


Sustaining lives and livelihoods: a decision framework for calibrating social and movement measures during the COVID-19 pandemic



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ISBN 978-92-4-001794-8 (electronic version)

ISBN 978-92-4-001795-5 (print version)

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Cataloguing-in-Publication (CIP) data. CIP data are available at <http://apps.who.int/iris>.

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Design and layout by L'IV Com Sarà

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Acknowledgements

The principal contributors to this document were Edith Patouillard, Andrew Mirelman, Tessa Tan-Torres Edejer from the World Health Organization (WHO) and Michele Cecchini from the Organisation for Economic Co-operation and Development (OECD).

We are thankful for guidance, contributions and reviews from:

- WHO: Agnès Soucat and the regional focal points of health systems governance and financing, the incident management support team of the WHO health emergencies programme and the COVID-19 publication review committee.
- OECD: Francesca Colombo, Mark Pearson, Stefano Scarpetta
- World Bank: Owen Smith, Zara Shubber, Netsanet Workie and Feng Zhao
- External reviewers: Alex Broadbent (Institute for the Future of Knowledge at the University of Johannesburg), Katharina Hauck (Imperial College London), Rouselle Lavado (Asian Development Bank), Peter C. Smith (Imperial College London and University of York), Jurrien Toonen and Noor Tromp (KIT Royal Tropical Institute), Anna Vassall (London School of Hygiene and Tropical Medicine, Amsterdam Institute for Global Health and Development)

Key messages

- The aim of public health and social measures in the context of COVID-19 is to limit the spread of the virus and reduce the number of deaths. Public health and social measures are often being implemented in combination and it is difficult to measure their individual impact. However, evidence shows that social and physical distancing and international travel-related measures (thereafter “social and movement measures”) significantly decrease individuals’ face-to-face interactions and movement, and thus contribute to reduce the pressure on health services both for COVID-19 and other health conditions, protect the health of the most vulnerable to COVID-19, such as the elderly and people with chronic conditions, and reduce the higher risk of infection faced by workers in contact-intensive sectors.
- Social and movement measures may also have unintended consequence on health if they disrupt access to care and delay diagnosis and treatment of other conditions, adversely affect mental health or increase exposure to behavioural risk factors. They can also exacerbate the economic slowdown induced by COVID-19 itself and can increase socioeconomic inequality, disproportionately harming workers with jobs less amenable to teleworking, those with precarious employment conditions and those with limited or no access to social protection.
- Policy-makers are faced with complex decisions to sustain both the lives and livelihoods of all members of society and to protect the most vulnerable in both the short and the long term. Delay in calibrating social and movement measures in a situation of widespread community transmission or an uncontrolled epidemic with limited or no additional health system response capacity and a risk of overwhelmed health services could result in excess morbidity and mortality and in a need to sustain stringent measures for longer; however, easing or removing social and movement measures too quickly could jeopardize the intended health benefits and the possibility of faster economic recovery. Strong, sustained policies that mitigate the harmful economic consequences of COVID-19 are also necessary to support workers and the viable businesses most affected by social and movement measures.
- Various aspects of health, economic and social welfare may be valued in different ways in different settings, but it is difficult to collect context-specific evidence on multiple dimensions in a rapidly evolving situation. Decisions are often made in conditions of great uncertainty and must be reviewed more frequently than in routine priority setting activities to account for new evidence and changes in the epidemiological situation. Inclusive, transparent, and evidence-based decision-making is therefore necessary.
- A five-step framework is proposed here to support decision-making. It starts from the health dimension, with assessment of the epidemiological situation, health system capacity and potential social and movement measures and is then extended to other dimensions of importance to a given society that may be affected by these measures, such as economic and equity dimensions. Other important considerations may be added according to the context.
- Implementation of the framework may be based on quantitative and qualitative information in concerted dialogue and deliberation among a broad range of stakeholders, including representatives of vulnerable and under-represented groups who may be affected by the outbreak and response interventions.

- The proposed five-step framework begins with a situational assessment and proceeds with identification of potential social and movement measures, assessment of impacts and decisions. The final step includes monitoring, adapting and communicating. This is a dynamic process, as decisions will have to be revised regularly, and clear communication should be an integral part of the process. The framework may also be used for implementing or adjusting other public health and social measures, as relevant.

Table 1. Five-step decision-making framework for social and movement measures

| Step | Actions |
|--|--|
| 1. Assess the situational level (as proposed by WHO (1)), and optimize health system response | <ul style="list-style-type: none"> • Agree on indicators and thresholds • Assess current epidemiological data, potential scenarios and distributions of transmission and burden (e.g. spatial, demographic) • Assess health system response capacity • Assess and optimize adherence to existing public health measures • Increase health system capacity, where possible |
| 2. Identify possible social and movement measures for each context and possible calibration options, and assess their health impacts | <p>On the basis of the situational assessment:</p> <ul style="list-style-type: none"> • Introduce or build on social and movement measures already in place, identify calibration options to maximize the health impact (geography, demography, occupation, individual discretionary behaviour, stringency, scope, enforcement) • Assess the impact of each option on health using an assessment scoring and/or weighting scheme |
| 3. Develop and populate an “extended assessment matrix” (see Table 2) of important non-health dimensions | <p>For each social and movement measure and calibration option:</p> <ul style="list-style-type: none"> • Extend the relevant impact dimensions to economic, social and equity criteria (or others deemed important according to the context) using the assessment scoring and/or weighting scheme • Include justifications for assessments • Consider all policies that could feasibly mitigate the economic, social and equity impacts of social and movement measures |
| 4. Establish dialogue and a decision-making process | <ul style="list-style-type: none"> • Develop a process to deliberate on the evidence and options derived from previous steps • Deliberate on key elements such as equity, potential unintended consequences of, and uncertainties around social and movement measures |
| 5. Monitor, adapt and communicate regularly throughout steps 1–4 | <ul style="list-style-type: none"> • Monitor indicators, and establish feedback mechanisms every 2–4 weeks • Review steps 1–4 to refine and calibrate social and movement measures • Use communication tools to build trust |

Introduction

The framework proposed in this document is intended to be used by national and/or sub-national decision-making bodies tasked with informing or choosing implementation and adjustment of COVID-19 measures. The framework is based on WHO interim guidance on considerations for implementing and adjusting public health and social measures, published on 4 November 2020 (1). It was further informed by a summary of key studies on the impact of COVID-19 and of public health and social measures on health and the economy and by a review of existing decision-making frameworks for COVID-19 control measures.

Public health and social measures are non-pharmaceutical individual and societal interventions including:

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); physical distancing measures (e.g. limiting the size of gatherings, maintaining distance in public or workplaces, domestic movement restrictions); and international travel-related measures (1).

The framework focuses on the last two types of measure, namely social and physical distancing and restrictions on international travels (hereafter, “social and movement measures”, Box 1), because they have been reported to significantly reduce individuals’ face-to-face interactions and movement and thus COVID-19 transmission.¹ They have also exacerbated the economic slowdown induced by COVID-19 itself. Social and movement measures can also have unintended and indirect negative consequences for health if they reduce access to

essential health services and delay diagnosis and treatment of other health conditions. Furthermore, by reducing movement and activity in the most contact-intensive sectors, social and movement measures can worsen living conditions and increase socioeconomic inequality. In the early phase of the pandemic, more stringent measures were associated with larger reductions in infection rates but also with worse macroeconomic impacts in all countries, regardless of the COVID-19 burden, although activity was also slowed by voluntary changes in economic behaviour before the measures were introduced (2). Recently, gradual signs of “pandemic fatigue” have been reported in many populations whose daily lives have been profoundly disrupted (aside from being infected with COVID-19) and whose motivation to follow public health and social measures is weakening (3, 4).

