WHO POLICY BRIEF

World Health Organization

COVID-19 surveillance

December 2024

Key points

- Countries are advised to sustain collaborative surveillance for COVID-19, in order to provide a basis for situational awareness and risk assessment and the detection of significant changes in virus characteristics, virus spread, disease severity and population immunity, as per the WHO Director-General's standing recommendations for COVID-19.
- Integration of COVID-19 surveillance with surveillance for other respiratory infections, e.g. influenza, should be prioritized, to provide baselines relative to other circulating viruses.
- WHO urges countries to report epidemiological and laboratory information in a timely manner to established WHO regional or global platforms, through RespiMart and the expanded activities of the Global Influenza Surveillance and Response System (GISRS).
- Multiple approaches should be applied to SARS-CoV-2 surveillance, including monitoring infections in populations at highest risk of severe disease, characterizing new SARS-CoV-2 variants and investigating post COVID-19 condition.
- SARS-CoV-2 testing should continue strategically and be integrated into existing infectious disease (e.g. respiratory pathogen) surveillance systems.
- It is crucial to continue genomic surveillance for SARS-CoV-2 and other pathogens with epidemic and pandemic potential using capacities that were strengthened for COVID-19. Testing, reporting and risk assessment for SARS-CoV-2 continues to be needed and should utilize genomic surveillance and phenotypic assessment.
- Strengthened COVID-19 surveillance systems enhance 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 approaches to timely detection of outbreaks, understanding risks and vulnerabilities.

Introduction

Nearly five years since the first SARS-CoV-2 infections were reported, the global COVID-19 situation has changed substantially. With widespread immunity from both vaccination and prior infection, currently circulating variants are now associated with lower severe disease rates and fewer hospitalizations. As a result, most countries have lifted public health and social measures and have moved to end their national COVID-19 emergencies. In this context, many around the world wish to move on and forget their experiences with the COVID-19 pandemic.

COVID-19 continues to circulate widely, however, presenting significant challenges to health systems worldwide. Tens of thousands of people are infected or re-infected with SARS-CoV-2 each week. From mid-

September to mid-October 2024, WHO received reports of more than 296 000 confirmed cases of COVID-19 (see the WHO COVID-19 Dashboard). This figure is certainly an underestimate, as there has been a persistent decline in COVID-19 surveillance and reporting, and wastewater surveillance indicates that circulation is 2–20 times higher than the case numbers that are reported.

It is vital that countries sustain the public health response to COVID-19 amid ongoing illness and death and the emergence of SARS-CoV-2 variants, adapting it to the requirements based on the current COVID-19 situation and risk. Countries are increasingly balancing COVID-19 prevention and response activities with other social and economic priorities.

On 9 August 2023, the WHO Director-General of published standing recommendations to support ongoing efforts for the prevention and control of COVID-19 in accordance with provisions of Articles 16 to 18, and 50 to 53 of the International Health Regulations (2005) (IHR). These standing recommendations are in effect for all States Parties (WHO Member States plus Liechtenstein and the Holy See) until 30 April 2025 *(1)*.

The updated WHO Strategic Preparedness and Response plan for 2023-2025 *(2)* is designed to help countries end the emergency phase of the pandemic and shift to comprehensive, long-term management of COVID-19 within broader disease prevention and control programmes. As countries continue to strengthen COVID-19 programmes within their public health systems, two objectives remain critical: 1) reducing the risk of emergence of and controlling the circulation of SARS-CoV-2 variants with increased growth rates and immune escape, with a particular focus on reducing infection in high-risk and vulnerable populations; and 2) diagnosing and treating COVID-19 to reduce mortality, acute severe disease morbidity and long-term sequelae.

Purpose of this document

In 2022 and 2023, WHO released a package of policy briefs designed to help countries formulate policies to manage SARS-CoV-2 transmission, particularly in high-risk and vulnerable populations and to reduce morbidity, mortality and long-term sequelae from COVID-19. The policy briefs have been updated to reflect the current situation and risk of COVID-19, the approaches outlined in the September 2023 WHO document Ending the COVID-19 emergency and transitioning from emergency phase to longer-term disease management: Guidance on calibrating the response *(3)* and the Director General's Standing Recommendations for COVID-19 *(1)*.

This policy brief is intended for national and sub-national policy- and decision-makers in ministries of health other governments agencies and partners engaged in and responsible for the health of the populations they serve. It provides a concise overview of the key recommended actions for Member States to take based on WHO COVID-19 technical guidance and strategies.

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

Countries are advised to sustain collaborative surveillance *(4)* for COVID-19, in order to provide a basis for situational awareness and risk assessment and the detection of significant changes in virus characteristics, virus spread, disease severity and population immunity, as per the standing recommendations for COVID-19 issued by the WHO Director-General *(1)*.

