Draft as of 3 Febuary 2020

2019 Novel Coronavirus (2019-nCoV):

STRATEGIC PREPAREDNESS AND RESPONSE PLAN

World Health Organization

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CONTENTS

ABOUT THIS DOCUMENT 01

SITUATION ASSESSMENT 03

Epidemiological overview as of 1 February 2020 03
Risk assessment 04
Recommendations of the Emergency Committee 04

RESPONSE STRATEGY 05

A) Rapidly establishing international coordination and operational suppot 06
- Partner coordination 06
- Epidemiological analysis and forecasting 07
- Risk communication and managing the infodemic 07
- Laboratory and diagnostics 07
- Technical expertise and guidance 08
- Pandemic supply chain coordination 08
- Travel and trade 10

B) Scaling up country readiness and response operations 11
- Country-level coordination 12
- Risk communication and community engagement 12
- Surveillance 12
- Points of entry 13
- Rapid response teams 13
- National laboratory system 13
- Infection prevention and control 13
- Case management and continuity of essential services 14
- Logistics, procurement, and supply management 16

C) Accelerating priority research and innovation 17
- Enhancing global coordination of all relevant stakeholders 17
- Support a clear and transparent global research and innovation priority setting process 17
- Build common platforms for standardized processes, protocols and tools, as well as for sharing specimens, data, and information 17

MONITORING FRAMEWORK 19

RESOURCE REQUIREMENTS 21

ABOUT THIS DOCUMENT

On 31 December 2019, WHO was alerted to a cluster of pneumonia patients in Wuhan City, Hubei Province of China. One week later, on 7 January 2020, Chinese authorities confirmed that they had identified a novel (new) coronavirus as the cause of the pneumonia (figure 1). The proposed interim name of the virus is 2019-nCoV.

Since the first cases were reported, WHO and its partners have been working with Chinese authorities and global experts to learn more about the virus, including how it is transmitted, the populations most at risk, the spectrum of clinical disease, and the most effective ways to detect, interrupt, and contain human-to-human transmission.

This strategic preparedness and response plan outlines the public health measures that the international community stands ready to provide to support all countries to prepare for and respond to 2019-nCoV. The document takes what we have learned so far about the virus and translates that knowledge into strategic action that can guide the efforts of all national and international partners when developing context-specific national and regional operational plans.

