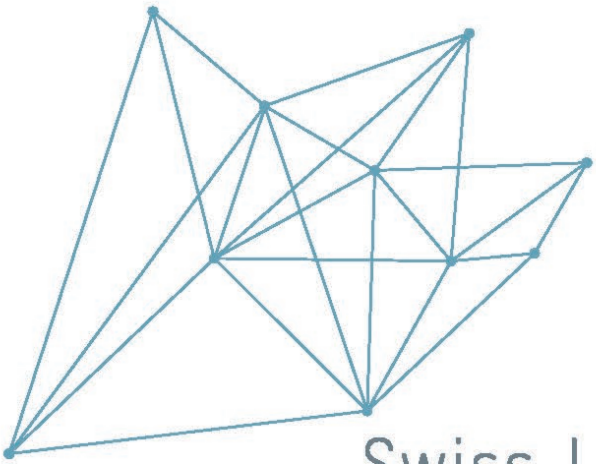

Swiss Learning Health System

Strengthening Pandemic Preparedness: Multi-Perspective Surveillance for Switzerland

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Pandemic preparedness, population-based surveillance, syndromic surveillance, COVID-19, SARS-CoV-2, influenza, RSV

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List of abbreviations

ARI	Acute Respiratory Infections
BAG	Bundesamt für Gesundheit
CH-SUR	COVID-19 Hospital-Based Surveillance
FOPH	Federal Office of Public Health
FORS	The Swiss Centre of Expertise in the Social Science
ILI	Influenza-like Illness
RSV	Respiratory Syncytial Virus
SPSP	Swiss Pathogen Surveillance Platform
SPSU	Swiss Paediatric Surveillance Unit
SSPH+	Swiss School of Public Health
SUR-PRISE	SURveillance of infectious diseases among health PRofessionals In SwitzErland) Study Group
WHO	World Health Organization
ZSAC	Zurich SARS-CoV-2 Cohort
ZVAC	Zurich SARS-CoV-2 Vaccine Cohort

Policy Briefs and Stakeholder Dialogues of the Swiss Learning Health System

The Swiss Learning Health System (SLHS) was established as a nationwide project in 2017, involving academic partners across Switzerland. One of its overarching objectives is to bridge research, policy, and practice by providing an infrastructure that supports learning cycles.

Learning cycles enable the continuous integration of evidence into policy and practice by:

- continuously identifying issues relevant to the health system,
- systemizing relevant evidence,
- presenting potential courses of action, and
- if necessary, revising and reshaping responses.

Key features of learning cycles in the SLHS include the development of **Policy Briefs** that serve as a basis for **Stakeholder Dialogues**.

A **Policy Brief** describes the issue at stake by explaining the relevant contextual factors. It formulates a number of recommendations to address the issue (evidence-informed recommendations, when available), and for each possible recommendation, it explains relevant aspects and potential barriers and facilitators to their implementation. Policy Briefs serve as standalone products to inform interested audiences on potential courses of actions to address the issue, as well as input for Stakeholder Dialogues.

In this case, the Policy Brief was developed using a co-creation approach. Rather than concluding the process with a Stakeholder Dialogue, the authors engaged key stakeholders at the very beginning through a co-creation workshop. This early engagement allowed researchers, policymakers and other actors to collaboratively identify priorities, shape the structure of the brief, and provide ongoing feedback throughout its development.

Key Messages

Background and Context

Pandemic surveillance is essential for detecting, monitoring, and responding to outbreaks of infectious diseases. Effective surveillance systems integrate various methods to track disease trends, assess healthcare burden, and guide public health interventions. In Switzerland, surveillance of illness caused by the three respiratory pathogens with greatest potential for pandemics and/or the largest burden of disease, SARS-CoV-2, influenza and RSV, relies on multiple complementary systems. The Swiss Sentinel Surveillance System (Sentinella) monitors acute respiratory infections and influenza-like illnesses through a network of general practitioners. This system is complemented by the Mandatory Reporting System and wastewater surveillance. Hospital-based surveillance (CH-SUR) was also used to detect severe cases of COVID-19 and influenza during the COVID-19 pandemic. During the COVID-19 pandemic, various other initiatives were set up by research institutions to supplement the core surveillance activities, for example, the Corona Immunitas network set up seroprevalence and related studies throughout Switzerland.

The Issue

While Switzerland has a strong surveillance system for respiratory diseases, we identified several key issues that should be addressed to strengthen pandemic preparedness, notably:

- Gaps in surveillance
- Limited connection between academia and public health administrations
- Low public trust and support

Policy options for Action

Policy option 1: Expand surveillance

To improve early detection and situational awareness in Switzerland, the following activities could expand the surveillance infrastructure:

- Improve Sentinella GP network participation by increasing GP recruitment and streamlining data collection
- Implement community-based participatory surveillance through expanding initiatives like GrippeNet would help capture data on symptomatic individuals who do not seek medical care
- Consider reintroducing semi-regular sero-epidemiological surveys across language regions
- Enhance surveillance in specific populations, e.g. persons living in nursing homes
- Introduce hospital-based syndromic surveillance by establishing a Severe Acute Respiratory Infection (SARI) syndromic surveillance system in hospitals

Policy option 2: Bridge the gap between administration and academia

A structured body that improves coordination between academia and public health authorities could be established. This vessel would facilitate regular discussions to align research with policy needs and ensure effective surveillance strategies while reducing working in silos.

