Calibrating public health and social measures in the context of COVID-19: towards sustainable application

Interim Framework for the South-East Asia Region

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1. Background

Countries have implemented various types and degrees of public health and social measures (PHSMs) in the context of COVID-19 pandemic. While PHSMs have been applied as the major tools to control COVID-19 transmission, countries are also faced with difficult decisions in balancing effective control of COVID-19 transmission and the associated socioeconomic costs.

The Ministerial Roundtable on COVID-19 at the Seventy-third Session of the WHO South-East Asia Regional Committee called for continued commitment and investments in risk reduction for the ongoing COVID-19 pandemic.[1] While vaccines are being developed at an unprecedented speed, non-pharmaceutical public health measures will continue to play critical roles in the control of COVID-19. Considering their socioeconomic impact, it is not practical and sustainable to apply stringent measures uniformly at a nationwide scale.

The fourth meeting of the IHR Emergency Committee on COVID-19 recommended that Member States share best practices and apply lessons learnt from countries that are successfully re-opening their societies and mitigating resurgence of COVID-19, and advised WHO to distil and rapidly communicate lessons learnt and best practices adopted.

This document proposes an interim framework for adjusting PHSMs in the South-East Asia Region, focusing on sustainable application at the subnational level. The document builds upon countries' experiences and lessons learnt, while being based on the six conditions proposed by the WHO headquarters guidance for relaxing the PHSMs [2]. The document aims to promote systematic and data-driven decision-making of the PHSMs, towards sustainable PHSM application, balancing effectiveness of interventions and their socioeconomic consequences.

Scope of PHSMs

PHSMs include personal protective measures (such as hand hygiene, respiratory etiquette, mask wearing), environmental measures (such as cleaning, disinfection, ventilation), surveillance and response measures (including contact tracing, isolation and quarantine), social and physical distancing measures (such as limiting the size of gatherings, maintaining distance in public or workplaces, restrictions on domestic movement), and international travel-related measures.[3]

2. Framework

This document proposes a framework consisting of the following four components:

1. **Information for decision-making.** Adjusting the PHSMs needs to be guided by the situation assessment, informed by a triangulation of information from multiple sources. This document proposes steps for situation assessment and potential indicators, which can be used to inform the calibration of PHSMs. It also encourages communicating the results of situation assessment and decisions, with rationale for adjusting the PHSMs.
2. **Strategic application of PHSMs.** Stringent restrictive measures lead to enormous negative socioeconomic consequences, and may not be sustainable for a long duration. It is critical to identify approaches that balance the objectives of disease control with equitable socioeconomic well-being. Towards this end, this framework proposes to combine multiple approaches, such as broad adoption of a "new normal" behaviour, case and contact management, staging of PHSMs and targeted application.
3. **Addressing vulnerabilities associated with PHSMs.** Vulnerable populations can be most severely affected by application of PHSMs, particularly the stringent measures. It is critical to safeguard vulnerable and disadvantaged populations through adopting timely and gender-sensitive policy options, mobilizing resources and engaging all relevant sectors and communities.
4. **Fostering enablers for effective implementation.** There are critical enablers for effective implementation of PHSMs, including multisectoral bodies to make coordinated decisions and guide implementation, risk communication and community

engagement (RCCE), as well as research, monitoring and evaluation activities to assess the effectiveness of PHSMs, generate evidence and identify lessons learnt for continuous improvement.

3. Information for decision-making

The decision to adjust PHSMs should be guided by the situation assessment at the relevant administrative level. The assessment will require consideration on various factors, such as the current epidemic situation, capacity to manage extra patients in health facilities or other locations, capacity to detect a resurgence in cases and trace and quarantine additional contacts, and public perception and support for the measures. Information from subnational and local areas is critically important to tailor the PHSMs to the local situation of the epidemic and the system capacities.[4]

3.1 Using multiple sources of information for response decision-making

Decisions to adjust PHSMs have to be made in a timely manner, using available surveillance data and other information on the epidemic situation, health system capacities and expected effectiveness and impact of the measures. However, surveillance systems have limitations and biases (Annex 2 summarizes examples of indicators and their potential limitations), and thus the assessment will require synthesizing multiple sources of information to reach the best possible understanding of the situation. One such approach to analyze the epidemic situation by organizing multiple sources of information was proposed as an epidemic analysis for response decision-making (ERD).[5] This approach has been applied and proven to be useful in informing adjustments of PHSMs in COVID-19 outbreaks. Building upon the experiences of ERD in the context of COVID-19, steps for the assessment to inform decisions are proposed in Annex 1.

In brief, the suggested assessment approach has the following seven steps: (1) clarify the decision question and options; (2) translate the decision options into an epidemiological and system situation; (3) identify indicators and information items; (4) describe the actual patterns in the available information; (5) address possible alternative explanations; (6) synthesize the information and provide recommendations for adjusting PHSMs; and (7) review indicators and systems periodically for situation assessment. Some examples of indicators with potential limitations are listed in Annex 2.

Case study: Using multiple sources of information to guide the decision to ease PHSMs (Timor-Leste)

Timor-Leste needed to make a decision whether to adjust the PHSM including lifting of its stringent measures. Faced with challenges to rapidly scale up formal case-based surveillance in the context of COVID-19, Timor-Leste used multiple sources of information from various surveillance systems. These include (1) community based surveillance, for which community health workers are trained to report suspect cases, (2) sentinel surveillance for influenza-like illness and severe acute respiratory infection at health care facilities, (3) enhanced syndromic surveillance, through which health care workers were encouraged to offer testing for patients presenting with respiratory symptoms, and (4) testing as part of exit screening for people departing the country. Through assessment using these multiple sources of information showing no evidence of local transmission, the Government made decisions to keep the state of emergency and maintained points-of-entry measures, while lifted the social economic restrictions posed at the early phase of the pandemic.

3.2 Identifying indicators and information sources

Situation assessment will require various sources of information, but each national and subnational system has different surveillance and reporting systems, and availability of data may differ depending on the local situation. Here, we describe the three broad categories of information which are considered essential to inform the decisions in calibrating PHSMs, namely epidemic situation, system capacities and public perception.

Each national or subnational system may need to identify indicators to monitor and assess the situation. A list of indicators is proposed in Annex 2, which is adapted from the WHO guidance.[4] Based on these lists and building upon the existing systems, indicators that are feasible to monitor should be identified.. The relative importance of indicators may evolve according to the epidemic situation, and as new evidence becomes available. For each category, information should be sought not only from indicator-based surveillance but also through event-based surveillance, including non-traditional information sources. Countries may also consider setting criteria in relaxing or tightening the PHSM (see WHO guidance[4]) but its application should be flexible based on overall assessment of the situation.

3.2.1 Epidemic situation

The number of reported cases in the recent time period serves an indicator to monitor the trend and magnitude of the epidemic. The number of reported cases per population (case incidence), and the proportion of persons tested positive for COVID-19 may provide the relative intensity of transmission, if comprehensive testing is being done (more than 1 per 1000 population per week). Where testing coverage is limited, syndromic surveillance indicators, such as the number of persons with fever or respiratory visits to outpatient clinics, or the number of influenza-like (or COVID-like) illnesses may provide supplementary information on the likely trend of COVID-19.

