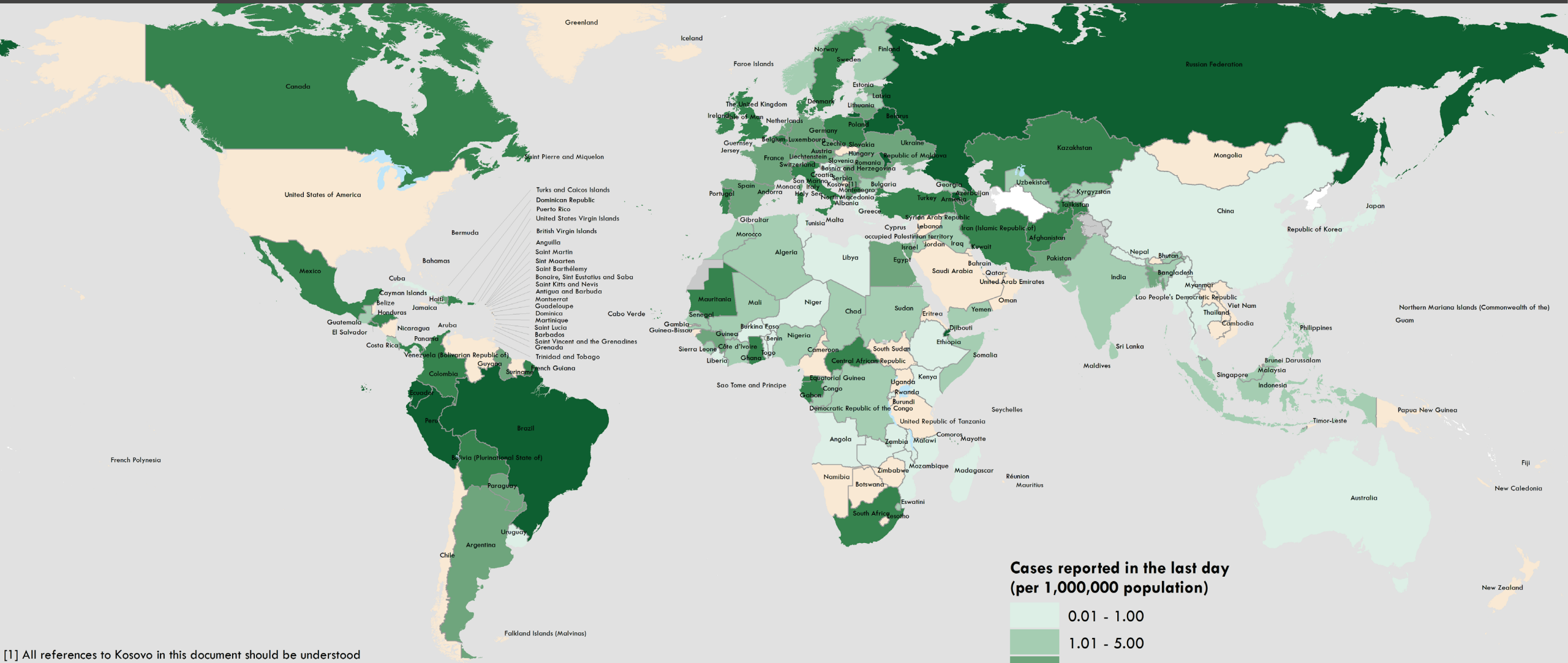
Current Situation (As of 20 May, 18H Geneva Time)

- **Updates from last 24 hours**
  - **65,637 new confirmed cases from 138 countries/territories/areas:**
  - The 10 countries reporting the highest number of cases in past 24 hours: Brazil (13140), Russian Federation (8764), India (5611), Saudi Arabia (2691), Peru (2660), Mexico (2414), The United Kingdom (2412), Iran (Islamic Republic of) (2346), Pakistan (1932), Bangladesh (1617)
  - **2,865 new deaths from 81 countries/territories/areas**
  - The 10 countries reporting the highest number of deaths in past 24 hours: Brazil (674), The United Kingdom (545), Italy (162), Mexico (155), Peru (141), India (140), Russian Federation (135), Ecuador (103), Germany (83), Spain (69)
- **Globally, between 31 Dec 2019 - 20 May 2020**
  - **4,801,202 cases from 215 countries/territories/areas and 1 international conveyance**
  - **318,935 death from 182 countries/territories/areas and 1 international conveyance**
  - The 10 countries with the highest number of cumulative cases: United States of America (1477459), Russian Federation (308705), Brazil (254220), The United Kingdom (248822), Spain (232037), Italy (226699), Germany (176007), Turkey (151615), France (140959), Iran (Islamic Republic of) (126949)

Countries, areas or territories with COVID-19 cases reported in the last day

(Per 1,000,000 population, from 19 May 2020, 10:00 to 20 May 2020, 10:00 (CEST))

World Health Organization



Cases reported in the last day (per 1,000,000 population)

- 0.01 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 50.00
- > 50.00

- No cases reported in the last day
- No reported cases

[1] All references to Kosovo in this document should be understood to be in the context of the United Nations Security Council resolution 1244 (1999).

Number of cases of Serbia and Kosovo (UNSCR 1244, 1999) have been aggregated for visualization purposes.

***Data Source**: World Health Organization, United Nations Population Division (Population prospect 2020)*
***Map Production**: WHO Health Emergencies Programme*

Not applicable

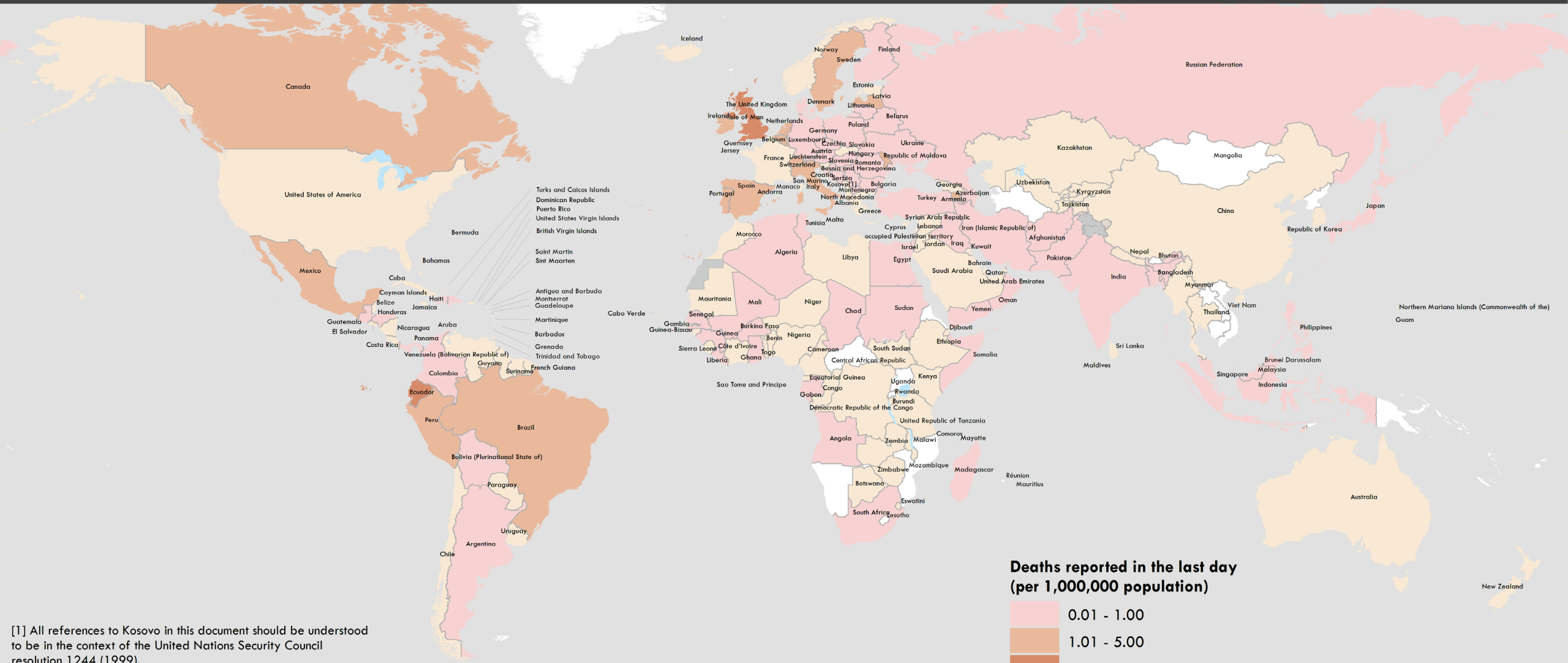
0 2,500 5,000 km

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Countries, areas or territories with COVID-19 deaths reported in the last day

(Per 1,000,000 population, from 19 May 2020, 10:00 to 20 May 2020, 10:00 (CEST))

World Health Organization



Deaths reported in the last day (per 1,000,000 population)

- 0.01 - 1.00
- 1.01 - 5.00
- 5.01 - 10.00
- 10.01 - 20.00
- > 20.00
- No deaths reported in the last day
- No reported deaths

[1] All references to Kosovo in this document should be understood to be in the context of the United Nations Security Council resolution 1244 (1999).

Number of deaths of Serbia and Kosovo (UNSCR 1244, 1999) have been aggregated for visualization purposes.

***Data Source**: World Health Organization*
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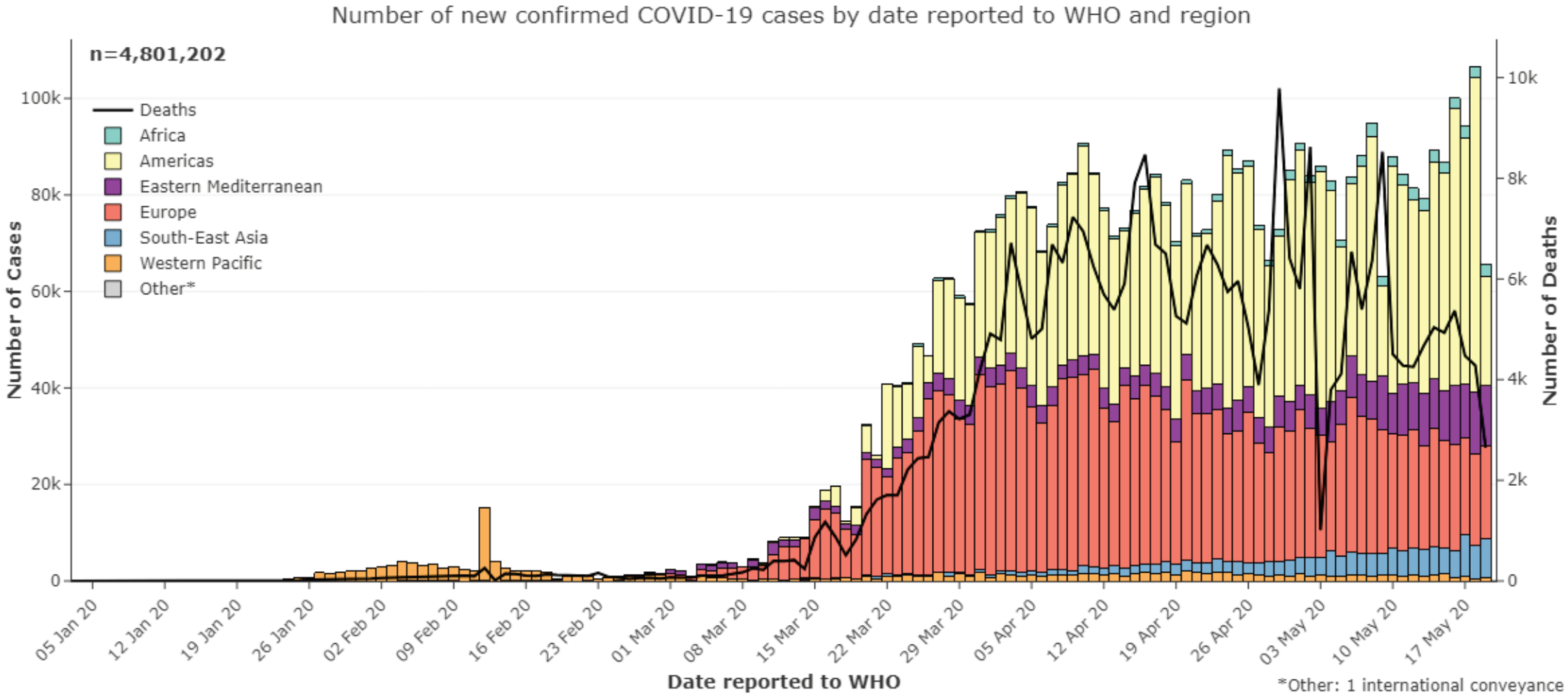
Global epidemic curve by region (cases reported to WHO as of 20 May 18H)