Policy option 3: Build public trust

To build public trust and increase acceptance of health surveillance measures, targeted surveys would characterize public knowledge, beliefs, and concerns. This would help identify misconceptions, awareness levels, participation barriers, and trusted information sources. Organizations like the Swiss Centre of Expertise in the Social Sciences (FORS), that are experienced in national population-based surveys, could lead this effort. The findings would guide cost-effective communication strategies and tailoring outreach to skeptical persons or groups with lower public trust.

Implementation Considerations

Barriers to implementation include:

- Unclear perceived benefit to improve surveillance and get involved in participatory surveillance in general public
- Lack of resources, including human resources and time to set up new surveillance systems
- Limited prioritization of pandemic preparedness

Facilitators to implementation include:

- Use existing networks, such as professional networks (e.g. MFE; Medix), to engage general practitioners to participate in Sentinella
- Leverage expertise from Corona Immunitas seroprevalence studies to help set up new seroprevalence studies
- Use existing networks such as SSPH+ to help bridge the gap between academia and administration
- Build on existing surveillance systems for specific populations (for example the SURPRISE+ healthcare worker cohort)

Background and Context

The COVID-19 pandemic was an unparalleled public health crisis which challenged countries' surveillance systems. Building on the experience of the COVID-19 pandemic, this policy brief aims to review surveillance efforts on the "big three" respiratory diseases—COVID-19, influenza, and respiratory syncytial virus (RSV)—to ensure preparedness for future pandemics in Switzerland.

Overview of different surveillance methods

International guidelines emphasize the importance of integrating diverse surveillance methods. The World Health Organization's "Mosaic Framework" outlines three domains for respiratory virus surveillance: 1) detection and assessment of emerging threats, 2) routine monitoring of epidemiological trends, and 3) guiding intervention strategies (1). The focus of this policy brief will be primarily on domains 2 and 3 and will focus on the surveillance of influenza, SARS-CoV-2 or RSV. These pathogens are currently endemic; strengthening routine monitoring and response systems for them supports pandemic preparedness by building and maintaining flexible infrastructure, ensuring continuity of surveillance expertise, and refining mechanisms for public health decision-making.

Surveillance systems are often structured in a pyramid model, whereby different levels capture varying degrees of disease occurrence in the population (Figure 1). The stage of the pandemic can mean that different types of surveillance can be more or less useful, for example, sero-epidemiological surveys to monitor seroprevalence is a valuable indicator early on in the pandemic but can be less informative as time goes on and more individuals are vaccinated, particularly if it is not easy to distinguish antibodies from infection and those from vaccination. Different surveillance systems will also have various issues with timeliness, costs and feasibility.

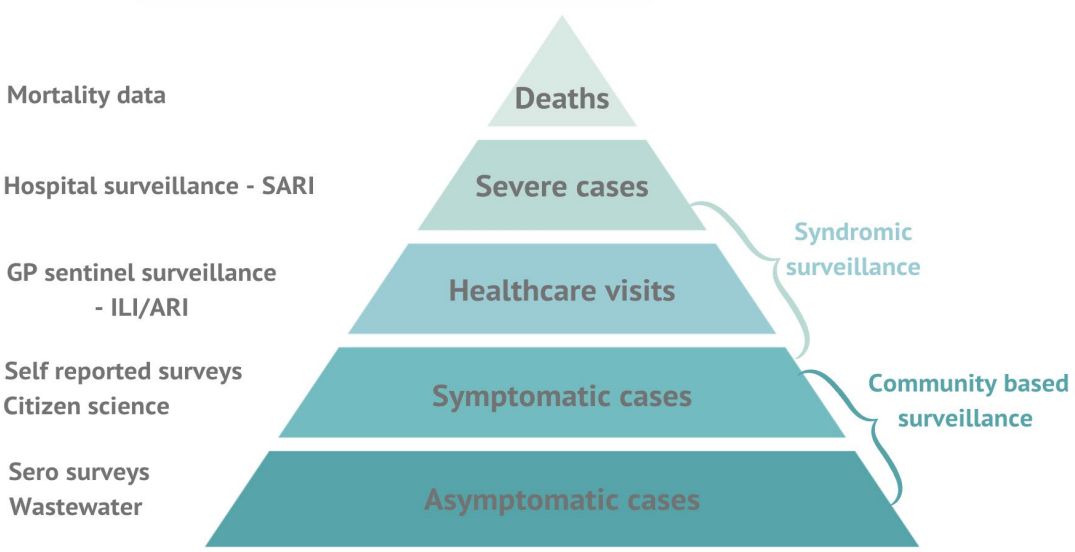

Figure 1: Surveillance pyramid, adapted from figure in Ryu et al.. Epidemiology and Transmission Dynamics of Infectious Diseases and Control Measures. Viruses. 2022 (2)