Making decisions on social and movement measures is perhaps more difficult than setting other priorities, as it directly impacts two important societal concerns – “lives and livelihoods”. It is characterized by:

- **Complexity** of the interactions between the health sector and the economy and the non-linearity of the impact over time, beyond the immediate future. Describing the response to COVID-19 as a “trade-off between protecting health or the economy” is a crude oversimplification, given the interplay between these dimensions. The potential for and nature of adverse effects on well-being in all population groups must be considered before introducing measures, with mitigation strategies.
- **Uncertainty** due to the novelty of the illness and the continuously emerging evidence, which requires frequent adjustments of strategies while taking a precautionary approach to decisions and potential experimentation. An extra layer of complexity relates to the behavioural responses of individuals, communities and groups, which

¹ Mention of these measures in this document does not constitute a WHO recommendation. WHO guidance on COVID-19 is available online on the Organization’s website and is updated regularly.

may change over time according to their perceptions of risk, motivations and the state of their livelihoods.

- **Urgency**, because of the devastating health and economic consequences of COVID-19 if decisions are not made quickly enough. Delay in introducing social and movement measures could result in excess morbidity and mortality and therefore more stringent measures to regain control, which could be detrimental for populations' well-being; however, easing or removing measures too quickly could jeopardize the intended health benefits and the possibility of faster economic recovery. Evidence is emerging continuously, and real-time analysis and online consultations are required to review and interpret the evidence, discuss and select policies and communicate and monitor the impact of those policies (1).

- **Uneven distribution of health and economic impacts** in a society. Each population group in a society should be considered, as the pandemic affects everyone, often in different ways. Decisions must be taken to ensure equity, given some of the regressive effects that social and movement measures may have.

- **Multiple layers of decision-making.** Decisions on social and movement measures involve many levels of government and different sectors, necessitating coordination. Decisions are also made nationally, sub-nationally and supra-nationally (5).

Decisions to implement and adjust social and movement measures to control COVID-19 "must be weighed against the impacts these measures have on societies and individuals" (1). The objective is to ensure the least harm to "lives and livelihoods" on

Box 1. Social and physical distancing and international travel-related measures

These measures, referred to as "social and movement measures" in this document, do not constitute WHO recommendations on measures to be used to control COVID-19. The scale of implementation may be general (national) or targeted (subnational, groups of people).

| Class of measure | Sub-class | Actions |
|--------------------------------|--|---|
| Social and physical distancing | Schools | <ul style="list-style-type: none"> • Adapt or close partially or completely. |
| | Offices, businesses, institutions and operations | <ul style="list-style-type: none"> • Adapt or close partially or completely. |
| | Gatherings | <ul style="list-style-type: none"> • Limit the size or prohibit private gatherings at and outside homes. and/or mass gatherings. |
| | Special populations | <ul style="list-style-type: none"> • Shield vulnerable groups, protect populations in closed settings, protect displaced populations. |
| | Domestic travel | <ul style="list-style-type: none"> • Restrict movement (suspend or restrict, containment zone). • Order to stay at home. • Restrict access to subnational areas. • Close national land borders. |
| International travel | | <ul style="list-style-type: none"> • Provide travel advice or warnings. • Restrict visas. • Restrict exit and/or entry. • Screen and isolate or quarantine travellers on entry and/or exit. • Suspend or restrict international flights, ferries and ships. • Close international land borders partially or completely. |

Source: reference (6).

the basis of the current knowledge and context. There is no one “correct” calibration policy and various options are available. Proactive, adaptive, transparent, inclusive decision-making is necessary to calibrate decisions that are ultimately context-specific.

With many countries likely to continue experiencing community transmission and seeking to introduce or adjust social and movement measures to various levels of scope and intensity, this document proposes a framework to support such a process. Before describing the framework, the key impacts of COVID-19 and social and

movement measures on health and the economy are summarized, with a focus on equity, laying the foundation for the proposed framework and identifying considerations for adapting it in a given context. The framework is not prescriptive but should be adapted by each country according to its socioeconomic situation, changes to the situation and changes in the priorities identified by policy-makers and key stakeholders. Given the importance of strong buy-in by the general public for effective control of COVID-19, this document mentions important procedural principles for the framework’s application.

Health impact of COVID-19 and social and movement measures and the health sector response

Global impact

This section summarizes how health has been impacted by COVID-19 and by social and movement measures, where evidence is available.

Direct impact

From the first reported cases in early January, the pandemic has spread to over 180 countries, many with community transmission, for a cumulative total of more than 61 million confirmed cases of COVID-19 and more than 1.4 million deaths reported to WHO (as of 29 November (7)). Most cases and deaths have occurred in the Americas and Europe. The estimated cumulative total of confirmed cases should be interpreted with the caveat that countries' policies and laboratory capacity for diagnostic testing are evolving, not only for symptomatic and asymptomatic cases but also for contacts.

A more comprehensive view of the extent of the pandemic is provided by seroprevalence studies of infection and infection fatality rates (deaths among all infections). A review of 338 studies reported as of August 2020 in 50 countries with a total of 2.3 million participants gave a corrected median seroprevalence rate of 3.2% (IQR, 1.0–6.2%) in the general population (8). Heterogeneity is seen by country and income, with rates of 3.4% in high-income countries and from 1.0% to 18.8% in low- and middle-income regions. The corrected seroprevalence rates are 11.9 times higher than the reported number of cumulative cases, for an estimated 643 million people with COVID-19 globally as opposed to the 54 million reported as of 17 November 2020 (9, 10). A statistical modelling study of adjusted data from 10 representative studies showed a steep age gradient in the infection fatality rate. The rate was estimated

to be 0.23% (0.14–0.42, 95% prediction interval range) when the model was applied to a typical low-income country with a young population and 1.15% (0.78–1.79) for a typical high-income country with an older population (11).

Factors have been identified that increase the risk for more severe disease and for death. Older patients, with a higher infection fatality rate, have a higher risk of more severe outcomes (hospitalization, intensive care, assisted breathing or death) than younger patients. Other risk factors for which there is the strongest, most consistent evidence are concomitant chronic kidney disease, chronic lung disease, heart disease, diabetes mellitus, obesity, cancer, solid organ transplant, sickle cell disease, pregnancy and smoking (12). The effect of older age might be due partly to the presence of some of these co-morbid conditions (13). People in lower socio-economic classes and vulnerable groups (14, 15) also suffer more than the better off, perhaps due to denser living conditions, greater potential for exposure at home and at work, pre-existing disease and inability to access good health care.

Some cases of COVID-19 are followed by longer-term sequelae, commonly described as “long COVID”. Data from a COVID-19 symptom application used in the United Kingdom by about 4 million people indicate that 10–20% of them experienced symptoms that lasted for > 4 weeks. The symptoms fluctuated, affected several body systems and appeared to be consistent with a number of different syndromes, such as post-intensive care syndrome, post-viral fatigue syndrome and long-term COVID-19 syndrome (16). Despite the diagnostic uncertainty, early reports confirmed the existence of a longer-term health impact in some COVID-19 patients and of “long COVID”; however, its predisposing risk factors and duration remain to be clarified.