World Health Organization

HEALTH EMERGENCIES programme

Surveillance Guidance

Surveillance strategies for COVID-19 human infection

Interim guidance

10 May 2020

World Health Organization

https://www.who.int/publications-detail/surveillance-strategies-for-covid-19-human-infection

Background

COVID-19 has spread rapidly around the world, affecting every community directly or indirectly. Stringent public health and social measures (PHSM) have been put in place by all countries to slow the spread of COVID-19. These include limitations on domestic and international travel; stay-at-home orders; closing of schools, shops, and religious centers; among other measures. As public health authorities consider the lifting some of these measures, it is critical that robust surveillance is in place or put in place to control the spread of COVID-19 and guide ongoing implementation of control measures.

The aim of surveillance for COVID-19 is to limit the spread of disease, enable public health authorities to manage the risk of COVID-19, and thereby enable economic and social activity to resume to the extent possible. Surveillance is also necessary to monitor the longer-term trends of COVID-19 transmission and the changes in the virus.

This guidance should be read in conjunction with WHO's

of COVID-19, and thereby enable economic and social activity to resume to the extent possible.

The objectives of COVID-19 surveillance include:

- enable rapid detection, isolation, testing, and management of suspected cases
- identify and follow up contacts
- guide the implementation of control measures
- detect and contain outbreaks among vulnerable populations
- evaluate the impact of the pandemic on health-care systems and society
- monitor longer term epidemiologic trends and evolution of COVID-19 virus
- understand the co-circulation of COVID-19 virus, influenza and other respiratory viruses

Case definitions for surveillance of COVID-19

See the most up-to-date WHO COVID-19 case definitions

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Aims and Objectives of Surveillance for COVID-19

Aims of COVID-19 Surveillance

- Limit spread of disease
- Manage risk of COVID-19
- Enable economic and social activity to resume to the extent possible

Objectives of COVID-10 Surveillance

- Rapid detection, isolation, and management of suspected cases
- Identify and follow-up contacts
- Identify outbreaks
- Guide control measures
- Monitor longer-term trends
- Understand co-circulation of influenza and other respiratory pathogens

Considerations for Surveillance for COVID-19

- New cases and clusters of COVID-19 are detected rapidly before widespread transmission occurs
- Robust comprehensive national surveillance
  - Geographically comprehensive
  - All populations included
- Adaptation and reinforcement of existing surveillance
- Scale-up of additional surveillance capacities
- A high level of surveillance should be maintained, even in areas with no cases

Type of Surveillance and Surveillance Sites for COVID-19

Type of Surveillance	Surveillance Sites					
	Individuals in the Community	Primary Care Sites (non-sentinel ILI/SARI)	Hospitals (non-sentinel ILI/SARI)	Sentinel ILI/SARI Site	Residential Facilities and Vulnerable Groups	Vital Statistics Offices
Immediate Case notification system	X	X	X	X	X	
Contact Tracing System	X					
Sentinel virus surveillance			X	X		
Sentinel case surveillance			X	X		
Cluster investigations	X	X	X	X	X	
Special settings			X		X	
Mortality	X		X	X	X	X

Contact Tracing for COVID-19

Contact tracing in the context of COVID-19

Interim guidance
10 May 2020

World Health Organization

https://www.who.int/publications-detail/contact-tracing-in-the-context-of-covid-19

Background

Coronavirus disease 2019 (COVID-19) is caused by the SARS-CoV-2 virus, and spreads from person-to-person through droplet and contact transmission. To control the spread of COVID-19, interventions need to break the chains of human-to-human transmission, ensuring that the number of new cases generated by each confirmed case is maintained below 1 (effective reproduction number < 1). As part of a comprehensive strategy, case identification, isolation, testing and care, and contact tracing and quarantine, are critical activities to reduce transmission and control the epidemic.[1]

Contact tracing is the process of identifying, assessing, and managing people who have been exposed to a disease to prevent onward transmission. When systematically applied, contact tracing will break the chains of transmission of an infectious disease and is thus an essential public health tool for controlling infectious disease outbreaks. Contact tracing for COVID-19 requires identifying persons who may have been exposed to COVID-19 and following them up daily for 14 days from the last point of exposure.

This document provides guidance on how to establish contact tracing capacity for the control of COVID-19. It builds upon WHO considerations in the investigation of cases and clusters of COVID-19.[2]

Critical elements of the implementation of contact tracing are community engagement and public support; careful planning and consideration of local contexts, communities, and cultures; a workforce of trained contact tracers and supervisors; logistics support to contact tracing teams; and a system to collate, compile, and analyse data in real-time.

For contact tracing to be effective, countries must have adequate capacity to test suspect cases in a timely manner. Where this is not possible, testing[3] and contact tracing strategies may instead focus on specific high-risk settings with vulnerable individuals, such as hospitals, care homes, or other closed settings (e.g. dormitories).

Because individuals may transmit COVID-19 while pre-symptomatic or asymptomatic, this guidance also emphasizes the importance of quarantining contacts to further reduce the potential for secondary transmission.[4]

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Purpose of Contact Tracing for COVID-19

Why do contact tracing?

- Break the chain of human-to-human transmission
- Reduce the number of new cases generated by each case to below 1 (Rt<1)

What is contact tracing?

- For a case of COVID-19, identify persons who may have been exposed from 2-days before illness onset
- Quarantine contacts, where possible
- Follow-up contacts daily for 14 days
- Isolate and test contacts with suspected COVID-19

Implementing Contact Tracing for COVID-19

How should contract tracing be implemented?

- Contact tracing should be used as part of a comprehensive control strategy
- Even when contact tracing is not 100%, it is effective at reducing transmission (e.g. https://www.mobs-lab.org/uploads/6/7/8/7/6787877/tracing_main_may4.pdf)
- For large outbreaks, contact tracing continues to be important for vulnerable populations and in areas with low case numbers

Further Elements to Consider

- Engaging Communities
- Establishing and training a contact tracing workforce
- Data management systems
- Apps and technology aids

Criteria to Adjust Public Health and Social Measures

Considerations in adjusting public health and social measures in the context of COVID-19

Interim guidance

16 April 2020

World Health Organization

https://www.who.int/publications-detail/considerations-in-adjusting-public-health-and-social-measures-in-the-context-of-covid-19-interim-guidance

Background

Across the globe, countries have implemented a number of control measures to comprehensively prepare for and respond to COVID-19. The overarching goal of the WHO global

adjusting these measures, so as not to trigger a resurgence of COVID-19 cases and jeopardize the health of the population. Until specific and effective pharmaceutical interventions (e.g. therapies and vaccines) are available, countries may need to continue to loosen or reinstate measures throughout the

https://www.who.int/publications-detail/public-health-criteria-to-adjust-public-health-and-social-measures-in-the-context-of-covid-19

Public health criteria to adjust public health and social measures in the context of COVID-19

Annex to Considerations in adjusting public health and social measures in the context of COVID-19

12 May 2020

World Health Organization

Background

In response to COVID-19, countries around the globe have implemented several public health and social measures (PHSM),

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Public Health Criteria for Adjusting Measures

Three public health questions

1. Epidemiology – is the epidemic controlled?
2. Health System – is the health system able to cope?
3. Public Health Surveillance – is the public health surveillance system able to detect and manage cases and contacts?

Using the criteria

- At least weekly review of the criteria, at subnational administrative level where feasible
- Criteria not prescriptive, thresholds are indicative, adapted by Member States

Public health criteria to adjust PHSM: Epidemiological Criteria

- Has the epidemic been controlled
- Key measure: Rt<1 for ≥2 weeks
- Supplemented by qualitative assessment all/some of the following indicators …

Epidemiological Criteria*
Decline of at least 50% over a 3-week period since the latest peak and continuous decline in the observed incidence of confirmed and probable cases
Less than 5% of samples positive for COVID-19, at least for the last 2 weeks, assuming that surveillance for suspected cases is comprehensive
Less than 5% of samples positive for COVID-19, at least for the last 2 weeks, among influenza-like-illness (ILI) samples tested at sentinel surveillance sites
Less than 5% of samples positive for COVID-19, at least for the last 2 weeks, among severe-acute-respiratory-illness (SARI) samples tested at sentinel surveillance sites
At least 80% of cases are from contact lists and can be linked to known clusters
Decline in the number of deaths among confirmed and probable cases at least for the last 3 weeks
Continuous decline in the number of hospitalization and ICU admissions of confirmed and probable cases at least for the last 2 weeks
Decline in the age-stratified excess mortality due to pneumonia

Public health criteria to adjust PHSM: Health System Criteria

- Can the health system can cope with new hospitalizations without becoming overwhelmed?
- Key measure: No. of new cases requiring hospitalization < estimated maximum hospital and ICU bed capacity of the health system
- In the absence of this info, a qualitative assessment of …

Health System Criteria
All COVID-19 patients can be managed according to national standard
All other patients with a severe non-COVID-19 condition can be managed according to national standard
There is no increase in intra-hospital mortality due to non-COVID-19 conditions
The health system can absorb or can expand to cope with at least a 20% increase in COVID-19 case load
An Infection Prevention and Control (IPC) focal point is available in all health facilities (1 full-time trained IPC focal point per 250 beds) and at district level
All health facilities have screening for COVID-19
All acute health facilities have a mechanism for isolating people with suspected COVID-19

Public health criteria to adjust PHSM: Surveillance Criteria

- Can the public health surveillance can identify most cases and their contacts?