When monitoring epidemiological characteristics, as described in the second WHO domain, surveillance occurs at multiple levels of the pyramid to capture trends, risk factors, and healthcare burden in both pandemic and non-pandemic periods. At the base of the pyramid, participatory or community surveillance requests individuals to self-report symptoms which identifies trends among individuals that do not seek medical care. Sero-epidemiological surveys also operate at this level which enables estimates of population-level exposure and immunity, both for persons with and without symptomatic infections and among those vaccinated. Sentinel surveillance for influenza-like illness (ILI) and acute respiratory infections (ARI), with laboratory confirmation, represent the middle of the pyramid and provide insights into patients who present at outpatient healthcare facilities. Hospital surveillance, healthcare capacity monitoring and mortality surveillance capture information on severe cases and the strain on health systems. Each surveillance type contributes a distinct perspective, and when combined, they provide a more complete understanding of transmission dynamics, affected groups, and the impact across healthcare settings over time.

The third domain outlined by WHO — guiding intervention strategies —, evaluates the impact of public health measures, vaccines, and clinical interventions by relying on surveillance approaches that span different levels of the pyramid. Additionally, vaccine effectiveness studies, mobility studies, and assessments of non-pharmaceutical interventions (NPIs) provide more targeted data on public health strategies and intervention outcomes. At the upper levels, cohort and case-control studies in specific settings, such as hospitals and long-term care facilities, offer more detailed insights into infection control measures and their effectiveness, although it should be noted that not all surveillance activities in special populations will be captured by the surveillance pyramid model. These combined surveillance activities provide evidence on vaccine uptake, intervention success, and changes in disease transmission over time which helps decision-making.

Respiratory virus surveillance in Switzerland

Switzerland has a multifaceted surveillance system to monitor infectious diseases, integrating several key components which are summarised in Figure 2. The Swiss Sentinel Surveillance System (Sentinella) was established in 1986 and is a voluntary network of approximately 170 general practitioners, internists and pediatricians (3). Around 50% of the network are general practitioners, around one third are internists and 15% are paediatricians. Sentinella focuses on monitoring selected infectious diseases and the estimated rates are then extrapolated to the general population. A subset of the sentinel physicians send samples to the national reference centre for testing for SARS-CoV-2, influenza (including type A and B and various subtypes), RSV and other respiratory pathogens. In addition, the Mandatory Reporting System requires healthcare professionals and laboratories to report specific communicable diseases (including Influenza and SARS-CoV-2) to cantonal authorities and the Federal Office of Public Health (FOPH). Hospital-Based Surveillance (CH-SUR) was set up in 2018 for the surveillance of hospitalized patients with laboratory confirmed influenza in Geneva. This system was adapted in 2020 to also capture information on patients hospitalized with laboratory-confirmed COVID-19 and expanded to more sites (4). There were up to 21 hospitals in Switzerland participating in this surveillance by the time it finished in 2024.