Figure 1 Timeline of early stages of 2019-nCoV outbreak

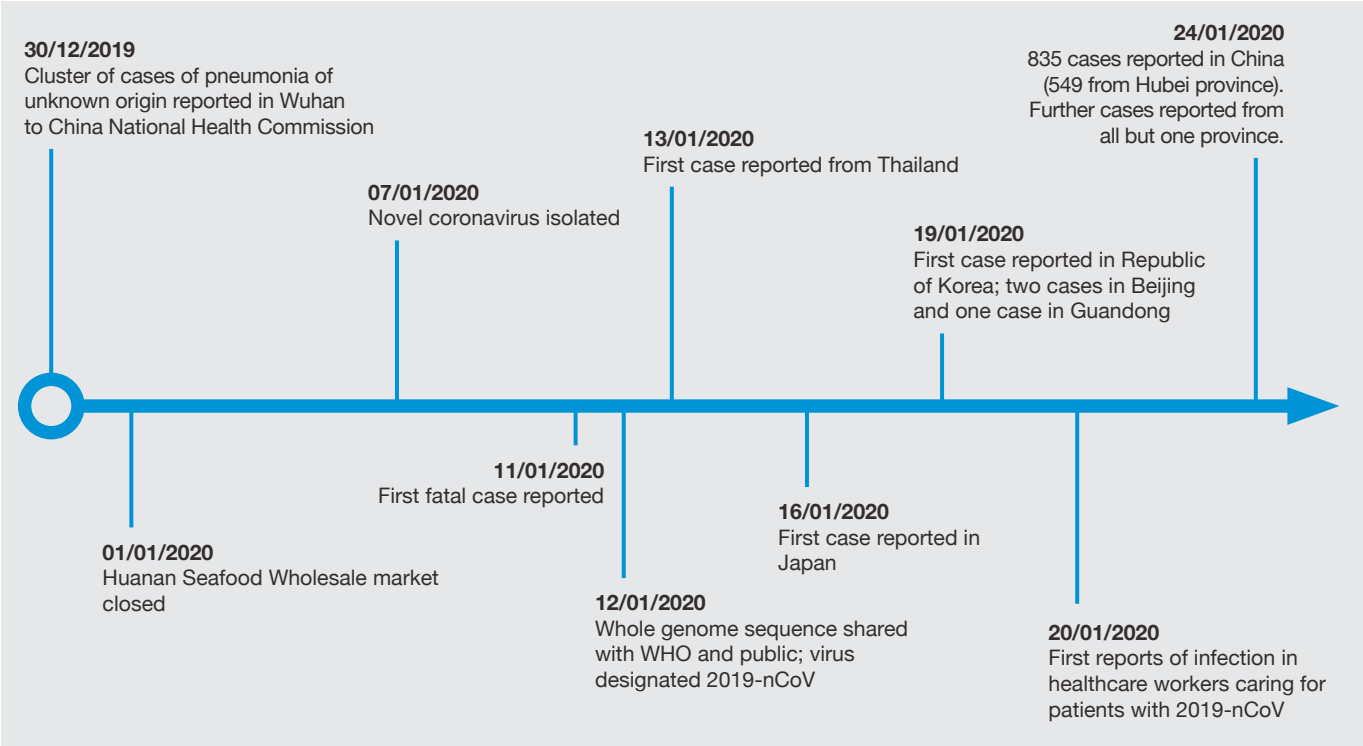


Photo: iStock.com/Robert Wei

SITUATION ASSESSMENT

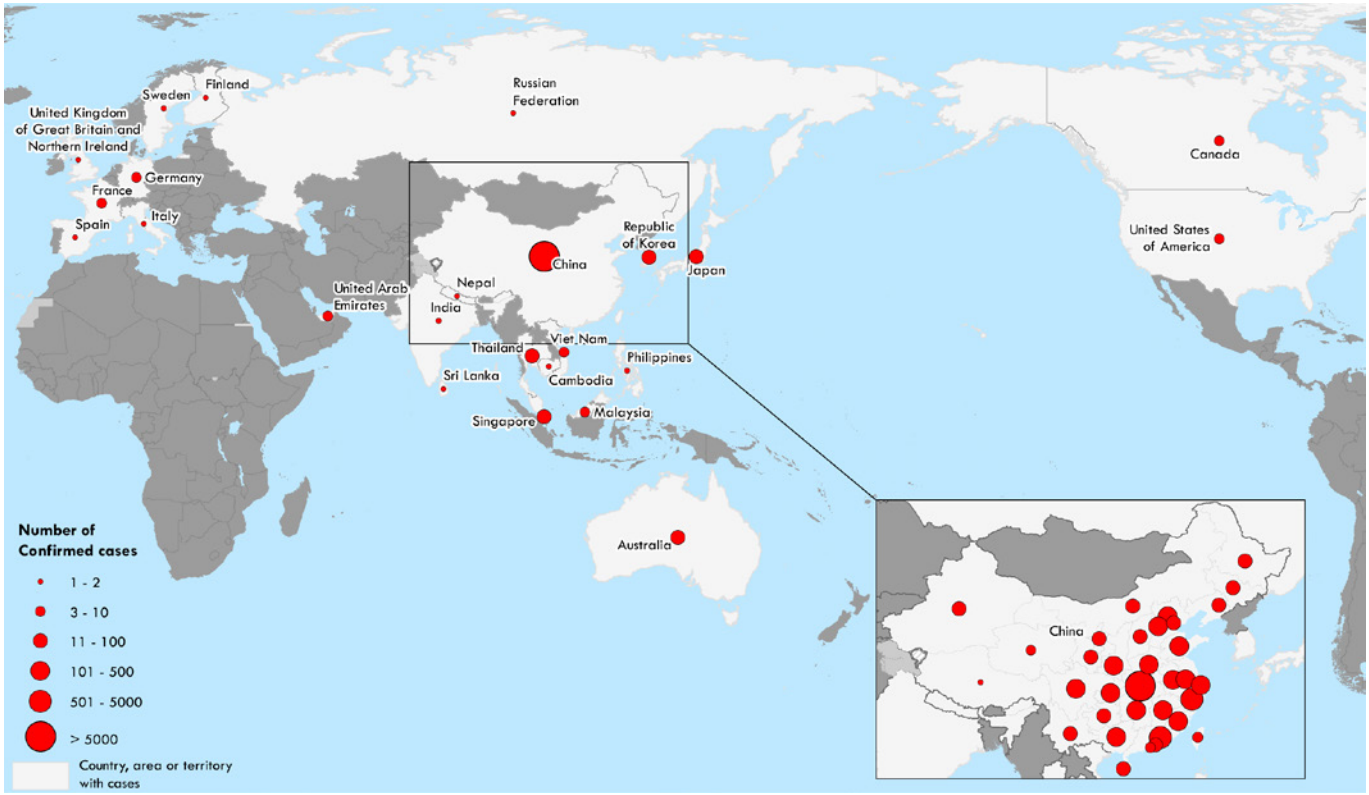
Epidemiological overview as of 1 February 2020

- A total of 11953 confirmed cases of 2019-nCoV have been reported worldwide (figure 2);
- Of the total cases reported, 11821 cases have been reported from China;
- In China, 60.5% of all cases since the start of the outbreak have been reported from Hubei Province. The remaining 39.5% of cases have been reported from 33 provinces, regions, and cities. After Hubei Province, the second largest number of cases has been reported from Zhejiang Province (599 cases);
- 132 confirmed cases have been reported outside of China in 23 countries (figure 2);
- Of the cases reported outside China, 14 are due to secondary transmission;
- 259 deaths have been reported to date.

Epidemiological evidence shows that 2019-nCoV can be transmitted from one individual to another. During previous outbreaks due to other coronaviruses, including Middle-East respiratory syndrome coronavirus (MERS-CoV) and the Severe Acute Respiratory Syndrome coronavirus (SARS-CoV), human-to-human transmission most commonly occurred through droplets, personal contact, and contaminated objects (fomites). The modes of transmission of 2019-nCoV are likely to be similar.

The precise zoonotic (animal) origin of the 2019-nCoV is still uncertain. The virus has been identified in environmental samples from a live animal market in Wuhan, and some human cases have been epidemiologically linked to this market. Other coronavirus, such as SARS and MERS, are also zoonotic, and can be transmitted from animals (civet cats and dromedary camels, respectively) to humans.

Figure 2 Distribution of 2019-nCoV cases as of 01 February 2020



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Data Source: World Health Organization, National Health Commission of the People's Republic of China

Map Production: WHO Health Emergencies Programme

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Risk assessment

WHO assesses the risk to be very high for China, high at the regional level, and high at the global level.

Factors taken into consideration include:

- **Likelihood of further spread:** Human-to-human transmission, including transmission within families and healthcare settings, has been confirmed within Wuhan, and in several cities outside China. The outbreak continues to grow within China at a rapid rate, and now affects all 31 provincial-level administrative regions. Ordinarily high volumes of domestic and international travel have been increased further by travel linked to Lunar New Year celebrations. Imported cases continue to be reported internationally, with several reported cases of secondary transmission now confirmed in countries outside of China. Limited testing capacity in many countries globally, non-specific symptoms of 2019-nCoV acute respiratory disease (the disease caused by 2019-nCoV infection), and co-circulation of other respiratory pathogens are factors that can complicate efforts to detect the virus quickly.
- **Potential impact on human health:** The virus can cause severe illness and death, although most cases appear to be mild. However, many uncertainties remain, including the full extent of the current outbreak within China, and the full clinical spectrum of illness, including the prevalence of mildly symptomatic cases.
- **Effectiveness of current preparedness and response measures:** China has dedicated substantial resources to public health control measures and clinical management, and has taken action that has included the quarantine of cities, and the widespread suspension of transport links between population centres. It will be important to continually assess the extent to which measures are effective and the need to adapt measures as the situation evolves. Up to now, countries that have reported an imported case have demonstrated efficient and effective disease surveillance and response measures. However, some countries are less prepared to detect and respond to an imported case. Rumours, misconceptions, and misinformation disseminated online via social media can have a negative impact on response measures and health-seeking behaviors.

