Key points

- Countries are advised to maintain core SARS-CoV-2 surveillance activities to meet key strategic objectives. WHO continues to request that Member States continue reporting surveillance variables previously specified in guidance documents.

- Multiple approaches should be applied to surveillance, including describing infection in populations at highest risk of severe infection, characterizing new variants and investigating post-COVID condition.

- Although national testing strategies are adjusting to a decline in the impact of COVID-19, SARS-CoV-2 testing should continue but be used strategically, while being integrated into longer-term respiratory pathogen surveillance.

- While reporting requirements will change as the pandemic progresses, WHO has urged Member States to provide more reporting on hospitalizations, ICU and mortality and relies on these data, rather than on case-based reporting, to measure burden and impact.

- It is crucial to strengthen genomic surveillance for SARS-CoV-2 and other pathogens with epidemic and pandemic potential. Testing and reporting strategies should be linked to genomic surveillance and phenotypic assessment.

- Strengthening COVID-19 systems leads the way to enhanced pandemic preparedness for respiratory pathogens. Countries are urged to maintain operational readiness for surges of COVID-19 and other emerging and re-emerging pathogens.

- WHO encourages its Member States to improve data linkage, share data and experiences and explore more innovative and collaborative ways of working to detect outbreaks early and fully understand risks and vulnerabilities.

Introduction

More than three years since the first SARS-CoV-2 infections were reported, the world is entering a new phase of the COVID-19 pandemic. Despite the current downward trend in incidence, hundreds of thousands of people continue to be infected each week (see WHO COVID-19 Dashboard). Furthermore, many uncertainties remain about the potential emergence of new SARS-CoV-2 variants of concern. It is vital that countries sustain their COVID-19 response, including strong surveillance for SARS-CoV-2, in the face of continued illness and death across the world.
WHO policy brief: COVID-19 surveillance

The World Health Organization (WHO) recognizes the challenges countries face in maintaining their COVID-19 response while addressing competing public health challenges, conflicts, and economic crises and continues to support countries in adjusting COVID-19 strategies to reflect the successes and leverage what they have learned from national responses. To assist national and global efforts to end the COVID-19 emergency worldwide, WHO updated the COVID-19 Global Preparedness, Readiness and Response plan in 2022 and outlined two strategic objectives. First, reduce the circulation of SARS-CoV-2 by protecting individuals, especially vulnerable individuals at risk of severe disease or occupational exposure to the virus. This action will reduce pressure on the virus to evolve and the probability that future variants will emerge and will reduce the burden on health systems. Second, diagnose and treat COVID-19 to reduce mortality, morbidity and long-term sequelae. WHO’s plan further looks ahead to research, development and equitable access to effective countermeasures and essential supplies.

WHO is updating its Global Preparedness, Readiness and Response Plan for 2023-2025 and in addition to the above objectives, has added a third objective to support countries to successfully transition from emergency response to longer-term sustained COVID-19 disease prevention, control and management. Reporting requirements will change as the pandemic progresses, and guidance on this will be provided separately.

Countries are in very different situations with regards to COVID-19 due to a number of factors, including differences in population level immunity; public trust; access to and use of COVID-19 diagnostics, therapeutics, vaccines, personal protective equipment and reliable information; and challenges from other health and non-health emergencies. WHO has produced a package of policy briefs aimed at helping countries update policies to focus on critical actions needed to manage the acute and long-term threats of COVID-19 while strengthening the foundation for a stronger public health infrastructure (see Strengthening the Global Architecture for Health Emergency Preparedness, Response and Resilience). The policy briefs to date have addressed: Building trust through risk communication and community engagement; COVID-19 testing; Clinical management of COVID-19; Reaching COVID-19 vaccination targets; Maintaining infection prevention and control measures for COVID-19 in health care facilities; and Gatherings in the context of COVID-19. (Link to all COVID-19 policy briefs at https://www.who.int/emergencies/diseases/novel-coronavirus-2019/covid-19-policy-briefs.)