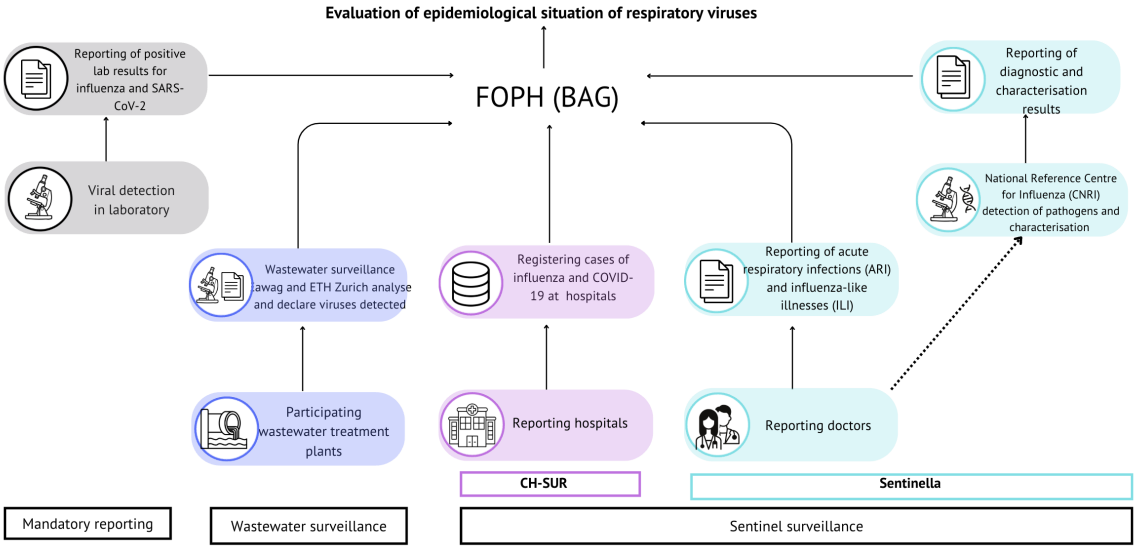

Figure 2: Surveillance systems of Switzerland, adapted from figure from the FOPH Rapport annuel sur les virus respiratoires 2023/2024/Jahresbericht respiratorische Viren 2023/2024 (5), available from https://www.bag.admin.ch/bag/de/home/krankheiten/krankheiten-im-ueberblick/grippe.html#par_tabs (accessed 11.12.2024)

Wastewater surveillance in Switzerland was set up during the COVID-19 pandemic and is designed to monitor the spread of SARS-CoV-2, influenza A and B, and RSV by analyzing wastewater, providing early detection of community-level infection trends (6). Researchers at ETH Zurich also sequence the SARS-CoV-2 found in the wastewater to monitor variants. In addition, the Swiss Pathogen Surveillance Platform (SPSP) has been set up, which is a one-health platform that facilitates near real-time sharing of pathogen whole genome sequencing data and associated clinical and epidemiological metadata to support surveillance and research (7). It integrates data across human, veterinary, environmental, and food health sectors. There is also the Swiss Paediatric Surveillance Unit (SPSU) which is a national voluntary surveillance system to collect information on rare illnesses in children.

These systems operate under the legal framework of the Epidemics Act, which mandates the establishment of early detection and monitoring systems for potential health hazards (8). The Federal Office of Public Health (FOPH) collaborates closely with cantonal authorities to ensure uniform reporting and evaluation criteria, facilitating coordinated responses to public health threats.

Non-Federal surveillance projects

During the COVID-19 pandemic in Switzerland, the Corona Immunitas research program was established by the Swiss School of Public Health (SSPH+). Corona Immunitas was a rapid, nationwide initiative that provided timely data through coordinated population-based seroprevalence studies carried out by 14 Swiss universities and health organizations to give nationwide seroprevalence estimates (9). Corona Immunitas demonstrated that Switzerland's academic and public health collaborators were able to mobilize quickly and effectively. Population-based epidemiological studies, such as those coordinated under Corona Immunitas, provide insights into transmission dynamics, identify high-risk populations, and assess the effectiveness of public health interventions. These capabilities complement other surveillance methods, offering a broader and more nuanced understanding of public health crises and they can also provide estimates of seroprevalence.

Corona Immunitas completed the final rounds of population-based seroprevalence studies in 2022. In addition to the seroprevalence studies, some of the institutions involved in the Corona Immunitas network also carried out 40 individual studies which were used to answer specific questions and focused on specific vulnerable or high-exposure populations. For example, the SURPRISE+ cohort was established in August 2020 with the aim to monitor seroprevalence, symptoms and risk factors for COVID-19 in healthcare workers from nine healthcare networks in Northern and Eastern Switzerland (10). As of May 2025, SURPRISE+ is an ongoing, performing participatory surveillance of acute viral respiratory infections and their long-term sequelae (long COVID), and assessing the loss of workforce due to these symptoms in this population.

While Switzerland's surveillance systems are strong and recent additions such as the wastewater surveillance are welcomed, they could be further enhanced by aligning with Domains 2 and 3 of the WHO's Mosaic Surveillance Framework and incorporating surveillance from across all the levels of the surveillance pyramid. Specific issues with the current state of pandemic surveillance and accompanying concerns are elaborated on in the next section of this policy brief.

The Issue

While the current surveillance systems in Switzerland are strong, there remain some issues, namely:

Gaps in Surveillance
Limited connection between administration and academia
Lack of public trust

These are discussed in more detail below.

Gaps in surveillance

When using the surveillance pyramid as a guide, some levels of the pyramid are better represented in Switzerland than others. For example, while Sentinella's syndromic surveillance provides insight into individuals who seek medical care, it does not account for symptomatic individuals who do not visit healthcare facilities or those who remain asymptomatic. This introduces surveillance bias, whereby relying solely on healthcare-based indicators, for example individuals who seek medical care, may give a biased estimate of the disease burden (11,12). One population-based surveillance that is currently missing is seroprevalence studies which estimate the infection attack rates and immunity in the population. During the pandemic, the Corona Immunitas (CI) study and related studies contributed to the understanding of the impact on the population, however CI concluded in 2023 (13) and most of the related studies have also now finished; the Zurich SARS-CoV-2 Cohort (ZSAC) and Zurich SARS-CoV-2 Vaccine Cohort (ZVAC) studies, which were longitudinal cohort studies based in Zurich, will wrap up in 2025. This means that the operational knowledge gained from how to best deal with ethics approvals, communication and cooperation across many institutes, data collection and management, as well as longitudinal data on immunity from these studies will no longer be available, leaving a gap in long-term population monitoring. Other population-based surveillance sources, such as wastewater monitoring, can provide key insights but there are some challenges in data interpretation, particularly for linking viral loads to infection severity or symptomatic case numbers.