Indirect impact

Even before the pandemic, 3.8–5.0 billion people, most of them in developing countries, lacked access to essential health services (17). As noted above, the COVID-19 pandemic has created a surge in demand on many health systems and has disrupted the continuity of essential health services. In a pulse survey of ministry of health officials in 105 countries in May–June 2020, nearly all reported service disruption, most of which were partial (change in 5–50%) but with greater disruption in lower- than in higher-income countries (18). The disruption of service provision has been attributed to issues of both supply and demand. Many ministries of health closed elective services, population screening and some outpatient services and/or repurposed the staff to COVID-19 care. At the same time, implementation of social and movement measures disrupted supply chains of personal protective equipment, medicines, diagnostic supplies and other technologies. The demand for these services has also decreased because the social and movement measures have complicated access by limiting transport and financial constraints and also because potential users fear contracting the virus and limit their movements voluntarily.

The findings of the pulse surveys have been borne out by reviews of statistics for outpatient attendance, deliveries and outreach activities in several countries. The World Bank is conducting analyses of disruptions of health services for women and children due to COVID-19 in a number of countries. In a study of 63 000 health facilities up to June 2020, the numbers of outpatient consultations recorded in routine health information systems decreased from the trends observed before March 2020, the service most affected being childhood vaccination; the number of fully immunized children decreased by 11–35% (19). Use of antenatal care decreased by approximately 15% in Liberia and Nigeria. Administrative data have also been used to document decreased services. In India, the Pradhan Mantri Jan Arogya Yojana programme, which covers hospitalization for the lower 40% of India's population, recorded a 51% fall in weekly claims over 10 weeks of lockdown from that in previous weeks. They also recorded a 26% decrease

in deliveries and almost a 95% decrease in elective surgery (20).

Indirect impacts on health are difficult to measure, and most analyses in developing countries have been based on projections of excess mortality with assumed percentage reductions in service coverage. Modelling studies on HIV, tuberculosis, malaria, cancer and maternal and child health gave estimates of increased mortality with assumed decreases in service coverage of 20–100%. In a study on excess mortality in 21 high-income countries, current estimates were compared with past data. In the period mid-February to May 2020, there were 206 000 (95% credible interval, 178 100–231 000) more deaths than would have been expected if COVID-19 had not occurred. Excess mortality varied by country. The causes of the excess deaths (COVID-19 or other) could not be determined, as causes of mortality were not included in the analysis. It was noted, however, that the number of excess deaths from all causes was 23% (7–38%) higher than the number of deaths attributed to COVID-19 as the underlying cause of death. It was acknowledged that, at the same time, fewer deaths could be expected from other respiratory causes and from injuries due to road traffic accidents (21).

Deterioration in mental health is a key concern. In a systematic review of studies of the general population in eight countries published up to early May 2020, relatively high rates of symptoms of anxiety (6.33–50.9%), depression (14.6–48.3%), post-traumatic stress disorder (7–53.8%), psychological distress (34.4–38%) and stress (8.1–81.9%) were reported (22). These wide ranges indicate a heterogeneous impact in these countries, which might be due to both COVID-19 and the local context, including social and movement measures, which can result in a sense of isolation and loss of opportunities for socialization. Domestic violence may also increase in populations asked or mandated to stay at home. Any increase in domestic violence is, however, difficult to document and quantify. Some countries have reported increases of 25–35% in the number of calls on helplines and an increased demand for emergency shelter (23).

Undernutrition, with its associated higher risk for morbidity and mortality, is expected to increase to affect 83–132 million people globally as a result of COVID-19 and the social and movement measures (24). The causes include closure of schools and thus lack of access to school food supplements, loss of income, increased food prices due to rupture of supply chains and work stoppage.

COVID-19 has thus become a major cause of morbidity and mortality globally, although the direct and indirect health impact is heterogeneous because of the pandemic itself, the resulting disruption of essential health services and behavioural responses to social and movement measures. COVID-19 will continue to have an adverse impact in the medium and longer term, with “long-COVID”, the effects of delayed diagnosis and treatment of other conditions and increased prevalence of mental disorders, domestic violence and undernutrition.

National monitoring

Monitoring COVID-19 transmission

The numbers of confirmed new cases and deaths of COVID-19 in a country, new hospitalizations and test positivity can be used to assess the health impact and track transmission of the virus. WHO has recommended categorization based on thresholds for these indicators, ensuring consistency across time and space (1) (Box 2).

This categorization reflects the current status of the pandemic. To calibrate the social and movement

measures in order to avoid overwhelming the health system, modelling and “what-if” projections can be conducted and continuously updated, preferably by countries themselves (25). The effective reproduction number (R_t) represents the number of people whom a single infected person is likely to infect. An $R_t < 1$ indicates that the pandemic is slowing, while an $R_t \geq 1$ indicates that it is worsening. Changes in the R_t reflect changes in mobility due to calibration of social and movement measures. The time to double the number of cases is another useful modelling parameter for interpreting the rate of change in R_t and assessing the impact on the health system. These parameters should be interpreted in the context of other epidemiological indicators, as the implications of an R_t of 2 are different if there are 100 or 10 000 cases and whether those cases can be traced to known sources or most have an unidentified source.

Monitoring the health impact of COVID-19

The numbers of cases and deaths due to COVID-19 reflect the effectiveness of the public health and social measures in place, the capacity of the health system to respond while maintaining essential services and other contextual factors (1). The resilience of health systems also depends on the country’s pre-COVID-19 status, ranging from those with already weak health systems that were unable to provide essential health services even before COVID-19 to those with strong referral systems that can cope with increasing numbers of patients. In addition, while social and movement measures are in place, individuals’ behaviour is influenced by the socio-politico-cultural milieu and the existence of

Box 2. Seven transmission categories proposed by WHO

- No cases/No known transmission
- Imported/Sporadic cases
- Clusters of cases
- Community transmission (CT)
 - CT1: Low incidence of locally acquired, widely dispersed cases detected in the past 14 days
 - CT2: Moderate incidence of locally acquired, widely dispersed cases detected in the past 14 days
 - CT3: High incidence of locally acquired, widely dispersed cases in the past 14 days
 - CT4: Very high incidence of locally acquired, widely dispersed cases in the past 14 days

Source: reference (1).

adequate social protection to support households and businesses. These factors interact, and it is difficult to differentiate their contributions to the numbers of COVID-19 cases and deaths due to decreasing transmission and the number of new cases of COVID-19 and to coping with new cases and avoiding deaths.

Effectiveness of social and movement measures and public health and social measures generally

The effectiveness of social and movement measures has been assessed mainly in international ecological studies, which show an association between the introduction of such measures and intermediate results such as mobility and health outcomes in terms of numbers of cases and deaths (after accounting for the appropriate time lag). A claim of causality, beyond association, can be made if a relation is consistently documented between the time the interventions were instituted or lifted and the corresponding expected increase or decrease in the number of cases.