Public Health Surveillance Criteria
Surveillance system
New cases can be identified, reported, and data included in epidemiological analysis within 24 hours
Immediate reporting of probable and confirmed cases of COVID-19 is mandated within national notifiable disease with requirements
Enhanced surveillance is implemented in closed residential settings and for vulnerable groups
Mortality surveillance is conducted for COVID-19 related deaths in hospitals and in the community
The total number of laboratory tests conducted for COVID-19 virus is reported each day
Case investigation
Public health rapid response teams are functional at all appropriate administrative levels
90% of suspect cases are isolated and confirmed/released within 48 hours of symptom onset
Contact tracing
At least 80% of new cases have their close contacts traced and in quarantine within 72 hours of case confirmation
At least 80% of contacts of new cases are monitored for 14 days
Information and data management systems are in place to manage contact tracing and other related data

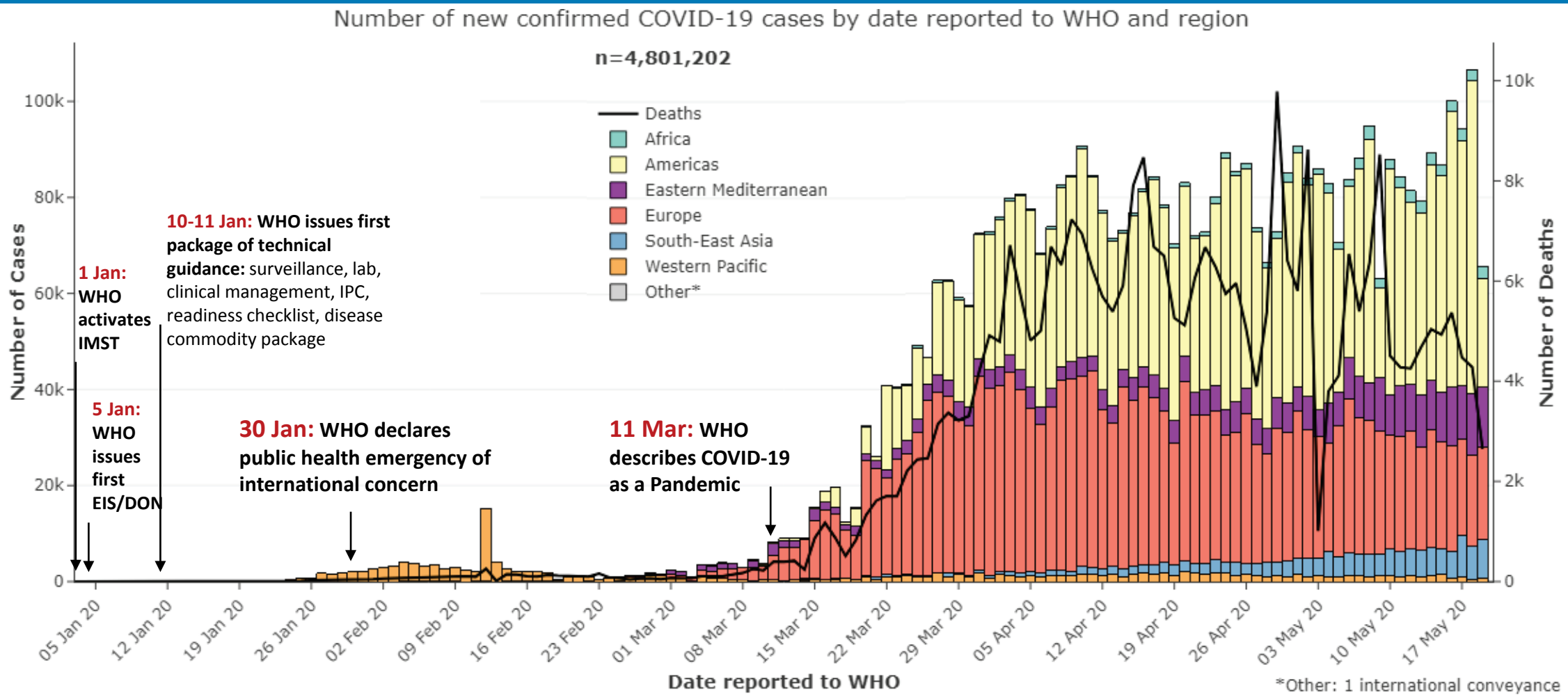
COVID-19: Brief Technical Update

Member State Briefing

21 May 2020


World Health Organization
PROMOTE HEALTH
KEEP THE WORLD SAFE
SERVE THE VULNERABLE
With COVID-19, WHO’s mission resonates more than ever before

Global epidemic curve by region (cases reported to WHO as of 20 May 18H)



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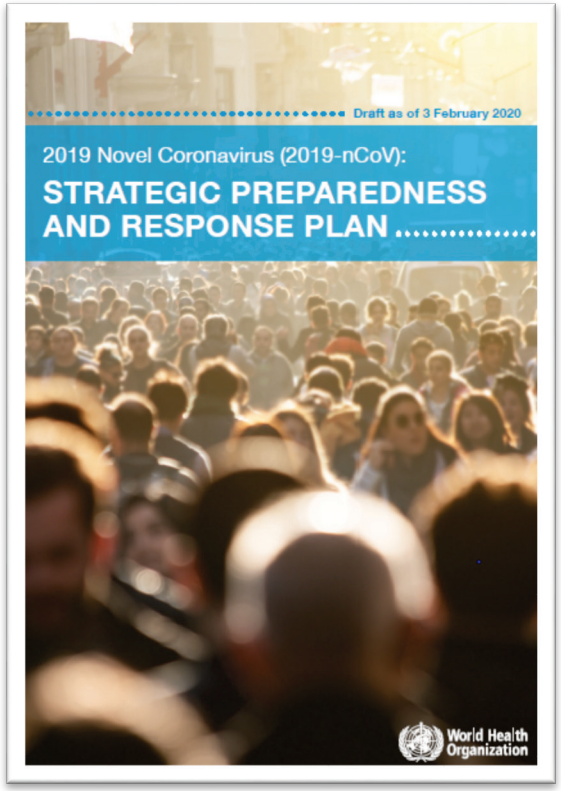
Health first: WHO leading the strategic global response



Global plan released 4 days after declaring a PHEIC

Catalyzed national action plans

- **WHO operational guidance/support**
  147 country offices, 6 regions mobilized
- **40% more national plans in 9 weeks**
  114 ➔160 countries (10/3 – 13/5)

Triggered global multisectoral action

- **WHO-led UN Crisis Management Team**
  23 UN entities, 9 areas of work
- **UN Socio-Economic Framework**
  Health services at the core of recovery

Mobilized financial resources

- **WHO mobilized $580 million in 3 months** 85% for country implementation & supplies

As of 13 May 2020

World Health Organization

WHO's normative function: leading policy & technical guidance

Steering policy through:

- HQ-Regional leadership: 73 meetings
- 45 Global Health Leaders: 11 meetings
- STAG-IH: 18 meetings

Convening experts for guidance development:

- 96 technical documents published by WHO including 55 guidance documents

- Surveillance
- Clinical management
- Laboratory
- Supply & logistics
- Modeling
- Infection prevention & control

> 400 experts
> 100 calls

Critical preparedness, readiness and response actions for COVID-19	Surveillance, rapid response teams, and case investigation	Surveillance, rapid response teams, and case investigation
Country-level coordination, planning, and monitoring	Clinical care	Infection prevention and control/WASH
The Unity Studies: Early Investigations Protocols	Essential resource planning	Guidance for schools, workplace and institutions
Risk communications and community engagement	Virus origin/Reducing animal-human transmission	Points of entry/mass gatherings

As of 12 May 2020

WHO's strong public voice based on science & evidence

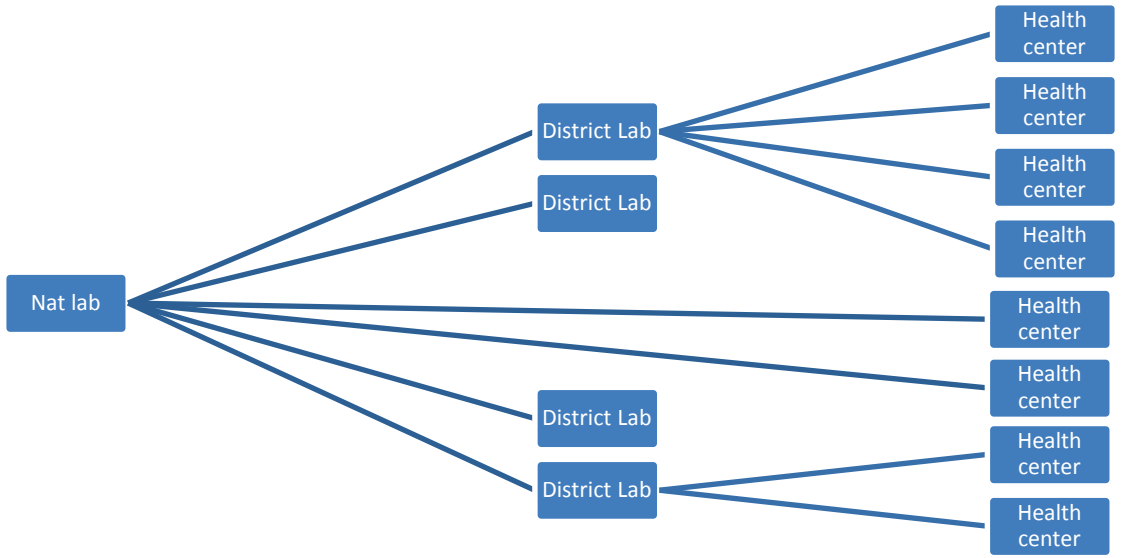
EPI-WiN

WHO's new way to translate science & manage infodemics

- **Whole of society COVID-19 engagement:** individuals, communities, countries, health, travel & trade, employers & workers, food & agriculture, faith-based organizations, youth organizations
- **Promoting health by tracking infodemics and driving practical guidance on public health measures**
- **>130 risk communication products:** 12 videos/animations, 25 mythbusters, 39 Infographics, 8 Q&As, living FAQs etc
- **Amplifying:** 60 webinars, >8500 participants, 128 countries

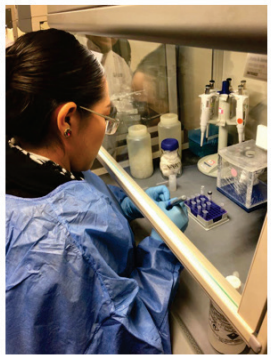
As of 13 May 2020

Tailored diagnostic solutions for COVID-19 and beyond



High-tech, high-throughput

Human resource-intensive, manual PCR

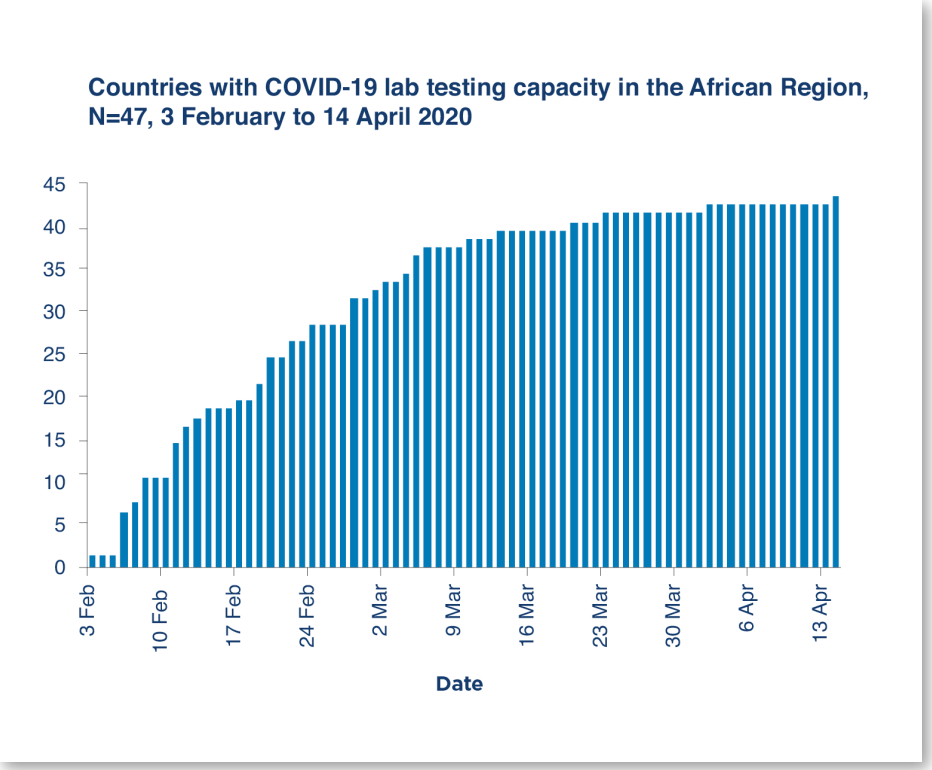


Automated PCR (sample in, answer out)