There are also gaps in surveillance in specific populations with increased risk of exposure, including nursing homes and healthcare workers. In Switzerland, a report found that deaths in retirement homes were 80% higher between Mid-October 2020-end of December 2020 compared to the average and they also found that in total over the whole of 2020, there was an increase of 16% of deaths in this group over the whole year (14). Influenza as well has a higher impact on the elderly (15).

Healthcare workers are of particular interest for two reasons. First, they are highly exposed to symptomatic patients, which increases their risk for viral respiratory infections and of transmitting it to uninfected and fragile patients (16). Second, the loss of workforce in healthcare workers due to these infections may jeopardize the functioning of our healthcare systems, as has been punctually observed during the COVID-19 pandemic (17). While there have been some initiatives to address healthcare workers, notably with the SURPRISE cohort, this surveillance only recruits healthcare workers from a relatively small selection of healthcare institutions and is not integrated with other forms of surveillance. Schools host another population with increased risk of exposure, with influenza a leading cause of absence (18). RSV is the

leading cause of hospitalization in young children (19,20) and so efforts to track symptoms or absences in community settings such as schools or in daycare (Kitas/Krippen/crèches) would improve surveillance completeness. While the SPSU exists for surveillance in children, this surveillance system does not focus on respiratory illnesses in community settings.

There is currently also no dedicated sentinel syndromic surveillance in hospitals, limiting insights into this higher level of the surveillance pyramid. The CH-SUR hospital surveillance system, which was set up in 2018 and modified in 2020 for the pandemic, monitored laboratory-confirmed influenza and SARS-CoV-2 cases but did not systematically track broader syndromic trends, furthermore this surveillance concluded as of 2024. The GP sentinel surveillance itself faces limitations. Currently, about 2% of primary care physicians contribute to Sentinella[1], which lies at the lower end of the 1–6% coverage range reported in the literature(21). Additionally the numbers of participating physicians has remained between 150 and 250 since it was established (22). Although expanding this surveillance system may not be essential, the manual and time-consuming data collection process makes recruitment of physicians difficult. Any efforts to automate reporting or facilitate physician recruitment would be highly beneficial.

Limited connection between administration and academia

The lack of integration between different surveillance systems further weakens monitoring efforts. While the Infectious Diseases Dashboard (IDD) provides useful data for clinical and research communities (21), concerns remain about the connection between academia and administration. For instance, various research groups and public health institutions conduct similar studies independently, with limited coordination, leading to duplication of efforts and fragmented data collection.

When looking at a comparison of different advisory bodies in Europe during the COVID-19 pandemic, Switzerland was one of the few European countries that established a new advisory body, the Swiss National COVID-19 Science Task Force, specifically for the COVID-19 pandemic. The Task Force was dissolved on 31 March 2022 (22) and it was replaced by the Scientific Advisory Panel which had the mandate until 31 December 2024 (23).

Switzerland was among a minority of European countries that established a new advisory body specifically in response to the COVID-19 pandemic rather than relying on existing structures as was done in other European countries (24). For example, in the United Kingdom, the Scientific Advisory Group for Emergencies (SAGE), though convened on an ad hoc basis, had been established prior to the pandemic and could be rapidly mobilized. Additionally, permanent expert bodies such as the New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) and the Joint Committee on Vaccination and Immunisation (JCVI) provided ongoing scientific guidance on respiratory pathogens and immunization strategies. The Netherlands relied on the Outbreak Management Team (OMT), a standing body coordinated by the National Institute for Public Health and the Environment (RIVM), which had been advising the govern-

[1] Based on estimate of 170 reporting GPs to Sentinella, and 9184 total primary care doctors in Switzerland, a figure from Federal Statistic Office in 2021 (40)

ment on infectious disease control since before the pandemic and Germany used several established scientific bodies to inform its pandemic response including the Standing Committee on Vaccination (STIKO), an independent advisory group within the RKI that provided recommendations on immunization.

In 2023, the Federal Council established thematic "clusters" of academics to provide structured advice to the federal administration, cantons, and the Federal Council itself. These include clusters on Public Health, Cybersecurity, and International Affairs, developed under a framework agreement signed on 8 December 2023 by the Federal Chancellery, the State Secretariat for Education, Research and Innovation (SERI), and six major scientific bodies: swissuniversities, the Swiss Academies of Arts and Sciences, the ETH Board, Innosuisse, the Swiss National Science Foundation, and the Swiss Science Council (25,26). The agreement aims to clarify cooperation processes before crises occur and ensures broad support across the scientific community. Swissuniversities is the single point of contact for the Federal Administration. Within the Public Health Cluster, sub-clusters focus on areas such as respiratory pathogens and health systems. While these structures represent important progress toward sustained academic–government collaboration, the inclusion of non-academic members, essential for comprehensive pandemic preparedness, is currently only possible within topic-specific working groups. These working groups are often reactive and narrowly focused and currently there is not a working group specifically focused on pandemic preparedness.