Recommendations of the Emergency Committee

On 30 January 2020, the Director-General of WHO declared the 2019-nCoV outbreak a public health emergency of international concern under the International Health Regulations (IHR) (2005), following advice from the Emergency Committee. The Director-General and Emergency Committee issued temporary recommendations to the People's Republic of China and to other countries.

The Emergency Committee also provided advice to WHO, and welcomed a forthcoming WHO-led multidisciplinary and multi-partner technical mission to China. The mission will review and support efforts to investigate the animal source of the outbreak, the clinical spectrum of the disease and its severity, the extent of human-to-human transmission in the community and in healthcare facilities, and efforts to control the outbreak. This mission will provide information to the international community to aid in understanding the situation, its impact, and effective public health measures to respond to the virus. The Committee recommended that WHO should continue to use its networks of technical experts to assess how best this outbreak can be contained globally, and intensify support for preparation and response, especially in vulnerable countries and regions.

RESPONSE STRATEGY

The overall goal of the strategic preparedness and response plan is to stop further transmission of 2019-nCoV within China and to other countries, and to mitigate the impact of the outbreak in all countries.

Taking the above into account, the strategic objectives of the plan are to:

- Limit human-to-human transmission, including reducing secondary infections among close contacts and healthcare workers, preventing transmission amplification events, and preventing further international spread from China;
- Identify, isolate, and care for patients early, including providing optimized care for infected patients;
- Identify and reduce transmission from the animal source;
- Address crucial unknowns regarding clinical severity, extent of transmission and infection, treatment options, and accelerate the development of diagnostics, therapeutics, and vaccines;
- Communicate critical risk and event information to all communities, and counter misinformation;
- Minimize social and economic impact through multisectoral partnerships.

These objectives can be achieved by:

A) Rapidly establishing international coordination to deliver strategic, technical, and operational support through existing mechanisms and partnerships;

B) Scaling up country preparedness and response operations, including strengthening readiness to rapidly identify, diagnose and treat cases; identification and follow-up of contacts when feasible (with priority given to high-risk settings such as healthcare facilities); infection prevention and control in healthcare settings; implementation of health measures for travelers; and awareness raising in the population though risk communication and community engagement.

C) Accelerating priority research and innovation to support a clear and transparent global process to set research and innovation priorities to fast track and scale-up research, development, and the equitable availability of candidate therapeutics, vaccines, and diagnostics. This will build a common platform for standardized processes, protocols and tools, to facilitate multidisciplinary and collaborative research integrated with the response.

The response strategy is based on several planning assumptions. Owing to the considerable uncertainty surrounding the extent of the outbreak within China, the transmissibility of the virus, and the clinical spectrum of the disease, it will be necessary to regularly update these assumptions as gaps in our knowledge of the disease are filled.

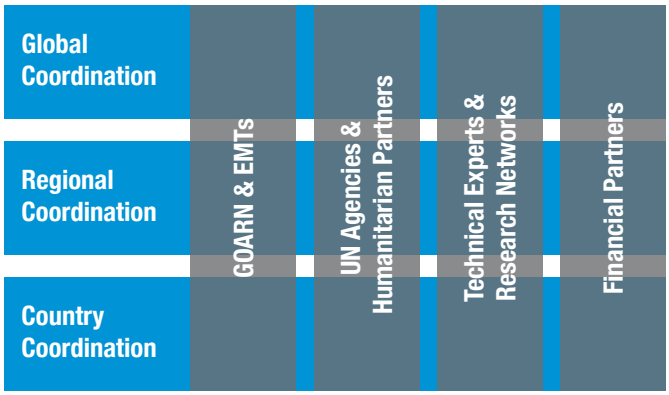
The current response plan assumes that human-to-human transmission takes place, and that it may be amplified in specific settings, including healthcare facilities. We also assume that human-to-human transmission is widespread within Hubei, and possibly other population centres in China.

It is expected that cases will continue to be exported to other countries while the outbreak continues in China. While the response emphasis will be to rapidly identify and isolate imported cases, there is a risk of clusters of cases caused by localized community transmission outside China. In some cases, countries may require operational assistance to strengthen their capacity to detect and respond to these imported cases. However, there remain significant uncertainties around the potential for more widespread transmission outside China, and it will therefore be necessary to have contingency plans in place to mitigate the challenges this would present.

A) Rapidly establishing international coordination and operational support

Partner coordination

To ensure effective coordination of international partners and stakeholders outlined above at global, regional and country levels, WHO will establish integrated incident management teams at the global, regional and country levels, as required. These teams ensure regular communication between incident managers at different geographical levels of the response, and close operational coordination with national governments, partners across all sectors, and services at all levels. More specific details of the coordinating mechanisms are given below, grouped by partner type and geographical breadth of activity.



Global level

The United Nations (UN) Inter-Agency Standing Committee (IASC) will meet on 4 February, and may decide to activate its standard operating procedures for Humanitarian System-Wide Scale-Up Activation — Protocol for the Control of Infectious Disease Events (April 2019), under which the UN response to the situation would be coordinated by WHO through the mechanisms established under its governance programme.

WHO has established an Incident Management Support Team (IMST) together with key operational partners under the leadership of the Director-General. The Director-General will bring together key technical and operational partners to meet on a regular basis to provide updates on the outbreak and take decisions.

At working level, operational partner coordination will be managed through the Global Outbreak Alert and Response Network (GOARN), which includes technical agencies, NGOs, and Red Cross and Red Crescent organizations. GOARN will coordinate global work on surveillance, epidemiology, modelling, diagnostics, clinical care and treatment, and other ways to identify, manage, and limit onward transmission of the virus. The GOARN network manager will chair these meetings.

Regional level

WHO regional offices have established regional IMSTs under the leadership of Regional Directors of the different regions. The IMSTs will coordinate the overall preparedness and response in their respective regions under the different functions. The IMSTs at regional level will work closely with the global level IMSTs to mobilize resources to support and monitor the implementation of activities in countries.

Country level

WHO will work through the regional IMSTs to provide guidance and assist national crisis management authorities to implement: enhanced surveillance recommendations; risk communications for the public regarding trade and travel; management of imported cases; and response to local outbreaks.