Event-based surveillance may also provide informal but timely and useful information, such as clusters of undiagnosed pneumonia, or increased deaths of unknown causes.

Case and cluster investigation may provide important information on conditions associated with development of clusters, such as religious gathering, entertainment venues, chorus groups, sporting facilities. Such information may help targeting application or intensification of certain PHSMs without imposing the measures universally to all the settings (see subsections 3.4 and 4.3).

3.2.2 System capacities

Health-care system capacities

An assessment of the capacity to manage extra patients in health facilities or other locations is an essential component of situation assessment in adjusting the PHSMs. This can be primarily monitored by hospital beds and intensive care unit (ICU) beds occupied by COVID-19 patients. In countries or areas where dedicated COVID-19 hospital beds or ICU beds are designated, occupancies in the COVID-10 beds could provide the indicators.

Event-based surveillance may also provide supplementary information on the situation of health-care system, such as overcrowding of hospitals, and difficulties in accessing health-care services in certain settings or populations.

Public health system capacities

It is critical to assess whether the public health system is able to identify and isolate cases and quarantine contacts, and whether the system is able to rapidly detect a resurgence of cases. The surveillance system should ensure new cases to be reported within 24 hours of identification. Performance of contact tracing should be monitored, as robust contact tracing will help reduce the chances of resurgence of cases, when PHSMs are eased (subsection 4.2).

Event-based surveillance may also provide additional information on the status of public health system capacities, such as access to laboratory testing.

3.2.3 Public perception

PHSMs can generate the expected impact only if the public is engaged and ready to support the measures being implemented. Risk perceptions influence individuals' judgements and evaluations of threats, and can affect response to information communicated by authorities, and compliance with the proposed measures. Risk perception within the public is a complex phenomenon and can be affected by general, community and individual experiences, and thus what individuals consider risky is difficult to know without "listening". Appropriate listening mechanisms should be put in place that allow national and subnational authorities to gauge the population response and behaviour in an ongoing and real-time manner.

Findings through listening mechanisms can be used to explore perceptions, acceptance of and compliance to measures, mental and physical health, behaviours, information needs and misperceptions. This intelligence enables health authorities to anticipate how the public will react, monitor their responses and to adjust measures and communication when needed.

In planning and adjusting PHSMs, public perception of risk would enable insights into: (1) the level of public support and acceptance for specific or combinations of PHSMs; (2) the level of public compliance; and (3) the enablers and barriers in adopting and adhering to PHSMs, which can be physical, psychological or societal (the perceived cost and perceived benefit from that action). This would enable the government to take appropriate action as to whether risk communication or action to remove the barriers and enhance the enablers.

There are various means to obtain insights into public perception. The followings are examples of potential sources to assess public perception:

- Survey
    - Online – faster, less expensive but limited to those who have access to smartphones, which limits the audience set (e.g., once a month)
    - Traditional – more expensive but often more representative (e.g., quarterly)

- Hotline (e.g., daily)
- Feedback from provincial family physicians and other health-care workers (e.g., weekly). – This helps in listening to some marginalized groups, such as women and mothers, as they may have formed a bond with health staff through regular interactions and will be privy to their concerns.
- Focus group discussion – This helps in obtaining views of marginalized or vulnerable populations. They may not have access or may not be allowed to other forms, but in small peer groups with people they trust, they may be more likely to reveal their views.
- Digital and traditional media monitoring – With or without artificial intelligence tools. This is a quick and relatively low-cost way of listening. However, the results can be skewed by those who have access to digital media and those who are more vocal on social media. Due to digital algorithms, the less vocal people could sometimes be missed.

To get a comprehensive and reliable picture of public perception, the feedback from multiple sources should ideally to be triangulated, weighted and analyzed. Based on those, a judgement of the level of risk perceived by the public can be made, and action taken accordingly.

Case study: Using a system approach to assess public perception (Thailand)

Thailand has a system in place for "listening" and assessing risk perception to be integrated into the decision-making process during an emergency. Thailand has regular feedback mechanisms, including surveys, feedback from hotlines, from health volunteers as well as from monitoring traditional and social media. The feedback from all sources are then analyzed by experts, and a weightage of risk perception is assessed. Findings are shared with the emergency operations centre and response team, which inform decisions on public health measures and risk communications.

3.3 Identifying high-risk settings

Transmission of SARS-CoV-2 appears not to be homogeneous. It has been reported that majority of COVID-19 cases did not cause secondary infection, while others had infected multiple people, causing clusters.[6,7] Epidemiological analysis of data from surveillance, case investigations and contact tracing may help identify such conditions or settings which are likely to amplify transmission of SARS-CoV-2. Studies have identified various settings that are associated with development of clusters or cause high secondary attack rate.[6,8] Those settings include health-care facilities, households, sporting facilities, night-clubs, restaurants and shared conveyances. Long-term care facilities, shelters of homeless people and migrants, and crowded informal settlements may also pose risks if disease control measures are not properly implemented. Identification of conditions that are more likely to amplify the transmission may enable targeting of PHSMs to such high-risk settings (see sub-section 4.3). Although some commonalities are expected across the countries, analysis of local data could inform high-risk conditions and settings in each local context.

Seroprevalence surveys do not necessarily show the current intensity of transmission, but could provide the scale of past infection. This may also help identify which group of people had higher incidence of infection, or in what settings people were more exposed to SARS-CoV-2. For example, in India, the results of a seroprevalence survey have indicated that urban slum areas with high population density showed much higher seroprevalence than non-slum areas.[9]

Case study: Analyzing secondary infection to identify high-risk settings (India) [6]

The epidemiological analysis of data collected in two Indian States, Tamil Nadu and Andhra Pradesh, estimated the overall secondary attack rate (or risk of transmission from an index case to an exposed contact) to be 10.7% for high-risk contacts, who had close social contact or direct physical contact with index cases without protective measures. Data on exposure settings, available for 18 485 contacts of 1343 index cases, revealed considerable differences in risk of transmission associated with different types of interaction. Estimates of secondary attack rates ranged from 1.2% in health-care settings to 2.6% in the community and 9.0% in the household. Among 78 individuals with high-risk travel exposures – defined as close proximity to an infected individual in a shared conveyance for more than 6 hours – we estimated a secondary attack rate of 79.3%.

3.4 Other sources of information for risk assessment

Countries have also used projections of the trajectory of the epidemic and potential impact of interventions, using

mathematical modelling, to inform risk assessment and decision-making on PHSMs. Modelling results, where available, may provide an additional source of information to guide decisions. However, it should also be noted that model-based projections are dependent on the quality of available data and assumptions made, and thus require careful interpretation, engaging relevant experts.

Decision-making for certain PHSMs may require information from other countries or other subnational areas. In particular, adjusting restrictions of movement across international borders or across subnational areas (such as states or provinces) can be informed by an assessment of the situation in other countries or areas, such as epidemic patterns, measures in place (such as exit screening), and the status of enforcement and compliance to PHSMs. Thailand has developed a scoring system to estimate risks associated with international and inter-provincial travel to inform adjustment in travel restrictions.

3.5 Communicating the assessment and rationale on adjusting PHSMs

Once the assessment is conducted and a decision is made to adjust PHSMs, decisions to maintain or adjust the PHSMs should be communicated to the public, including the results of the assessment and rationale of the adjustment. Transparent information sharing will foster trust and gain public support for PHSMs.

