpreted. Workshop discussions raised that transparency was not always adequate in regard to school closure advice. In order to facilitate this type of transparency, roles and responsibilities should be clearly laid out and communication channels need to be strengthened and maintained. Misalignment of expectations regarding roles and responsibilities complicates the advice-making process during crisis, when time and resources are scarce and needed elsewhere. Disagreements in the media are not necessarily always counterproductive, assuming it is clear why different advice-making bodies are offering different advice. But when the explanation for the differences is not clearly and honestly communicated, disagreements between the two key advice-making bodies risks leading to confusion and apathy among the regions, teachers, parents and the public in general.

5.4.2 Transparency in decision-making

The other type of transparency participants noted as good practice relates to the decision-making process and the objectives of decisions. The rationale (whether value- or science-based) underlying a decision should be made explicit and should include clear articulation of how to know when the objectives motivating the decision have been met. Objectives underlying a decision could very well include political or other goals. But communicating what the decision is trying to achieve is essential to gain understanding and engagement among key stakeholders and audiences. Some workshop participants voiced the opinion that it should be legally required to define the explicit objectives of key NPIs and to articulate how the NPIs would help achieve those objectives. This is consistent with the Finnish Parliament's Constitutional Law Committee's position that the government needs to explicitly define the criteria to end a restrictive measure [79]. Regardless of legality, transparency should be considered good practice as an essential component of evidence-based decision-making.

5.4.3 Transition from emergency/crisis management to management under stress

In the workshop, participants noted that good practice should include the establishment of clear guidelines for how and when to scale down from emergency/crisis management and return to more standard management procedures characterised by less urgency and more reliance on empirically proven or evidence-informed advice. There was a sense that government agencies involved in pandemic management were in constant crisis mode, even after the states of emergencies (from 16 March to 16 June 2020 and from 1 March to 27 April 2021, respectively).

Crisis mode meant that decisions were centralised and that evidence was subject to less scrutiny and discussion among the full range of relevant experts and stakeholders, even within THL. Some AAR participants stated that appropriate advice-making was effectively short-circuited due to the sustained application of an emergency management approach (following the precautionary principle). Participants thought that this approach was no longer necessary once advice-making bodies knew more about the virus, had more experience dealing with the pandemic and had access to evidence regarding the effectiveness of school closures. They expressed that relying more on the proportionality principle rather than the precautionary principle would have been beneficial, as it would have allowed for more evidence-based deliberations. This resonates with the Finnish Parliament's Constitutional Law Committee, which argued in favour of a high threshold for the use of emergency powers and for prohibiting precautionary use of emergency powers [79]. The Emergency Powers Act lays down sunset clauses and sets restrictive criteria for the use of emergency powers, including that they should be necessary and proportionate to the specific purpose of the Emergency Power Act and that they can only be used if the crisis cannot be controlled by their regular powers [31]. Long stretches of the pandemic, the argument goes, could mostly be controlled through regular administrative procedures and powers.

Workshop participants expressed concern that future responses to health emergencies could be political rather than proportional to the threat. If strong leadership during a pandemic is equated with strong restrictions, then this could constitute a threat to the proportionality principle (that the measures implemented are commensurate to the threat) and evidence-based advice-making. Participants noted that good practice would not only encompass provisions outlining when implemented measures would be removed, but would also provide clear guidelines for when and how organisations should move away from emergency mode.

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Annex 1. Informed consent form

After-action review of the Finnish advice-making process for school interventions during the COVID-19 pandemic

The goal of this project is to conduct an after-action review (AAR) on evidence-based decision making during the COVID-19 pandemic. This AAR looks at the advice-giving process in Finland for the continued operation of schools during COVID-19 with particular emphasis on the Omicron phase. The central question is how evidence has been used to inform recommendations.

You have been identified as a stakeholder who has been part of the advice-making process, and this is why you are asked to participate in this exercise.

- Your participation in the interview/workshop is entirely voluntary, and if you agree to take part, you are free to change your mind or withdraw at any time without consequences.
- If you agree to take part in the interview/workshop, any processing of your personal data will comply with Regulation (EU) 2018/1725 and Finnish national law. ECDC is the data controller of this processing operation, and the data is collected and stored by the Amsterdam Institute for Global Health and Development on its behalf, in its role as processor of the data.
- With your agreement, we may want to quote some of what you say in a country and/or aggregated report, but we will do so in a way that ensures that it cannot be ascribed to you.
- With your agreement, we may want to include your name and institutional affiliation in an Annex that lists the informants who have contributed to this case study project.
- With your agreement, we may want to record the conversation which will only be used for our notes and be deleted after the project finishes.