In countries where the IASC Humanitarian System-Wide Scale-Up Activation for Infectious Disease Events protocols are activated, a Humanitarian Country Team will be established with context-appropriate coordination structures of which the UN contributions and support is coordinated by the UN Resident Coordinator with the WHO Head of Country Office as overall technical lead, if need be supported by a WHO incident manager. Sub-national coordination hubs will be deployed, including space for non-governmental organizations/civil society involvement, and immediate surge capacity deployments will be requested from IASC member organizations. A package of technical guidance, essential supplies, and operational support will also be provided in such circumstances.

Epidemiological analysis and forecasting

To get ahead of the outbreak we need to answer two urgent questions: 1) what is the extent of the outbreak in China, and what is its most likely trajectory within China, and 2) what is the risk and trajectory outside of China. Epidemiological analysis and forecasting are the primary tools we have for answering these two questions.

Early epidemiologic investigations are critical to carry out early in an outbreak of a new virus to address key unknowns. The data collected from such studies are used to refine recommendations for surveillance and case definitions, to characterize the key epidemiological transmission features of 2019-nCoV, help understand spread, severity, spectrum of disease, impact on the community, and to inform operational models for implementation of countermeasures.

Accurate analysis and forecasting rely on accurate and timely data. WHO has already taken rapid action with partners to establish a global surveillance system that gathers standardized data at the level of individual cases where appropriate, and at the aggregate level for countries with sustained transmission. Partners will continue to collaborate closely to use these data in concert with other datasets (e.g., travel and trade volume data, migration patterns, knowledge and attitude surveys) to forecast epidemiological trends at national and global levels, and ensure that national and global preparedness and response plans are informed by the most robust and accurate analyses possible.

The latest epidemiological updates are currently provided by WHO daily as a public situation report. It will be crucial for partners to maintain formal communication channels among Member States, international organizations, key stakeholders, and technical/professional associations to facilitate information sharing.

Risk communication and managing the infodemic

The 2019-nCoV outbreak and response has been accompanied by an "infodemic:" an over-abundance of information — some accurate and some not — that makes it hard for people to find trustworthy sources and reliable guidance when they need it. Due to the high demand for timely and trustworthy information about 2019-nCoV, WHO technical risk communication and social media teams have been working closely to track and respond to myths and rumours. WHO and partners are working 24 hours a day to identify the most prevalent rumours that can potentially harm the public's health, such as false prevention measures or cures. These myths are then refuted with evidence-based information. WHO and partners are making public health information and advice on the 2019-nCoV, including mythbusters, available on social media channels (including Weibo, Twitter, Facebook, Instagram, LinkedIn, Pinterest) and organizational websites.

In addition, an expanding group of global response organizations such as the United Nations Children's Fund (UNICEF) and the International Federation of Red Cross and Red Crescent Societies (IFRC) are coordinating efforts with WHO to ensure that biomedical recommendations can be applied at the community level. These organizations are active at the global, regional, and country level to ensure that affected populations have a voice and are part of the response. Ensuring that global recommendations and communication are tested, adapted, and localized will help countries better control the 2019-nCoV outbreak.

Laboratory and diagnostics

Partners will work together to strengthen global diagnostic capacity for 2019-nCoV detection in order to improve surveillance and track the spread of disease. Public health efforts to limit spread and strengthen disease control in countries with imported cases depend critically on the ability to detect the pathogen. WHO and partners have activated a network of specialized referral laboratories with demonstrated expertise in the molecular detection of coronaviruses. These international laboratories can support national laboratories to confirm new cases.

WHO and partners will work to ensure the availability of tests, including through the screening validation of current academic and commercially available assays. WHO will work with commercial and non-commercial agencies with the capacity to manufacture and distribute newly-developed 2019-nCoV molecular assays. WHO will begin supporting its regional and country offices to make these tests available from the first week of February 2020.

Technical expertise and guidance

On 10 January, WHO published a range of information for all countries on how they can prepare for and respond cases and clusters of 2019-nCoV, including handling possible cases, how to identify and monitor sick people, collect and test samples, treat patients, prevent onward spread, control transmission in healthcare facilities, maintain adequate stocks of supplies, and communicate with the public about 2019-nCoV infection.

Guidance was developed from existing materials for MERS-CoV and updated with input from a global network of partners from affected countries, and global partners with expertise in laboratory, clinical management, infection prevention and control, mathematical modelling, risk communication, and community engagement.

The full WHO technical guidance pack including the following guidance materials is reviewed and updated regularly as new information becomes available:

- Surveillance case definitions for human infection with 2019-nCoV;
- Interim guidance on laboratory testing of human cases suspected of 2019-nCoV infection, and protocols for molecular testing for 2019-nCoV;
- Clinical management of severe acute respiratory infection when 2019-nCoV infection is suspected;
- Infection prevention and control during healthcare when 2019-nCoV infection is suspected;
- Home care for patients with suspected 2019-nCoV infection presenting with mild symptoms and management of contacts;
- Guidance on risk communication and community engagement and initial response;
- Recommendations on the prevention of transmission from animals to humans;
- Early investigations of suspected cases.

A country readiness checklist was also made available to support teams to review their capacities to detect, manage, and respond to suspect cases and clusters. A disease commodity package for 2019-nCoV outlines the supplies needed for surveillance, laboratory analysis, clinical management, and infection prevention and control.

Global coordination of technical expertise for laboratory, clinical management, infection prevention and control, risk communication and community engagement, and mathematical modelling will continue to gather real-time information and be incorporated into available guidance.

Pandemic supply chain coordination

Partners will use their expertise in quantifying global needs according to various outbreak scenarios, and in the coordination of procurement and supply mechanisms, to ensure that countries and populations most in need are assured of access to crucial supplies and commodities. In practice, this will entail the gathering and analysis of all available information from partner networks to establish supply scenarios based on a prioritized list of countries and population affected, number of patients to be treated, and population to be protected. This analysis will inform the deployment necessary health logistics personnel to regional and country level locations to support logistical efforts. The Pandemic Supply Chain Network and coordination mechanism will be activated to ascertain the current and forecast availability of crucial supplies in order to coordinate the distribution of appropriate supplies to where they are most needed.