For example, the government of Germany gained a high level of public trust through clearly communicating its risk assessment and rationale for the decision-making. Overall, Germany's focus on collecting and analyzing data and communicating the results to the public has led to an informed set of policy choices that is generating unusual levels of public support. Germany has adjusted PHSMs based on the data-driven rationale. The German government has focused on three indicators – infection rate, disease severity, and health system capacity. Setting clear expectations and providing transparency to the public on the criteria for government decision-making about reopening has been a key factor in gaining public trust.[10]

4. Strategic application of PHSMs

The control of SARS-CoV-2 transmission aims to achieve an effective reproductive number (number of new cases per source case) of below one. To achieve this aim, stringent measures to restrict people's movement have been used by countries. However, such stringent restrictive measures lead to enormous negative socioeconomic consequences, and are not sustainable for a long time. Building upon countries' experiences, this section describes directions and approaches to use PHSMs in a sustainable and targeted manner, balancing the objectives of disease control and recovery of socioeconomic activities.

4.1 Broad adoption of the "new normal" behaviours

Personal behaviours are a critical component of PHSM, such as hand hygiene, staying at home when unwell, physical distancing, proper use of masks and avoidance of the three Cs – closed spaces, crowded places and close-contact settings. If these "new normal" behaviours are effectively adopted by individuals, the risks of transmission in communities are expected to be less. This subsequently reduces the need for the authorities to use more stringent measures, such as restriction of movement, including lockdowns.

For example, one of the key features of Japan's management of COVID-19 has been a nationwide campaign through consistent risk communication messages to the public, warning people to avoid the "three Cs" – closed spaces with poor ventilation, crowded places with many people nearby, and close-contact settings such as close-range conversations. An early study indicated that transmission commonly occurred in closed environments without adequate ventilation, where people had close contacts, such as, at entertainment venues, restaurants and gyms. These findings led to the government launching a nationwide campaign warning people to avoid the "three Cs".[11] To date, Japan practically avoided stringent restrictive measures, while maintaining control of the spread of the virus.

RCCE plays a critical role in establishing "new normal" behaviours; this was highlighted by the Ministerial Roundtable on COVID-19 at the Seventy-third Session of the WHO South-East Asia Regional Committee.[1] Adopting any new behaviour, including a "new normal" behaviour, is a process influenced by multiple factors. These include the individual's perception of severity of the disease, perceived vulnerability, perceived efficacy of the recommended behaviour, perceived self-efficacy, as well as the social, cultural and economic environment.

To ensure the adoption of new normal behaviours, authorities will need to:

1. understand people's perceptions and context, as well as barriers that affect any attempt to change, and systems that motivate or enable change;
2. create an environment that facilitates their behaviour adoption, for example by engaging communities and trusted leaders from various sections so that there is a societal and peer support and encouragement for such behaviours;
3. ensure that physical, administrative, regulatory and other infrastructure, systems and materials are in place to enable and facilitate the adoption of these PHSMs; for example, adequate quantities of masks, availability of soap, water or their alternatives, markets being open appropriately to prevent crowding, and flexi-working hours, and gender-friendly measures; and
4. identify and prioritize the most effective behaviours in each local context, which may differ in different cultures and systems.

4.2. Case and contact management

Experiences in countries have shown that effective case and contact management can identify and break chains of transmission. In the areas where PHSMs are relaxed, resurgence of cases may occur. However, capacities to rapidly detect outbreaks and aggressively trace contacts will minimize the chance that resurgence of COVID-19 cases develops into a large outbreak, and thus avoid the use of stringent PHSMs. WHO has issued interim guidance on contact tracing in the context of COVID-19.[12]

To ensure robust contact tracing, the overall system should be strengthened to engage whole-of-society stakeholders, building on existing public health systems, and by involving those in charge of RCCE, non-health government stakeholders, civil society organizations and communities.[13]

Data on contact tracing also provide useful information on conditions and settings that are more likely to amplify the transmission and develop clusters. Efforts to retrospectively investigate past activities of multiple infected persons in each locality may help identify common sources of infection, such as religious gatherings, night clubs or sporting facilities. Contacts associated with those common sources of infection can then be monitored closely to prevent possible spread.[14] Identification of common sources of infection, or high-risk settings, may also enable targeted application of control measures (see subsection 4.4).

Case study: Using contact tracing data to identify risk factors for cluster development (Sri Lanka)

One of the unique approaches of Sri Lanka's contact tracing is that contacts have been traced not only to limit the spread of illness from a confirmed case but also to identify risk factors for the formation of clusters. Clusters identified in Sri Lanka have been associated with groups of persons returning from overseas, local tour guides, a network of people who use drugs, and a group of naval soldiers. These findings led authorities to introduce enhanced surveillance and strengthened communications and community engagement for these groups to adopt precautionary measures.

4.3 Phased application through staging of PHSMs

PHSMs can be applied in a phased manner with different levels of intensity, guided by the situation assessment. To do so, countries have developed sets of PHSMs to be applied at different severity levels of the COVID-19 outbreaks.

Local data on the effectiveness and acceptability of each PHSM have been limited in many countries; however, as more global and local data become available, staging of the PHSM should be reviewed and adjusted, engaging local experts and stakeholders. The new WHO interim guidance[3] proposes staging of the PHSMs, which may be used as a guide in setting the stages of PHSMs in each local context.

Indicator-based criteria for adjusting the PHSMs can be established as a guide for decision-making; however, flexible application may be needed informed by careful assessment of overall situation, incorporating qualitative information (see subsection 3.1), rather than strictly relying on predetermined criteria.

Country experiences have shown that the measures should be eased gradually, and the situation should be assessed carefully before shifting to the next phase. On the other hand, PHSMs may need to be reintroduced or tightened rapidly depending on the situation of the epidemic, or high-risks are expected in the local context.

Case study: Employing risk-based staging to implement PHSMs (Thailand)

Thailand has developed a system of staging PHSMs according to assessed severity of COVID-19 outbreaks. This staging takes into consideration the number of new confirmed cases per week, geographical distribution of cases in provinces and health regions, and epidemiological features. Beginning from the first week of May 2020, the government initiated easing of lockdown in six phases, taking into consideration the proposed staging. Each phase was planned at a minimum two-week interval, allowing appropriate time to review and assess the impact of relaxing measures. At every step, risk assessment was conducted and decisions of moving to the next stage were informed to the public.

Red (high level of severity)

Restrictions on movement (stay at home) and inter-provincial travel; closure of non-essential businesses and activities; only online classes for schools; no public gathering; border closure.

Orange (moderate level of severity)

Inter-provincial travel restricted; some low-risk businesses and activities allowed, with strict precautionary measures; online classes for schools; restaurants, retail shops and markets can be operational, following control measures; closure of entertainment venues, pubs, bars.

Yellow (low level of severity)

Inter-provincial travel permitted; essential businesses and activities allowed, with strict precautionary measures; on-site classes allowed for schools, but if crowded, alternate schedules advised; public transport permitted with 70% capacity; cinemas with 50% capacity; indoor stadiums permitted, without spectators.

Green (not severe; no vaccine)

Group activities allowed, ensuring disease control measures; inter-provincial travel permitted; businesses and activities allowed as normal, with precautionary measures; 100% on-site classes allowed for schools; indoor stadiums with 25% or 15% spectators; public transport with 100% capacity; cinemas at 70% capacity.