Lack of public trust and support

Public participation is crucial for research projects or survey-based surveillance systems; however engagement remains low, potentially due to limited epidemiological literacy and concerns about data use and transparency. Following the 2009 H1N1 pandemic, a two-wave longitudinal survey in Switzerland examined public trust in institutions managing disease outbreaks. The results showed moderate to high trust in medical organizations, the WHO, the Swiss government, and the pharmaceutical industry, but lower trust in the media. Over time, trust in most institutions declined, and concerns about vaccine safety were widespread, showing skepticism toward government and media responses (27).

Without public trust, participation in self-reported symptom tracking, seroprevalence surveys, and other participatory surveillance efforts remains low, reducing the validity of these complementary surveillance instruments. Research on the use of the SwissCovid app revealed that uptake of the app was associated with higher household income, frequent internet use, adherence to mask-wearing, and nonsmoker status. Trust in government and health authorities also played a significant role. There was lower adoption of the app in non-Swiss citizens and French-speaking respondents. The main reasons for not using the app included a perceived lack of benefit, phone compatibility issues, and privacy concerns (28). Further research on the topic of healthcare data and public trust showed that participants wanted their data to be used for societal benefit, and they also wanted transparency in data use, communication strategies, and measures to minimize harm (29,30).

There have also been discussions on whether to abandon the term *"surveillance"*, which some argue carries negative connotations and may hinder public trust (31), while others argue that "*surveillance"* should be retained, as it goes beyond monitoring to include reporting, accountability, and institutional responsibility which are core elements of effective public health practice (32). There are also arguments that abandoning the term could weaken public health

symbolically and operationally, as its roots in military language reflect the urgency and coordination needed to respond to threats (33). Nevertheless, public trust remains a key issue and needs further study—particularly in the Swiss context.

Policy options to improve surveillance for pandemic preparedness in Switzerland

Policy option 1: Expand surveillance

Improve reporting of Sentinella and recruitment

Addressing the participation rates in the Sentinella GP network, currently involving around 1–2% of GPs, could strengthen primary care surveillance. Increasing GP recruitment would be beneficial as it could allow for more precise estimates, though challenging due to existing barriers such as time constraints for reporting. Outreach through established Swiss doctor networks like MFE or Medix could support recruitment efforts. While expanding participation would require significant investment, maintaining the quality of the Sentinella system is essential, particularly during epidemic peaks when reporting burdens increase.

Strengthen community-based surveillance with participatory surveys

Community-based surveillance would further enhance situational awareness by capturing data on symptomatic individuals who do not seek medical care. Existing tools like Google Search Trends provide some insight, but a more structured and dedicated approach such as an expanded version of GrippeNet (34), currently hosted by the Multidisciplinary Center for Infectious Diseases (MCID) at the University of Bern would enable the collection of higher-quality, longitudinal data. Strengthening this initiative would also align Swiss surveillance efforts with global GrippeNet networks.

Investigate sero-epi surveys

Sero-epidemiological surveys represent another important component of a comprehensive surveillance strategy. While widely used during the COVID-19 pandemic to assess population seroprevalence and immunity, their value extends beyond initial outbreak phases. Even in the presence of widespread vaccination, national level seroprevalence surveys remain valuable as baseline tools, particularly when integrated with wastewater surveillance to see if there are major changes in population immunity in the context of a new strain or variant. If concerns about their cost-effectiveness persist, a preliminary cost-benefit study should be conducted. The expertise of the Corona Immunitas group could facilitate the design of a regular seroprevalence survey, and partnerships with blood donor organizations could provide additional data, although getting ethical approval would be complex and issues of sample representativeness would need to be addressed. Such initiatives would require significant collaboration across the public health research community, regulatory bodies, and laboratory networks, but they offer long-term benefits for immunological research and vaccine effectiveness assessments.

Implement surveillance in specific high-risk or target populations

Finally, leveraging and expanding existing studies could provide additional insights into key population groups. For example, the SURPRISE+ healthcare worker study could be extended to other regions, offering valuable data on frontline health professionals. Targeted participatory surveillance in high-risk settings, such as nursing homes, healthcare facilities, childcare settings and schools, would also contribute to a more comprehensive understanding of disease spread and response dynamics. While surveillance in specific populations is not always the

most cost-effective approach, it remains essential for identifying vulnerabilities and ensuring targeted interventions.