Where necessary, partners will establish appropriate operational mechanisms to secure critical supplies with private sector manufacturers and logistics providers to provide country-level support, and negotiate commitments from manufacturers and wholesalers to ensure procurement of critical supplies, prevent stockouts, and mitigate market disruptions and hoarding. Contingency plans will be developed to mitigate disruption to supplies of food and essential commodities (non-medical) supplies in the event that vulnerable countries are affected by widespread transmission.

Travel and trade

Evidence has shown that restricting the movement ofpeople and goods during public health emergencies may be ineffective, and may interrupt vital aid and technical support, disrupt businesses, and have a negative impact on the economies of affected countries and their trading partners. However, in certain specific circumstances, such as uncertainty about the severity of a disease and its transmissibility, measures that restrict the movement of people may prove temporarily useful at the beginning of an outbreak to allow time to implement preparedness activities, and to limit the international spread of potentially highly infectious cases. In such situations, countries should perform risk and cost-benefit analyses before implementing such restrictions, to assess whether the benefits outweigh the drawbacks.

WHO has published and will regularly update advice for international travel and trade, which includes advice for international travelers, as well as measures for international travel such as entry or exit screening.

WHO will continue to monitor additional health measures under IHR (2005) that countries implement in response to the current outbreak. In the event of measures that interfere significantly with international traffic (travel bans, refusal of entry or exit of passengers or cargo for more than 24 hours), in accordance with Article 43 of IHR (2005), States Parties are obliged to send WHO the public health rationale for any such measures, and WHO is obliged to share this information with other States Parties.

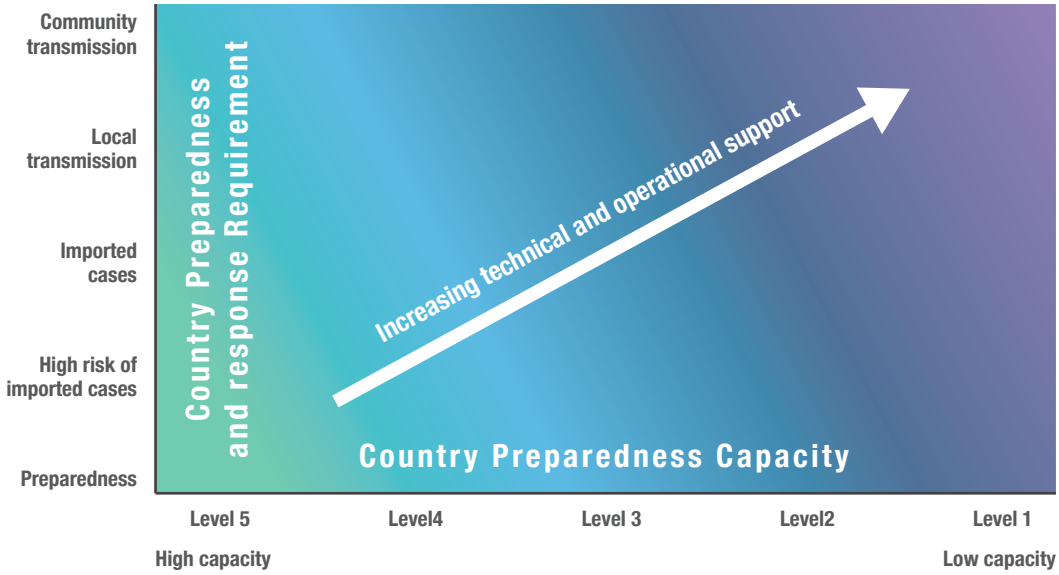
WHO and partners will maintain communication with representatives of airlines and international tourism organizations to exchange information (with a focus on case management on-board aircraft) and reporting should a traveler with respiratory disease symptoms be detected. This will be done in accordance with the International Air Transport Association guidance for cabin crew to manage suspected communicable diseases on board an aircraft.

B) Scaling up country readiness and response operations

Beyond establishing international coordination and operational support, it is crucial to scale up country preparedness and response operations, including the rapid identification, diagnosis and management of cases, identification and follow up of contacts when feasible (with priority given to high-risk settings such as healthcare facilities), infection prevention and control in healthcare settings, implementation of health measures for travelers, and awareness raising in the population though risk communication and community engagement.

All countries are at risk and need to prepare for 2019-nCoV. Partners will prioritize countries with weak health systems and significant gaps in preparedness capacity for technical and operational support (figure 3). A rapid risk and vulnerability mapping has been done based on country capacity as measured through Member States annual reporting of IHR (2005) core capacities, and the likelihood of importation of cases based in international travel volumes from high-risk cities China in January 2020.

Figure 3 Country risk and vulnerability mapping



Country-level coordination

In national risk management, the government is the natural leader for overall coordination and communication efforts. Building on global risk assessments to inform national risk assessments and to decide on actions needed, the national government should help public and private agencies and organizations by providing guidance, planning assumptions and making appropriate modifications to the laws or regulations at all levels and sectors to enable an effective response. These efforts are supported by WHO and other UN organizations under IHR (2005), and through the Cluster-coordination approach where relevant. The process should build on existing public health emergency contingency, preparedness and response plans, including for pandemic influenza. A key step is the activation of existing national emergency response committee(s) to take the lead in coordination of these functions, and to provide the forum for partners to be involved in response operations.

A Public Health Emergency of International Concern will test the resilience of nations, businesses, and communities, depending on their capacity to respond. No single agency or organization can prepare for or respond to such an event on its own. Inadequate or uncoordinated preparedness of interdependent public and private organizations will reduce the ability of the health sector to control disease spread. A comprehensive approach to risk management is therefore required and must take a whole-of-society and whole-of-government approach. All entities need to consider supportive financial resources for response operations, and to develop plans for essential service continuity and recovery operations.

Risk communication and community engagement

Country risk communication and community engagement is a critical public health intervention in all countries. Countries should prepare to communicate rapidly, regularly and transparently with the population. All countries should prepare existing public health communication networks, media and community engagement staff to be ready for a possible case, and for the appropriate response if this happens. Countries should coordinate communications with other response organizations and include the community in response operations. Partners stand ready to coordinate with partners to support countries in their communication and community engagement response.

Surveillance

National authorities must notify WHO of detected cases under IHR (2005), and undertake case-based and/or aggregated reporting as per global surveillance guidance. Partners will provide any support necessary to enable authorities to fulfil these obligations. Disaggregated data on age, sex, pregnancy status and outcome (as appropriate) should be reported.

