Public health surveillance for COVID-19

Interim guidance

16 December 2020

World Health Organization

Background

This document summarizes current WHO guidance for public health surveillance of coronavirus disease 2019 (COVID-19) in humans caused by infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (hereafter referred to as COVID-19 surveillance). This guidance combines and supersedes two earlier documents: Global surveillance guidance for COVID-19 caused by human infection with COVID-19 virus: Interim guidance and Surveillance strategies for COVID-19 human infection: Interim Guidance 10 May 2020.

This document should be read in conjunction with the WHO guidance on preparedness, readiness and response activities, and contact tracing for COVID-19.

Updated information and other guidance on COVID-19 can be found on the WHO COVID-19 website.

What is new in this version:

- Incorporation of antigen-detecting rapid diagnostic tests (Ag-RDTs) into case definitions, in the context of guidance on Antigen detection in the diagnosis of SARS-CoV-2 infection using rapid immunoassays
- Update of transmission classifications with the latest subcategories from Considerations for adjusting public health and social measures in the context of COVID-19
- In several places in the document, terminology has been updated to better clarify the distinction between COVID-19, as the disease, and SARS-CoV-2, as the causative agent

Purpose of this document

This document provides guidance to Member States on the implementation of surveillance for COVID-19 disease and the SARS-CoV-2 virus that causes it, and the reporting requirements for WHO.

Definitions for surveillance

1. Case definition

The case definitions for suspected and probable cases below have been revised to account for updated evidence on the most common or predictive symptoms and clinical and radiographic signs present in COVID-19 as well as known transmission dynamics. The current case definition integrates recent knowledge on signs and symptoms of COVID-19 issued from:

- Publications describing the clinical spectrum of COVID-19 among hospitalized (e.g. Guan 2020 [1], Menni 2020 [2]) and non-hospitalized (e.g. Spinato 2020[3]; Tostamnn 2020 [4], Struyf 2020 [5]) COVID-19 patients and WHO Clinical management of COVID-19
- WHO's and partners' analysis of sensitivity, specificity and predictive value of most described signs and symptoms using surveillance data
- Expert consultations with clinicians, radiologists and laboratory scientists connected to global expert networks who supported validation of the definition.

Countries may need to adapt these case definitions depending on their local epidemiological situation and other factors. All countries are encouraged to publish adapted definitions online and in regular situation reports and to document periodic updates to definitions that may affect the interpretation of surveillance data.

Suspected case of SARS-CoV-2 infection (three options, A through C):

A. A person who meets the clinical **AND** epidemiological criteria:

Clinical criteria:

1. Acute onset of fever AND cough;

   OR

2. Acute onset of ANY THREE OR MORE of the following signs or symptoms: fever, cough, general weakness/fatigue,[1] headache, myalgia, sore throat, coryza, dyspnoea, anorexia/nausea/vomiting, diarrhoea, altered mental status.

AND

Epidemiological criteria:

1. Residing or working in a setting with high risk of transmission of the virus: for example, closed residential settings and humanitarian settings, such as camp and camp-like settings for displaced persons, any time within the 14 days before symptom onset;

   OR

2. Residing in or travel to an area with community transmission anytime within the 14 days before symptom onset;

   OR

3. Working in health setting, including within health facilities and within households, anytime within the 14 days before symptom onset.

B. A patient with severe acute respiratory illness (SARI: acute respiratory infection with history of fever or measured fever of ≥ 38 C°; and cough; with onset within the last 10 days; and who requires hospitalization).

C. An asymptomatic person not meeting epidemiologic criteria with a positive SARS-CoV-2 antigen-detecting rapid diagnostic test (Ag-RDT).[2]

Probable case of SARS-CoV-2 infection (four options, A through D):

A. A patient who meets clinical criteria above **AND** is a contact of a probable or confirmed case or is linked to a COVID-19 cluster.[3]

B. A suspected case (described above) with chest imaging showing findings suggestive of COVID-19 disease.[4]

C. A person with recent onset of anosmia (loss of smell) or ageusia (loss of taste) in the absence of any other identified cause.

D. Death, not otherwise explained, in an adult with respiratory distress preceding death **AND** who was a contact of a probable or confirmed case or linked to a COVID-19 cluster[3].