As a data subject, you have the right of access and rectification of your personal data. Feel free to ask any questions you may have about the interview or the processing of your personal data. If you have questions after the interview/workshop is over, please contact Emma Wiltshire at ECDC: emma.wiltshire@ecdc.europa.eu.

Please check 'yes' or 'no' by each of the following statements, and then sign and date the document in the space provided below.

Statements	Yes	No
1. I agree for this conversation to be audio recorded and understand that the recording will be used for note-taking only and deleted after the project.		
2. I agree to having my words used as quotes in the final report, and I understand that my words will be anonymised so that it will not be possible to ascribe any of my comments to me.		
3. I agree to having my name and institution included in an Annex at the end of the final report that lists the informants who have contributed to this case study project.		

Signature: _____

Name (in CAPITALS): _____

Place & Date: _____

Annex 2. Interview guide

Part 1: What happened, who was involved and how did they make sense of the situation?

Involvement

- What does your institution do? What is your role?
- What was the role of your institution in the Omicron advice-giving process? How were you included?
- If not included: Did you want to be? Why were you not involved in the advice-making process?
- If role in advice-making: can you map out the various stakeholders or groups that you were involved in during the advice-making process?

Part 2: Why did it happen? How did evidence contribute? Why did the decision develop the way it did?

Evidence in advice-making

- What struck you as most influential on the way that the advice-making process developed? Why?
  - Think beyond research evidence, also think about resources, population characteristics or environmental and organisational contexts.
- To what extent do you feel that the advice made was 'evidence-based'? Why/why not?
  - What value and weight did experts and decision-makers place on different pieces of evidence?
  - What happened when there was no conclusive scientific evidence available?
  - What types of scientific evidence were looked at? How was this evidence gathered? How was it interpreted?
  - What other factors were looked at alongside the evidence and how were these balanced against each other when decisions were made?
- How has evidence been used to inform decisions made during this period? How did decision makers adapt evidence to apply it in their own context?
  - How does it compare to earlier waves?
- Could you give an example of when evidence was used well/not used well?
  - How did you determine if evidence was used well or not well?
  - What monitoring mechanisms do you use?
- Who assessed the impact of the advice and how did they do so?

Implementation

- How did you understand and implement the advice? Were there any unclear aspects?
- Were you able to provide feedback about implementation?
- How did the advice change the epidemiological situation?

Part 3: What can be learned? What should change? How can change be implemented and monitored?

- What were the main lessons learned from this event, with respect to evidence-based decision-making?
- What should change, with respect to the evidence-based decision-making process?
- Have you seen any changes in the decision-making process since the event? To what extent have these changes benefitted the use of evidence in the process?

Closing

- Is there anything else you would like to add?

Annex 3. AAR workshop programme overview

Time	Activities
13 September – Arrival	
	• Morning: consultants arrive (ECDC staff is already there) • Early afternoon: brief coordination meeting • Afternoon: TBD (could be visits to key schools or municipalities)
14 September – Workshop 'The use of evidence'	
9:00–10:00	**Session 1: Introduction of project** The goal of the AAR is to foster opportunities for discussion and dialogue on the role of evidence in the decision-making process as to whether schools should close for physical attendance after the 2021–2022 winter holiday (Omicron variant). The process appeared to have been characterised by conflicting perspectives as to whether schools should close for an extended period or whether ramping up other non-pharmaceutical interventions would suffice. Participants are invited to reflect on the advice-giving and decision-making process and help identify best practice suggestions for improvement. • Word of welcome (5 min) – TBD, THL • Introduction of project (10 min) – ECDC • Brief round of introductions (15 min) • Review of AAR activities (30 min) – Olivier Rubin, Professor Department of Social Sciences and Business, Roskilde University & Erik Baekkeskov, senior researcher, School of Social and Political Science, Melbourne University
10:30–12:30	**Session 2: What happened and who was involved?** In this session, we plan to discuss a preliminary timeline of key decision-making/advice-giving events and trace the processes (formal and informal) related to advice relevant for the decision of whether schools should close for physical attendance after the 2021–2022 winter holiday This also entails mapping out the various stakeholders that participants had contact with during the response, including agency roles.
12:30–13:30	Lunch & break
13:30–16.30	**Session 3: Why did the decision develop the way it did? How was evidence used?** Here we will discuss how evidence influenced the advice-giving/decision-making process as well as what evidence was available and how it was used (or not used). The purpose of the session is not to uncover 'mistakes' or 'good decisions' (with the benefit of hindsight), but to understand why the decision-making dynamics unfolded as they did and what role evidence played in these dynamics. Participants will be asked to identify how and when evidence was brought into the advice's decision-making process, and how it was responded to.