It will be important to enhance existing respiratory-disease-surveillance systems, including indicator-based surveillance, community event-based surveillance, and sentinel surveillance (e.g., Severe Acute Respiratory Infection and Influenza-like illness), and establish active case finding at points of entry, health facilities and in communities. It may be necessary to engage the private sector in case identification and surveillance where appropriate.

Points of entry

Countries should establish or update a multi-sectoral contingency plan at points of entry, integrated with other emergency operational plans at point of entry, covering relevant stakeholders, and conduct simulation exercises to assess the operational applicability of the plan. In terms of physical infrastructure it will be necessary to designate an appropriate place, separate from other travelers, where travelers who meet the definition of a suspected 2019-nCoV case can be interviewed in a safe (including provision of personal protective equipment) and dignified way away from other travelers.

Any suspected cases should be granted access to medical follow up by establishing arrangements with local medical facilities for isolation, treatment, and other support services that may be required, including for sample collection and transport for laboratory testing. Protocols and referral pathways should be established to guide safe transport of patients and their close contacts to designated medical facilities.

Points of entry authorities should also establish mechanisms and procedures for communicating information (see also risk communication above) to travelers via travel health clinics, travel agencies, tour operators and at points of entry, about the disease, preventative measures to reduce the general risk of acute respiratory infections, and how and where to seek medical attention.

Rapid response teams

National rapid-response teams should be trained and equipped for investigation of suspected 2019-nCoV cases and initial treatment where appropriate. This will require the preparation and dissemination of case investigation protocols (as per WHO guidance) and supplies, establishment of a system for contact tracing and monitoring, and the implementation of a community-based surveillance mechanism.

National laboratory system

The Shipping Fund Programme established by the Global Influenza Surveillance and Response System will be used by countries as a mechanism to test clinical samples at international referral laboratories from patients who meet the suspect-case definition. National capacity for detection of the novel coronavirus also needs to be strengthened so that diagnostic testing can be performed rapidly without the need for overseas shipping. One way this can be achieved is by working with existing global networks for detection of respiratory pathogens, such as National Influenza Centres. Working with regional and national WHO laboratory focal points, WHO has compiled a global list of laboratories that have the technical capability to test for 2019-nCoV but that lack the necessary reagents. WHO will procure and distribute testing kits to laboratories on this list that request reagents. The first shipment of kits will supply enough tests to screen 250 000 suspect cases.

Infection prevention and control

Infection prevention and control (IPC) measures are absolutely essential to ensure healthcare workers are protected from infection with 2019-nCoV and amplification events in healthcare facilities. An IPC programme at national and facility level with a dedicated and trained team, or at least an IPC focal point, should be in place and supported by the national authorities and facility senior management.

In countries where IPC is sub-optimal or limited, partners will need to support national authorities to ensure that at least minimum requirements for IPC are in place as soon as possible, both at the national and facility level, and to gradually progress to achievement of all requirements of the IPC core components according to local priority plans.

Partners should support national authorities to undertake a risk assessment of IPC capacity at all levels of the healthcare system (includes availability of triage and appropriately ventilated isolation rooms) and, on the basis of this assessment, define a referral pathway in collaboration with case management capacity. Particular attention should be given to ensuring IPC compliance with basic IPC principles at the first point of care (usually primary care). Capacity for triage, early recognition, standard precautions, isolation capacity, and referral procedures should align with WHO IPC guidance on 2019-nCoV. If supplies are needed to implement recommended protocols (e.g., hand hygiene resources, personal protective equipment, environmental cleaning, and waste management), partners should assist national authorities in procurement and supply where appropriate.

Partners will support national efforts to identify IPC surge capacity (numbers and competence) that can be deployed to strategic locations.

It will be important to monitor, analyse, and feedback to relevant stakeholders any data on healthcare-associated infections in patients and in healthcare workers to ensure such infections are prevented.

Case management and continuity of essential services

Partners will support vulnerable countries affected by widespread transmission to ensure the continuity of essential health services, including through the provision of personnel, medicines, diagnostics, and other supplies.

National authorities, with the support of partners where requested, should designate referral facilities for care of patients with 2019-nCoV, and map existing public and private health facilities and referral systems in case they need to be brought into the response as surge capacity. Supplies for case management and infection control should also be reviewed, resupplied if necessary, and pre-positioned at strategic locations.

In order to strengthen readiness, partners will support national authorities when requested to disseminate information, train and refresh medical/ambulatory teams in the management of severe acute respiratory infections and 2019-nCoV specific protocols. WHO is working with partners to develop a 2019-nCoV critical care app for mobile phones to rapidly disseminate information to front-line healthcare workers.

Public health clinical operations should be informed by a 2019-nCoV clinical database platform.

National authorities can play an important role in supporting research and development blueprint efforts by preparing to rapidly assess laboratory diagnostics, therapeutics, and vaccines for trials, regulatory approval, market authorization, and post-market surveillance.

HIGH
TRAILER

Logistics, procurement, and supply management

Logistics, procurement, and supply chain management must be integrated across national preparedness and response efforts. This includes ensuring that logistics and supply management addresses needs and risks arising from epidemiological events, communication needs, and geopolitical events, all of which may have a substantial impact on the market's ability to manufacture necessary supplies, and to distribute them equitably and efficiently to the appropriate locations.

WHO and partners stand ready to assist national authorities, and will activate the relevant emergency logistics rosters by preparing roster members for deployment to regional and country locations as necessary. Partners will also leverage existing long-term agreements across the UN system to ensure the necessary commitment of supplies and logistics capacity.

Partners may need to work with national authorities to prepare procurement mechanisms and storage space for medical and other supply management, underpinned by strengthened regional operational support and stockpiling at strategic hubs. Supply chain management dashboards will be integrated into Situation Reports to enable all response stakeholders to have an overview of activities, priorities, and potential risks at country level. It will be necessary to monitor ongoing operations with service providers and product manufacturers/wholesalers to continuously refine operations and reduce operational risk, and ensure necessary and appropriately-scaled activities. In some cases it may be necessary to establish emergency transport and distribution systems.