Confirmed case of SARS-CoV-2 infection (three options, A through C):

A. A person with a positive Nucleic Acid Amplification Test (NAAT)

B. A person with a positive SARS-CoV-2 Ag-RDT **AND** meeting either the probable case definition or suspected criteria A OR B

C. An asymptomatic person with a positive SARS-CoV-2 Ag-RDT **AND** who is a contact of a probable or confirmed case.

Note: Clinical and public health judgment should be used to determine the need for further investigation in patients who do not strictly meet the clinical or epidemiological criteria. Surveillance case definitions should not be used as the sole basis for guiding clinical management.

[1] Signs separated with slash (/) are to be counted as one sign.

[2] NAAT is required for confirmation, see Diagnostic testing for SARS-CoV-2

[3] A group of symptomatic individuals linked by time, geographic location and common exposures, containing at least **one NAAT**-confirmed case or at least **two** epidemiologically linked, symptomatic (meeting clinical criteria of Suspect case definition A or B) persons with **positive Ag-RDTs** (based on ≥97% specificity of test and desired >99.9% probability of at least one positive result being a true positive)

[4] Typical chest imaging findings suggestive of COVID-19 include the following (Manna 2020 [6]):

- chest radiography: hazy opacities, often rounded in morphology, with peripheral and lower lung distribution
- chest CT: multiple bilateral ground glass opacities, often rounded in morphology, with peripheral and lower lung distribution
- lung ultrasound: thickened pleural lines, B lines (multifocal, discrete, or confluent), consolidative patterns with or without air bronchograms.

2. Definition of a contact

A contact is a person who has experienced any one of the following exposures during the **2 days before and the 14 days after the onset** of symptoms of a probable or confirmed case:

1. face-to-face contact with a probable or confirmed case within 1 meter and for at least 15 minutes
2. direct physical contact with a probable or confirmed case
3. direct care for a patient with probable or confirmed COVID-19 disease without the use of recommended personal protective equipment
   OR
4. other situations as indicated by local risk assessments, as outlined in table 1 in Contact tracing in the context of COVID-19.

More information on contact ascertainment is available in Contact tracing in the context of COVID-19.

Note: for confirmed asymptomatic cases, the period of contact is measured as the 2 days before through the 14 days after the date on which the sample that led to confirmation was taken.

3. Definition of death due to COVID-19

A COVID-19 death is defined for surveillance purposes as a death resulting from a clinically compatible illness in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 disease (e.g. trauma). There should be no period of complete recovery between the illness and death.

4. Recommendations for laboratory testing

Suspected and probable cases should be investigated for the presence of SARS-CoV-2 virus according to WHO guidance on Diagnostic testing for SARS-CoV-2.While recommended response activities are largely the same for probable and confirmed cases, testing of probable cases, where resources allow, is still useful since it can exclude cases and reduce the burden required for isolation and contact tracing.

Depending on the intensity of the transmission in a specific location, the number of cases and the laboratory capacity, a subset of suspected or probable cases can be prioritized for testing. WHO has provided recommendations on how to prioritize persons to be tested during community transmission in Laboratory testing strategy recommendations for COVID-19.

Recommended COVID-19 surveillance for Member States

This section provides an overview of surveillance approaches that Member States should consider for comprehensive national surveillance for COVID-19. The section emphasizes the need to adapt and reinforce existing national systems where appropriate and to scale up surveillance capacities as needed.

When considering national capacities for surveillance, Member States should include regular reporting to WHO according to the requirements below.

1. Aims and objectives

The aim of national surveillance for COVID-19 is to enable public health authorities to reduce transmission of SARS-CoV-2, thereby limiting associated morbidity and mortality.

The objectives of COVID-19 surveillance are to:

- Enable rapid detection, isolation, testing, and management of cases
- Detect and contain clusters and outbreaks, especially among vulnerable populations
- Identify, follow-up and quarantine contacts
- Guide the implementation and adjustment of targeted control measures, while enabling safe resumption of economic and social activities
- Evaluate the impact of the pandemic on health care systems and society
- Monitor longer term epidemiologic trends and evolution of SARS-CoV-2 virus and monitor trends in covid-19 deaths
- Contribute to the understanding of the co-circulation of SARS-CoV-2 virus, influenza and other respiratory viruses, and other pathogens.

2. Surveillance approaches

Most countries need significantly strengthened surveillance capacities to rapidly identify and care for cases of COVID-19, trace and quarantine their contacts and monitor disease trends over time. Comprehensive national surveillance for COVID-19 will require the adaptation and reinforcement of existing national systems, where appropriate, and the scale-up of additional surveillance capacities, as needed. Digital technologies for rapid reporting, contact tracing and data management and analysis may support these capacities.