Core surveillance activities for SARS-CoV-2 provides early warnings of changes in epidemiological patterns, monitors circulation and the emergence of new SARS-CoV-2 variants and enables monitoring of both morbidity and mortality trends and disease burden on health care capacities (health and care workers, hospitalizations and intensive care unit admissions). These activities also measure the longer-term

impacts of Post COVID condition (also known as Long COVID). Incorporating strategic and geographically representative genomic surveillance enables the monitoring of the circulation of SARS-CoV-2 variants of concern (VOCs), early detection of new variants of interest (VOIs) and tracking of SARS-CoV-2 in potential animal reservoirs, along with other changes in virological patterns.

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

To maintain visibility on the epidemiology of COVID-19 globally, WHO continues to request that countries collect, monitor and report the following COVID-19 surveillance data *(1)*[*]:

- **Weekly reporting** of detailed surveillance variables:
  - Confirmed cases and deaths, as required by the International Health Regulations (IHR 2005)
  - Age and sex of confirmed deaths
  - Number of new cases admitted for hospitalization and to intensive care units
  - Number of persons tested with a nucleic acid amplification test (NAAT) and/or other testing methods
  - For SAR-CoV-2 variants of concern (VOCs) and variants of interest (VOIs), the date of detection of first case and weekly relative prevalence based on representative sampling
  - For COVID-19 vaccination, the number of persons (re-)vaccinated with a dose of COVID-19 vaccine in the reporting year, ideally disaggregated by risk group (see Public health surveillance for COVID-19: interim guidance and addendum to this interim guidance *(5,6)*.

WHO urges Member States to report on hospitalizations, intensive care unit admissions and mortality. WHO relies on these data, rather than on case-based reporting, to understand disease burden and public health impact. Reporting epidemiological and laboratory information in a timely manner to established WHO Regional or global platforms and through RespiMart and the expanded activities of the Global Influenza Surveillance and Response System (GISRS) is also vital to understand the intensity of the virus circulation.

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

Since 2020, 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) *(7)*; and integrating SARS-CoV-2 into existing respiratory diseases surveillance systems such as the Global Influenza Surveillance and Response System (GISRS), including influenza-like-illness (ILI), acute respiratory infection (ARI) and severe acute respiratory infections (SARI) *(8)* surveillance and Integrated Disease Surveillance and Response *(9, 10, 11)*. Participatory disease surveillance has also gained prominence. This involves asking at-risk populations to submit relevant data to health authorities, making use of mobile phone applications, simple hotlines and other tools.

WHO continues to recommend that Member States conduct three enhanced surveillance activities. The first is to monitor and describe SARS-CoV-2 infections in populations at the highest risk of severe disease, including people over the age of 60 years, immunocompromised individuals and people of any age with underlying health conditions. Second, identify and characterize new variants, including their virulence, transmissibility, immune escape and the effectiveness of existing countermeasures. Last, measure and

[*] Reporting requirements will change as the pandemic progresses, and guidance on this will be provided separately.

better understand post-acute and long-term health effects of SARS-CoV-2 infection (also known as post COVID-19 condition and long COVID) as well as the identification of risk factors and the role of immunity.

While SARS-CoV-2 circulation is primarily driven by human-to-human transmission, SARS-CoV-2 is a zoonotic virus that can be transmitted between people and animals. 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 on the extent of circulation in animals illustrates the need for epidemiological 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. These activities require close collaboration across relevant sectors (e.g. public health, animal health, wildlife and environment) 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 (see Considerations on monitoring SARS-CoV-2 in animals) *(12)*, report results to national veterinary services (who report these findings to the World Animal Health Information System) and share genomic sequencing data on publicly available databases.

Surveillance of community wastewater and international conveyance wastewater has been and should continue to be used to monitor the intensity of circulation in the community, as can samples from closed settings, such as long-term care facilities, humanitarian settings and travelers at points of entry (see Environmental surveillance for SARS-CoV-2 to complement public health surveillance – Interim Guidance) *(13).* Moreover, as case counts have been increasingly unreliable due to reduced testing and widespread use of self-testing, wastewater surveillance has been shown to correlate with hospitalizations, providing a proxy for circulation of SARS-CoV-2 and of community infections and can provide early warning signals.

Countries are recommended to continue to initiate, support, and collaborate on research to generate evidence to better understanding the unknown areas such as the impact of climate, seasonality, and behavior on the SARS-CoV-2 transmission patterns and the breadth and duration of immunity after infection, vaccination, or both, and cross-reactivity with other coronaviruses.

The most appropriate systems that countries will use depend on surveillance objectives. Relying on a variety of surveillance approaches permits a more comprehensive understanding of the COVID-19 situation. 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; and prioritize and target technical assistance and financial investments to meet the most pressing surveillance needs. 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.