- Diagnostics supply chain consortium: 4 million tests purchased and shipped for 1st month of scale-up
- EQA jointly with influenza in progress in 260 labs
- Additional EQA for COVID-PCR
  (1800 labs applied for participation)
- Need for unprecedented scale-up of trained human resources

World Health Organization

Country impact: WHO's support to scale up COVID-19 testing capacity in the African region



- 16-fold gain in February alone (2 → 32 countries)
- By 14 April, 44 (94%) countries in region have PCR-testing capacity
  - 4 countries received their 1st ever PCR machines
- WHO role: technical support, missions, virtual trainings, equipment/supplies, facilitating test kits
- **WHO's regional cost for scale up: $1.5 million**
  - supplies
  - equipment
  - reagents and test kits
  - technical support including mentoring by & twinning with regional reference labs

WHO COVID-19 reference laboratory network as of 29 April 2020 (n=26)

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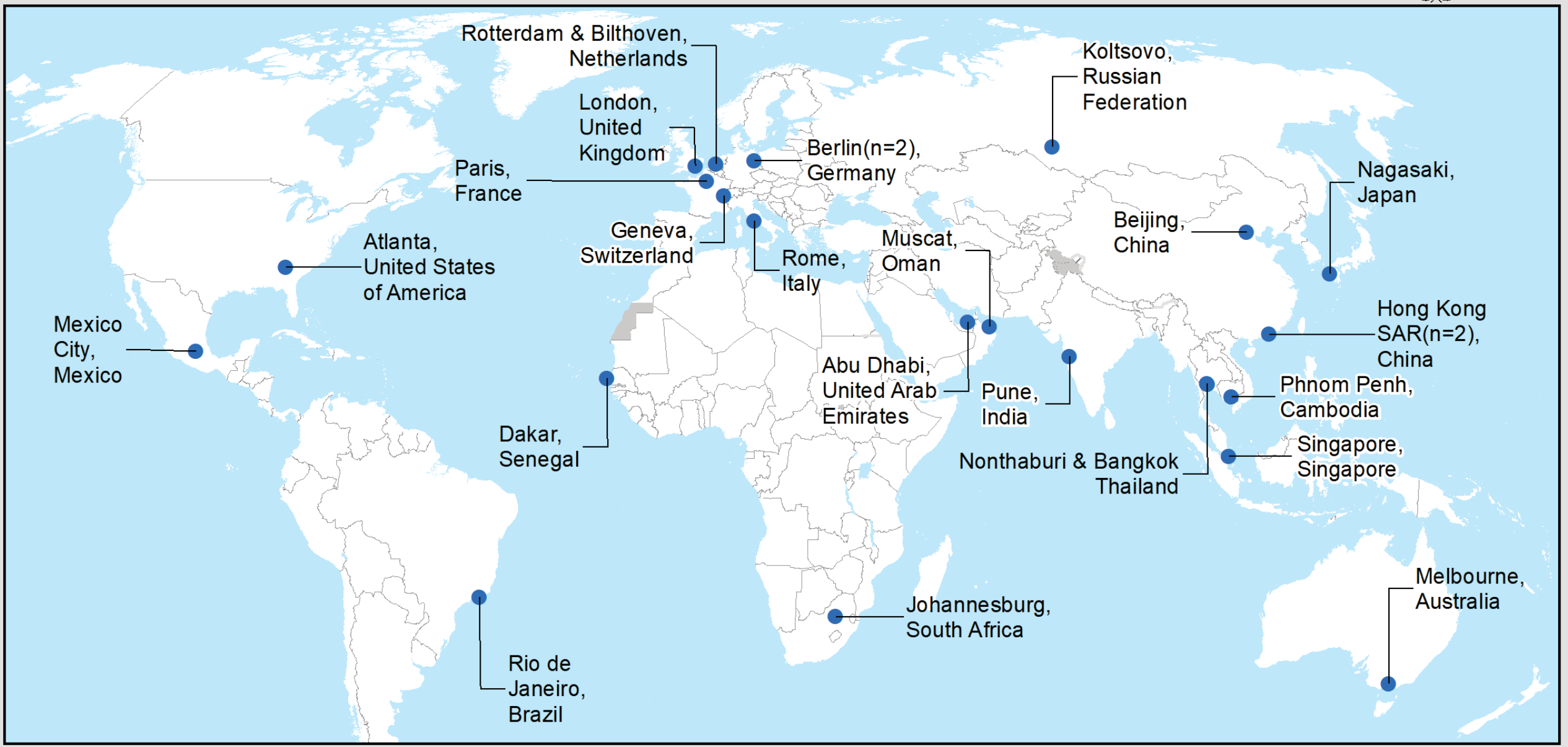

Data Source: *World Health Organization,*
Map Production: *WHO Health Emergencies Programme*

Not applicable

0 1,900 3,800 km

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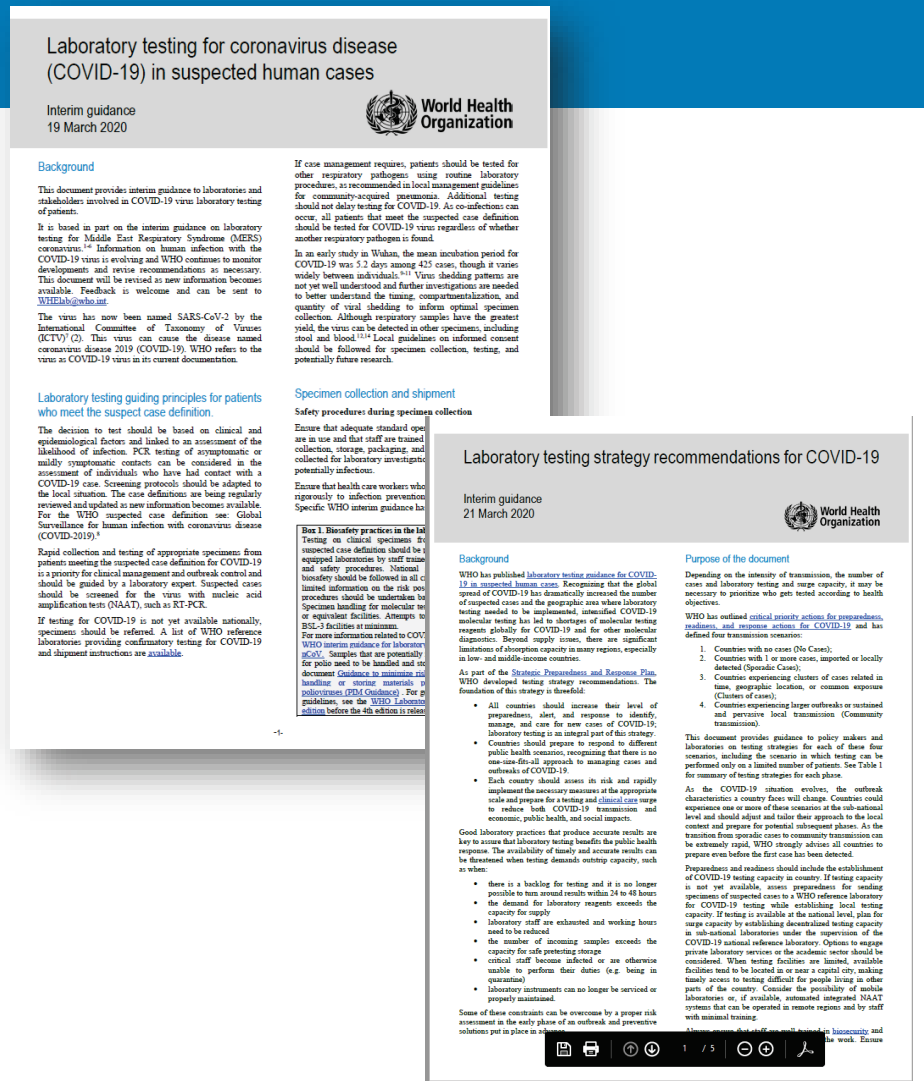
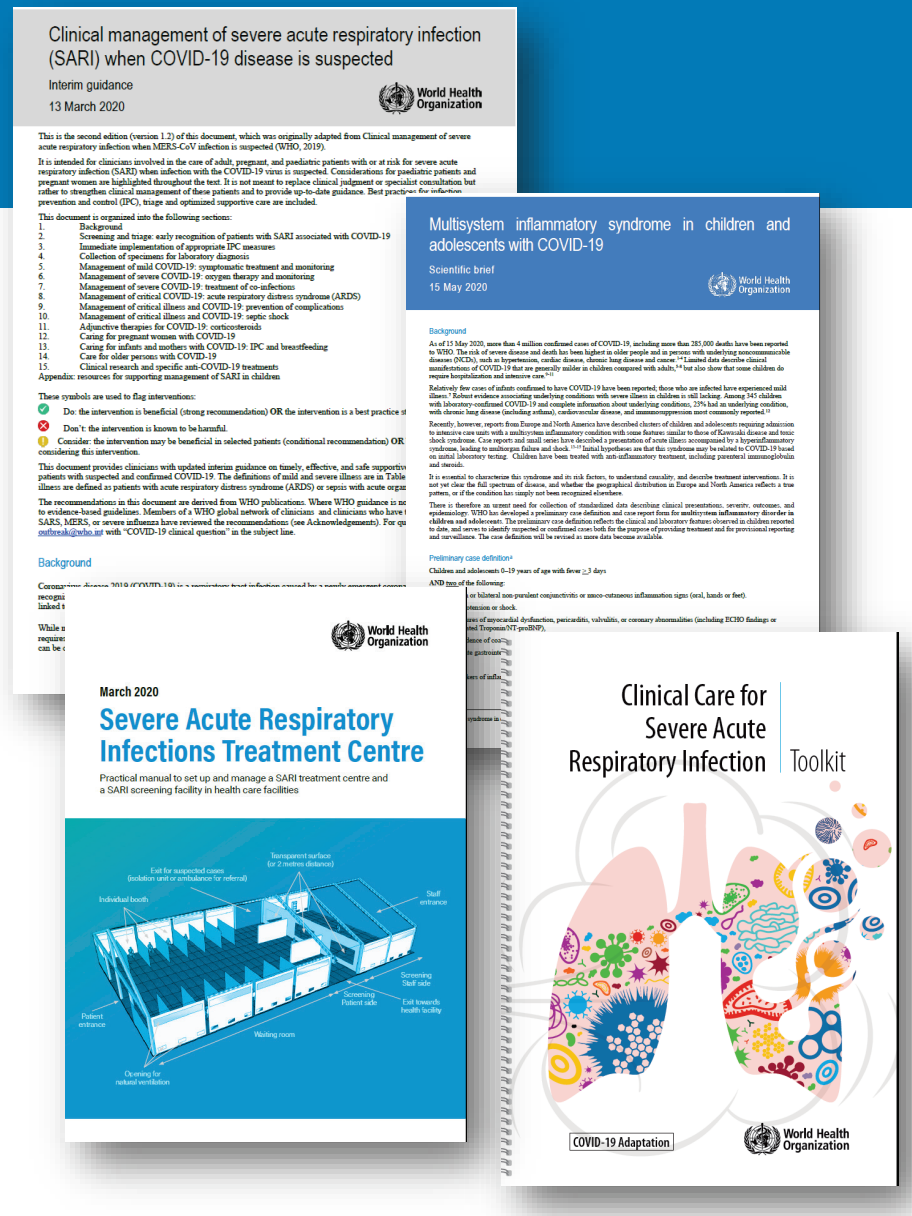
Guidance documents: Laboratory