Robust comprehensive surveillance, once in place, should be maintained even in areas where transmission has been suppressed or controlled, even if there are few or no cases. It is critical that new cases and clusters of SARS-CoV-2 infection be detected rapidly before outbreaks or widespread transmission occurs. Ongoing surveillance for COVID-19 is also important to understand longer-term epidemiological trends, such as incidence and mortality among different age groups, which population groups are at higher risk for severe disease and death and potential epidemiological changes over time.

Key actions for comprehensive COVID-19 surveillance include:

- Use, adaptation and strengthening of existing surveillance systems
- Strengthen laboratory and testing capacities
- Use, adaptation and enhancement of public health workforce to carry out case finding, contact tracing and testing
- Include COVID-19 as a mandatory notifiable disease
- Implement immediate reporting
- Establish systems to monitor contact tracing activity.

It is important to maintain routine syndromic surveillance for other infectious diseases, especially those caused by respiratory pathogens, such as influenza and respiratory syncytial virus, through surveillance for influenza-like-illness (ILI), severe acute respiratory infection (SARI), atypical pneumonia and unexplained fever, with sampling and laboratory testing of all or a subset of cases. This is critical for understanding trends in other diseases with similar presentations to guide appropriate public health preparedness and clinical management.

3. Essential surveillance for COVID-19

Considering the potential for rapid and exponential growth of COVID-19 outbreaks, new cases and clusters should be identified and reported as rapidly as possible, and data should be included in any relevant epidemiological analyses within 24 hours of diagnosis. National authorities should include COVID-19 as a mandatory notifiable disease with requirements for immediate reporting.

Surveillance systems should be geographically comprehensive, and surveillance for vulnerable or high-risk populations should be enhanced. This will require a combination of surveillance systems including contact tracing for all levels of the health care system, at the community level, in closed residential settings and in other vulnerable groups.

Table 1 shows how surveillance systems can be combined across different sites.

Table 1. Surveillance systems across different sites/contexts

System / Site/ Context	Immediate case notification	Contact tracing	Virologic surveillance	Cluster investigations	Mortality surveillance	Serologic surveillance
Community	X	X		X	X	X
Primary Care Sites (non-sentinel ILI/ARI)	X		X	X		
Hospitals (non-sentinel ILI/SARI)	X		X	X	X	X
Sentinel ILI/ARI/ SARI sites	X		X			
Closed settings*	X	X		X	X	X
Health care-associated SARS-CoV-2 infection	X	X		X	X	X
Travelers at Points of Entry	X	X		X		

*Including but not limited to long-term living facilities, prisons and dormitories.

3.1 Surveillance approaches by site/context

3.1.1 Surveillance in the Community

Where possible, individuals who have signs and symptoms of COVID-19 and all suspected cases should be able to access evaluation and testing, ideally, at the primary care level. When testing at the primary level is not accessible, individuals in the community can play an important role in the surveillance of COVID-19. Community-based surveillance (CBS) – the systematic detection and reporting of events of public health significance within a community by community members – may serve to bridge the gap between the community and the health system. In CBS, alerts generated by trained volunteers are reported to health authorities for verification and response through established surveillance and referral mechanisms. More guidance on establishing CBS, including simplified alert case definitions, is available from the International Federation of Red Cross and Red Crescent Societies, here.

Participation in contact tracing and cluster investigations are other important ways in which individuals and communities can contribute to the surveillance of COVID-19 and breaking chains of transmission. Contact tracing is the identification and follow-up of all persons who may have had contact with an individual with SARS-CoV-2 infection. By following such contacts daily for up to 14 days since they had contact with the source case, it is possible to identify individuals at high risk of being infectious or ill and to quarantine them before they transmit the infection to others. Contact tracing can be combined with door-to-door case-finding or systematic testing in closed settings, such as residential facilities, or with routine testing for occupational groups, such as health workers or essential workers. See Contact tracing guidelines for COVID-19.