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

At this stage of the pandemic, it remains important to sustain fit-for-purpose testing systems and strategies that strive to support three main objectives: 1) enable timely and appropriate clinical management of COVID-19 for those at highest risk of severe disease; 2) track epidemiological trends and the circulation and evolution of the virus to detect increases in incidence and the emergence and public health impact of SARS-CoV-2 variants; and 3) reduce the spread of new SARS-CoV-2 variants during surges of cases that threaten the capacities of health systems (see WHO policy brief: COVID-19 testing) *(14).*

WHO recommends integrating SARS-CoV-2 surveillance and diagnosis within existing 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) *(8)*, 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), the Integrated Disease Surveillance and Response Strategy (IDSR) *(9)* and those for national notifiable diseases and conditions, integrated disease surveillance and response (environmental surveillance and seroepidemiological surveillance see The Unity Studies: Early Investigation Protocols) *(7)*. This comprehensive approach will aid in monitoring the spread and comparative burden of respiratory viruses, including SARS-CoV-2.

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

The timing, specific mutations and antigenic characteristics and the potential public health impact of future SARS-CoV-2 variants continues to remain unclear. While new variants with increased growth rate and immune escape are expected to emerge, the virulence of these variants remains unknown. Persistent declines in SARS-CoV-2 surveillance and declines in geographic representativeness of sequencing make it more difficult to rapidly assess emerging and circulating variants. In line with WHO`s global genomic surveillance strategy (see Global genomic surveillance strategy for pathogens with pandemic and epidemic potential 2022–2032) *(15)* aiming the leveraging on the capabilities and capacities gained during the COVID-19 pandemic, countries need to continue to maintain their capacities and remain vigilant for the emergence of new variants.

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 *(16)*, Operational considerations to expedite genomic sequencing component of GISRS surveillance of SARS-CoV-2 *(17)*, and Methods for the detection and characterization of SARS-CoV-2 variants - second update) *(18).*

To ensure better geographic representativeness globally, national sampling approaches should enable sequencing of specimens from individuals who test positive, where feasible. Performing genomic sequencing on a subset of positive specimens from respiratory disease sentinel sites on a weekly basis, as recommended in the expanded GISRS guideline on implementing integrated sentinel surveillance of influenza and other respiratory viruses *(19)*, would establish information on variant distribution from a representative population. To mitigate the impact of dramatic declines in individual testing on monitoring variant distribution and early detection of emerging variants, genomic surveillance strategies should be adjusted accordingly with additional approaches like targeted programmes for high-risk groups or restricted settings and environmental surveillance. Implementing targeted genomic surveillance programmes for willing inbound travelers may facilitate the early detection and characterization of emerging variants and offer insights into the circulation of SARS-CoV-2 variants in countries with limited domestic testing capacities.

Genomic and phenotypic characterization data are needed to assess the risk posed by SARS-CoV-2 variants, including 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 Viral Evolution (TAG-VE) *(20)* and the Technical Advisory Group on COVID-19 Vaccine Composition (TAG-CO-VAC) *(19).* Both advisory groups provide guidance to WHO as part of global COVID-19 preparedness and response efforts.

Establishing and maintaining testing and sequencing systems for pathogens with pandemic and epidemic potential that are fit for purpose requires considerable political will, sustained financing and expertise(see Global genomic surveillance strategy for pathogens with pandemic and epidemic potential *(15)*. WHO has established the Coronavirus Network (CoViNet) to bring together surveillance programs and reference

laboratories to support enhanced epidemiological monitoring and laboratory (phenotypic and genotypic) assessment of SARS-CoV-2, MERS-CoV and novel coronaviruses of public health importance.

5. Maintain operational readiness for surges of COVID-19 and other emerging and re-emerging pathogens

Strengthening COVID-19 surveillance systems enhances pandemic preparedness for respiratory pathogens, but these systems must remain active. Historically, scaling down programmes after a pandemic or an epidemic has proven counterproductive. Prematurely reducing surveillance operations leaves countries vulnerable to known threats and weakens their capacity to detect new emerging threats. As a result, when the next emergency arises, countries must rebuild teams, relearn lessons and redesign strategies. The WHO document Ending the COVID-19 emergency and transitioning from emergency phase to longer-term disease management: guidance on calibrating the response *(4)* outlines key recommended actions and activities for transitioning from emergency to longer term disease management, including for collaborative surveillance (surveillance, epidemiological investigation, contact tracing and adjustment of public health and social measures).

Enhanced preparedness for future health emergencies requires national operational plans that are tailored, responsive and scalable and incorporate 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) *(22)*. 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 the required financial, logistical and human resources for an unexpected surge of COVID-19 or another emerging or re-emerging pathogen.

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

Surveillance and sequencing, including real-time sharing of data, remain critical for tracking known and emerging variants and monitoring 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 minimal investment but offers significant benefits, as timeliness is critical for real time policy adjustments.

WHO encourages its Member States to explore more innovative and collaborative approaches to timely detection of outbreaks, understanding 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 animal reservoirs.

Conclusion

At this stage of the COVID-19 pandemic, it is crucial to sustain the gains made in strengthening COVID-19 surveillance, including advancements in diagnostics and genomic surveillance capacities. Countries should prioritize the integration of COVID-19 into existing respiratory pathogen surveillance and maintain the ability to rapidly scale up surveillance efforts as needed.

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