- Published Guidance
  - Laboratory guidance document for COVID-19
  - Laboratory testing strategy recommendations for COVID-19
  - Biosafety guidance document for COVID-19 (updated 13 May)
  - Laboratory Assessment Tool for laboratories implementing COVID-19 testing
  - SOP for initial distributed assay (more in pipeline aligned with procurement)
  - Guidance for laboratories shipping specimens to WHO reference laboratories that provide confirmatory testing for COVID-19 virus
- In the pipeline
  - Maximizing impact of genetic sequencing on public health for COVID-19
- Scientific brief
  - Advice on the use of point-of-care immunodiagnostic tests for COVID-19



Natural history in humans and infectious dose

- Proportion of sub-clinical infections unknown and critical for understanding possible transmission and potential immunity
- Among reported cases
  - 40% have self-limited mainly respiratory illness probably of ~ 14 days duration
  - 40% have pneumonia, not requiring respiratory support
  - 15% have severe illness requiring medical care +/- hospitalization
  - 5% need intensive care +/- ventilation
- Infectious dose has not been determined



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Duration of PCR positivity

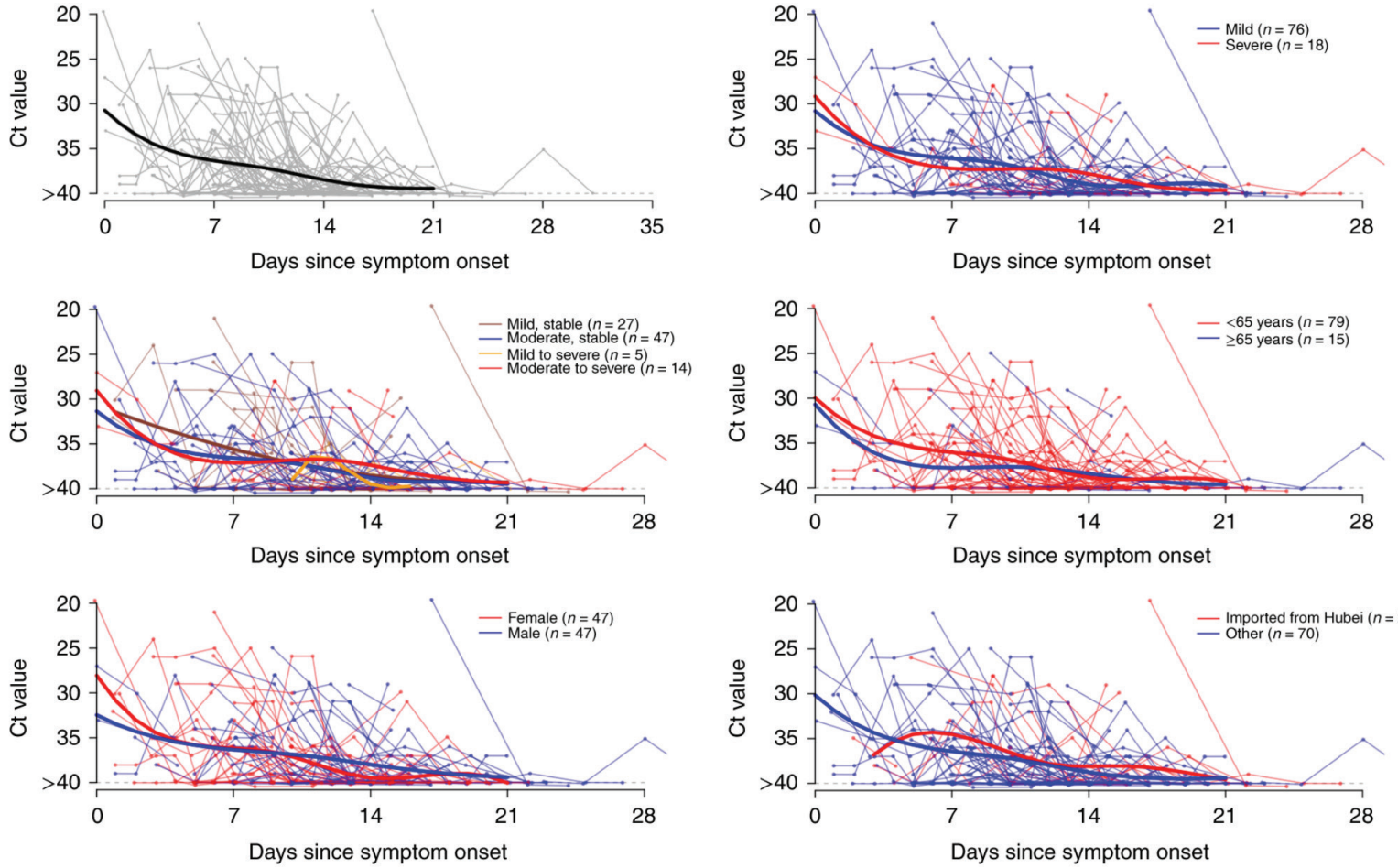
High nasopharyngeal titres of SARS-CoV-2 within the first 24 h of the illness onset, which gradually decrease

Midgely 2020, Young 2020, Zou 2020, Wölfel 2020

Following recovery from clinical illness, many patients no longer have detectable viral RNA in upper respiratory specimens, but there are case reports of prolonged viral shedding

No clear correlation has been described between length of illness and duration of post-recovery shedding of detectable viral RNA in upper respiratory specimens.

Midgely 2020, Wölfel 2020



He X et al. *Nature Med* 2020

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Infectious period

Replication-competent virus has not been successfully cultured more than 9 days after onset of illness

Estimated likelihood of recovering replication-competent virus approaches zero by 10 days

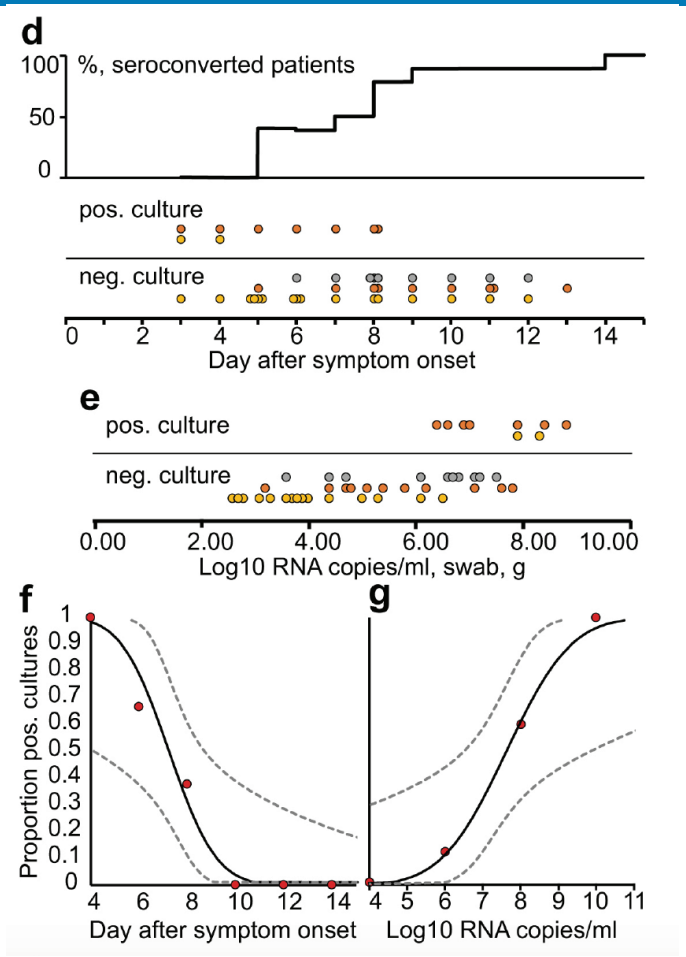
(Wölfel 2020, Arons 2020)

Attempts to culture virus from upper respiratory specimens largely unsuccessful when viral burden is in low but detectable ranges (i.e., Ct values higher than 33-35)

Infectious virus has not been cultured from urine or reliably cultured from feces;

- minimal risk of transmitting infection and can be sufficiently mitigated by good hand hygiene

(Midgely 2020, Wölfel 2020)



Wolfel R et al. *Nature* 2020

COVID-19 Routes of transmission

- **Droplet transmission**
  - COVID-19 virus is transmitted by droplets during close (within 1 m), unprotected contact
  - Preliminary viral shedding data suggests highest shedding at or around the time of symptom onset
- **Transmission through fomites**
  - The virus has been detected on surfaces in the patient environment
  - Possible for people to be infected after touching contaminated surfaces and touching eyes, nose or mouth
- **Aerosol transmission**
  - Aerosol generating procedures produce aerosols that can remain in the air for longer periods of time, compared to larger droplets and be transmitted to others over distances greater than 1m
- **Fecal-oral transmission**
  - RNA has been detected in the stool
  - The roles of fecal-oral transmission remains uncertain, but likely not major driver of transmission

Definitions: Symptomatic, pre-symptomatic & asymptomatic transmission


Coronavirus disease 2019 (COVID-19)
Situation Report – 73

HIGHLIGHTS

SITUATION IN NUMBERS

Figure 1. Countries, territories or areas with reported confirmed cases of COVID-19, 2 April 2020

- **Symptomatic transmission**
  - Defined as: transmission of the virus from a person with symptoms compatible with COVID-19
  - evidence from COVID-19 affected countries indicates that symptomatic transmission is the major driver of transmission
  - supported by viral shedding data
- **Pre-symptomatic transmission**
  - Defined as: transmission of the virus from a person without symptoms at the time of transmission, but who goes on to develop symptoms compatible with COVID-19
  - evidence that those infected with COVID-19 virus may shed virus 1-2 days before onset of symptoms
  - has been documented in the context of contact tracing, but is unlikely to be major driver of transmission
- **Asymptomatic transmission**
  - Defined as: transmission of the virus from a person who has no symptoms at the time of testing and who does not develop any signs/symptoms
  - Few reports of cases who are truly asymptomatic, reports of some with "mild" or "very mild" symptoms
  - Direct information about the occurrence and extent of possible asymptomatic transmission come from contact tracing efforts, household transmission studies, seroepidemiologic investigations; estimates/inferences from mathematical modelling

- **Estimates of asymptomatic/pre-symptomatic transmission range 0-6.4% but models suggest % much higher (12.6-50-60%)**

COVID-19: Risk factors for infection for HCW

- **Health care worker infections have been reported in a large number of countries**
- **Risk factors for infection**
  - Infection outside of health care facilities, from family members
  - Within health care facilities
    - Shortage of PPE for frontline workers
    - Inadequate training for IPC of respiratory pathogens of frontline workers
    - Improper use of PPE precautions early in outbreak
      - Late recognition of COVID-19
      - In wards without contact/droplet precautions (e.g., geriatric, long term care wards)
      - Inexperience with infectious diseases (e.g., dentists, ophthalmologists)
    - Suboptimal/unqualified hand washing
    - Long-term exposure to large scale infected patients
      - Long shifts, inadequate rest periods
      - Surge in patients, wards not specified for ID
    - Psychological distress

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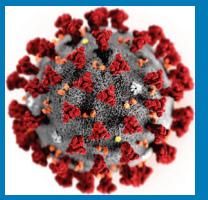
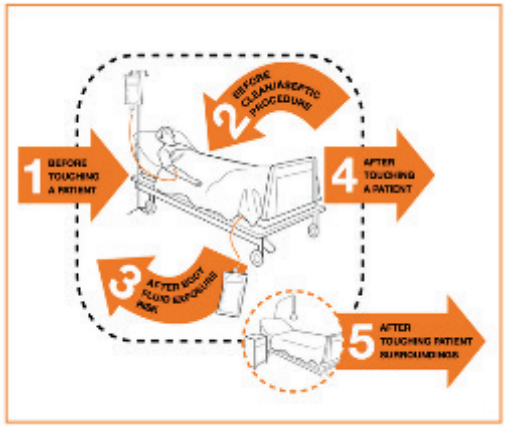
IPC online training options