3.1.2 Surveillance at the primary care level

Surveillance in primary care settings is needed to detect cases and clusters in the community. Where possible, testing should be available at primary care clinics. A complementary option is to establish dedicated SARS-CoV-2 community testing facilities, such as drive-through sites or fixed sites in community buildings. Patients with probable or confirmed SARS-CoV-2 infection should be notified within 24 hours of identification. Rapid data reporting and analysis are critical to detect new cases and clusters and to initiate contact tracing. Therefore, a minimum number of data variables should be collected for each case: age, sex, location of residence, date of illness onset, date of sample taken and test result. Daily data reporting to local or national public health authorities can be facilitated using online systems, through mobile phone applications, via SMS text message or over the telephone. Zero reporting – the reporting of zero cases when none are detected – by all sites at the primary care level, ideally daily, is crucial to verifying that the surveillance system is continuously functioning and for monitoring virus circulation.

3.1.3 Hospital-based surveillance

Patients with probable or confirmed COVID-19 admitted to hospitals should be notified to national public health authorities within 24 hours of identification. Some essential data (e.g. outcome) may not be immediately available but should not delay notification to public health authorities.

The minimum essential data from hospital settings should include:

- Age, sex/gender and place of residence
- Date of illness onset, date of sample collection, date of admission
- Type of laboratory test and laboratory test result
- Whether the case is a health care worker or not
- Severity of the patient's illness at the time of reporting (admitted and treated with ventilation or admitted to intensive care unit)
- Outcome of the patient after illness (date of discharge or death).

Daily zero reporting from hospitals is crucial to verify that the surveillance system is continuously functioning.

3.1.4 Sentinel site (ILI/ARI/SARI) surveillance

Sentinel syndromic surveillance is a complementary approach to the other forms of surveillance listed in this document. The advantage of using a sentinel surveillance system is that a systematic, standardized approach to testing is used and not affected by changes in testing strategies affecting the other COVID-19 surveillance approaches; this allows for monitoring trends more easily.

Countries that conduct primary care or hospital-based sentinel surveillance for influenza-like-illness (ILI), acute respiratory infection (ARI), severe acute respiratory infection (SARI) or pneumonia should continue this syndromic surveillance and continue to collect respiratory specimens using existing case definitions through sentinel networks. Laboratories should continue virologic testing of routine sentinel site samples for influenza, with the addition of testing samples for SARS-CoV-2. Countries are encouraged to conduct year-round sentinel surveillance for acute respiratory syndromes with testing of samples for SARS-CoV-2.

Within the existing surveillance systems, the patients selected for additional testing for SARS-CoV-2 should preferably be representative of the population and include all ages and both sexes. If possible, continue to collect samples from both ILI and SARI sentinel sites to represent both mild and severe illness. It is recognized that, based on the local situation, resources, and epidemiology, countries may wish to prioritize sampling among inpatients (SARI or pneumonia cases) to understand SARS-CoV-2 circulation in patients with more severe disease.

SARS-CoV-2 infections identified through sentinel surveillance should be reported into overall national SARS-CoV-2/COVID-19 case counts, as well as through relevant sentinel-site channels.

Additional guidance on sentinel site surveillance for COVID-19 is found in the interim guidance for maintaining surveillance of influenza and monitoring of COVID-19.

3.1.5 Closed settings

Dedicated enhanced surveillance for some high-risk groups residing or working in closed settings is necessary to ensure the prompt detection of cases and clusters faster than through primary-care or hospital-based surveillance. People who live in closed environments, such as prisons, residential facilities, retirement communities and care homes for persons with disabilities, can be especially vulnerable to COVID-19. The reasons include living in settings where the probability of transmission may be higher than in the general population or having health conditions or predisposing factors that increase the risk of developing severe illness and death. Enhanced surveillance in closed settings includes the use of active case finding through daily screening for signs and symptoms for COVID-19, including daily temperature monitoring; and daily zero-reporting for all individuals in high-risk groups under surveillance.

3.2 Health care-associated SARS-CoV-2 infections

In countries with mandatory reporting systems for health care-associated infections, SARS-CoV-2 infection should be included as a priority condition for reporting within these systems, in addition to being counted within general COVID-19 surveillance. All cases and clusters in health care settings should be investigated and documented for their source and transmission patterns to allow rapid control. Ideally, specific reporting of the number of COVID-19 cases and deaths (including asymptomatic SARS-CoV-2 infections) in health workers should be implemented. Additional resources on COVID-19 among health workers in a health care setting can be accessed here and here.