Purpose of this document

This policy brief on COVID-19 surveillance is intended for national and sub-national policy makers in health and other ministries; and provides a concise overview of the key actions advised to Member States based on recommendations published in WHO COVID-19 technical guidance and strategies. It also articulates the importance of sustained financing as well as the need for a trained and protected workforce.

Essential actions for Member States to consider in updating COVID-19 surveillance policies

At this stage of the pandemic, it remains critical to sustain robust surveillance despite prevailing impressions that the pandemic is over. Several countries continue to have worrisome increases in the number of reported new COVID-19 cases and deaths due to the emergence of new Omicron subvariants, inadequate vaccination coverage, waning immunity and a lack of access to life-saving COVID-19-specific therapeutics. Globally, the fluctuating trend in the number of newly reported cases needs to be interpreted with caution due to significant changes to national surveillance systems and strategies, reductions in testing and delays in reporting by many countries. Furthermore, limited reporting of hospitalization data and reporting lags make it difficult to draw firm conclusions from trends in hospitalizations.
Declining and unrepresentative surveillance and sequencing are making it more difficult to rapidly assess known variants and detect new ones. Moreover, the virus has not stabilized into a predictable pattern of evolution. More variants are expected with increased growth rate and immune escape, with no certainty about changes in severity. There is some heterogeneity in dominant variants across regions, and some recombinants have been detected throughout the pandemic. With continued intense circulation worldwide, new variants could emerge anywhere. Countries must remain vigilant.

1. **Maintain core SARS-CoV-2 surveillance activities to meet key strategic objectives, and continue reporting to WHO**

Maintaining core surveillance activities is essential for:

- providing early warning of changes in epidemiological patterns
- monitoring trends in morbidity and mortality
- monitoring the burden of disease on health care capacity (health and care workers, hospitalizations, and intensive care unit admissions)
- incorporating strategic and geographically representative genomic surveillance to monitor the circulation of known variants of concern (VOCs), enable early detection of new variants of interest (VOIs) and track circulation of SARS-CoV-2 in potential animal reservoirs and changes in virological patterns.

WHO continues to request that COVID-19 surveillance reporting variables to WHO from Member States include:

- **cases and deaths from systems that continue to record them at this frequency**, as per International Health Regulations (IHR 2005) requirements
- **required weekly reporting** of detailed surveillance variables
  - age and sex of confirmed cases and deaths
  - cases and deaths among health and care workers
  - number of new cases admitted for hospitalization and to an intensive care unit (ICU)
  - number of persons tested with a nucleic acid amplification test (NAAT) and other testing methods.
- **variants of concern (VOCs) and variants of interest (VOIs)**: date of detection of first case and weekly relative prevalence (based on representative sampling)
- **vaccination**: doses administered; number of persons vaccinated with a primary series and booster, ideally by age and risk group (see Public health surveillance for COVID-19: interim guidance (1)).

2. **Apply multiple approaches to surveillance while maintaining longstanding fit-for-purpose systems**

Many countries have made advancements in event-based surveillance (which examines reports, stories, rumours and other information about health events); seroepidemiological investigation (see Population-based age-stratified seroepidemiological investigation protocol for COVID-19 infection)(2); and incorporating SARS-CoV-2 surveillance with that for influenza-like-illness (ILI), acute respiratory infection (ARI) and severe acute respiratory infections (SARI). Participatory disease surveillance, which collects

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1 Reporting requirements will change as the pandemic progress and guidance on this will be provided separately.
data for public health action by directly involving the population at risk in submitting relevant data through forms ranging from sophisticated mobile phone apps to simple hotlines, has also come to the fore.

WHO continues to recommend Member States having the capacity to carry out enhanced surveillance activities and conduct special studies to:

- describe and monitor SARS-CoV-2 infection in populations that continue to be at the highest risk of exposure or severe disease, including people over the age of 60, people of any age with underlying conditions.
- characterize new variants, including aspects of their severity, transmissibility, immune escape and the effectiveness of countermeasures
- further investigate the post COVID-19 condition (also known as long COVID), including the role of immunity and risk factors.