White (safe; vaccine available)

Group activities allowed, ensuring disease control measures; inter-provincial travel permitted; businesses, cinema, public transport, school and sports activities permitted as normal; indoor stadiums with 50% or 25% spectators.

4.4 Targeted application of PHSMs

Analyses of case investigation and contact tracing data may identify specific conditions or settings that amplify transmission and are associated with development of clusters. Public health surveillance data may inform the current hotspots for COVID-19 transmission. If such information is available, PHSMs can be targeted to or strengthened for certain settings or activities, instead of applying the stringent measures universally.

For example, in Tokyo, Japan, cluster investigation identified that night-life entertainment venues are found to be at high-risk of transmission and development of clusters. This has helped local authorities to improve guidance and enforcement of measures for those night-life entertainment venues.[15]

At the same time, targeting of PHSMs may leads to stigmatization and discrimination of certain occupations or groups of people. Country experiences have also shown that targeting of certain geographical areas, such as designation of “containment areas”, may discourage people to receive testing to avoid their residential communities to be designated as such. Targeting application of PHSMs should be always accompanied by efforts and communication to avoid stigmatization, and to create a supportive environment.

Case study: Adopting measures to target high-risk settings (Thailand)

In late March 2020, many of Thailand’s confirmed COVID-19 cases were found among men who attended Thai boxing events and engaged in Bangkok’s nightlife. This included clusters identified in connection with Bangkok’s indoor Lumpini Stadium where thousands of Muay Thai kick-boxing spectators were present. Over 100 cases were linked to clusters at boxing stadium events and bars. Guided by these findings, the authorities imposed regulations, forcing nightclubs, bars and boxing stadiums to close, and prohibited people from going out in the night.

5. Addressing vulnerabilities associated with PHSMs

In implementing PHSMs, special attention must be given to those individuals and population groups who are most vulnerable and most likely to be left behind in the challenging times. Inequities, including gender-based

inequities, in access to information, prevention, care and financial and social protection are likely to disproportionately affect the vulnerable population facing social exclusion and stigma, and render them further vulnerable to COVID-19. Country experiences have shown that it is possible to mitigate health and economic consequences through timely policy action. While the health system response is critical, engagement of stakeholders of the non-health sector and civil societies, through whole-of-government and whole-of-society arrangement is essential to support and protect vulnerable communities and individuals, by ensuring equitable access to testing and treatment, safe water and sanitation, and efforts to protect livelihoods (see subsection 6.1).

5.1 Essential life needs

When PHSMs are applied, vulnerable communities and disadvantaged individuals may face immediate challenges in meeting their basic life needs, such as income, shelter and food. It is crucial that those essential life needs be addressed, in order to enable people to survive and comply with measures, particularly if restrictive measures are applied. Appropriate arrangements should be made to ensure accessibilities to essential life and health services.

People with high risk of developing severe illness from COVID-19

People who are aged over 60 years, and people who have underlying medical conditions (such as diabetes, hypertension, cardiac disease, chronic lung disease, cerebrovascular disease, chronic kidney disease, immunosuppression and cancer) are at higher risk of developing severe illness from COVID-19. Particular attention should be paid to the essential health and life needs of those with high risks and individuals in contact with high-risk persons (e.g. residents in same household, long term care facility employees). Special arrangement may be needed to minimize their exposure to virus, while ensuring their physical and psychosocial well-being.

Case study: Addressing essential needs of the elderly under stay-at-home measures (India)

A study conducted in the states of Tamil Nadu and Andhra Pradesh, India, revealed limited incidence and mortality due to COVID-19 among the elderly. The researchers suggested that it is plausible that delivery of essentials through social welfare programmes and regular interactions with community health workers could have helped the elderly to comply with the stringent stay-at-home measures, and restricted their exposure to the virus.[6]

5.2 Structural barriers

Generally, overcrowded living and working conditions may increase risks of SARS-CoV-2 transmission. Moreover, even with effective RCCE, some people cannot comply with the recommended PHSMs due to structural constraints. In such settings, achieving control measures such as hand washing, physical distancing and other PHSMs will perhaps be difficult and some of the restrictive measures such as home confinement may directly result in more harmful negative socioeconomic and overall public health consequences.

First, it is important to understand those structural barriers in vulnerable communities to comply with PHSMs, and to explore actions that could address those barriers and enable people to comply with the recommended measures. Those measures need to be pragmatic and leverage the strengths of the local communities and systems to overcome structural constraints, notably through social mobilization and strong community engagement.[16]

Authorities and stakeholders should make proactive efforts and mobilize resources, while experiences have shown that forging partnership in a way that empower communities to take proactive roles and utilizing local knowledge could potentially lead to more effective local response initiatives, including those for health screenings, contact tracing and health promotion[17] (see subsection 6.2).

5.3 Psychosocial challenges

Mental health

During the COVID-19 pandemic, people experience anxiety, fear, worry and stress of losing loved ones and their livelihoods, as well as face stigma, compounded by rumours, social isolation and separation under stay-at-

home orders. People with pre-existing mental health conditions or substance use disorders may be particularly vulnerable in such an emergency.[18] The impact of the lockdown is likely to be most significant among those who are alone, those who are marginalized, and those with pre-existing mental health issues. On other hand, health-care workers, 70% of whom are women, feel stressed by the possibility of becoming infected and transmitting the virus to their families and friends.

Mental health issues may be compounded by restrictive PHSMs, yet the increasing demand of mental health or psychosocial support has been impeded by the interruption to mental health services in many countries due to conversion of mental health facilities into COVID-19 care facilities, reduced caring capacity from infected mental health staff and closing of face-to-face services.

Continued efforts are critical to strengthen mental health services and communication, engaging community-based approaches and peer support mechanisms. Policy-makers should ensure broad availability of emergency mental health and psychosocial support, inclusion of mental health and psychosocial considerations in national response plans, investment in teleconsultation by mental health-care workers to continue emergency psychiatry essential services, and support for community actions that strengthen social cohesion and reduce loneliness.[19] Addressing rumours and stigma will also reinforce positive public support.

Case study: Engaging communities to address the needs of people under the lockdowns (Thailand)

The Ministry of Public Health works with nearly one million village health volunteers across the country, including 15 000 volunteers in Bangkok. Decades-long investment of village health volunteers in Thailand has helped reduce the transmission of SARS-CoV-2 and improve psychosocial support, health promotion, contact tracing and assuring adherence to quarantine and isolation. During 2–26 March 2020, village health volunteers visited 3.3 million households nationwide. Between 27 March and 11 April 2020, they visited 8 million additional households to look for potential cases of COVID-19. The volunteers helped with the efforts to prevent and control COVID-19, and to keep people physically and mentally fit; thus reducing pressure on hospitals and clinics and allowing essential health-care services to continue without disruption. They reassured people during an uncertain, anxious time by strengthening communities' sense of safety and self-care, easing the social stigma around people being investigated for COVID-19. The village health volunteers update themselves about COVID-19 and operational guidelines through an app designed especially for their use during the outbreak, as well as through social media group chats among primary care health personnel.