15 September – Workshop 'lessons learned'	
09:00–10:15	**Session 4: How did decision-makers make sense of the situation?** In this session, participants' opinions will be collected to get a variety of perspectives on why the decision-making process of the formal advice unfolded as it did. Participants should also reflect on how various professional backgrounds and experiences, institutional practices and procedures, and the type and availability of evidence shaped and defined sensemaking.
10:30–11:30	**Session 5: What can be learned? Any need for change? How can new initiatives be implemented and monitored?** Identify and discuss major lessons learned about the use of evidence during key decision-making processes regarding advice related to the decision whether schools should close for physical attendance after the 2021–2022 winter holiday. What can be done to improve gaps or challenges and to sustain best practice?
12:00–13:00	**Session 5 (continued)**
13:00–14:00	**Lunch and break**
14:00–15:00	**Session 6: Wrap up, closing and evaluation** Opportunity to reflect on the consultation process itself, but also on the outcomes. Agreement on the next steps, including the writing process for the final report. The session will be closed with a brief evaluation.
16 September – debrief and follow-up interviews	
	Possible follow-up interviews
13:00–14:00	**Session 7: Hot debrief** Consultants will review preliminary findings with all interested parties, verify and validate the findings, and review agreements for next steps.

Annex 4. Timelines

The following timelines were provided by the Finnish Institute for Health and Welfare (THL). Links to English or Swedish content are provided, if available; otherwise, content may be in Finnish.

Timeline for school closure decision/non-decision in January 2022

- First cases of the Omicron variant appeared in December, fast spread in December–January.
- Extending school holidays/switching to distance learning in early January was considered.

21.12.2021 THL published its statement to STM regarding the activation of the "emergency break mechanism", which was amended, without STM's request, by an evaluation of children's situation (part 5 in the statement).

"*THL regards school closure as an ineffective measure. Reducing contacts of children and youth for example through school closures or extending the holiday period will have no remarkable effect on the course of the epidemic, and therefore is not justifiable in the light of epidemiological data. What socially active adults do, holds the largest significance.*" The statement was largely based on an earlier THL working paper "The COVID-19 in children and youth in autumn 2021, Finland" (25.11.2021), that was partly based on results of a scientific study: "Closing lower secondary schools had no impact on COVID-19 incidence in 13-15-year-olds in Finland".

21.12.2021 The Helsinki Metropolitan Area coronavirus coordination group (here: HMACCG) agreed that schools will start the spring term as normal (on 10.1.2022) with contact teaching. This applied to both comprehensive and secondary education. The decision was made in line with the principle of "children and young people first" stated in the government's Hybrid strategy to manage the COVID-19 epidemic. If necessary, the situation would be reassessed closer to the start of the term.

21.12.2021 According to media, the government negotiated, along with other measures, the order in which different school grades were to be closed, and the most urgent topic was the closure of upper secondary school (for 16–19-year-olds). In the end, the government did not recommend distance learning to primary and lower secondary schools, or to second grade (16 to 19 years). Furthermore, the government stated that The Ministry of Education and Culture (OKM) and THL were to update their earlier recommendations for education and training providers (see next).

22.12.2021 THL and the Ministry of Education and Culture (OKM) published their updated recommendations for education and training providers. The recommendations did not concern school closure.

23.12.2021 The regional coronavirus coordination group of Helsinki and Uusimaa Hospital district (here: HURCCG) recommended the Regional State Administrative Agency for Southern Finland (esavi) the closure of different public spaces but noted that the closure does not concern schools (source: HURCCG meeting minutes 23.12.; see HURCCG and esavi roles in pandemic response).

3.1.2022 The Metropolitan Area coronavirus coordination group outlined that the right for contact teaching should be secured for schoolchildren and students (stated in meeting minutes 3.1.2021, not in media release).