Introduce hospital based syndromic surveillance

To improve the robustness and responsiveness of current surveillance systems, we recommend expanding syndromic surveillance to include hospital-based monitoring to complement the existing GP-based Sentinella network. A structured hospital surveillance system, based on Severe Acute Respiratory Infection (SARI) syndromic surveillance, would significantly enhance early detection and situational awareness. Although the CH-SUR surveillance that was set up during the pandemic did not provide dedicated syndromic surveillance, its infrastructure and networks could be leveraged to establish a more comprehensive approach. While implementing this would require substantial investment, hospital-based syndromic surveillance is a fundamental pillar of pandemic preparedness. A pilot study conducted by academia or a university hospital could assess both feasibility and impact. Alternatively, leveraging ICD codes for hospital surveillance could be considered, though this approach has limitations. A more effective strategy would involve establishing a clear syndromic case definition and integrating it with PCR testing in a subset of sites.

Policy option 2: Bridge the gap between administration and academia

The existing framework described in the previous section demonstrates encouraging progress in bridging the gap between administration and academia with the creation of a Public Health Cluster, but also highlights the ongoing need for a permanent, inclusive mechanism, either integrated into current structures as a standing working group, or in a different manner, that enables long-term, cross-pathogen coordination on pandemic preparedness and surveillance, and remains active beyond crisis periods. A standing body or working group on pandemic preparedness would help maintain continuity of expertise, enhance preparedness, and enable a more timely and coordinated response to emerging public health threats, reducing reliance on reactive, ad hoc measures. This body would serve as a structured platform for regular discussions among key stakeholders, including healthcare facilities, universities, the FOPH, cantonal health authorities, and other relevant organizations.

The implementation of such a body should be relatively straightforward, as similar advisory structures already exist in other European countries (24). The primary function would be to facilitate the exchange of information between academia and public health administration, ensuring that research aligns with policy needs and that policy makers stay informed of the latest scientific developments. This would help bridge the gap between evidence and policy while fostering a more integrated approach to health surveillance.

Regular meetings would enhance collaboration and reduce the current tendency for institutions to work in silos. Furthermore, formalizing these discussions through an official body would lend credibility to the process and, if publicly acknowledged, could enhance public trust in pandemic preparedness and response efforts. To ensure the body's effectiveness, a designated entity or secretariat would be needed to oversee organizational tasks such as scheduling meetings, keeping minutes, maintaining communication channels, and managing stakeholder engagement. This entity could be hosted by an existing institution, such as SSPH+, which would provide the infrastructure for the committee's work.

The example of NERVTAG in the UK can be used to show how the implementation of such a body is done in other countries (35). NERVTAG is a standing expert committee hosted by the UK Department of Health and Social Care, with secretariat support from the UK Health Security Agency. It advises the Chief Medical Officer on respiratory virus threats, with its academic and clinical expert members appointed through open competition to typically serve two year terms. The minutes are published online to ensure transparency (36). Other countries offer similar examples. In Australia, the Communicable Diseases Network Australia (CDNA) is a standing, expert committee under the Australian Health Protection Principal Committee (AHPPC) which provides national coordination and evidence-driven guidance on communicable disease (37). In Canada, the "Time to Act Is Now" report calls for establishing a more robust, permanent national science advisory system for pandemic emergencies including better coordination, a mobilizable research infrastructure, and formalized advisory structures (38).

Other key lessons learned from a review of similar bodies in the COVID-19 pandemic in Europe are that the body should have flexibility in mandates and membership to adapt to evolving crises while maintaining transparency and independence to prevent political interference and build trust (24). If the body has an advisory role, then clear processes should be established to minimize ambiguity and prevent selective use of recommendations. They also found that understanding the political dynamics between advisers and decision-makers can help maintain objectivity, while thorough documentation and evaluation improve transparency and learning for future crises. Furthermore, it would be important to regularly communicate the findings/results of discussions to the public.

Policy option 3: Build public trust

To enhance public trust and increase acceptance of health surveillance measures, we recommend conducting a targeted survey to assess public knowledge, beliefs, and concerns about surveillance and pandemic preparedness. Understanding the specific misconceptions and attitudes within different population groups will allow for the development of more effective, trust-building communication strategies.

This survey should focus on identifying:

- Levels of awareness about public health surveillance initiatives and their purpose
- Key barriers to participation in health surveillance programs, such as GrippeNet
- Preferred sources of health information and trusted messengers
- Which types of information the public needs and in which form for informed decision making
- How the public perceives terms such as "surveillance" (Überwachung in German), which can carry negative connotations

This could be carried out by an organization such as the Swiss Centre of Expertise in the Social Sciences (FORS) which currently carries out the Swiss Household Panel survey and has also previously organized an FOPH mandated survey for 2000 people in 2017-18 which measured knowledge and attitudes of the Swiss population towards human research. There is also valuable experience and knowledge in this area from the researchers involved with the COVID-19 social monitor, which collected data on the physical and mental well-being of the Swiss population during the pandemic (39). As the current situation has changed significantly since prior

to the pandemic, it is important to do a new updated survey to a population based representative sample with the relevant questions addressed above.