Gender-based violence

Women and girls are likely to experience distinct challenges and risks associated with the COVID-19 outbreak, exacerbating already existing gender inequalities. In particular, circumstances under PHSMs have increased the risk factors for gender-based violence (GBV) at the individual and social levels, due to isolation and barriers for victims in seeking help and reporting their situation – "the shadow pandemic".

Strict restrictions on movement ("lockdown") often create conditions that facilitate violence against women, such as increased control by perpetrators through confinement of victims at home, isolation of women and difficulties for women to escape from violence.[20] This maybe compounded by the stress and hardships on perpetrators due to the pandemic and its consequences, such as loss of income and unemployment. In addition, access to sexual and reproductive health services becomes more limited under the lockdowns.

It is important to raise awareness of the increased risk of violence against women during the pandemic in communities. The government and civil society organizations may offer alternative means of communication, such as code words, code numbers and "no-dial or chat"[21] options to enable women to access support services.

Policy-makers and stakeholders should also ensure gender-responsive and principled humanitarian COVID-19 response, support the full and meaningful participation of women's groups, maintain essential health services for women and girls in vulnerable situations, ensure the availability and accessibility of legal aid as needed for GBV, and support women to access reliable COVID-19 information adapted to the local cultural context.[22]

The health sector has a key role to play in responding to GBV. Health facilities should identify information about locally available services for victims, including opening hours, contact details and whether these can be offered remotely, and establish referral linkages. Health workers can offer first-line support to the victims.

In adapting PHSM measures, government and civil organizations should ensure that women have access to financial support packages, through secure and confidential channels.

Migrants

Migrants face similar health threats from COVID-19, but have limited resources and specific vulnerabilities due to language barriers and limited local networks. Lockdowns and closure of businesses also hinder migrants' access to social services upon which they often rely to fulfil basic life needs and for psychological well-being. In addition, it is not uncommon for the migrant population to face structural barriers to practice social distancing and hygiene practices.

Migrant workers may continuously face elevated levels of stress and anxiety related to COVID-19. They are isolated, have limited access to support networks, and may also fear deportation if they lose their jobs and work permits or contract the virus.

Many migrants are often excluded from national programmes for health promotion, disease prevention, treatment and care, as well as from financial protection schemes for health and social services. Undocumented migrants have been reported to avoid health-care services for fear of triggering investigations of their legal status.

The government and civil society organizations may adopt migrant-inclusive risk management and community engagement approaches to understand the needs of migrants and involvement of those migrants to strengthen surveillance, contact tracing and health promotion activities.

Case study: Enabling migrants to access services in the context of COVID-19 pandemic (Myanmar, Maldives)

In Myanmar, returnee migrant workers systematically received and proper quarantine procedures were enforced regardless of their legal status. In Maldives, the commitment of the government to safeguard health and well-being of migrants was evident in the COVID-19 response. The migrants were provided access to services and care as Maldivian citizens. Health information was well-communicated in various languages of the migrants. To encourage irregular migrants to seek care during the COVID-19 outbreak, dedicated expatriate flu clinics were opened in Malé and Hulhumalé, where migrants need not show any identification documentation nor bear any costs for consultation. Any migrants who were tested positive were isolated and their contacts quarantined in government-designated COVID-19 facilities where all medical expenses and necessities were borne by the government with no "out-of-pocket" expenses.

6. Strengthening enablers for effective implementation

6.1 Leadership and multi-sectoral coordination for implementation of PHSMs

Country experiences have shown that the highest-level political leadership is crucial for effective implementation of PHSMs, not only at the national level, but also at the subnational and local levels. Decision-making for PHSMs require high-level multisectoral coordination mechanisms, as PHSMs have considerable impact on various sectors and require coordinated action across the sectors. Countries have also engaged relevant authorities to enhance enforcement of measures and to provide support for the residents during the stay-at-home orders. The arrangement for multisectoral coordination may need to be reviewed occasionally and adjusted to ensure that necessary functions are covered by competent authorities, and roles and responsibilities of each stakeholder are clearly defined.

Decision-making bodies should be informed by a group of technical experts who monitor the epidemic situation, system capacities and public perception, and conduct situation and risk assessments. The decision-making body may also consult a scientific advisory group, academic institutions and international organizations to ensure that decisions are informed by scientific evidence. Each sector will require guidelines and protocols for defining their respective measures, which necessitate close coordination with public health experts.

Informal mechanisms of governance and civil society organizations should also be engaged in decision-making on PHSMs.[16] Collaboration with and engagement of community-based and nongovernmental organizations working with disadvantaged populations with special needs must be explored to design and facilitate availability and accessibility of basic services.

6.2 Risk communication and community engagement (RCCE)

A successful application of any PHSM from personal-level measures to stringent measures depends on effective RCCE.

Effective risk communication should be guided by risk and perception assessment, and should provide the rationale – why PHSMs need to be implemented, and why the measures are relaxed or tightened. Transparent and timely communication will help maintain and strengthen trust and support from the public, which is essential to achieve desired results.

The first step of RCCE is to listen (as explained earlier in this document), which allows the identification of people's perceptions as well as their motivations and barriers. Understanding these will enable complementary efforts to support people to adopt certain behaviours and to remove barriers; for example, ensuring availability of masks, ensuring means for hand hygiene, such as soap, water or alternatives, and ensuring that vulnerable people have access to testing and treatment. Listening also enables early identification and addressing of the infodemic, particularly rumours and misinformation and fake news, which can misguide people into harmful actions.

The goal of risk communication is to create awareness of the risks and motivate people towards action. This can be achieved through a combination of mass media and digital media, personal communication from trusted sources and engagement with community to encourage communication among peers.

Case study: Countering misinformation in the context of COVID-19 outbreak (India, Indonesia, Maldives, Myanmar)

COVID-19 has been an infodemic along with a pandemic. To ensure people's compliance with PHSMs, it is imperative to address misinformation, which countries have countered in different ways. For example, the Government of India's Public Information Bureau has initiated a "Fact Check" handle on twitter. Indonesia has a website dedicated to address misinformation on COVID-19 and is working with civil society organizations through social media and community literacy to dispel fake news. Maldives has set up a dedicated email to which people can send in their doubts regarding fake news. Myanmar has established a monitoring system for misinformation, which is addressed through health workers and on traditional and social media.

Communities can play a major role in improving compliance to and effectiveness of PHSMs. Community members can serve to address the needs of fellow residents, and to identify local solutions for their community members. Partnering with communities may enable more effective relief, response and recovery in the context of COVID-19 pandemic.[17]

To engage and empower communities to implement COVID-19 response activities, including PHSMs, local authorities can capitalize on and further build capacities of existing mechanisms for community governance or other informal networks. This will increase community ownership of COVID-19 response actions and will consequently strengthen trust. It is critical to work with community leaders to identify or establish mechanisms for community engagement, which are locally and culturally acceptable and address the specific needs of vulnerable population groups. To do so, partnership with different community leaders should be considered, including but not limited to faith-based communities, representatives of groups of adolescents, women and people with disabilities.