Relevant partners will continuously refine technical guidance according to new epidemiological information, and disseminate across WHO, partners, and government networks and platforms. WHO and other relevant partners may also be called on to provide technical guidance and support to partners to facilitate customs clearance for emergency goods.

C) Accelerating priority research and innovation

The 2019-nCoV outbreak presents many urgent questions. How easily is the virus transmitted? What is the zoonotic source? How severely does the virus affect patients, and who is most at risk? And what countermeasures — diagnostics, vaccines, and therapeutics — might be developed to stop the virus spreading, improve treatment outcomes, and strengthen our ability to rapidly detect the disease? It is crucial that the international community agrees on priority areas for research and innovation, and the most efficient ways to address them. WHO will convene all stakeholders to address these challenges in the following three key areas.

Enhancing global coordination of all relevant stakeholders

The world needs an emergency mechanism to coordinate all the different stakeholders in global research and development (R&D), from academics and industry to national governments, civil society groups, and non-governmental organizations. That mechanism already exists: the R&D Blueprint Global Coordination Mechanism (GCM) is a voluntary framework to facilitate information sharing and incentivize funders, product developers, and researchers to share evidence about candidate vaccines, therapeutics, and diagnostics in the pipeline that could be brought to bear against 2019-nCoV. Such coordination is essential to make sure that any gaps in the research agenda are filled, and any duplication of effort is avoided. The GCM has been activated.

Support a clear and transparent global research and innovation priority setting process

A consensus global research roadmap will enable potential funders and researchers to access critical information that will enable them to prioritize investment and research options for 2019-nCoV. This roadmap will consider all relevant research aspects, including operational research.

WHO is coordinating several expert consultations that will feed into an international research and innovation forum (planned in February 2020). This forum will ensure a transparent process that engages a broad group of policy makers, researchers, public health experts, non-governmental organizations, funders, and the private sector. Crucially, the consultation will engage researchers from affected countries to set priorities that respond to country needs, and that reduce barriers and maximize opportunities for research at national level.

Build common platforms for standardized processes, protocols and tools, as well as for sharing specimens, data, and information

As a global research community, we need to agree common standards for clinical trials, specimen sharing, and data sharing during this and other outbreaks. This harmonization is needed to ensure that only the most robust methods are used in any research. WHO is bringing together stakeholders to agree on standardized protocols for biological sampling, sample storage, shipment and transport, testing, record taking, and data entry. Shared platforms will include common repositories for data, research outcomes and findings, and dissemination strategies will be put in place to enable the sharing of preliminary research findings and data. Master protocols for clinical trials will ensure the quality and facilitate the aggregation of evidence.

MONITORING FRAMEWORK

The key performance indicators listed below will be used to globally monitor the implementation of the 2019-nCoV strategic preparedness and response plan. Systems will be established with national governments and partners to monitor key performance indicators on a regular basis.

Category	Indicator	Target	Rationale for use
Epidemiology situation	Number of countries with cases	N/A	Basic epidemiological data to understand the scale and evaluation of the event. Further analyses and stratification: • Number of confirmed cases worldwide • Number of countries with local transmission • Number of countries with imported cases • % of countries in which there are cases that were not directly associated with travel to areas affected by community spread • % of alerts, suspects or confirmed cases detected at points of entry • % deaths reported among reported cases
	% of cases who are healthcare workers	TBD	This measure can be useful to strengthen IPC over time. Data might be available if online reporting platforms for data sharing are established. Some caution should be added about interpretation as some healthcare workers may have high risk of community transmission.
Global response – Programme management	% Strategic Response Plan (SRP) budget funded	80%	This measure helps to assess the financial support to the global response as per the SRP.
	% of funds received for the SRP implemented	100%	This measure helps to assess the level of implementation of the global response as per the SRP.
Global response – Supply	% of countries requesting personal protective equipment that have received stockpiles	N/A	This indicator focuses on capacity to deploy supplies to countries during the event.
	# of companies/organizations actively participating in the PSCN	N/A	Indicates strength of the PSCN and breadth of coverage of private sector organizations at global and country levels related to WHO's operations.
Global response – R&D	% countries eligible to enroll in clinical trials that enrolled	TBD	This measure focuses on country collaboration and can serve to advocate for acceptance of multi-site clinical trials in countries where it was not feasible during the outbreak.
Country readiness – Capacity	Preparedness index & Operational readiness index (Using 18 different indicators from SPAR)	Level 1: <=30 Level 2: <=50% Level 3: <=70% Level 4: <=90% Level 5: > 90%	Demonstrate the level of preparedness and operational readiness based on the implementation of IHR (2005) capacities. They are based on the objective assessments not on the functional evaluation. The findings should be triangulated with the other instruments like AAR and SIMex.
	# of countries that activated their public health Emergency Operations Centre or a coordination mechanism for the 2019-nCoV event	100%	Indicates health system preparedness to manage the event.
	% countries that have prepared a referral system to care for 2019-nCoV patients	TBD	This addresses health system readiness. Countries should have designated hospitals for patients.

Category	Indicator	Target	Rationale for use
Country – Surveillance and rapid detection	% of countries that reported the first 2019-nCoV case to WHO within 24 hours of confirmation as per IHR (2005) requirements	100%	This measure can focus on global collaboration/ information-sharing which is essential to facilitate global risk management.
	For the first 10 suspected cases in a country, percentage of laboratory results available within 72 hours	TBD	This indicator reflects system capacity to rapidly establish testing capacity or access/connect to a laboratory that can test for 2019-nCoV. The indicator reflects preparedness/readiness. In the long-term, it can be the basis for further system strengthening.
IPC & Biosafety	% of acute healthcare facilities with triage capacity	80%	In the context of corona virus, the healthcare facility should have the infrastructure, as well as the standard operating procedures (questionnaires).
	% of acute healthcare facilities with isolation capacity	80%	Isolation capacity: defined as availability of single rooms and/or areas for cohorting. Appropriately equipped with personal protective equipment for contact and droplet precautions.
Country – Risk communication and community engagement	% countries reported to have contextualized their risk communication and community engagement strategies	>80%	A reporting mechanism needs to be set up to enable data collection for this potential indicator.
	Number of individuals reached with tailored information through (frequency) (% of those that took action — changed course)	TBD	This measure focuses on alternative channels to reach individuals and decision makers in different sectors — travel and tourism, food and agriculture, healthcare workers, and business.