Several studies (26–28) provide data from the past 6 months on the numbers of COVID-19 cases and deaths and on the time of introduction of public health and social measures generally, as many were applied concurrently. One study of the impact of 6068 individual measures on the R_t of COVID-19 in 79 territories worldwide was based on four statistical modelling methods and validated the findings in two other external datasets (29). It showed that no single measure can reduce the R_t to < 1 and that the combination of measures, their timing and their sequence (“the earlier, the better”) depends on the context of the country and the transmission level. Generally, the most effective measures are reported to be closing and restricting most places in which people gather for an extended time (such as businesses, bars and schools and other closed areas). Land border measures are also reported to be effective (29), and government support to vulnerable populations and risk communication strategies improves compliance and effectiveness; however, the effectiveness of these measures varies considerably. “The same non-pharmaceutical intervention can have a drastically different impact if taken early or later, or in a different country” (29).

As the effectiveness of public health and social measures depends on the individual country context, another approach to determining their effectiveness is to define the counterfactual and determine the numbers of excess cases and deaths that would have occurred if the measures had not been implemented. These studies take the form of gross comparisons of statistics on mobility, use of health services and numbers of cases and deaths before and after the pandemic or modelling “what-if” scenarios or construction of counterfactuals. Such studies have been conducted for example in China (> 67 times more cases without public health and social measures (30)) and in the United Kingdom, which early on demonstrated that intensive social and movement measures in combination with other measures may be necessary to prevent overwhelming the health system (31).

Monitoring health sector response capacity

Even before the pandemic, there was a global shortage of health workers, mainly in developing countries. The World Health Statistics 2020, in a review of the latest data from countries, reported that $> 40\%$ of countries have fewer than 10 medical doctors per 10 000 people, and $> 55\%$ have fewer than 40 nursing and midwifery personnel per 10 000 people (17, 32). With the advent of COVID-19, the lack of human resources for health became more acute as health workers were transferred to work on the COVID-19 response, and as front-line health workers became ill or were quarantined because of exposure to patients with COVID-19. In samples of health care workers in 97 studies in Asia, Europe and the USA, about 11% were confirmed to be infected with SARS-CoV-2, and half of those infected were nurses (33).

Hospitals were also put under stress. Countries that are members of the OECD have a median of 10 (range, 3.3–33) intensive care beds per 100 000 population (34), whereas recently published data on 14 low- and middle-income countries showed a median of 0.8 (range, 0.07–2.59) intensive care beds per 100 000 population (35). Little information is available on the oxygen capacity in hospitals in low- and middle-countries. In four countries in sub-Saharan Africa, only 43.4% of medical facilities had

both continuous power and available oxygen (36). Less information is available on laboratory capacity in terms of quantity and quality. In 2010, 617 laboratories in 47 countries in Africa were assessed according to the Stepwise Laboratory Quality Improvement Process Towards Accreditation; 84% of the laboratories scored zero out of five stars. Of the 302 laboratories that completed the 16-month quality assurance programme, at least 70% were able to achieve one star. As of 2018, about 1100 laboratories have been guided toward International Standardization Organization requirements (37).

There is no global mechanism for tracking how countries' health systems have coped during the pandemic in terms of clinical capacity. One indicator is the proportion of hospital beds occupied (1), although this also reflects the country's policy for hospitalization for COVID-19 and reimbursement. This has nevertheless been the primary indicator of whether a health system is being "overwhelmed". WHO has suggested that a hospital occupancy rate < 75% indicates adequate capacity and suggests that a threshold of 90% indicates limited capacity. Related capacity indicators might be the number of intensive care beds per 10 000 population or the number of hospital beds with access to an oxygen supply. Indicators of the impact of disruption of essential services could also be considered.

The capacity to respond with various public health functions could also be assessed and monitored. Diagnostic testing can be assessed by monitoring the number of people tested per 1000 population per week, averaged over 2 weeks; the suggested threshold for limited capacity is < 1 per 1000 per week (38). This is also best interpreted with positivity rates. For contact-tracing, the proportion of cases for which an investigation has been conducted within 24 h of identification could be tracked.

Indicators of behavioural responses to individual public health measures can also be tracked. Data collated for about 30 countries show that these measures and social and physical distancing measures could be improved in countries in which compliance is currently as low as 10% for wearing masks and 60% for avoiding crowded public spaces (39). At this point, pandemic fatigue may be

setting in. A survey in the United Kingdom as early as April 2020 found that behavioural reactions to social and movement measures could be classified into three groups: accepters, sufferers and resisters (40). The three groups were identified in terms of socio-demographic characteristics, which could allow tailoring of risk communication.

Tracking these indicators is important, as they can indicate when surge capacity in hospitals or laboratories should be increased and when greater reinforcement of behavioural modification interventions is necessary. As one of the immediate goals of social and movement measures is to avoid overwhelming the health system, effective action should be taken in the health sector to prevent further transmission and to decrease demand (4). The surge capacity of the health system and supply could also be increased (34). Ideally, these twin objectives are attained maximally in order to reduce the need for intensive, prolonged, mandatory social and movement measures.

The transmission status of the pandemic and the ability of the health system to detect and cope with COVID-19 patients while maintaining essential health services are the key considerations in calibrating social and movement measures. WHO has proposed situational levels based on a joint assessment of suggested indicators and thresholds for these two health considerations (see Table 1 in (1)). Assessment of these indicators indicates the situational level for triggering a set of suggested actions. For example, situational level 4, which is widespread community transmission and limited response capacity (e.g. hospital occupancy rate of $\geq 90\%$), would imply strict measures (closure of schools, offices, businesses). It is suggested that the situation be assessed regularly, every 2 weeks.

Countries can select their own indicators and thresholds and also suggest actions for each situational level. Ideally, the situation is assessed in coordination at the administrative or geographical level at which the data are available, and such subnational areas could be plotted according to their population size on a grid to provide a quick overview of the current situation in each area.

All the selected indicators and thresholds must be closely monitored. Estimates of indicators can be affected by many factors; for example, the number of confirmed new cases may depend on the testing capacity and reporting mechanisms in the country, and trends should be interpreted cautiously. A threshold that is set too high or too low, depending on the indicator, might lead to the loss of more lives. Suggestions for thresholds by type of activity or sector are publicly available. For example, WHO provides guidance for assessing the risk of transmission at mass gatherings (41). Thresholds should also be reviewed regularly as the pandemic evolves.

In summary, the pandemic and social and movement measures implemented thus far have had heterogeneous effects on national health systems, both directly in terms of cases and deaths

and indirectly by disrupting essential health services. The poor and those with co-morbid conditions suffer disproportionately more than others. The impact is also continuing due to “long-COVID”, mental health problems, domestic violence and undernutrition. The health system is complex and adapting constantly, and the epidemic situation, health system capacity and effectiveness of behavioural responses should be monitored frequently and consistently. Social and movement measures should be calibrated carefully, informed by these indicators and thresholds, after health system capacity and public health measures have been maximized. Deliberation is key when deciding to ease or intensify social and movement measures in order to preserve the gains and to start a virtuous cycle of controlling the pandemic, leading to greater confidence in the system and facilitating economic recovery.