Case study: Communities have played critical roles in COVID-19 response in Dharavi, Mumbai (India)

Dharavi is the Asia's largest slum, with high population density – a population of approximately a million in an area of 2.1 sq. km. The first COVID-19 case in Dharavi was reported on 1 April 2020, and since then, cases grew rapidly, making public health authorities deeply concerned. However, community engagement played critical roles in controlling the spread COVID-19 and mitigating its impact. Influential community leaders and volunteers worked closely with the local municipal authority, Brihanmumbai Municipal Corporation and local nongovernmental organizations to raise awareness on preventive measures. They also played a key role in health screening and contact tracing, and encouraged the residents to contact authorities when symptomatic and to receive testing. They also helped deliver essential public services, psychosocial services and even financial support when needed. The authority also engaged 350 local private practitioners whom the slum dwellers knew well, which helped in gaining trust and facilitated access to health services.

6.3 Strengthening the evidence base through research, monitoring and evaluation

PHSMs will continue to play major roles in controlling the COVID-19 epidemic. It is critical to ensure their effectiveness, while social and economic disruption must be minimized. To continuously improve a balanced application of PHSMs, it is important to strengthen evidence base and identify lessons learnt. More implementation research studies are encouraged to assess the effectiveness of PHSMs, and to identify enablers and barriers affecting their outcomes.

Systematic analyses of existing information, such as data from surveillance, case investigation, contact tracing, surveys, mobility monitoring and social science studies, may contribute in evaluating the implementation. Some countries have used modelling studies to estimate the potential impact of PHSMs.

It is also crucial to review and identify what has worked and what has worked less well, and explore opportunities for improvements. Towards this end, WHO has developed a guide for country COVID-19 IARs and a set of supplementary tools, which may facilitate planning and conduct of reviews of implementation of PHSMs in individual settings.

Case study: Intra-action review to inform improvements in COVID-19 response (Indonesia)

Indonesia conducted an intra-action review (IAR) for the COVID-19 response to identify strengths, gaps and opportunities to inform improvements in ongoing response activities. It was a review of all the nine pillars of the country's COVID-19 preparedness and response plan, which included the implementation of PHSMs. Indonesia has developed and issued procedures for Pembatasan Sosial Berskala Besar (PSBB), or large-scale social restrictions, which remain in place in several provinces and districts throughout Indonesia, and biweekly PSBB assessments are conducted to inform potential extension. At the same time, participants in the IAR discussed priority actions to optimize the implementations of PSBB, including further improving cross-sectoral coordination, development of the monitoring and evaluating tools and updating the guidelines of PSBB by incorporating the lessons.

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Annex 1. Suggested steps for the situation assessment to inform adjustment of PHSMs

The following steps are adapted from the epidemic analysis for response decision-making (ERD): systematic organization of multi-source information to inform response decisions.[5]

Preparatory steps: Conduct the following steps 1 to 3 to set the foundation for the regular situation assessment. These steps 1 to 3 can be revisited to review the set of indicators and reference criteria as the epidemic evolves and more evidence and lessons becomes available.

1. Establish a consensus among the risk assessment team on decision questions and the options. For example, decision questions can be whether to ease or tighten specific or sets of PHSMs, and decision options can be yes or no.

2. Then, translate decision options into the epidemiological and system situation in the local context. This step will require consultations with decision-makers on what would make them decide between the options. For example, PHSMs may be eased in the following situation.
   1) Epidemic is being controlled
   2) The system has capacities to cope with the epidemic situation:
      a. Health-care system has adequate capacity to accommodate COVID-19 patients and provide care as per the national policy
      b. Public health system has adequate capacities to timely identify, isolate and monitor cases, and trace and quarantine contacts
   3) There is favourable public support for and compliance with the PHSMs

3. Brainstorm, identify and list information items and indicators that would reflect the above situation. Review the indicator list from the WHO guidance[4] and Annex 2 of this document for the potential indicators and possible criteria, but tailor to the local context, taking into consideration the national or local systems and data availability. The following are shown as an example:

   1) Epidemic is being controlled
      - A reduction in transmission, as indicated by
        - trend in the number of newly reported cases
        - test positivity ratio (with consideration of the trend in the number of testing)
        - proportion of cases with unknown links
        - new COVID-19 hospitalizations

   2) The system has capacities to cope with the epidemic situation

      a. Health-care system has adequate capacity to accommodate COVID-19 patients and provide care as per the national policy
         - Proportion of hospital beds occupied by COVID-19 patients – on decline, or at the low level
         - Proportion of intensive care unit (ICU) beds occupied by COVID-19 patients – on decline, or at the low level

      b. Public health system has adequate capacities to timely identify and isolate for COVID-19 patients, and trace and quarantine contacts
         - Proportion of cases with contacts listed – maintained at a high level (over 80%)
         - Proportion of new cases who have their close contacts traced and in quarantine within 48 hours of case confirmation – maintained at a high level (over 80%)

   3) There is favourable public perception of the PHSMs
      - Public support, measured through monitoring of digital and traditional media and information from hotlines – favorable perception maintained

- Public compliance, measured through survey and analysis of data on people's movement – improving or maintained at high level

Routine steps: Based on the indicators selected in steps 1 to 3, carry out an assessment following steps 4 to 6 on a regular basis (such as every one or two weeks), or when there is a need to adjust the PHSMs. Please see Table 1 for an illustrative example of steps 4 to 6.

4. Describe the actual patterns in the available information. For each selected quantitative and qualitative information item from step 3, describe the actual patterns based on available information. For the quantitative indicators, describe value and trend compared with the previous assessment. If there is any additional notable information – even if not selected at step 3 – describe as part of assessment (e.g., event-based surveillance and case investigation may provide information on a recent large cluster of COVID-19 outbreak).

5. Carefully interpret the observed trend or situation, taking into consideration the alternative explanations as to whether the observed increase or decrease is reflecting the true change of the situation. For example, the increase in newly reported cases may be due to the recent rapid increase in testing capacities, rather than the true increase in incident cases. Change in the test positivity ratio may be due to the recent change in testing strategy.

6. Synthesize the information and provide assessment for each category defined in step 2 – epidemic situation, system capacity and public perception. Then, propose overall assessment and recommendations for maintenance or adjustment of PHSMs – lift, ease, tighten or re-introduce. Recommendations may be made on the basis of a country's staging system of PHSMs if such a system is established in the country (see subsection 4.3).

Periodic review: The practices, indicators and reference criteria should be reviewed occasionally to inform continuous improvement.

7. Review that the system of situation assessment using above procedures adequately support decision-making to calibrate PHSMs, and make necessary adjustments as needed. For example, data previously not used for assessment may become available, or a selected indicator may become less relevant or less reliable due to development in epidemic situation.