3.3 Mortality Surveillance

The number of COVID-19 deaths (see definition below) occurring in hospitals should be reported daily. The number of COVID-19 deaths occurring in the community, including in long-term-care facilities, should also be reported daily if possible or at least weekly. For both hospital and community COVID-19 deaths, the age, sex, and location of death should be recorded. Reporting of deaths for COVID-19 surveillance is distinct from legal requirements of death certification, which should be done as routinely required by civil registration systems. Vital statistics should be used to monitor excess all-cause mortality over time. Countries should also monitor deaths due to non-specific respiratory causes (e.g. unspecified pneumonia), which may represent undiagnosed COVID-19; and changes in rates of other causes of death, which may be related to the COVID-19 pandemic effects on health systems. In places where civil registration and vital statistics systems are limited or non-existent, rapid mortality surveillance may be considered. Further guidance can be found in the document Revealing-the-toll-of-COVID-19.

3.4 Laboratory surveillance

Data on the number of individuals tested for SARS-CoV-2 should be collected from all relevant laboratories. NAAT testing is the reference standard method to identify SARS-CoV-2 infection. If other diagnostic methods are used, the number of tests conducted and infections confirmed by each diagnostic method used should be recorded and reported. While surveillance systems will typically capture the number of cases of SARS-CoV-2 infection, it is also important to collect information on the testing criteria and the total number of individuals tested for SARS-CoV-2 (this is distinct from the number of tests conducted, which may not be an accurate denominator due to the possibility of repeat testing of a single individual). Knowing the testing denominator can indicate the level of surveillance activity, and the proportion of positive tests can indicate the intensity of transmission among individuals.

- Nucleic acid amplification tests

In the initial stages of the epidemic, nucleic acid amplification test or NAAT (e.g. RT-PCR) was the only WHO-recommended assay for confirmation of a case. PCR and other NAAT assays can be manual or have varying degrees of automation that simplify use. For the purposes of surveillance, however, all NAAT tests are considered equal. More information can be found in Diagnostic testing for SARS-CoV-2.

- Antigen-detecting rapid diagnostic tests (Ag-RDTs)

In this revised version, in addition to NAAT tests, which remain the reference standard, WHO introduces antigen-detecting Rapid Diagnostic Tests as a confirmatory method. This new technology for SARS-CoV-2 detection is much simpler and faster to perform than nucleic acid amplification tests like RT-PCR. This method relies on direct detection of SARS-CoV-2 viral proteins in nasal or naso-pharyngeal swabs using a lateral flow immunoassay (also called an RDT) that gives results in 15-30 minutes. Although these Ag-RDTs are less sensitive than NAAT, they offer the possibility of rapid, inexpensive and early detection of the most infectious SARS-CoV-2 infections in places where PCR testing is not available or results are not timely.

Further information is available in Antigen detection in the diagnosis of SARS-CoV-2 infection using rapid immunoassays.

- Antibody detection (Serology)

Serological assays that detect antibodies produced by the human body in response to infection with the SARS-CoV-2 can be useful in various settings.

Serosurveillance studies can be used to support the investigation of an ongoing outbreak and to support the retrospective assessment of the attack rate or the size of an outbreak. As SARS-CoV-2 is a novel pathogen, understanding of the antibody responses it engenders is still emerging; therefore, antibody detection tests should be used with caution and not used to determine acute infections. Non-quantitative assays (e.g. lateral flow assays) cannot detect an increase in antibody titres, in contrast to semi-quantitative or quantitative assays. Lateral flow antibody detection assays (or other non-quantitative assays) are currently not recommended for acute diagnosis and clinical management and their role in epidemiologic surveys is being studied. For more information on the utility of rapid immunodiagnostic tests, refer to the WHO scientific brief with advice on SARS-CoV-2 point-of-care immunodiagnostic tests.

Immune seroconversion is determined by testing for the presence (and concentration) of antibodies directed against various SARS-CoV-2 proteins early in the course of disease (acute phase – first few days after onset of symptoms) and again weeks later after symptoms have resolved (convalescent phase). A significant rise in antibody titers from baseline to the convalescent phase allows retrospective case confirmation. More information can be found in Diagnostic testing for SARS-CoV-2.

4. Additional surveillance methods and approaches for COVID-19

Additional surveillance approaches can be used along with the essential elements of comprehensive surveillance for COVID-19. New approaches, such as environmental surveillance of non-infective viral fragments of the SARS-CoV-2 virus in wastewater, are being developed but are not yet robust enough for routine use.