Economic impact of COVID-19 and social and movement measures and the economic response

Economic impact

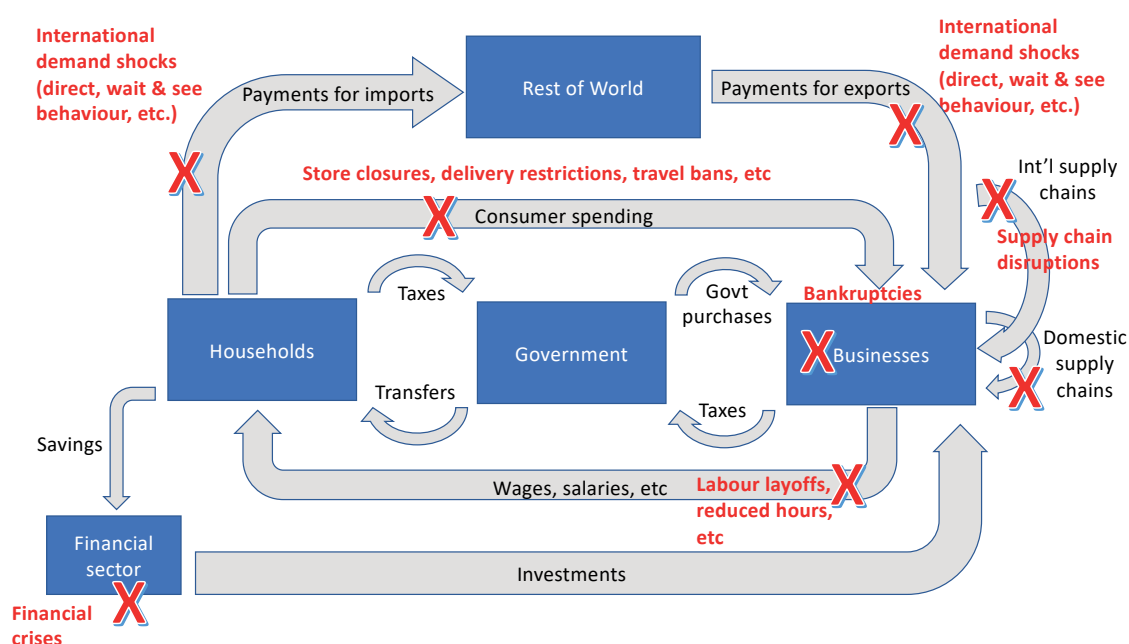
The COVID-19 pandemic has altered the confidence of economic actors who have changed their behaviour, notably reducing face-to-face interactions and movement so as to protect themselves from the risk of infection (2, 42, 43). The impact of these behavioural changes on economic activity has been exacerbated by social and movement measures (Fig. 1). This year, global economic output is estimated to have decreased by > 4% from the projected pre-pandemic level (2). Worse macroeconomic outcomes were observed in countries with more stringent social and movement measures, regardless of the COVID-19 burden. How COVID-19 and these measures affect economies reflects not only the stringency of the measures but also the structural and functional

characteristics of the economies before the pandemic and their resilience and capacity to absorb shocks.

Reduced income and increased poverty

The World Bank's latest publication on the impact of COVID-19 on global poverty and inequality shows a reversal of the gains in global poverty for the first time in a generation, with job losses and deprivation induced by the pandemic severely hitting the already-poor and socioeconomically vulnerable and pushing millions of people into poverty (45). People projected to fall into poverty because of COVID-19 are reported to be likely to live in crowded urban areas and work in the worst-affected sectors (46, 47).

Fig. 1. Disruptions to global and domestic income flow due to COVID-19



Source: reference (44).

Construction, manufacturing, hospitality, retail and other service sectors are reported to be the most severely affected globally by social and movement measures, as they are less amenable to physical distancing. In those sectors, most businesses have had to reduce their production, decrease working hours or close temporarily or permanently. For example, the tourism sector, an important source of income for many low-income countries, is expected to register its worst performance since 1950 in terms of the volume of travellers and revenue, whereas it accounted for one in four new jobs created over the past 5 years globally (48).

Workers in the worst-affected sectors have been disproportionately hit as their employment is frequently temporary or seasonal, and they generally have lower unemployment benefits or social insurance coverage. While each country and each business is different, the construction and transport sectors uniformly employ most temporary workers in most countries, with different proportions in manufacture and service sectors in different countries (49). Self-employed people and workers in the informal sector, who tend to have lower wages (or none in family businesses), are also reported to be severely hit by social and movement measures. As informal workers represent a higher share of total employment in low- and middle-income countries (90% and 67%, respectively) than in high-income settings (18%), social and movement measures have had disproportionately negative consequences on economic activity in the former (50).

Fewer workers in sectors and activities in which work can be done from home to ensure business continuity have experienced reductions in working time. In high-income countries, high-frequency transaction data show large heterogeneity among income groups, with wealthier households consuming less and saving more, while lower-earning households have used savings or increased borrowing for essential spending (51). In all settings, social and movement measures have a demographic and gender bias, with younger and female workers more severely affected, partly because their employment status is precarious and they tend to work in the worst-affected sectors (52).

The income sent by migrant workers who are still in their host countries to their families in their home countries has decreased, exacerbating the income shock that recipient countries experience on their own economies (52). In 2019, remittance flows to low- and middle-income countries were larger than foreign investment flows and overseas development assistance, implying that reduced remittance flows, combined with reduced foreign direct investments, will also increase the challenges faced by countries to finance and service their debts (53, 54).

Fewer opportunities for learning and reduced human capital accumulation

During closure of face-to-face schooling, many children miss regular education, which could result in loss of more than half a year of effective basic learning in a child schooling globally (55). Loss of learning is a concern, because it implies loss of skills and, later, loss in productivity and income. In the absence of strategies to ensure continued learning, each primary and secondary schoolchild could experience a reduction of nearly US\$ 880 in annual earning or US\$ 16 000 over a working life, resulting in a significant reduction in the return on investment of governments in basic education (56). In the Philippines, school closures implemented until mid-2020 could reduce the lifetime earning of current students by 3%, equivalent to a long-term reduction in GDP of 1.5% over decades (57).

School closure may also reduce educational aspirations and increase the risk of disengagement from the school system (58, 59). Globally, it is estimated that > 20 million additional children and young people may drop out or have no access to school in 2021 because of COVID-19 (56). In some countries, COVID-19 has triggered a reduction in public spending on education as the economic crisis puts pressure on tax revenues and funding is redirected to support increasing health care costs and livelihoods (59). Stringent measures on international travel have severely affected higher education by disrupting, for example, learning and examinations and stranding international students in their host countries, which could contribute to a drop in international student enrolment in the near future (48, 59).

The children who suffer most from school closures are reported to be those who live in poor or vulnerable households, notably girls, children with disabilities and marginalized populations (56). These children may have more difficulty in learning at home, especially if they live in overcrowded homes or in settings with poor digital connection. Furthermore, the families of children affected by school closures often lose wages or reduce their productivity in order to take care of their children (60).

Economic response

The economic response to the impact of social and movement measures includes extension or adaptation of existing policies and introduction of additional instruments,¹ monitored and informed by conventional economic statistics and supplemented by high-frequency data (Box 3). The remainder of this section provides an overview of the direct and indirect support provided to households, individuals and businesses and to human capital accumulation. Detailed information on these policies and others is available (48, 61, 62).

Support to households, individual and businesses

Direct support to individuals and households to sustain their income and living conditions includes wage subsidies, unemployment benefits, cash transfers and/or in-kind donations. Indirect measures include financial support to households to pay utility bills, loans or mortgages and deferral or subsidization of other costs (e.g. rent, utility bills, interest payments). Support to businesses tends to be specific to each sector and/or the size of the activity, generally targeting firms, notably small and medium enterprises, at risk of liquidity shortages and layoffs. Low-interest rate loan packages and/or loan guarantees have been introduced in some settings to assist businesses in paying their wage bills or other costs. Tax relief measures may support some households and businesses, including, for example, deferred tax filing and a waiver or reduction in taxes.