5.1.2022 In a regional coronavirus coordination group of Helsinki and Uusimaa Hospital district meeting, the other municipalities (in HU district) endorsed the above statement (source: HURCCG meeting minutes 5.1.2021).

5.1.2022 According to media (Yle and HS), STM intended to propose school closure, beginning the spring semester (from 10.1.) in distance learning. STM had posed a question to the Ministerial Working Group on Health and Social Services: "*Should distance learning at schools still be considered, so that we could still promote the vaccination coverage a bit (with 3rd doses to the elderly being underway)*?". STM was very worried about the effects of school opening on the core functions of the society; minors accounted for a large part of infections at the moment, and the spreading from schools to parents would mean workplace absenteeism (on critical areas), including teachers. The proposition was to be presented to the Ministerial WG on Coordinating COVID-19 Response, convening on 7.1. to decide on recommendations for further restrictions.

The Minister for Education and Culture (Li Andersson) stated: "*Regions already have the possibility to switch schools or classes to distance teaching if necessary. Overall, the government may give recommendations, but regions hold the authority on school closure decisions, not the government.*"

5.1.2022 A group of Infectious Disease Physicians of large cities and hospital districts published an open letter in favour of keeping the schools open. The letter refers to "a thorough report from THL on 20.12.2021"

6.1.2022 In media, the Mayor of Helsinki (Juhana Vartiainen) said the schools in Helsinki will principally begin in contact teaching after holidays (10.1.): "*We, of course, are waiting for Government's outline, that is already long overdue regarding schools*".

7.1.2022 In media, stakeholders commented on school closure decisions.

Oona Mölsä, esavi: "*The schools will begin in contact teaching after holidays. We (avi) are also waiting for the conclusion from the meeting of Ministerial WG on Coordinating COVID-19 Response. Thereafter, STM will possibly direct us with a guidance letter. This is how the process has also gone before. The final deliberation is made in regions and municipalities.*" In practice, for example, the municipalities in the Metropolitan Area and the Helsinki and Uusimaa Hospital district would review the necessity and proportionality in the current epidemiological situation. AVI would gather these stakeholders' views to make the decision.

Markku Mäkijärvi (chairman of HURCCG, member of HMACCG, CEO of HUS) did not take a stand on school closure but refers to "*a large part of experts to seemingly agree that the benefits would be small, if any*". "*We have not formed a position, as it hasn't been asked yet. In the whole range of interventions, distance learning is quite a minor tool. Depending on how this proceeds, some resolutions would be made possibly next week*".

7.1.2022 In media, chairman Olli Luukkainen of the Trade Union of Education (OAJ), took a position in favour of distance learning, and would like to extend it to smallest children and pupils requiring special support. OAJ's position was based on the risk of school closures as a result of most teachers getting sick.

7.1.2022 Ministerial working group on COVID-19 proposed measures to curb worsening epidemic situation. "*In line with the recommendation of THL, no national recommendation on distance learning was issued.*" Statement on 21.12.2021.

11.01.2022 The Metropolitan Area coronavirus coordination group announced that in comprehensive and upper secondary education, contact teaching will continue and every effort will be made to secure the conditions for continuing contact teaching with all available means. Stated in the context of children's hobbies: "*The Metropolitan Area coronavirus coordination group's decision-making is based on the principle of 'children and young people first'. This means that restrictive measures in regard to children and young people are to be avoided and will only be used as a last resort, if absolutely necessary. The coordination group always evaluates the restrictive measures from the perspective of the best interests of the child and their priority.*"

Timeline for school closures in winter/spring 2021

May 2020 – On 6 May 2020, the government adopted a resolution on **a plan for a hybrid strategy** to manage the COVID-19 crisis. It aimed to:

- prevent the spread of the virus in society,
- safeguard the carrying capacity of the healthcare system and
- protect people, especially those in risk groups.

Autumn 2020 – The **action plan** for implementing the government's hybrid strategy, adopted in autumn 2020, divided the COVID-19 epidemic into three phases. This classification was used to assess the development of the epidemic and the need for recommendations and restrictions and to ensure that they were appropriately targeted in Finland. Phases of the epidemic (Figures 1A and 2A):

- Stable level
- Acceleration phase
- Community transmission phase

The action plan was updated for January–May 2021.