Table 1. Example of summary of assessment to inform adjustment of PHSMs

Categories	Indicators	Actual pattern from available information (step 4)				Interpretation / alternative explanation (step 5)	Assessment synthesizing information items (step 6)
		Last assessment	Trend	Latest			
Epidemic situation	Number of newly reported COVID-19 cases in the past week	69	↗	82	Increasing; 32 cases per 100 000 population in the past 7 days	The increase may be due to a recent rapid increase in testing capacity.	It is likely that there is no major increase in new infection. Test positivity ratios are stable, while increase is new cases may be due to an increase in testing. Careful monitoring of the situation is needed.
	Test positivity ratio in the past week	4.1%	→	4.0%	Stable; at around 4% in the past 4 weeks		
	Number of new COVID-19 hospitalization in the past week	221	→	228	Slight increase		
System capacity – health-care system	Proportion of dedicated COVID-19 hospital beds occupied	56%	↘	48%	Overall decline in the past 2 weeks, but two hospitals have >80% occupancy	100 additional hospital beds are allocated as dedicated COVID-19 beds.	Bed occupancy has seen some decline but continues to be at a high level.
	Proportion of intensive care unit (ICU) beds occupied by COVID-19 patients	37%	→	38%	Stable in the past 3 weeks		
System capacity – public health system	Proportion of new cases with contacts listed	52%	↘	39%	Declined	The contact tracing team is getting overwhelmed, with increasing number of reported cases.	Contact tracing performance has declined with an increasing workload.
	Proportion of new cases who have their close contacts traced and in quarantine within 48 hours of case confirmation	32%	↘	28%	Declined		
Public perception	Public support		→	Public generally support for current measures (as per social media monitoring)			There is continued public support on the ongoing measures, but compliance appears to be declining.
	Public compliance		↘	Recent survey and data on people's movement shows compliance is on decline.			
Overall		(Step 6) The current level of PHSMs to be maintained, as overall, there seems no major increase or decrease in the level of transmission, and the health-care system will be able to accommodate additional patients with the current patient load. However, efforts are needed to strengthen workforce for contact tracing, and communication campaign to improve compliance with PHSMs.					

Annex 2. Potential indicators to inform situation assessment and decision-making in calibrating PHSMs

This list is provided as examples of indicators, from which countries can choose and monitor to inform situation assessment and decision-making to adjust the PHSMs. These indicators are largely aligned with other global and regional guidance.[44,23,24,12] The indicators in bold letters are proposed as priority indicators.

Categories	Domain	Indicators	Description	Consideration
Epidemic situation	Transmission	**Number of the newly reported cases (confirmed, probable)** **New cases per 100 000 population per week (confirmed, probable)**	Number of cases is suggestive of the magnitude of transmission, given suspected cases are being tested with decent coverage (more than 1 individual per 1000 person per week). Seven day moving average can be used to monitor the epidemic trend. Consider calculating the number of the reported cases per 100 000 population per week (case incidence), which shows relative magnitude of transmission against standards or criteria.	Influenced by surveillance system performance, testing strategy, laboratory capacity, access to testing, and health-seeking behaviours. At low levels and in small geographical regions, it can be sensitive to minor fluctuations in case counts. Keep in mind possible time-lag between symptom onset or testing to reporting.
		Proportion of individuals tested positive for COVID-19	Test positivity ratio is suggestive of the magnitude of transmission, provided that comprehensive testing is offered to more than 1 individual per 1000 person per week, focusing on suspected cases and high-risk individuals. Use 7-day moving average. One option is to monitor test positivity ratio at sentinel sites, which can limit the influence of surveillance strategy. Consider calculating adjusted test positivity ratio.[25]	Influenced by the testing strategy, case definition and populations being tested and settings (e.g. point-of-entry). If data are obtained only from sentinel sites, data may not be representative of the general population if there are only limited sentinel sites. Ensure the ratio is calculated for recent days (e.g. 7 days) rather than using cumulative values.
		Number of respiratory or fever visits to outpatient clinics (syndromic)	This syndromic indicator may provide supplementary information of the case trend, especially where coverage of testing is limited or results of testing takes time to be returned.	This is a syndromic indicator and not specific to COVID-19; affected by health-seeking behaviour.
		Number of influenza-like illnesses (ILI) (syndromic)	This syndromic indicator may provide supplementary information of case trend, especially where coverage of testing is limited or results of testing takes time to be returned.	This is a syndromic indicator and not specific to COVID-19; affected by health-seeking behaviour. If collected from selected number of sentinel sites, the data may not be representative.
	Severe disease	**Number of newly hospitalized COVID-19 patients (confirmed, probable)** **New COVID-19 hospitalizations per 100 000 population per week**	Indicative of utilization of the health-care system, and generally indicates number of severe and critical cases (unless mild cases are also hospitalized); It could serve as delayed measure of case incidence. Less subject to surveillance policy changes and differences. Consider calculating new COVID-19 hospitalization per 100 000 population.	Influenced by the hospitalization policy, e.g. if even mild cases are hospitalized for isolation purposes;

		Number of patients in ICU (confirmed, probable)	Indicative of number of critical cases and healthcare utilization. ICU care may not be available in some subnational areas	Influenced by availability, accessibility and affordability of ICU care
		Number of the reported deaths (confirmed, probable) **Number of COVID-19 attributed deaths per 100 000 population per week**	Indicative of COVID-19-related mortality and severe and critical diseases.	Substantial under-reporting may be common in some settings. At low levels and in small geographical regions, can be sensitive to minor fluctuations (e.g. one versus two deaths).
		All-cause (excess) mortality trends	This can be useful for identifying trends in COVID-19 cases, where COVID-19 deaths make up a substantial proportion of overall deaths. Must be analyzed in the context of other potential causes of changes in mortality rates (e.g. concurrent influenza circulation).	This indicator is not directly indicative of COVID-19 cases/deaths; ideally compared with baseline data on mortality in order to identify excess above normal (e.g. seasonal) fluctuations.
		Number of severe acute respiratory infection (SARI) cases (syndromic)	This syndromic indicator may provide supplementary information of the case trend, especially where coverage of testing is limited or results of testing takes time to be returned.	This is a syndromic indicator and not specific to COVID-19. If collected from selected number of sentinel sites, the data may not be representative.
	Sources	Proportion of imported cases among all the reported cases	It indicates the sources of infection. If proportion of the imported cases is high, local transmission may be limited.	This indicator is dependent on the requirement for testing among international travellers.
		Proportion of unlinked cases amongst new cases	Defined as the proportion of cases not previously listed as contacts (alternatively, proportion not linked to known clusters/transmission chains). This is a measure of spread in the community beyond known clusters.	Heavily influenced by case investigation and contact tracing capacity.
		Information on clusters	Information on clusters from case investigation and event-based surveillance helps targeting of PHSMs.	Dependent on the quality of case investigation conducted.
System capacities	Health-care system	**Proportion of occupied hospital beds**	High morbidity and mortality will occur if there is insufficient capacity to hospitalize severe cases; should count all hospitalizations, not only COVID-19	May be influenced by hospitalization policy (e.g. if all cases are isolated in hospital, admission and discharge criteria).

		Proportion of intensive care unit (ICU) beds occupied by COVID-19 patients	Indicative of hospital capacity to accommodate the demand for critical care for COVID-19 patients; may not be useful in countries with very few ICU beds (can be substituted with proportion of occupied hospital beds +/- oxygen in these situations); if very low, consider inadequate right away.	Influenced by availability, accessibility and affordability of ICU care
		Case fatality rate of resolved (i.e. outcome known) hospitalized cases	Overall impact indicator of adequate COVID-19 care.	Highly dependent on age and various biases. Must take into account any changes in case detection or testing strategy
System capacities	Public health systems	Number of persons tested per 1000 population per week	Without sufficient testing, it is difficult to appropriately isolate and treat cases	Not all laboratories are able to report individuals tested; if possible, can count number of new rather than repeat tests; otherwise can count number of tests but this may be misleading due to repeat testing. Laboratories not reporting location of cases may mask disparities in testing (e.g. among non-urban populations).
		Proportion of new cases for which an investigation has been conducted within 24 hours of identification	This indicates that the capacity to identify transmission risks and exposed contacts. Where investigation is not recorded directly, can be measured by proxy indicator – proportion of cases with contacts listed. In settings where laboratory turnaround time is long, contact tracing may need to be initiated before laboratory confirmation.	It may be difficult to obtain timely data. As the case number increases, contact tracing face challenges. Further mobilizing and training additional workforce may be needed. Contact tracing data may provide important information to adjust and target PHSMs.
		Proportion of new cases who have their close contacts traced and in quarantine within 48 hours of case confirmation		
		Number and proportion of contacts of new cases who are monitored for 14 days		
		Time from symptom onset to case confirmation (median), or laboratory turnaround time (median)	Indicative of capacities to rapidly diagnose, isolate and trace contacts, when the case is infectious; laboratory turnaround time (median) can also be monitored as a subset.	As the case number increases, laboratory and surveillance team may be over-burdened, and time from symptom onset to case confirmation and reporting may be extended
		Time from case confirmation of the new cases to reporting and inclusion in epidemiological analysis (median)		
Public perception	Public support	Public support for the measures	Based on media monitoring (including social media), surveys, hotlines, and other listening mechanisms; data	