¹ The information summarized in this section provides an overview of the range of policies and does not make recommendations. Governments may take additional measures or refine these measures.

Globally, the fiscal support has been unprecedented, totaling US\$ 12 trillion since the start of the pandemic (63). Fiscal policies are, however, costly and contribute to increase public debt while tax revenues are decreasing because of reduced economic activity. Therefore, not all countries have been able to provide the same level of support; this is partly determined by access to borrowing and debt levels before the pandemic (63).² The fiscal response in high-income and some middle-income countries has benefited from the support of central banks to keep interest rates low and to mitigate the cost of borrowing, while the response in other countries has been more limited because of already-high levels of debt and more limited space for borrowing. The share of national income allocated to budgetary fiscal support to people and firms is reported to range from < 2.5% to > 10% of a country's GDP (64).³

The risk of infection is still high, and uncertainty remains. Therefore, governments have been advised to sustain exceptional support to households and businesses (63). One study shows that income support through paid sick leave, notably for those on daily wages, may incentivize workers who have COVID-19 symptoms or suspect infection to be tested and may therefore reduce the risk that they may carry the infection when reporting for work, making other health measures, such as contact-tracing and self-isolation, more effective (65). The policy recommended depends on the stage of a country's epidemic and its fiscal support capacity, from targeting support to jobs at risk and stimulating economic growth through public investments in high-income countries to reprioritizing resource allocation and increasing spending efficiency in lower-income settings, supplemented by additional financial support and debt relief in the lowest-income settings.

² For the extent of support to firms and households and the choice of instruments according to a range of factors and for a description of the implications of different types of fiscal measures for public finances, see <https://blog-pfm.imf.org/pfmblog/2020/08/-covid-19-funds-in-response-to-the-pandemic.html>

³ The section does not address how measures are funded, e.g. COVID-19 funds. For more information, see <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19> and <https://blog-pfm.imf.org/pfmblog/2020/08/-covid-19-funds-in-response-to-the-pandemic.html>

2.2.2 Support to human capital accumulation

To mitigate the impact of social and movement measures on human capital accumulation, policies have been introduced to ensure the continuity of learning and development opportunities, including supporting teachers and parents while schools are closed, for instance with distance-learning technology, including online classrooms, radio and television (66). By April–May 2020, three types of strategy were used in countries for

reopening schools and mitigating adverse effects on education, including recovering lost learning time with remedial courses, adjusting school calendars or curricula, monitoring re-enrolment and attendance of children by individual telephone follow-up and identification of vulnerable children who do not return to school by local authorities or the community (66). Given the uncertain trajectory of the pandemic, some countries have decided on school reopening according to how long they remained closed in the first two quarters of 2020, with different reopening plans for each scenario.

Box 3. Real-time micro data to monitor the economic situation

Micro data are required to monitor and respond to the socioeconomic impacts of COVID-19 and the frequent changes in the health response. Routinely collected economic data, which can be disrupted by social and movement measures and which take some time to analyse, are being complemented by high-frequency data (e.g. on energy consumption, mobile phone financial applications, bank card transactions, web-searches) (67–71). In high-income countries, monthly routine qualitative surveys, generally conducted by telephone or e-mail with businesses or households, provide helpful advance warning of turning-points in aggregate economic activity (72). In several low- and middle-income countries, national statistics offices, with support from the World Bank and other partners, have extended high-frequency household telephone surveys, reaching > 100 countries in all regions in November 2020. Large-scale monthly regional surveys are also under way (73). Examples of the topics and indicators collected during these surveys are listed in Annex 2. A functioning education management information system has proved useful for monitoring the situation in the education sector and for identifying additional needs (66).

Decision-making framework

Decision-making principles

As COVID-19 affects not only health and economic indicators but also social contracts and ethical and human rights principles (e.g. the right to health and protecting the most vulnerable), a decision framework for social and movement measures must have a broad perspective. Several ethical frameworks are available for making decisions in pandemic situations, with various principles or proposed means for defining an “optimal” decision (74). These frameworks have various objectives, but, regardless of the ethical perspective, decisions on COVID-19 measures must be based on evidence and be open and inclusive. Decisions should be based on multiple voices, with clarity of purpose. Further principles of good governance, such as transparency and accountability, also apply to decision-making. Many of these principles have been mentioned in work by the OECD on managing pandemics, which calls for transparent governance that is adaptable and which enables learning (75). The principles are also included in priority two of the Sendai Framework for Disaster Risk Reduction, which calls for clear objectives and ample coordination among sectors and levels of government (76).

During a pandemic, decisions will continue to be made at many levels of government. Specific bodies may be formed to make decisions in response to the pandemic. As COVID-19 unfolds in various stages, different decision-makers may be involved. A review by OECD indicated several structural approaches to government decision-making (77) but acknowledged that additional mechanisms for a coordinated response may raise other issues, such as overlap and lack of coherence.

Three challenges have been identified in maintaining a trusted connection between decision-makers and scientific advisors (77):

- managing multidisciplinary perspectives across scientific areas and civil society;
- maintenance of centres of government as the gatekeepers, giving decision-makers enough space for discretion and supplying evidence in a timely manner with appropriate quality checks; and
- provision of evidence in a timely manner, with collaboration to speed up evidence generation.

Robust decision-making should include mechanisms for collecting data on indicators and for dialogue and deliberation among sectors. Importantly, decisions for social and movement measures in the context of COVID-19 require detailed understanding of the current health and socio-economic situation and of the feasibility, acceptability and financial resources required for those measures and the economic response (e.g. income support, job retention schemes and wage subsidies, social protection).

Governance mechanisms for decision-making are being investigated in at least 20 countries within the Response Governance Mapping Initiative (78). One conclusion of this work was that “adaptivity” during the COVID-19 pandemic has led to “take-over”, with “task forces composed of non-health actors, or with ministries of finance or defence assuming the governance lead in the pandemic response”. Inclusive governance is difficult to achieve in practice, and one survey found that “default” governance arrangements have dominated during the COVID-19 crisis. It is clear that inclusive governance is easier to implement when processes are in place before an emergency (79).

New evidence and new information are becoming available on COVID-19 and related policies. Systems are required for processing the information and assessing the quality of evaluations. Use of data and evidence requires trust between a government and the population and also between agencies and other stakeholders, and open data-sharing agreements can help build trust. Such initiatives

should be based on transparent practices and include statements of conflicts of interest (80). The vast increase in the amount of information that has appeared during the COVID-19 pandemic has led to an “infodemic”, which can further erode trust between governments and the population. Organizations such as WHO have taken proactive approaches to managing the infodemic and to finding ways of encouraging healthy behaviour during the pandemic (81).

Developing a decision-making framework

The proposed five-step framework begins with a situational assessment and proceeds through the identification of policy options, assessment of potential impacts and making decisions. The final step includes monitoring, adapting and communicating, reflecting that the process is dynamic, as decisions will have to be revised regularly and clear communication should be an integral part of the process. It is envisioned that this framework will be useful for both national and subnational decision-making bodies that inform or make decisions on social and movement measures. In line with the WHO interim guidance of 4 November 2020 on considerations for adjusting public health and social measures, this framework may be used in making decisions on implementing, adjusting or revising social and movement measures (1).