While SARS-CoV-2 circulation is driven by human-to-human transmission, SARS-CoV-2 is a zoonotic virus that can be transmitted between people and animals. Although there is no evidence that SARS-CoV-2 infections in animals have a significant impact on human health, animal health or biodiversity, there is concern about the establishment of new animal reservoir(s) and potential virus evolution in novel hosts. The global scarcity of SARS-CoV-2 data in animals illustrates the need for epidemiologic follow-up on animal contacts of confirmed human COVID-19 cases and an increase in targeted surveillance in animals that may be susceptible to infection with SARS-CoV-2 (including pets, livestock, and wild animals). All these activities require close collaboration across relevant sectors (e.g., public health, animal health, wildlife and environmental) following a One Health approach. A joint statement by the Food and Agriculture Organization (FAO), World Organisation for Animal Health (WOAH) and WHO in March 2022 called on countries to monitor mammalian wildlife populations for SARS-CoV-2 infection, reporting results to National Veterinary Services (who report these findings to the World Animal Health Information System) and sharing genomic sequencing data on publicly available databases.

Environmental surveillance of community wastewater and international conveyance wastewater can serve as a source for genomic testing, as can samples from closed settings, such as long-term care facilities, humanitarian settings and travellers at points of entry (see Environmental surveillance for SARS-CoV-2 to complement public health surveillance – Interim Guidance). Moreover, wastewater surveillance has been shown to correlate well with case counts and may, therefore, provide a proxy of community spread in the future, as case counts become increasingly unreliable (e.g., due to widespread use of self-testing, which is not captured by most surveillance systems).

The most appropriate system for a country depends on surveillance objective(s). Relying on a variety of surveillance approaches permits a more comprehensive picture of the COVID-19 situation. While reporting requirements will change as the pandemic progresses, WHO has urged Member States to provide more reporting on hospitalizations, ICU and mortality and relies on these data, rather than on case-based reporting, to measure burden and impact.

3. Use SARS-CoV-2 testing strategically and integrate SARS-CoV-2 testing into longer-term respiratory pathogen surveillance

As countries continue to respond to the current pandemic and maintain vigilance regarding the emergence or re-emergence of other pathogens, testing remains paramount. At present, because the impact of COVID-19 has been reduced owing to increasing population-level immunity from vaccination and infection along with better access to life-saving therapeutics, national testing strategies are adjusting. It is critical to
maintain testing at a level that enables early identification of COVID-19 patients who require clinical care, thereby facilitating their entry into the care pathway and ensuring optimal care to prevent severe disease and death. Testing should also allow for the detection of unusual increases in disease incidence in parallel with timely and sensitive detection of variants (see WHO policy brief: COVID-19 testing)(5).

While addressing current needs regarding SARS-CoV-2, WHO recommends integrating SARS-CoV-2 surveillance and diagnosis within existing respiratory disease surveillance systems, especially for diseases caused by respiratory pathogens (such as influenza and respiratory syncytial virus). This can be done through surveillance for influenza-like-illness (ILI), acute respiratory infection (ARI), and severe acute respiratory infections (SARI)(3), including sampling and laboratory testing of all or a subset of cases from sentinel surveillance sites. Countries should use different components of surveillance systems, including leveraging existing national and global surveillance networks, such as the Global Influenza Surveillance and Response System (GISRS), those for national notifiable diseases and conditions, integrated disease surveillance and response investigations(2) environmental surveillance and seroepidemiological surveillance. This approach will aid in monitoring the spread and intensity of transmission of respiratory viruses, including SARS-CoV-2.

In the longer term, WHO is working with Member States to further strengthen surveillance for respiratory viruses with epidemic and pandemic potential as a group, rather than individually. This approach recognizes that it is impossible to address the many complex needs of respiratory virus surveillance with a single system. Multiple surveillance systems and studies must fit together as tiles in a “mosaic” to provide a complete picture of the risk, transmission, severity and impact of respiratory viruses of epidemic and pandemic potential.

The WHO Mosaic Respiratory Surveillance Framework is intended to help national authorities:

- identify priority respiratory virus surveillance objectives and the best approaches to meet them
- develop implementation plans according to national context and resources
- prioritize and target technical assistance and financial investments to meet the most pressing needs.