4.1 Event-based surveillance

The capacity to rapidly detect any changes in the overall COVID-19 situation can be further strengthened through robust event-based surveillance (EBS) mechanisms. EBS captures unstructured information from formal and informal channels such as online content, radio broadcasts and print media across all relevant sectors to complement conventional public health surveillance efforts. Successful EBS implementation requires dedicated human resources and clear processes to sift through large volumes of information to filter, triage, verify, compare, assess and communicate relevant content. Many web-based systems have been developed over the years to support EBS activities, many of which converge through the WHO-led Epidemic Intelligence from Open Sources (EIOS) initiative. It is equally important to monitor for other potential events that may emerge in parallel, having further impact on lives and compromising COVID-19 response efforts. Further guidance on EBS can be found at https://africacdc.org/download/africa-cdc-event-based-surveillance-framework/.

4.2 Telephone hotlines

Telephone hotlines made available to the public for advice and referral to health-care services may provide an early indication of disease spread in a community. Effectively running a telephone hotline service requires dedicated resources and trained staff to triage calls and appropriately refer callers to the relevant health care or other service.

4.3 Participatory surveillance

Participatory disease surveillance enables members of the public to self-report signs or symptoms, without laboratory testing or assessment by a health care provider (Menni 2020 [2],). Participatory disease surveillance relies on voluntary reporting, usually through dedicated smartphone applications. Although this type of surveillance may not be very specific for identifying cases of COVID-19, the analysis of trends of self-reported illness by members of the public can indicate communities where early disease spread may be occurring. Data collected from participatory surveillance can also give indications of changes in health care-seeking behavior, which are important to understand when interpreting facility-based surveillance data.

4.4 Serological surveillance

Population-based surveys of antibody seropositivity and the use of serology in specific settings/populations can help provide estimates of the proportion of a population that has been infected by SARS-CoV-2 virus as measured by antibodies. Enhanced surveillance, surveys and outbreak investigations can assess the extent of infection in the general or subpopulations, in specific age groups and, potentially, the proportion of unrecognized infections (e.g. asymptomatic or subclinical infections). Further information about the use of serology and sero-epidemiology in the context of COVID-19 can be found at https://www.who.int/emergencies/diseases/novel-coronavirus-2019/serology-in-the-context-of-covid-19.

4.5 Surveillance in humanitarian and other low-resource settings

In refugee camps and among displaced populations and in other humanitarian or low-resource settings, additional considerations for implementation can be considered.

Detection of SARS-CoV-2 infection in these settings can include several strategies. Event-based surveillance can help pick up early warnings and alerts. Where Early Warning, Alert and Response (EWAR) or CBS systems are in place, COVID-19 disease should be integrated into them; and active case finding can be conducted where feasible. In health care facilities, syndromic surveillance may be put in place. Vulnerable groups, including health workers, persons with risk factors for developing severe disease and persons with insufficient access to health care should be prioritized for surveillance and response, as should those in closed settings with high risk of disease transmission.

Testing strategies should target suspect cases following WHO case definitions. Further prioritization can depend on the transmission classification, high risk groups and resources available.

Further information can be found in the Interagency Guidance on scaling-up COVID-19 outbreak readiness and response operations in humanitarian situations. Additional guidance for humanitarian operations, camps and other fragile settings can be found here.

5. Reporting and analysis of surveillance data

The essential surveillance data for COVID-19 described above should be reported, compiled, and analyzed daily, with zero reporting when there are no cases. Data should be compiled either nationally or at an appropriate government administrative level (e.g. district, province, prefecture, state). More in-depth analyses on age, sex, testing patterns and severity should also be conducted on a periodic basis. Routine analysis reports should be distributed to every reporting site in the surveillance system and ideally made publicly available via a government website. Many national and local public health agencies have developed online dashboards to report surveillance data.

To meaningfully interpret surveillance data in the context of this new disease, WHO recommends that the surveillance data be analyzed and presented with clear descriptions of: case definitions in use for probable and confirmed cases (e.g. whether persons with positive results on rapid tests are counted as confirmed case); detection strategies (e.g. active case finding, community detection); and testing strategies (targeted or systematic testing, testing limited to hospitalized patients, etc.); including changes to definitions/criteria over time. Changes in definitions or criteria have an impact on case ascertainment and, consequently, multiple epidemiologic parameters, such as the epidemic curve and calculation of the case fatality ratio.

Relevant data should be reported to WHO as outlined in the section below: reporting COVID-19 surveillance data to WHO.