RESOURCE REQUIREMENTS

The following section outlines the estimated resources required to be mobilized by the international community to implement priority public health measures in support of countries to prepare for and respond to 2019-nCoV.[1]

The response requirement period is three months, from 1 February 2020 to 30 April 2020. The estimated resource requirement for this period is outlined below.

2019-nCoV Strategic preparedness and response pillars	Estimated requirement (USD)
A) Rapidly establishing international coordination and operations support	30,577,500
B) Scaling up country preparedness and response operations	640,361,927
C) Accelerating priority research and innovation	4,741,000
Total estimated resource requirement	**675,680,427**

The estimated resource requirements outlined above are for overall planning purposes and will be adjusted as the situation evolves. Detailed operational plans will be developed with global, regional, and country level implementation partners consistent with the overall strategic framework and based on actual needs, gaps, and implementation capacity.

A) Rapidly establishing international coordination and operations support

To rapidly establish international coordination to deliver strategic, technical, and operational support through existing mechanisms and partnerships, IMSTs will need to be established at global and regional levels.

These IMSTs will consist of WHO and partner staff assigned to the response, as well as other short -term staff, consultants, and contractors required to rapidly scale capacity. The costs below also include the operational support costs and supplies required to run the IMSTs. A significant portion of the requirements below will be provided as “in-kind” contributions of staff from implementing partners.

International coordination and operations support sub-pillars	Estimated requirement (USD)
Partner coordination	5,292,000
Epidemiolocal analysis and forecasting	4,320,000
Risk communication and managing infodemic	5,616,000
Laboratories and diagnostics	3,213,000
Technical expertise and guidance	5,499,000
Pandemic supply chain coordination	5,328,000
Travel and trade	1,309,500
Total	**30,577,500**

1 Measures required to mitigate the social and economic consequences of 2019-nCoV are outside the scope of these resource requirements.

B) Scaling up country preparedness and response operations

Resource requirements for scaling up country preparedness and response operations are based on: a) an assessment of the capacities required by countries to prepare and respond to 2019-nCoV for a given risk level; and b) the current country preparedness capacity.

The capacities required by countries to prepare and respond to 2019-nCoV are based on if a country has:

- Clusters of community transmission of 2019-nCoV;
- Clusters of local transmission of 2019-nCoV;
- Imported cases of 2019-nCoV;
- High-risk of imported cases[2] of 2019-nCoV.

The capacities required by countries to prepare and respond to 2019-nCoV will be updated on a regular basis based on the evolving epidemiological situation and risk of spread.

The current country preparedness capacity is based on IHR (2005) State Parties Self-Assessment Annual Reporting Tool that measures reported core capacities in respect of health security including surveillance, laboratory, and emergency coordination capacity and ranks capacity on a 1-5 scale. Country preparedness capacity to respond to 2019-nCoV will be updated based on specific country-level gap analyses.

As of 1 February 2020, the summary of country prepared/response requirements versus country preparedness capacity is as follows:

Preparedness and response requirement	Country preparedness capacity					
	Level 5	Level 4	Level 3	Level 2	Level 1	Grand Total
Community transmission	1					1
Localized transmission	4	2	1			7
Imported cases	11	1	3	1		16
High-risk of imported cases	19	46	34	25	2	126
Preparedness	6	16	16	6		44
Grand Total	41	65	54	32	2	194

Based on based on country preparedness and response operations required for 2019-nCoV outlined in this document, the estimated unit costs for the international community to support a country of Level 1 or 2 capacity to a given level of preparedness/response are as follows:

Preparedness and response requirement	Setup cost (USD)	Monthly cost (USD)	Duration	Estimated unit cost (USD)
Community transmission	11,697,500	13,882,995	3 months	53,346,485
Local transmission	1,467,750	2,885,039	3 months	10,122,867
Imported cases	114,050	475,197	3 months	1,539,641

2 As measured by countries with greater than 1,000 air travelers from high-risk affected areas in China during January 2020 and/or IDA eligible countries.

Based on this, the total estimated resources required to support countries to prepare for and respond to 2019-nCoV for a given response level and country capacity is as follows:

Country preparedness and response operations					
Preparedness and response requirement	**Country preparedness capacity**				
	Level 4	**Level 3**	**Level 2**	**Level 1**	**Total**
Country support factor	20%	50%	100%	100%	
Community transmission	0	0	0	0	0
Localized transmission	21,338,594	26,673,243	0	0	48,011,837
Imported cases	2,024,573	15,184,301	10,122,867	0	27,331,741
High-risk of imported cases	93,130,376	172,088,739	253,071,675	20,245,734	538,536,524
Preparedness	4,926,851	12,317,128	9,237,846	0	26,481,825
Grand Total	**100,081,801**	**226,263,410**	**272,432,388**	**20,245,734**	**640,361,927**

The estimated resource requirements outlined above are based on the following assumptions:

- Resource estimates are inclusive of essential supplies, as outlined in the 2019-nCoV Disease Commodity Packages, and critical staffing, technical, and operational support costs, including training and incentives for national workforces;
- Countries with preparedness capacity Level 1 or 2 will require 100% of estimated support costs;
- Because of increasing capacity of health systems, countries with preparedness capacity Level 3, 4, and 5 estimated support costs will be factored at 50%, 20%, and 0%, respectively;
- Support will be provided on a no regrets basis resulting in: a) all countries receiving support to manage imported cases; b) countries with imported cases or high-risk of imported cases receiving support to manage localized transmission; and c) countries with localized transmission receiving support to manage community transmission.

C) Accelerating priority research and innovation

The estimated resource requirement for accelerating priority research and innovation to support a clear and transparent global process to set priorities and fast track and scale-up research, development, and the equitable availability of candidate therapeutics, vaccines, and diagnostics is outlined below.

This includes resources required to build a common platform for standardized processes, protocols and tools, and to facilitate multidisciplinary and collaborative research integrated with the response.

Research and innovation	Estimated requirement (USD)
Accelerating priority research and innovation	4,741,000

This resource requirement does **not** include the costs associated with the actual development, manufacturing, testing, and licensing of research and development products including therapeutics, diagnostics, and vaccines.

NOTES

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