579,000 enrolments and in 15 languages



- https://openwho.org/channels/covid-19



Standard precautions: Hand hygiene
Self-paced English
Most health care-associated infections are preventable through good hand hygiene – cleaning hands at the right times and in the right way. The WHO Guidelines on hand hygiene in health care support hand hygiene promotion and improvement in health care facilities worldwide and are complemented by the WHO multimodal hand hygiene improvement strategy, the guide to implementation, and implementation toolkit, which contain many ready-to-use practical tools. This module has been prepared to help summarize the WHO guidelines on hand hygiene, associated tools and ideas for effective implementation.
Show course details Enroll me for this course

How to put on and remove personal protective equipment (PPE)
Self-paced English
This is a guide for healthcare workers involved in patient care activities in a healthcare setting. It aims to show the type of personal protective equipment or PPE needed to correctly protect oneself. Based on the current available evidence, the WHO recommended PPE for the care of COVID patients are CONTACT and DROPLET precautions, with the exception of aerosol producing procedures, which require CONTACT and AIRBORNE (hence, a respirator mask such as N95, FFP2, FFP3). Keeping in mind, PPE is part of a larger infection prevention and control bundle of measures and should be implemented as part of a multimodal strategy of management of COVID-19 patients. Only clinical staff who are trained and competent in the use of PPE should be allowed to enter the patient's room.
Show course details Enroll me for this course

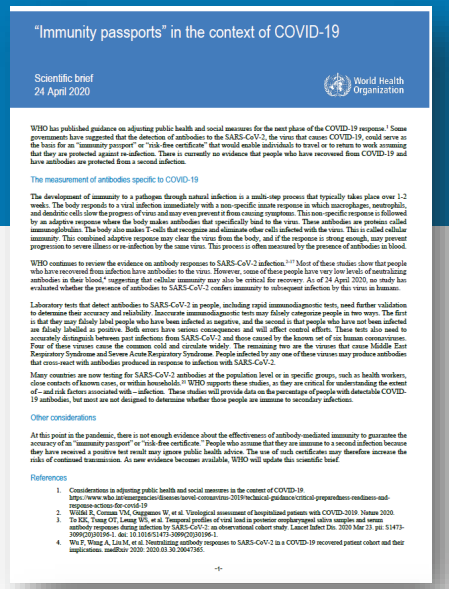
Infection Prevention and Control (IPC) for Novel Coronavirus (COVID-19))
Self-paced English
This course provides information on what facilities should be doing to be prepared to respond to a case of an emerging respiratory virus such as the novel coronavirus, how to identify a case once it occurs, and how to properly implement IPC measures to ensure there is no further transmission to HCW or to other patients and others in the healthcare facility.
This training is intended for healthcare workers and public health professionals, as it is focused on infection prevention and control.
Show course details Enroll me for this course

WHO is providing a global platform for COVID-19 serology

1. WHO is working with global network of laboratories and FIND on the development, evaluation and validation of serologic assays for SARS-CoV-2

2. Within WHO's Solidarity II global collaboration, WHO is working partners to facilitate accelerate the development the global sharing of well characterized panels of sera to enable standardization of serologic assays worldwide, and to develop standardized serologic assays for collaborators to use

3. Adapted early epidemiological investigations protocols for COVID-19 to better understand these characteristics and how they may be used to inform public health measures
   - These Unity studies are underway in more than 50 countries to implement these studies:
     - First few X case and contacts
     - Health worker seroepidemiologic investigation of risk factors for infection
     - Household transmission study
     - Age-stratified population based serologic study


"Immunity passports" in the context of COVID-19

Scientific brief
24 April 2020

World Health Organization

WHO has published guidance on adjusting public health and social measures for the next phase of the COVID-19 response.[1] Some governments have suggested that the detection of antibodies to the SARS-CoV-2, the virus that causes COVID-19, could serve as the basis for an "immunity passport" or "risk-free certificate" that would enable individuals to travel or to return to work assuming that they are protected against re-infection. There is currently no evidence that people who have recovered from COVID-19 and have antibodies are protected from a second infection.

The measurement of antibodies specific to COVID-19

The development of immunity to a pathogen through natural infection is a multi-step process that typically takes place over 1-2 weeks. The body responds to a viral infection immediately with a non-specific innate response in which macrophages, neutrophils, and dendritic cells slow the progress of virus and may even prevent it from causing symptoms. This non-specific response is followed by an adaptive response where the body makes antibodies that specifically bind to the virus. These antibodies are proteins called immunoglobulins. The body also makes T-cells that recognize and eliminate other cells infected with the virus. This is called cellular immunity. This combined adaptive response may clear the virus from the body, and if the response is strong enough, may prevent progression to severe illness or re-infection by the same virus. This process is often measured by the presence of antibodies in blood.

WHO continues to review the evidence on antibody responses to SARS-CoV-2 infection.[2,3,7] Most of these studies show that people who have recovered from infection have antibodies to the virus. However, some of these people have very low levels of neutralizing antibodies in their blood,[4] suggesting that cellular immunity may also be critical for recovery. As of 24 April 2020, no study has evaluated whether the presence of antibodies to SARS-CoV-2 confers immunity to subsequent infection by this virus in humans.

Laboratory tests that detect antibodies to SARS-CoV-2 in people, including rapid immunodiagnostic tests, need further validation to determine their accuracy and reliability. Inaccurate immunodiagnostic tests may falsely categorize people in two ways. The first is that they may falsely label people who have been infected as negative, and the second is that people who have not been infected are falsely labelled as positive. Both errors have serious consequences and will affect control efforts. These tests also need to accurately distinguish between past infections from SARS-CoV-2 and those caused by the known set of six human coronaviruses. Four of these viruses cause the common cold and circulate widely. The remaining two are the viruses that cause Middle East Respiratory Syndrome and Severe Acute Respiratory Syndrome. People infected by any one of these viruses may produce antibodies that cross-react with antibodies produced in response to infection with SARS-CoV-2.

Many countries are now testing for SARS-CoV-2 antibodies at the population level or in specific groups, such as health workers, close contacts of known cases, or within households.[5] WHO supports these studies, as they are critical for understanding the extent of – and risk factors associated with – infection. These studies will provide data on the percentage of people with detectable COVID-19 antibodies, but most are not designed to determine whether those people are immune to secondary infections.

Other considerations

At this point in the pandemic, there is not enough evidence about the effectiveness of antibody-mediated immunity to guarantee the accuracy of an "immunity passport" or "risk-free certificate." People who assume that they are immune to a second infection because they have received a positive test result may ignore public health advice. The use of such certificates may therefore increase the risks of continued transmission. As new evidence becomes available, WHO will update this scientific brief.

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1. Considerations in adjusting public health and social measures in the context of COVID-19. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/critical-preparedness-readiness-and-response-actions-for-covid-19
2. Wölfel R, Corman VM, Guggemos W, et al. Virological assessment of hospitalized patients with COVID-2019. Nature 2020.
3. To KK, Tsang OT, Leung WS, et al. Temporal profiles of viral load in posterior oropharyngeal saliva samples and serum antibody responses during infection by SARS-CoV-2: an observational cohort study. Lancet Infect Dis. 2020 Mar 23. pii: S1473-3099(20)30196-1. doi: 10.1016/S1473-3099(20)30196-1.
4. Wu F, Wang A, Liu M, et al. Neutralizing antibody responses to SARS-CoV-2 in a COVID-19 recovered patient cohort and their implications. medRxiv 2020. 2020.03.30.20047365.


Advice on the use of point-of-care immunodiagnostic tests for COVID-19

Scientific brief
8 April 2020

World Health Organization

In response to the growing COVID-19 pandemic and shortages of laboratory-based molecular testing capacity and reagents, multiple diagnostic test manufacturers have developed and begun selling rapid and easy-to-use devices to facilitate testing outside of laboratory settings. These simple test kits are based either on detection of proteins from the COVID-19 virus in respiratory samples (e.g. sputum, throat swab) or detection, in blood or serum, of human antibodies generated in response to infection.

WHO applauds the efforts of test developers to innovate and respond to the needs of the population.

However, before these tests can be recommended, they must be validated in the appropriate populations and settings. Inadequate tests may miss patients with active infection or falsely categorize patients as having the disease when they do not, further hampering disease control efforts. **At present, based on current evidence, WHO recommends the use of these new point-of-care immunodiagnostic tests only in research settings. They should not be used in any other setting, including for clinical decision-making, until evidence supporting use for specific indications is available.**

WHO continues to evaluate available immunodiagnostics tests for COVID-19 and will update this scientific brief when necessary.

Rapid diagnostic tests based on antigen detection

One type of rapid diagnostic test (RDT) detects the presence of viral proteins (antigens) expressed by the COVID-19 virus in a sample from the respiratory tract of a person. If the target antigen is present in sufficient concentrations in the sample, it will bind to specific antibodies fixed to a paper strip enclosed in a plastic casing and generate a visually detectable signal, typically within 30 minutes. The antigen(s) detected are expressed only when the virus is actively replicating; therefore, such tests are best used to identify acute or early infection.

How well the tests work depends on several factors, including the time from onset of illness, the concentration of virus in the specimen, the quality of the specimen collected from a person and how it is processed, and the precise formulation of the reagents in the test kits. Based on experience with antigen-based RDTs for other respiratory diseases such as influenza, in which affected patients have comparable concentrations of influenza virus in respiratory samples as seen in COVID-19, the sensitivity of these tests might be expected to vary from 34% to 80%.[1]

Based on this information, half or more of COVID-19 infected patients might be missed by such tests, depending on the group of patients tested. These assumptions urgently require further study to understand whether they are accurate. Additionally, false-positive results – that is, a test showing that a person is infected when they are not – could occur if the antibodies on the test strip also recognize antigens of viruses other than COVID-19, such as from human coronaviruses that cause the common cold. If any of the antigen detection tests that are under development or commercialized demonstrate adequate performance, they could potentially be used as triage tests to rapidly identify patients who are very likely to have COVID-19, reducing or eliminating the need for expensive molecular confirmatory testing.

With the limited data now available, WHO does not currently recommend the use of antigen-detecting rapid diagnostic tests for patient care, although research into their performance and potential diagnostic utility is highly encouraged.