January 2021 – In its meeting on 25 January 2021, the government decided to supplement the action plan implementing the hybrid strategy to combat COVID-19. In line with the decision, **the action plan was supplemented with three new sets of measures (Tiers 1-3)** aimed at combating the acceleration of the COVID-19 epidemic and, in particular, at curbing the spread of the more infectious virus variant in Finland (Figures 1A and 2A).

Figure 1A. Phases of the epidemic and tiers of prevention measures (in Finnish)

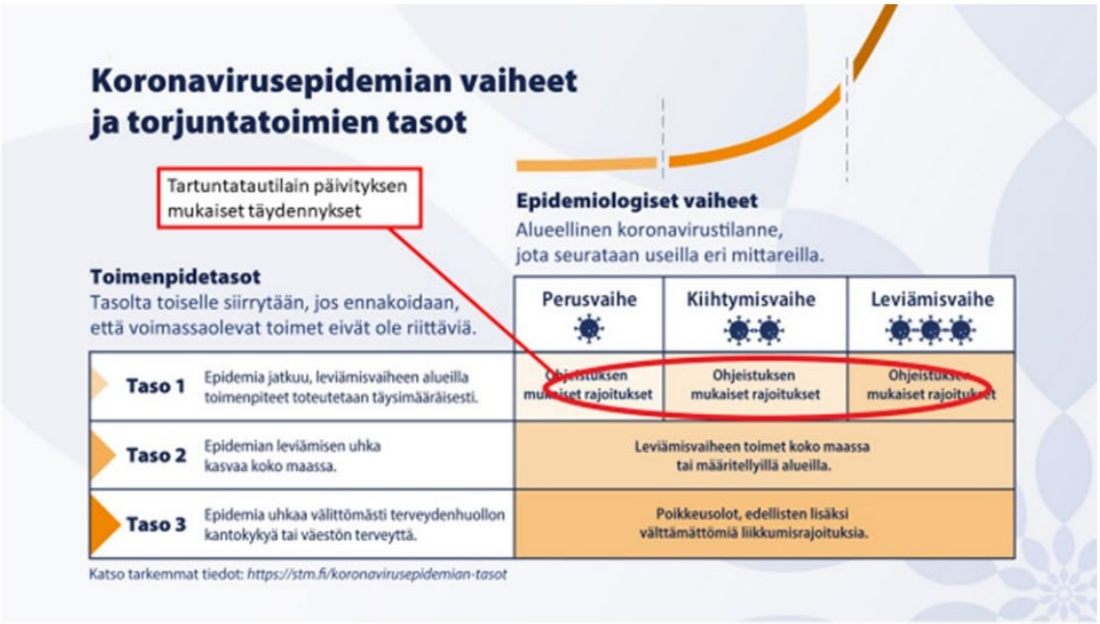


Figure 2A. Phases of the epidemic and tiers of prevention measures (in English)

	Phases of the epidemic Regional covid-19 situation monitored using various indicators		
Tiers of prevention measures Transition to the next tier if it is anticipated that the current measures will not be sufficient	**Stable level**	**Acceleration phase**	**Community transmission phase**
Tier 1	Restrictions in place according to the guidelines	Restrictions in place according to the guidelines	Restrictions in place according to the guidelines
Tier 2	Measures for the community transmission phase in place throughout the country or in specified areas		
Tier 3	Emergency conditions, necessary restrictions are increased in addition to the restrictions above		

February 2021 – As the disease situation had deteriorated again, at the end of February 2021, a shift to more centralised control took place. In its meeting on 24 February 2021, the government decided to impose more stringent measures to combat the COVID-19 pandemic and to **transition to tier 2 of prevention measures**.

The government stated that there were grounds for transition to tier 2 based on THL's statement given on 23 February 2021 (See the statement here, attachment 3).

- With effect from **8 March** and as part of the additional measures for tier 2, **the upper grades of comprehensive school were instructed to switch to temporary distance learning** in areas where the epidemic was in the community transmission or acceleration phase. School closure was mentioned as a last resort measure.
- More info: Exceptional teaching arrangements in basic education.
- This led to e.g. **the transition of primary, secondary and tertiary education to distance learning**. The upper classes were finally in distance education from 8–28 March, 2021, the secondary and tertiary students even longer.

March 2021

1.3.2021 **The government, in cooperation with the President of the Republic, declared a state of emergency in Finland** due to COVID-19. In its plenary session, the government declared that the country is in a state of emergency as referred to in section 3, paragraph 5 of the Emergency Powers Act.