1) Assess the situational level of COVID-19 transmission and health sector capacity, and optimize the health response. The assessment should include the epidemiological situation on the horizontal axis and the health system response capacity in the vertical axis, as reflected in Table 1 of the latest WHO guidance on public health and social measures (1). It is recommended that countries develop similar tables for their contexts, with the appropriate indicators and thresholds for each assessment level to trigger a set of suggested actions. The first set of suggested actions would be measures to optimize the health sector response, by increasing health system capacity and adherence to existing public health and social measures.

2) Identify possible social and movement measures, with possible calibration options for each context, and assess their impact on health. An example of a set of such options is provided in Table 2 of the WHO guidance (1). An online tool published by RAND indicates the phase of an outbreak at which certain measures should be introduced and when to consider ending the measures (82). An important exercise in identifying relevant measures is consideration of the many “calibration points” for each. Calibration points account for the main uncertainties and scenarios linked to the dynamics of the virus. Several publicly available tools present only broad policy options, and the finer calibration points should be considered carefully in decision-making.

3) Develop and populate an “extended assessment matrix” of important non-health dimensions. Socioeconomic considerations and others deemed important in a given context should complement steps 1 and 2. As outlined in previous sections, the economic impacts of social and movement measures are not inconsequential. In several studies, combined epidemiological and economic models (that differ in structure and use) have been used to account for both the health and economic impacts of the pandemic (82–84). Other dimensions, such as political factors, should be taken into account in decision-making, as these factors may alter the effectiveness of social and movement measures (85). One approach to structuring assessment in many dimensions is the use of a decision-making aid such as a matrix (82, 86–88). A matrix can be collated in step 2, with each social and movement measure assessed on a different row. An example of such a matrix, referred here as an “extended assessment matrix for calibration of social and movement measures”, is shown in Table 2.

The dimensions to be included should be determined by decision-makers and stakeholders according to what they deem important, and the dimensions should be selected in an inclusive process. In Table 2, four non-health dimensions are shown for illustrative purposes. The policy options identified in step 2 are assessed against the dimensions identified during decision-making by all stakeholders, such as those used

Table 2. Example of an extended assessment matrix that accounts for both health and non-health dimensions

An assessment of both health and non-health dimensions can provide a broader perspective for introducing or adjusting social and movement measures. These dimensions and their associated assessments are provided here as an illustration and are intended as an example only. The dimensions and assessments should be adapted to the context at the lowest possible geographical level. The assessment of non-health dimensions can also indicate when socioeconomic support or other mitigation strategies are necessary before the measures are introduced or adjusted.

| Situational level (illustrative and adapted from reference (7)) | Sub-classes of social and movement measures (illustrative) | Health dimension (illustrative) | | | Non-health dimensions (illustrative, adapted from reference (82)) | | | |
|--|---|---------------------------------|----------------------------|----------------------|---|---------------|------------------|--------------------|
| | | COVID-19 health impact | Non-COVID-19 health impact | Health system impact | Implementation cost | Economic cost | Impact on equity | Political barriers |
| Level 3. Community transmission with limited additional capacity to respond and a risk that health services will be overwhelmed. More measures might have to be put in place to limit transmission, manage cases and ensure control of the pandemic. | Partial closure of offices, businesses, institutions and operations. | Medium | Low | Medium | Medium | Medium | Medium | Medium |
| | Partial closure of schools and in-person teaching, and institution of e-learning. | Medium | Low | Low | Medium | Low | High | Medium |
| | Limit the size of gatherings at a given threshold. | Medium | Low | Low | Low | Medium | Medium | Low |
| | No additional measures. | Low | Low | Low | Low | Medium | Low | Medium |
| Level 4. Uncontrolled pandemic with limited or no additional health system response capacity, thus requiring extensive measures to avoid overwhelming health services and substantial excess morbidity and mortality. | Complete closure of offices, businesses, institutions and operations. | High | Medium | High | Medium | Low | High | High |
| | Prohibit gatherings. | High | High | High | Low | High | Medium | Medium |
| | No additional measures. | Low | Low | Low | Low | Medium | Low | Medium |

Note: The scale "low", "medium" and "high" is indicative; other weighting systems can be used.

for illustration in Table 2. The dimensions should be defined according to the context, and a system should be established for assessing the level and/or weighting to be given to each dimension. In a review of decision-making frameworks (Annex 3), several systems included a series of checks, a “traffic light” system (e.g. low, medium, high) or a scale from 1 to 10. One provided a weighting system in addition to the assessment score (88). For each intervention, the assessment should be justified, for example in terms of the interventions available to counteract harmful impacts.

4) Establish dialogue and a decision-making process for the COVID-19 response.

Dialogue or deliberation should adhere to good governance principles for decision-making and be multidisciplinary, inclusive and transparent. This step is an opportunity to discuss the uncertainties and potential unintended consequences of policy scenarios. In this step, decision-makers should move beyond the technocratic approaches of previous steps that involved the assessment of evidence and placement of data into tables or matrices in order to organize the information. Nevertheless, the realities of each country are complex; dialogue to ensure the broad perspective of many stakeholder groups will ensure that decisions on interventions are manageable.

5) Monitor, adapt, and communicate. A system for monitoring should include relevant indicators of the critical dimensions identified in previous steps. Many of the health and economic indicators that could be used are described in the sections on health and economic impacts. Other indicators are available for real-time monitoring of the impacts of COVID-19 policies, which include compliance with policies and data on movement (39, 89). The results of monitoring should be fed back to previous steps in the decision-making process, repeated regularly (every 2–4 weeks), to ensure that the most up-to-date evidence is used. Communication is the final critical element for ensuring that the decisions made will be acceptable to the public. The tools

listed for this decision-making framework can be used to communicate clearly to the population why certain decisions were made and the costs, benefits and principles that were considered.

This decision-making framework is meant to be flexible yet structured to account for the health and economic conditions and policy options in each country. It provides an adaptable process that can be updated as the pandemic progresses. The process will ensure clear communication to the public and can assist in building trust to further the fight against the pandemic. Continuous monitoring is necessary to determine how well the policies are working and whether they should be changed. Indicators of the health and economic impacts, of implementation and of population acceptance and adherence should be measured to assess whether the policies are effective or should be changed. The decision-making framework acknowledges that there is no “one size fits all” approach to social and movement measures. For example, measures that work in high-income countries may not work as well in low-income countries where a larger share of the population is impoverished (90). In resource-limited settings, social and movement measures may have negative consequences for health, such as violence, starvation and stress (91).

This section shows that a comprehensive framework should be based on the health situation and the health system capacity of each country and on available social and movement measures. Further dimensions can then be assessed on the basis of quantitative and qualitative information, dialogue and deliberation to ensure a broad perspective, as well as evidence and voices. The context and situation of each country (and subnational area) requires different decisions on social and movement measures. Balancing the many impacts of social and movement measures for health and the economy and other dimensions is not easy, but explicit criteria and processes for making decisions can improve trust and stability throughout society.

Concluding remarks

The decision framework proposed here incorporates both health and non-health dimensions and can be adapted to other considerations, depending on priorities. The framework is founded on key procedural principles for a transparent, inclusive, evidence-informed dialogue for calibrating social and movement measures. This framework can contribute to a consistent, predictable process that will increase a sense of ownership in a context of uncertainty and the effectiveness of the selected measures.