Countries are also encouraged to monitor the quality of COVID-19 surveillance by monitoring performance indicators such as timeliness, completeness and representativeness of surveillance data.

Reporting COVID-19 surveillance data to WHO

WHO requests that Member States report daily counts of cases and deaths and weekly aggregate counts of cases and deaths at different levels of aggregation.

1. Objectives of global surveillance

The updated objectives below build on global surveillance to date. Objectives of global surveillance are to:

- Monitor trends in COVID-19 at national and global levels
- Monitor mortality caused by, and indirectly associated with, COVID-19
- Estimate morbidity and mortality for health care workers
- Assess the impact of control measures.

Country metadata

Member States are requested to provide additional surveillance metadata to WHO to facilitate interpretation of submitted surveillance data:

1. Definition of epidemiologic period/week in use in country (e.g. "Monday to Sunday")
2. Case definitions used by the country, and the date these definitions came into effect
3. Surveillance/detection strategy or strategies in place in the country, and the date these strategies came into effect
4. Testing strategy or strategies in place in the country and the date these strategies came into effect
5. Situation reports whenever they are issued.

Data should be submitted using the dedicated mailbox for COVID-19 surveillance (covidsurveillance@who.int) or channelled through respective WHO Regional Offices.

2. Daily aggregated data collection

Daily counts of SARS-CoV-2 infections/COVID-19 cases and deaths are compiled by WHO Regional Offices, which in turn receive data either directly from Member States or through extraction from official government public sources (e.g. Ministry of Health websites). Member States are thus encouraged to continue providing these daily counts on an ongoing basis. WHO collects and reports the number of confirmed infections and deaths daily in its situation reports, global dashboard (covid19.who.int) and elsewhere.

Counts are based on WHO case definitions unless stated otherwise (see Country, territory, or area-specific updates and errata). All data represent date of reporting as opposed to date of symptom onset. All data are subject to continuous verification and may change based on retrospective updates to accurately reflect trends, changes in country case definitions or reporting practices. Major updates to country data are noted in Country, territory, or area-specific updates and errata.

Counts of new infections and deaths are calculated by subtracting previous cumulative total counts from the current count. Due to differences in reporting methods, cut-off times, retrospective data consolidation and reporting delays, the number of new infections may not always reflect daily totals published by individual countries, territories or areas.

Further information on the data collected and displayed can be found here.

3. Weekly aggregated reporting

The aim of ongoing weekly aggregate reporting is to obtain further information on global COVID-19 trends for enhanced analysis. New variables are added to take into consideration the new case definition (including probable cases) and objectives of global surveillance (health care workers count of cases and deaths) and are shown in **bold** in the list below:

- Number of confirmed cases
- **Number of probable cases**
- Number of confirmed deaths
- **Number of probable deaths**
- Number of individuals hospitalized (confirmed and probable)
- Number discharged (confirmed and probable)
- **Number of health care workers infected (confirmed + probable) as a subset of total cases count**
- **Number of health care workers who died due to COVID-19 (confirmed + probable) as a subset of total death count**
- Number of persons tested
- **Number of persons tested by PCR**
- Confirmed + **probable** cases by age group and sex (see below)
- Confirmed + **probable** deaths by age group and sex (see below)
- Transmission classification.

Age categories have been changed in the latest form: The following age categories (in years) are requested: 0-4, 5-9, 10-14, 15-19, 20-29, 30-39, 40-49, 50-59, 60-64, 65-69, 70-74, 75-79, 80 and over.

These data can be reported via Excel using the form "Global Surveillance of COVID-19: WHO process for reporting aggregated data- V2" available here. A data dictionary is included. MS can also report using the dedicated submission weekly surveillance platform. The weekly surveillance platform for the collection of the minimum variables at the national level and the **transmission classification** at national and sub-national levels is available for Member States to self-report their weekly data directly to WHO (for further information, to obtain login credentials, or to update transmission classifications during the week, please email covidsurveillance@who.int). Weekly zero case reporting is advised, as appropriate. The platform provides a data visualization dashboard for direct visualization of the new data entered.

WHO recommends using the following categories to describe transmission patterns at national (and sub-national levels wherever possible) to guide decisions for preparedness, readiness and response activities.