2.3.2021 The Regional coronavirus coordination group of Helsinki and Uusimaa Hospital district considered that the necessity aspect of distance learning was met and **recommended to the Regional State Administrative Agency of Southern Finland the transfer of secondary schools to distance learning throughout Uusimaa from 8–28 March.** The group also strongly recommended that municipalities decide on the transition to upper secondary education.

4.3.2021 The Regional State Administrative Agency of Southern Finland, with the pursuant to section 58 §:n 1 of the Infectious Diseases Act, ordered the premises of **educational institutions located in its area of operation to be closed so that the premises may not be used for teaching grades 7–9.**

The order was valid: **8–28.3.2021**

5.3.2021 THL stated that efforts must now be made to prevent the epidemic as effectively as possible, quickly and with the least possible delays, in order to avoid a more severe epidemic phase. The statement did not include distance learning as such.

9.3.2021 The Regional State Administrative Agency for Southern Finland, pursuant to section 58 §:n 1 of the Infectious Diseases Act, ordered the premises of educational institutions to be closed so that the premises may not be used for the organisation of teaching in grades 7–9 **or additional education in accordance with the Basic Education Act.**

The order was valid: **10–28.3.2021**

18.3.2021 HURCCG discussed the necessity of distance learning of grades 7–9. It was said that municipalities can make school closure decisions themselves if wider closures are not necessary. **If, due to the epidemic situation, there is a need to reduce contacts, there is no reason to dismantle distance learning**.

On the same day, THL proposed that if the number of cases in Espoo, Helsinki, Kauniainen, Turku, and Vantaa did not decline during week 11, these municipalities would as soon as possible **introduce mobility and residence restrictions** to combat a serious danger to human life or health. The statement did not include distance learning as such.

24.3.2021 Due to the severity of the epidemic situation, **HURCCG recommended that the Regional State Administrative Agency of Southern Finland continue to close the premises of educational institutions from 29 March to 5 April**, concerning all municipalities in Uusimaa. Regarding secondary education, the decisions were municipality specific, but it was recommended that they be continued at least until 5 April.

25.3.2021 The Regional State Administrative Agency of Southern Finland, pursuant to section 58 §:n 1 of the Infectious Diseases Act, continued the order of closing the **educational institutions located in the hospital districts of South Karelia (Etelä-Karjala), Helsinki and Uusimaa, Tavastia Proper (Kanta-Häme) and Päijänne-Tavastia (Päijät-Häme).**

The order was valid first from **29.3. to 5.4.2021** and then on 30 March **continued to 6–11.4.2021**.

30.3.2021 HURCCG summarised that based on the epidemiological data available, the Hospital District of Helsinki and Uusimaa (HUS), municipalities outside of the metropolitan area, as well as metropolitan area coronavirus coordination group recommended continuing distance learning until 11 April 2021.

The order of closing the educational institutions in the hospital districts mentioned above was **continued from 6–11.4.2021** (see above).

April 2021

1.4.2021 THL published a news item: **The risk of infection after exposure in school continues to be significantly lower** than the risk of infection in other situations involving exposure.

6.4.2021 HURCCG recommended that upper secondary schools, secondary schools, and liberal arts institutions **transition to a hybrid model (alternating between distance and contact learning)** as of 12 April or 15 April, and given the epidemic situation in the region, distance learning if the hybrid model is not possible.

The Regional State Administrative Agency of Southern Finland was not going to pursue the decision to close educational premises for grades 7–9. Municipalities were able to make decisions about their own area, if necessary.

For example, in the Helsinki metropolitan area, **in the upper secondary schools of Helsinki, Espoo, Vantaa and Kauniainen, a hybrid model was introduced**, in which the year classes alternated in distance and contact education. High schools and vocational schools continued in distance education until the end of the fourth period (until **about 15 April 2021**). After that, half of the high school students and a third of the students in the profession could be in contact hours at a time.