4. Strengthen genomic surveillance for SARS-CoV-2 and other pathogens with epidemic and pandemic potential

To assess changes and virological characteristics of SARS-CoV-2 variants, COVID-19 testing and reporting strategies should be linked to genomic surveillance and phenotypic assessment (see World Health Organization. Guidance for surveillance of SARS-CoV-2 variants: Interim guidance(6), Operational considerations to expedite genomic sequencing component of GISRS surveillance of SARS-CoV-2, the Global genomic surveillance strategy for pathogens with pandemic and epidemic potential 2022–2032 (7) and Methods for the detection and characterisation of SARS-CoV-2 variants - second update)(8). To ensure geographic representativeness, national sampling approaches should enable sequencing of specimens from individuals who test positive, where feasible. Genomic and phenotypic characterization data are needed to assess the risk posed by SARS-CoV-2 variants, including to the accuracy of diagnostics and effectiveness of medical countermeasures, such as COVID-19 therapeutics and vaccines. These data are vital to support the work of the Technical Advisory Group on SARS-CoV-2 Virus Evolution (TAG-VE)(9) and the Technical Advisory Group on COVID-19 Vaccine Composition (TAG-CO-VAC)(10), both of which advise WHO as part of the COVID-19 response. Establishing and maintaining testing and sequencing systems for pathogens with epidemic and pandemic potential that are fit for purpose (7) for the longer term will require considerable political will, sustained financing and expertise.
5. **Maintain operational readiness for surges of COVID-19 and other emerging and re-emerging pathogens**

Strengthening COVID-19 systems leads the way to enhanced pandemic preparedness for respiratory pathogens, as long as the system remains active.

Historically, scaling down programmes as the severity of an event or epidemic subsided has repeatedly proven to be counterproductive. Following past emergencies, strengthened surveillance operations contracted prematurely, leaving countries vulnerable to known threats and weakened in their capacity to detect new emerging threats. As a result, when the next emergency occurred, countries had to re-build teams, re-learn lessons and re-devise strategies.

Each country has a unique risk profile. Enhanced preparedness for future health emergencies requires national operational plans that are tailored, responsive and scalable, incorporating the lessons learned from COVID-19 to meet current and future needs (see [Preparedness and Resilience for Emerging Threats Module 1: Planning for respiratory pathogen pandemics. Version 1.0](https://www.who.int/docs/default-source/coronaviruse/2020---public-health-intelligence-systems-and-data-reporting-2020-2023?sfvrsn=ff6f542e_5))

Above all, countries are advised to adopt policies that maintain agile surveillance operations. National and sub-national level authorities should assess surge capacity and identify required financial, logistical and human resources for an unexpected wave in the current pandemic or the appearance of a new one.

6. **Improve data linkage and continue to share data and experiences**

Surveillance and sequencing, including real-time sharing of data, remain critical to track known and emerging variants and monitor trends. Countries should prioritize the integration of genomic and clinical-epidemiological data to enable reliable and rapid risk assessments and sharing of experiences to continue to learn from each other. Improving data linkage requires relatively little investment yet yields considerable benefits. Timeliness is critical to drive policy making and adjustment in real time. At present, some parts of the world remain surveillance blind spots. Strengthening and networking national surveillance capacities can shine a light on potential dangers before they become a major problem. Communicating openly and honestly and listening to the concerns of communities are critical.

WHO encourages its Member States to explore more innovative and collaborative ways of working to detect outbreaks early and fully understand risks and vulnerabilities. In the near term, the world needs better data on virus natural history and transmission, strengthened capacities for genomic sequencing, and more information about the animal reservoir.

**Conclusion**

SARS-CoV-2 is expected to continue circulating for the foreseeable future. It is crucial to sustain the gains made in strengthening COVID-19 surveillance since 2020, including technological advancements in diagnostics and genomic surveillance and the strengthening of networks and partnerships. Even as public health resources are reallocated to other pressing needs, countries must retain the agility and the public health intelligence necessary to rapidly scale up efforts in response to the changing nature of the pandemic threat.
References


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