Table 2: Definition of the categories for transmission pattern

Category name	Definition
No (active) cases	No new cases detected for at least 28 days (two times the maximum incubation period), in the presence of a robust surveillance system. This implies a near-zero risk of infection for the general population.
Imported / Sporadic cases	Cases detected in the past 14 days are all imported, sporadic (e.g. laboratory acquired or zoonotic) or are all linked to imported/sporadic cases, and there are no clear signals of further locally acquired transmission. This implies minimal risk of infection for the general population.
Clusters of cases	Cases detected in the past 14 days are predominantly limited to well-defined clusters that are not directly linked to imported cases, but which are all linked by time, geographic location **and** common exposures. It is assumed that there are a number of unidentified cases in the area. This implies a low risk of infection to others in the wider community if exposure to these clusters is avoided.
Community transmission – level 1 (CT1)	**Low incidence** of locally acquired widely dispersed cases detected in the past 14 days not linked to specific clusters; transmission may be focused in certain population sub-groups. Low risk of infection for the general population.
Community transmission – level 2 (CT2)	**Moderate incidence** of locally acquired widely dispersed cases detected in the past 14 days; transmission less focused in certain population sub-groups. Moderate risk of infection for the general population.
Community transmission – level 3 (CT3)	**High incidence** of locally acquired widely dispersed cases in the past 14 days; transmission not focused in certain population sub-groups. High risk of infection for the general population.
Community transmission – level 4 (CT4)	**Very high incidence** of locally acquired widely dispersed cases in the past 14 days. Very high risk of infection for the general population.

For reference, see Considerations for adjusting public health and social measures in the context of COVID-19

WHO requests that Member States report the classification for administrative level 0 as a priority**.** When national transmission classification is not available but sub-national transmission classifications are available, WHO will assign the highest transmission classification reported in any administrative level 1 to the national level. WHO only requests reporting of the main transmission scenarios (i.e. no cases, imported/sporadic cases, clusters, or community transmission); reporting of sub-classifications of community transmission is not necessary.

During the evolution of the epidemic, transmission classification can be upgraded or downgraded as the situation dictates. When there is movement from one scenario to another WHO recommends:

- From a lower to a higher transmission scenario: change to be reported at any time (in the next weekly update)
- From higher to lower transmission scenario: observe during a 28-day period before confirming downgrading of transmission.

Before changing transmission classification, WHO recommends that a consultation be conducted between the Member State and the WHO Country Office to consider how surveillance performance and testing strategy influence the observed epidemiology.

The deadline for Member State submission of weekly data and transmission classification for each epidemiologic week is Thursday of the following week. Member States are requested to submit weekly data even when no new cases were reported during the week (zero reporting).

The data will be publicly available without editing or filtering by WHO to all Member States and the general public through the WHO website; it may be pooled with other data to inform international response operations and may be periodically published in WHO situation updates and other formats for the benefit of all Member States.

4. Case-based reporting

Reporting of individual case report forms is no longer required by WHO.

On a voluntary basis, Member States may wish to continue to submit case report forms in consultation with their WHO Regional Offices. Data-sharing policies regarding case-based data and analysis strategy and output sharing will be managed by the relevant Regional Office.

Although WHO recommends ceasing case-based reporting for surveillance, the Organization encourages countries to participate in the reporting of clinical data on COVID-19 patients using the dedicated tools available at: https://www.who.int/publications/i/item/WHO-2019-nCoV-Clinical_CRF-2020.4

5. Reporting of COVID-19 through Global Influenza Surveillance and Response System (GISRS)

WHO has a long history of monitoring influenza trends and virology through the Global Influenza Surveillance and Response System (GISRS), which gathers information on ILI, ARI, SARI and pneumonia cases and mortality, mainly through sentinel surveillance. Countries are encouraged to maintain and strengthen existing sentinel syndromic surveillance and to additionally test samples collected for influenza surveillance for SARS-CoV-2 (see https://www.who.int/influenza/gisrs_laboratory/covid19/en/. Data from sentinel syndromic surveillance and from laboratory testing for influenza and SARS-CoV-2 (numbers tested and numbers positive) identified at GISRS sites should be reported to WHO via existing reporting platforms and existing formats and frequencies, both through the GISRS system and the aggregate reporting for COVID-19 (as outlined above). Further information about reporting to GISRS can be found at Operational considerations for COVID-19 surveillance using GISRS.

Selected references

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WHO continues to monitor the situation closely for any changes that may affect this interim guidance. Should any factors change, WHO will issue a further update. Otherwise, this interim guidance document will expire 2 years after the date of publication.

WHO reference number: WHO/2019-nCoV/SurveillanceGuidance/2020.8