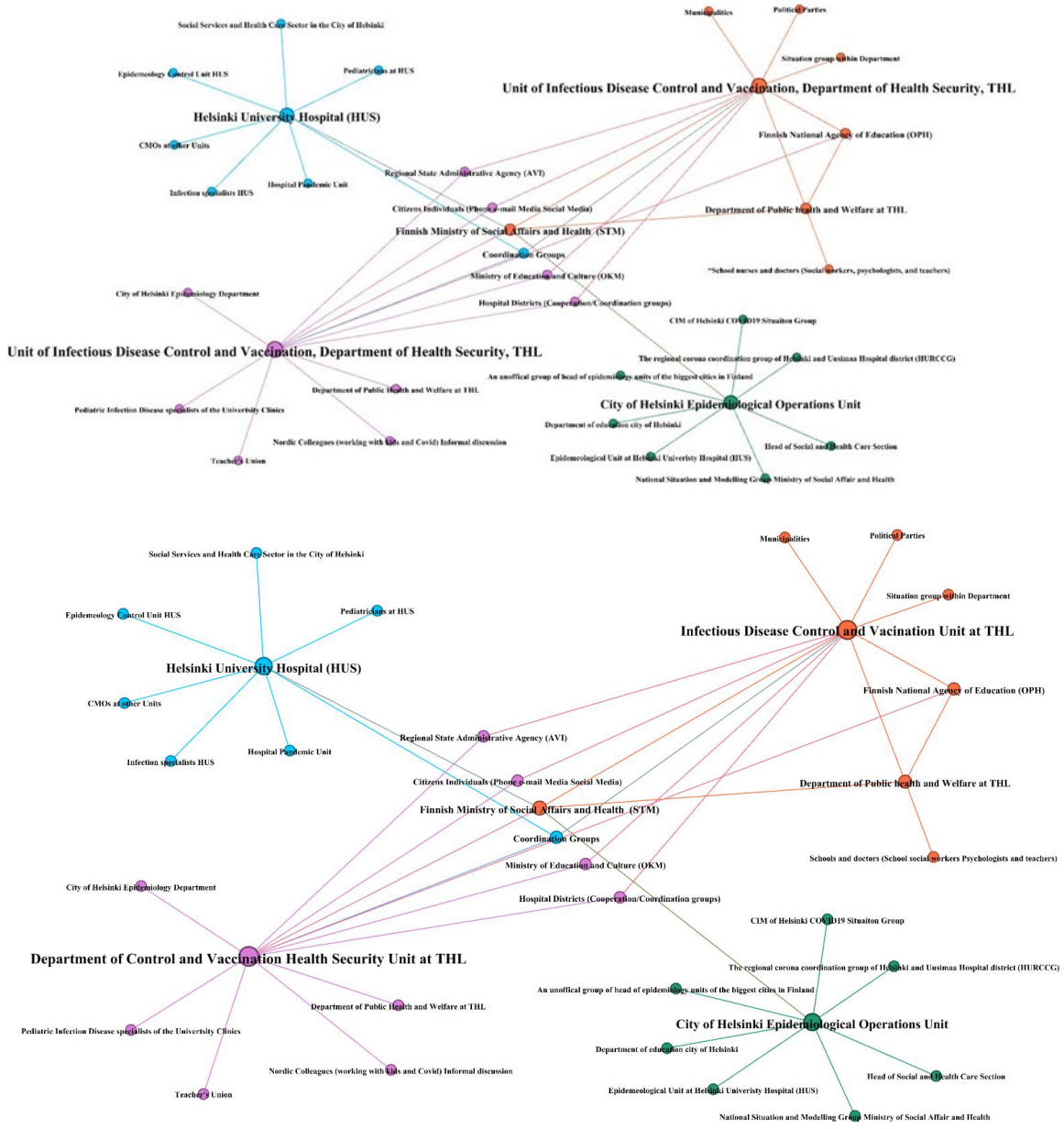
May 2021

In its resolution on 6 May 2021, the government stated that the use of nationwide tiers of COVID-19 prevention measures could be **discontinued**.

On 27 May 2021, the government issued a resolution on an update of the hybrid strategy to manage the COVID-19 epidemic. The goal was to keep the COVID-19 epidemic under control in Finland until a sufficient vaccination coverage had been reached and the risk of a resurgence in the epidemic was significantly lower.

Annex 5. Disaggregated stakeholder mapping and data

Figure 3A. Disaggregated visual representation of the network in accordance to the importance of the nodes, connecting 30 nodes that were drawn by five individuals during the workshop



The size of the nodes denotes the importance of the network, as indicated by the workshop participants.

European Centre for Disease Prevention and Control (ECDC)

Gustav III:s Boulevard 40
16973 Solna, Sweden

Tel. +46 858601000
ECDC.info@ecdc.europa.eu

www.ecdc.europa.eu

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