	Public compliance	**Level of compliance to the measures among the public**	on population mobility may provide the level of social mixing and compliance. For the PHSMs to be effective, pubic support and compliance are essential; may need appropriate risk communication to enhance support and compliance.	Public support and compliance may evolve over time – particularly as the measures be sustained for long period.
	Barriers and enablers	Barriers and enablers for the measures		

References

Note: The links to references 3 and 4 are inserted following the publication of final version on 4 November 2020.

1. Ministerial Roundtable on COVID-19: Country experiences and lessons learnt with future transition to the 'new normal'. 2020. https://apps.who.int/iris/bitstream/handle/10665/334161/sea-rc73-3.pdf?sequence=1&isAllowed=y.
2. Considerations for implementing and adjusting public health and social measures in the context of COVID-19. https://www.who.int/publications/i/item/considerations-in-adjusting-public-health-and-social-measures-in-the-context-of-covid-19-interim-guidance.
3. Considerations for adjusting public health and social measures in the context of COVID-19. Interim guidance. 4 November 2020. https://www.who.int/publications/i/item/considerations-in-adjusting-public-health-and-social-measures-in-the-context-of-covid-19-interim-guidance
4. Public health criteria to adjust public health and social measures in the context of COVID-19. Annex to Considerations for adjusting public health and social measures in the context of COVID-19. Interim guidance. 4 November 2020. https://www.who.int/publications/i/item/considerations-in-adjusting-public-health-and-social-measures-in-the-context-of-covid-19-interim-guidance
5. Epidemic analysis for response decision-making: systematic organization of multi-source information to inform response decisions. Manila, Philippines: World Health Organization; 2020. https://apps.who.int/iris/handle/10665/333046
6. Laxminarayan R, Wahl B, Dudala SR, et al. Epidemiology and transmission dynamics of COVID-19 in two Indian states. *Science* 2020. https://science.sciencemag.org/content/early/2020/09/29/science.abd7672/tab-pdf
7. Nishiura H, Oshitani H, Kobayashi T, et al. Closed environments facilitate secondary transmission of coronavirus disease 2019 (COVID-19). *medRxiv* 2020. https://apps.who.int/iris/handle/10665/333046
8. Furuse Y, Sando E, Tsuchiya N, et al. Clusters of Coronavirus Disease in Communities, Japan, January-April 2020. *Emerg Infect Dis* 2020; **26**(9). https://wwwnc.cdc.gov/eid/article/26/9/20-2272_article
9. What Do the Delhi and Mumbai Sero-Survey Results Tell Us About COVID-19 in India? 2020. https://science.thewire.in/health/delhi-mumbai-seroprevalence-survey-results-infection-fatality-rates/2020).
10. Emerging COVID-19 success story: Germany's strong enabling environment. 2020. https://ourworldindata.org/covid-exemplar-germany.
11. Japanese cluster study revives '3Cs' warning as coronavirus cases surge anew. 2020. https://www.japantimes.co.jp/news/2020/06/27/national/japanese-cluster-study-3cs-warning-coronavirus/ (accessed 14 October 2020).
12. Contact tracing in the context of COVID-19: interim guidance. 2020. https://apps.who.int/iris/bitstream/handle/10665/332049/WHO-2019-nCoV-Contact_Tracing-2020.1-eng.pdf?sequence=1&isAllowed=y.
13. Establishing integrated nationwide contact tracing systems. 2020. https://iris.wpro.who.int/handle/10665.1/14553.
14. Omi S, Oshitani H. Japan's COVID-19 Response. 2020. https://www.mhlw.go.jp/content/10900000/000635891.pdf (accessed 14 October 2020).
15. Speak quietly and follow the rules, Tokyo nightclubs told as coronavirus re-emerges. 2020. https://www.reuters.com/article/us-health-coronavirus-japan/speak-quietly-and-follow-the-rules-tokyo-nightclubs-told-as-coronavirus-re-emerges-idUSKBN24B0ID.
16. Interim Guidance on Public Health and Social Measures for COVID-19 Preparedness and Response Operations in Low Capacity and Humanitarian Settings;. 2020. https://www.who.int/publications/m/item/public-health-and-social-measures-for-covid-19-preparedness-and-response-in-low-capacity-and-humanitarian-settings.
17. Venkatachalam P, **N. N**. Engaging communities is critical to the COVID-19 response: Lessons from community engagement to tackle the disproportionate spread of COVID-19 in India's urban slums. 2020. https://idronline.org/engaging-communities-is-critical-to-the-covid-19-response/.

18. Mental health in emergencies. 2019. https://www.who.int/news-room/fact-sheets/detail/mental-health-in-emergencies.
19. Policy Brief: COVID-19 and the Need for Action on Mental Health. https://www.un.org/sites/un2.un.org/files/un_policy_brief-covid_and_mental_health_final.pdf.
20. Q&A: Violence against women during COVID-19. 2020. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/violence-against-women-during-covid-19?gclid=CjwKCAjwrKr8BRB_EiwA7eFapjo2WMfHVEJT3Ql3Y3gL_ndoMJ98M8qIeldyKGGgbKlbYXEmXApE2BoCgTUQAvD_BwE.
21. Erskine D. Not just hotlines and mobile phones: GBV Service provision during COVID-19. 2020. https://www.unicef.org/media/68086/file/GBV%20Service%20Provision%20During%20COVID-19.pdf.
22. Minimum requirements checklist for integrating gender equality in the implementation of the UN Framework for the Socioeconomic Response to COVID-19. 2020. https://www.unwomen.org/-/media/headquarters/attachments/sections/library/publications/2020/ianwge-minimum-requirements-checklist-for-integrating-gender-equality-in-covid-19-response-en.pdf?la=en&vs=2913.
23. Global surveillance of COVID-19: WHO process for reporting aggregated data. 2020. https://www.who.int/publications/i/item/aggregated-weekly-reporting-form.
24. Indicators to monitor health-care capacity and utilization for decision-making on COVID-19. 2020. https://iris.wpro.who.int/handle/10665.1/14568.
25. Vong S, Kakkar M. Monitoring COVID-19 where capacity for testing is limited: use of a three-step analysis based on test positivity ratio. 2020. https://apps.who.int/iris/handle/10665/334198.