Rapid diagnostic tests based on host antibody detection

There is another, more common type of rapid diagnostic test marketed for COVID-19; a test that detects the presence of antibodies in the blood of people believed to have been infected with COVID-19.[2,3] Antibodies are produced over days to weeks after infection with the virus. The strength of antibody response depends on several factors, including age, nutritional status, severity of disease, and certain medications or infections like HIV that suppress the immune system.[4,5] In some people with COVID-19, disease confirmed by molecular testing (e.g. reverse transcription polymerase chain reaction: RT-PCR), weak, late or absent antibody responses have been reported.[4,5,6] Studies suggest that the majority of patients develop antibody response only in the second week after onset of symptoms.[3,4,5,6,7] This means that a diagnosis of COVID-19 infection based on antibody response will often only be possible in the recovery phase, when many of the opportunities for clinical intervention or interruption of disease transmission have already passed. Antibody detection tests targeting COVID-19 may also cross-react with other pathogens, including other human

World Health Organization

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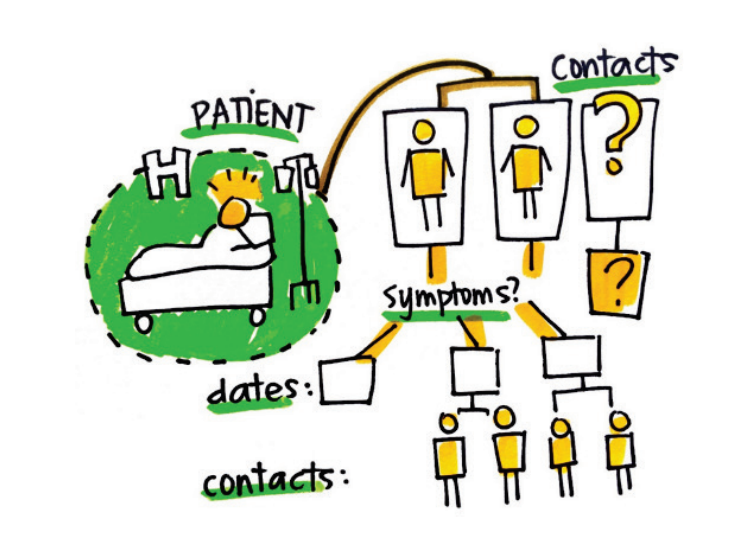
Country impact: building research capacity through WHO's Unity Study Protocols



To collectively better understand COVID-19 transmission dynamics, severity and sero-prevalence

- Standard protocols developed by WHO's expert groups
- Powerful way to aggregate & analyze data across different settings globally, using WHO designed tools including Go.Data
- **Unity and equity together:**
  50 countries implementing the protocols, more in pipeline
  58% of countries participating are **low- and middle-income**

As of 12 May 2020

Early results (based on pre-pub results; subject to change)

- >90 seroepidemiologic studies are underway
- Available studies include peer-reviewed publications (n=2), pre-print publications, and publications released by government institutions (n>15)
- WHO has not reviewed methodologies of all ongoing studies in full
  - Studies have used the ELISA Euroimmun assay, rapid immunodiagnostic tests or an in-house assays
  - Few studies report validation of the assay used or, when validation is reported, is often reported based on small convenience samples of recovered patients and pre-epidemic sera
  - Populations/samples under study include: blood donors, households, outpatient samples, clinical chemistry samples, hospital visitors, first responders, pregnant women and industry workers
- Most study results* suggest <10% of populations under study have evidence of SARS-CoV-2 antibodies, with up to 20% in higher transmission intensity areas and/or among frontline workers

**from publications, pre-prints and press releases*

Health systems facing COVID-19 outbreak

- Huge stress posed by the large number of patients with COVID-19
- Lack of supplies and equipment
- Burden on health care workers
- Disruption of essential health services

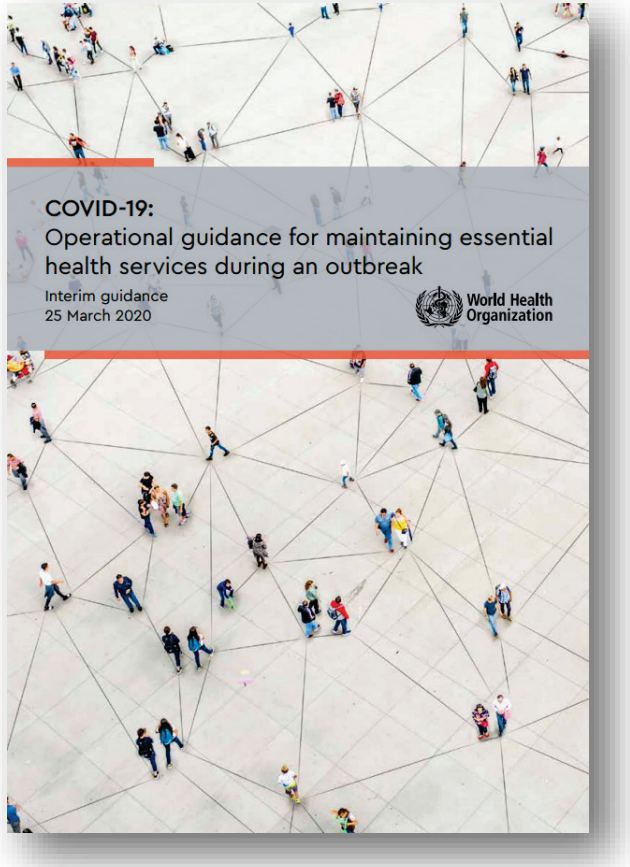
Dilemma: balance the demands of responding to COVID-19 with strategic planning and coordinated action to maintain quality essential health services

WHO technical guidance: Essential Health Services

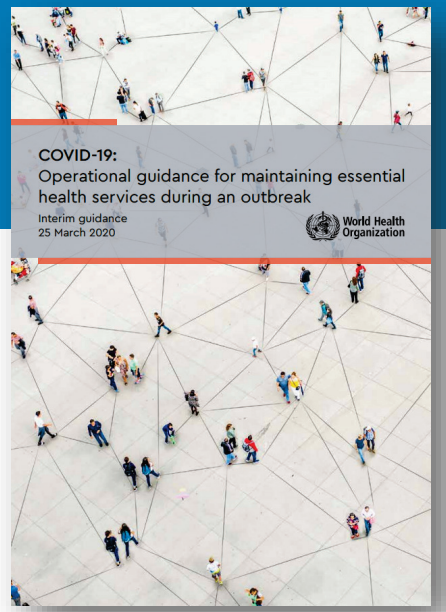
- Provides guidance on "a set of targeted immediate actions that countries should consider at national, regional, and local level to reorganize and maintain access to essential quality health services for all."

- Countries will need to make difficult decisions to balance the demands of responding directly to COVID-19, while simultaneously engaging in strategic planning and coordinated action to maintain essential health service delivery, mitigating the risk of system collapse.

- **Update**: Organized around **nine** areas…

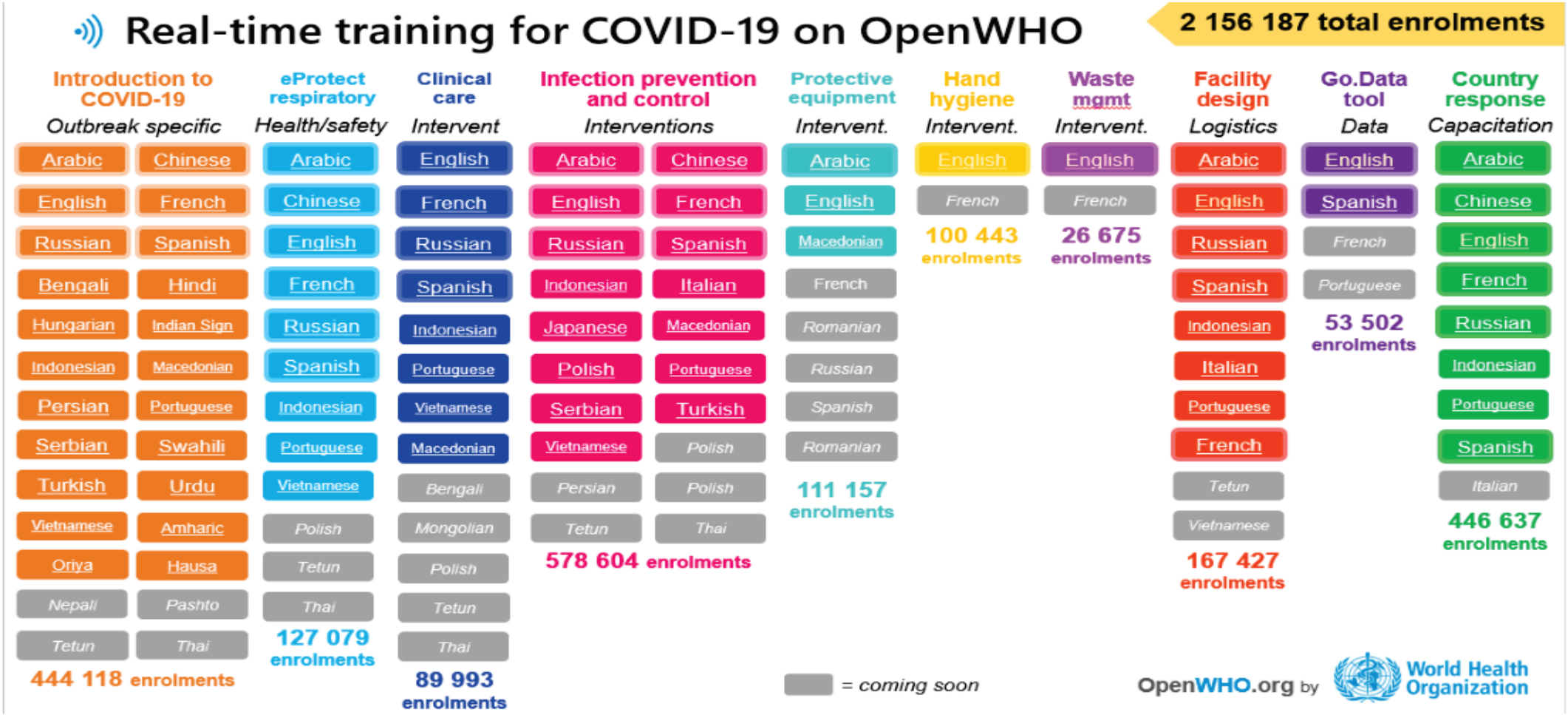


Operational guidance for maintaining essential health services during an outbreak – UPDATED to include 9 areas



1. Establish simplified purpose-designed governance and coordination mechanisms to complement response protocols
2. Identify context-relevant essential services
3. Optimize service delivery settings and platforms
4. Establish effective patient flow (screening, triage, and targeted referral) at all levels
5. Rapidly re-distribute health workforce capacity, including by re-assignment & task sharing
6. Identify mechanisms to maintain availability of essential medications, equipment & supplies
7. Reduce financial barriers for essential services
8. Strengthen communication and use information technologies to support appropriate use of essential services
9. Reinforce health information systems

OpenWHO Training



Critical preparedness, readiness and response actions for COVID-19

Intensity of actions based on transmission scenario:

1. Countries with no cases (No Cases)
2. Countries with 1 or more cases, imported or locally detected (Sporadic Cases)
3. Countries experiencing cases clusters in time, geographic location, or common exposure (Clusters of cases)
4. Countries experiencing larger outbreaks of local transmission (Community transmission)

Countries could experience one or more of these scenarios at the sub-national level and should adjust and tailor their approach to the local context

Critical preparedness, readiness and response actions for COVID-19

Interim guidance
22 March 2020

World Health Organization

This document is an update to the interim guidance document entitled 'Critical preparedness, readiness and response actions for COVID-19.' This version provides updated links to WHO guidance materials and provides the full list of WHO technical guidance available for COVID-19 and provides updated recommendations in the table.

Background

Several countries have demonstrated that COVID-19 transmission from one person to another can be slowed or stopped. These actions have saved lives and have provided the rest of the world with more time to prepare for the arrival of COVID-19: to ready emergency response systems; to increase capacity to detect and care for patients; to ensure hospitals have the space, supplies, and necessary personnel; and to develop life-saving medical interventions. Every country should urgently take all necessary measures to slow further spread and to avoid their health systems becoming overwhelmed as a result of seriously ill patients with COVID-19.

The Strategic Preparedness and Response Plan for COVID-19 aims to:

- Slow and stop transmission, prevent outbreaks, and delay spread
- Provide optimized care for all patients, especially the seriously ill
- Minimize the impact of the epidemic on health systems, social services, and economic activity

All countries should increase their level of preparedness, alert and response to identify, manage, and care for new cases of COVID-19. Countries should prepare to respond to different public health scenarios, recognizing that there is no one-size-fits-all approach to managing cases and outbreaks of COVID-19. Each country should assess its risk and rapidly implement the necessary measures at the appropriate scale to reduce both COVID-19 transmission and economic, public and social impacts.

Scenarios

WHO has defined four transmission scenarios for COVID-19:

1. Countries with no cases (No Cases);
2. Countries with 1 or more cases, imported or locally detected (Sporadic Cases);
3. Countries experiencing cases clusters in time, geographic location, or common exposure (Clusters of cases);
4. Countries experiencing larger outbreaks of local transmission (Community transmission).