Once this data is collected, communication strategies can be refined to address issues raised in the survey with outreach targeted to populations that are found to have lower awareness or higher skepticism in the survey, therefore optimizing resource allocation. This approach has long-term benefits, as improving trust leads to higher voluntary participation in surveillance programs and reducing the need for expensive reactive measures during health crises. A well-designed survey would provide the necessary evidence to shape public health messaging, ensuring that limited resources are directed toward the most impactful strategies to improve public trust.

Implementation Considerations

Facilitators and barriers to implementation at different levels are discussed in detail in the tables below.

Table 1: Facilitators to implementing the policy options

Levels	**Policy option 1: Enhancing surveillance**	**Policy option 2: Bridge the gap between administration and academia**	**Policy option 3: Build public trust**
General public	Knowledge of surveillance gained from COVID-19 pandemic. Willingness to participate in community surveillance such as GrippeNet.	Group membership, nomination process and topics of discussion should be made public to allow the general public to have insight over the process.	Accessible survey that is distributed widely to a public with a willingness to fill in a survey and understanding of goals of surveillance. Use media campaigns and target certain populations to answer the survey through adverts on social media.
Healthcare provider	Use knowledge and experience gained in the COVID-19 pandemic (with CH-SUR) to implement a pilot study on hospital surveillance in collaboration with FOPH to create a surveillance system designed from a public health perspective.. Use networks (e.g. MFE; Medix) to engage with healthcare workers and help improve participation in sentinel surveillance.	Use healthcare provider networks to communicate results of the discussions with the board. Use networks (e.g. MFE; Medix) to investigate whether healthcare providers would like to or be able to attend meetings with this committee and then discuss membership terms and conditions.	N/A
Administration	Dedicated funding to finance the improvement of existing surveillance and pilot projects to investigate new methodologies. Investigate the feasibility of using blood donations for seroprevalence surveillance.	Protected time for staff in FOPH and other institutions to get involved and attend meetings with the new committee.	Make use of organizations like FORS that have carried out similar research before.

Academia	Make the most of existing networks such as Corona Immunitas to carry out sero-epidemiological surveillance and build on expertise such as with SURPRISE surveillance for healthcare workers. Consider applying for SNSF grants for pilot projects, specifically for a pilot hospital syndromic surveillance and for a cost effectiveness study on seroprevalence surveillance. Use the expertise of researchers at the Institute of Social and Preventative Medicine in Bern to improve GrippeNet.	Clear communication on what this board will be for and transparent nomination process. Use existing networks like SSPH+ to start recruitment for the board from academia.	Clear, defined role for academia in producing the survey to examine public trust. Make links with researchers at the Digital Society Initiative (DSI) in Zurich that are currently researching public trust for digital transformation.
Cantonal public health authorities	Clarify which types of surveillance can be implemented at the cantonal level and invite cantonal authorities to meetings early on, especially for surveillance in specific settings such as schools, nursing homes, and daycare centers.	Make sure they are included and invited to the board and the mandate and responsibilities are made clear.	Outreach at the cantonal and community level to get surveys to hard to reach communities.

Table 2: Barriers to implementing the policy options

Levels	**Policy option 1: Enhancing surveillance**	**Policy option 2: Bridge the gap between administration and academia**	**Policy option 3: Build public trust**
General public	Lack of knowledge regarding existence of community surveillance tools Lack of public trust and willingness to take part in surveillance activities.	Unclear how decisions get made or how these types of committees work.	Unwillingness to answer questionnaires and participate as no perceived benefit.
Healthcare provider	Lack of resources/funding especially for extra surveillance in hospitals. Lack of personnel to carry out surveillance	No time or funds to attend another meeting and cannot see the benefit of attending.	N/A
Administration	Lack of resources/funding	Do not see the importance of another committee and do not have time to attend or organize meetings.	Do not agree with the cost to carry out this survey and improve public trust.
Academia	Unclear roles and responsibilities, ambiguous link to research activities. They may not have time and don't see the importance of extra surveillance	Do not see the importance of another committee and do not have time to attend or organize meetings.	Unclear link between research and practice. Working in silos on similar topics. No incentive to change current system and build more public trust.
Cantonal public health authorities	Lack of political will to implement changes Unclear roles and responsibilities	Unclear roles and responsibilities and no time to attend another committee meeting.	No time or resources to help implement another survey.

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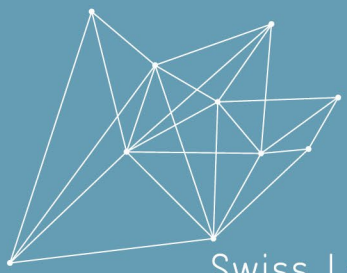

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