Countries could experience one or more of these scenarios at the sub-national level and should adjust and tailor their approach to the local context.

Countries should prepare to respond to all transmission scenarios, following the framework laid out in the Strategic Preparedness and Response Plan for COVID-19. Prioritization and focus of resources for each technical area will depend on which transmission scenario(s) a country is managing.

COVID-19 is a new disease that is distinct from other SARS, MERS, and influenza. Although coronavirus and influenza infections may present with similar symptoms, the virus responsible for COVID-19 is different with respect to community spread and severity. There is still much to discover about the disease and its impact in different contexts. Preparedness, readiness, and response actions will continue to be driven by rapidly accumulating scientific and public health knowledge.

The Table describes the preparedness, readiness and response actions for COVID-19 for each transmission scenario. Hyperlinks to WHO Technical Guidance are provided.

All technical guidance for WHO can be found on the WHO website.

1

Adjusting public health and social measures

Considerations to minimize risk of resurgence in COVID-19 cases

- COVID-19 transmission is controlled
- Sufficient public health workforce and health system capacities are in place
- Outbreak risks in high-vulnerability settings are minimized
- Preventive measures are established in workplaces
- Manage the risk of exporting and importing cases from communities with high risks of transmission
- Communities are fully engaged

- Annexes for Schools, Workplaces, Mass Gatherings, Indicators

Considerations in adjusting public health and social measures in the context of COVID-19

Interim guidance
16 April 2020

World Health Organization

Background

Across the globe, countries have implemented a number of control measures to comprehensively prepare for and respond to COVID-19. The overarching goal of the WHO global COVID-19 response strategy[1] is for all countries to control the pandemic by slowing down transmission and reducing mortality associated with COVID-19, with the ultimate aim of reaching and maintaining a state of low-level or no transmission. Based on local epidemiology, some countries are in the process of scaling up public health and social measures, while others are or currently considering scaling down these measures.

Although the goal in all countries is to suppress transmission and provide care for all patients, the intensity of implementation of control measures to achieve this — including identification, testing, isolation and care for all cases, tracing and quarantine of all contacts, public health and social measures at individual and community levels, etc.— varies based on the transmission scenario each country is facing (no cases, first cases, clusters of cases, or community transmission).[2]

Public health and social measures

Public health measures include personal protective measures (hand hygiene, respiratory etiquette), environmental measures, physical distancing measures, and travel-related measures. Physical distancing measures apply to individuals (e.g. isolation of cases and quarantine of contacts) or to communities, specific segments of the population, or to the population as whole. These measures are not mutually exclusive.

WHO recommends that all suspected cases be identified, tested, isolated and cared for, and their contacts identified, traced, and quarantined.[3]

Additional large scale public health and social measures (PHSM), including movement restrictions, closure of schools and businesses, geographical area quarantine, and international travel restrictions have been implemented by a number of countries. These are sometimes referred to as "lockdown" or "shutdown" measures.

An assessment of the public health impact of PHSM for COVID-19 is not yet available but is needed. This assessment needs to take into account the social consequences and economic costs of such measures, which may be considerable. As such, a careful risk assessment and staged approach is needed to balance the benefits and potential harms of adjusting these measures, so as not to trigger a resurgence of COVID-19 cases and jeopardize the health of the population. Until specific and effective pharmaceutical interventions (e.g. therapies and vaccines) are available, countries may need to continue to loosen or reinstate measures throughout the pandemic.

Decisions to tighten or loosen or re-institute PHSM should be based on scientific evidence and real-world experience and take into account other critical factors, such as economic factors, security-related factors, human rights, food security, and public sentiment and adherence to measures.

Individual measures, including medical masks for symptomatic people,[4] isolation and treatment of ill individuals, and hygiene measures (hand hygiene, respiratory etiquette) should be sustained.

This document is intended for national authorities and decision makers in countries that have introduced large scale PHSM and are considering adjusting them. It offers guidance for adjusting public health and social measures, while managing the risk of resurgence of cases.

Scenarios

WHO has previously defined four transmission scenarios to describe the dynamic of the epidemic: no reported cases (whether truly no cases or no detected cases), sporadic cases, clusters of cases, and community transmission.[2] A country or area can move from one transmission situation to another (in either direction) while experiencing different situations at subnational levels. Each transmission scenario requires a tailored control approach at the lowest administrative level.[2]

Although it is unknown how the pandemic will continue to evolve, three outcomes can be envisaged:

i. complete interruption of human-to-human transmission;
ii. recurring epidemic waves (large or small); and
iii. continuous low-level transmission.

Based on current evidence, the most plausible scenario may involve recurring epidemic waves interspersed with periods of low-level transmission. This guidance has been developed in the context of these scenarios and will be updated as knowledge of the dynamics of the pandemic evolves.

1

WHO coordinating the COVID-19 global research roadmap

WHA 2016 supported a global strategy for rapidly activating R&D activities during epidemics. A global good.

For COVID-19:

Roadmap charted in February	WHO convened world scientists, joint effort to accelerate research
>700 clinical trials underway	WHO tracking systematically, relying on independent panels to advise on recommendations
Solidarity 1 clinical Rx trial	Launched by WHO & partners >100 countries, >2300 patients enrolled
Access to Tools Accelerator	Convenes partners to work on tools with speed, scale & equity at heart

As of 8 May 2020

COVID-19 therapeutics and vaccines

Therapeutics

- **There are currently no licensed therapeutics for COVID-19**
  - Many clinical trials currently underway

- **"Solidarity" is an international clinical trial to help find an effective treatment for COVID-19, launched by WHO and partners**
  - International clinical trial to help find an effective treatment for COVID-19, launched by WHO and partners
  - Compares four treatment options
  - Assesses their relative effectiveness against COVID-19
  - >3000 patients enrolled from 17 countries*

*as of 18 May

https://www.who.int/emergencies/diseases/novel-coronavirus-2019/global-research-on-novel-coronavirus-2019-ncov

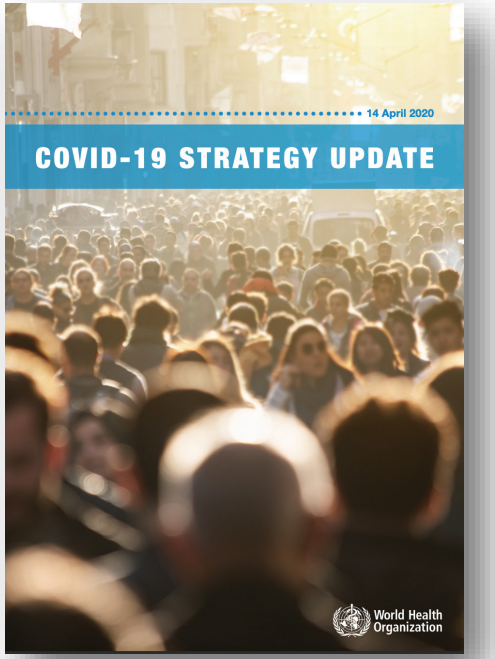
Vaccines

- **Harnessing a broad global coalition to develop and evaluate candidate vaccines as quickly and safely as possible**
  - >120 vaccines are in development

- **Access to COVID-19 Tools Accelerator : ACT Accelerator (launched Friday 24 April)**
  - Brings together the combined power of several organizations to work with speed and scale
  - Shared commitment is to ensure all people have access to all the tools to defeat COVID-19
  - Development and production of save and effective vaccine; Production at scale; Equitable access to vaccine – global engagement

Support for using evidence-based recommendations to manage COVID-19

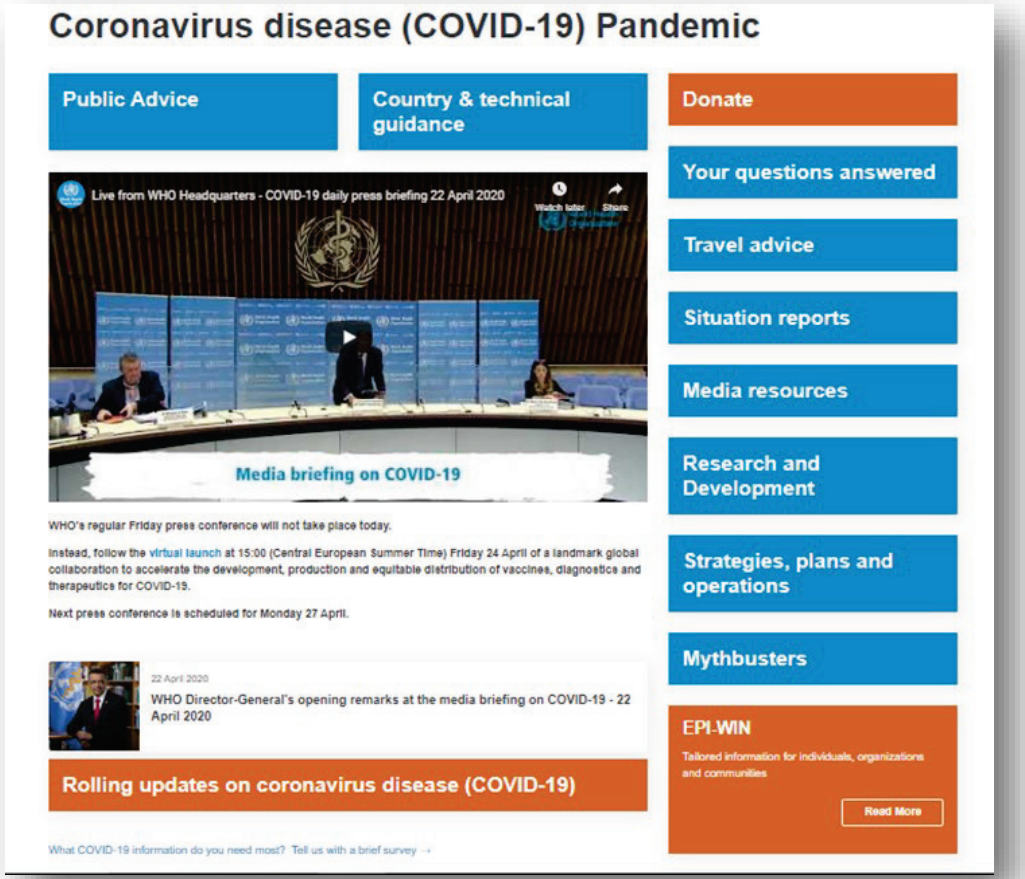
- **Goal firmly remains suppression of transmission and saving lives**
- **Implement evidence-based recommendations and guidance**
  - Agile, adaptive according to transmission intensity and need
- **Strengthening health systems now**
  - Develop workforce to identify, isolate, test, treat all cases and trace and quarantine every contact
  - Ensure resources to protect health workforce
- **Advocate and adopt a whole of society, whole of goernment approach to ensure public health and social measures to reduce transmission and how they are adjusted as necessary over the course of the pandemic**
  - Intensifying and easing
- **Ensure lessons learned are documented and intergrated into preparedness, response and recovery to reduce transmission and how they are adjusted across the course of the pandemic**
- **Document and share good practices/challenges with WHO and others**



WHO COVID-19 resources

- **Be well informed & stay informed with the latest information**

- **WHO Coronavirus website**
  - Strategic preparedness and response plan
  - Daily situation reports and global dashboard
  - Country and technical guidance
  - FAQs Myth busters
  - Research and Development
  - EpiWin: WHO information network for epidemics
  - Advice for individuals
  - Training for frontline workers: OpenWHO.org
  - News, speeches, press conferences. Mission reports
  - And more…



http://www.who.int/emergencies/diseases/novel-coronavirus-2019

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