The complex calibration of social and movement measures suggests the following considerations for an “after-action review”:

- The continuing need to calibrate measures underlines the irrationality of considering public health spending as a cost rather than an investment. The way in which health is valued should be radically changed, so that it is seen as protection for the future (92).
- Any shock to health in a complex adaptive system will have different expected and unexpected impacts in population groups, within and outside the health system and now and in the future. The many variables and how they interact can be considered together only in a decision framework based on evidence and inclusive societal dialogue.
- Once a differential impact has been demonstrated on people who are less well-off versus those who are better off, a mitigation response beyond the health system is necessary, frequently requiring a whole-of-government approach. Exacerbation of pre-pandemic inequality and leaving communities and groups behind will have long-term consequences for human development.
- Responses should be based on timely data on changes. Useful indicators of a health and economic shock and the effectiveness of the response can be obtained from less conventional data sources, such as pulse and high-frequency surveys, with strengthening of routine surveillance and statistical offices. Evidence and decision-support tools, particularly policy impact models, can save lives by informing decision-makers about the impact of different policy options.
- Deliberations that are inclusive, transparent and based on evidence should be the regular input for making health and other decisions. In the short term, they can provide legitimacy and support for difficult decisions that must be made in response to a health shock. If they are institutionalized, they can contribute to virtuous cycles of trust-building and more effective policies in the longer term (93).

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Annex 1. Possible calibration of social and movement measures

This annex does not present WHO recommendations. It suggests the range of possible measures by sub-class and possible types of action, possible scope, target and timing (6). These measures can be enforced to different extents, as a recommendation or a requirement. For more information on enforcement levels, see reference (6).

| Sub-class of measures | Possible types of action | Possible scope, target and timing |
|--------------------------------|---|--|
| Social and physical distancing | Stay-at-home measures | <ul style="list-style-type: none"> • by area • by age group • by health condition or exposure to risk factors (positive or negative for COVID-19) • by time, e.g. curfew |
| | Closure of schools | <ul style="list-style-type: none"> • by area • by school • by classroom within a school • by education level / year in all schools • by category, e.g. primary vs secondary vs university • by time, e.g. selected days for different classes in the same school |
| | Closure of workplaces | <ul style="list-style-type: none"> • by area • by sector • by type of goods or services produced, e.g. essential vs non-essential; category of workers • by time, e.g. 1–2-week closure; weekly staff rotation; regulated closing hours (e.g. restaurant closure at 22:00) |
| | Cancellation of public events | <ul style="list-style-type: none"> • by area • by threshold, e.g. > 1000 people • by type, e.g. sport vs concert |
| | Restriction on size of gatherings | <ul style="list-style-type: none"> • by area • by type, e.g. outside vs inside • by threshold, e.g. > 10 people; > 11–100 people; 101–1000 people; ≥ 100 people • by sector, e.g. restaurant > 6 people from same household or > 4 people in a regular social bubble |
| | Closure of public transport | <ul style="list-style-type: none"> • by area • by time, e.g. outside working hours of essential services • by type, e.g. selected transport type |
| | Restrictions on domestic movements | <ul style="list-style-type: none"> • by area, e.g. not leaving a given area • by age group, e.g. children, older people • by time, e.g. ≤ 1 h; once a day • by size, e.g. ≤ 1 person from same household • by type, e.g. for essential needs only, to exercise |
| International travel | Screening, quarantine, travel ban, border closure | <ul style="list-style-type: none"> • by area, e.g. country of origin • by sector, e.g. essential workers allowed to commute across borders (e.g. health workers living in France to enter Switzerland) |

Annex 2. Examples of topics and selected indicators in high-frequency mobile phone surveys in low- and middle-income countries

High-frequency mobile phone surveys, such as those supported by the World Bank and partners before the pandemic to monitor household welfare, have been scaled-up to respond to the emergency. The surveys include up to 84 indicators of 14 topics, including access to food and other basic needs, employment, income loss, safety nets and coping strategies. With a flexible design, countries' national statistical offices can adapt the data collection tool to their evolving needs, priorities and insights from emerging data (73).

| Topic | Examples of indicators (%) |
|-------------------|--|
| Income | <ul style="list-style-type: none"> Households that experience a decrease in total income Households with farm income as the source of livelihood in the past 12 months that had decreased farm income Households with non-farm business income as the source of livelihood in the past 12 months that had decreased income from non-farm family business Households that receive remittances that had decreased remittance |
| Financial | <ul style="list-style-type: none"> Households that could not access a financial institution when necessary Households that could not access a financial institution when necessary because of movement restrictions |
| Labour | <ul style="list-style-type: none"> Respondents who are currently employed and aged > 18 years who have changed jobs since the start of the pandemic Respondents > 18 years who are self-employed Respondents in wage employment who did not work as usual who received partial or no payment when not working as usual Households unable to perform normal farming activities (crop, livestock, fishing) |
| Safety nets | <ul style="list-style-type: none"> Households that had received any form of assistance since the start of the pandemic Households that had received any form of government assistance since the start of the pandemic Respondents who stopped working or received less labour income who received government assistance after losing a job or receiving less labour income |
| Coping strategies | <ul style="list-style-type: none"> Households that reduced consumption of goods (essential and non-essential) Households that sold assets to pay for basic living expenses Households that used emergency savings to cover basic living expenses |
| Education | <ul style="list-style-type: none"> Households with school-age children who attended school before the pandemic who have engaged in any learning or educational activity since school closure Households with school-age children who attended school before the pandemic who have used mobile learning apps since school closure |

Source: reference (73).

Annex 3. Review of decision-making frameworks in the context of COVID-19

In order to develop the decision-making framework, we conducted a review of key guidance documents and references for assessing evidence and making decisions related to COVID-19. Our review was based on the criteria that frameworks contain both health and non-health elements for examining COVID-19 policies and public health and social measures. Frameworks also needed to contain an element of informing decision-making through assessing the different dimensions and being targeted to decision and policy-makers. We excluded references from the economics literature that attempts to inform decision-making through aggregated welfare function analysis since this does not accurately reflect real-world decision-making. We conducted our review by searching standard online databases such as Google Scholar. We also queried key institutions, including our own agencies, and searched COVID-19 research resources. Each identified framework was reviewed for its relevance to our objective, and we extracted important elements of each for the decision-making framework. The results of the search are presented in this annex.

The Africa Centres for Disease Control and Prevention and the Partnership for Evidence-based Response to COVID-19 have developed a dashboard that facilitates a holistic and evidence-based response to decisions on COVID-19 policies (94). The framework has five dimensions: disease situation, public health and health system capacity, economic burden, social disruption and implementation of and adherence to public health and social measures. The dashboard also suggests indicators for each dimension, five-point scales of weights according to the indicator and suggested data sources for indicators.

The WHO Regional Office for the Western Pacific has developed guidance on decision-making for non-pharmaceutical interventions (86). The framework contains several useful visualizations that balance the epidemiological situation with economic and socioeconomic costs and the context of the country.

Another framework for weighing evidence is based on the WHO-INTEGRATE framework (95). In a content analysis, the authors identified “11+1” criteria to support decision-making and to balance criteria for non-pharmaceutical interventions.

In spring 2020, the World Bank reported another framework for policy response (96). The report describes which elements should be considered in easing lockdown measures, accounting for the capacity of the health system and public health, capability for making decisions and possible scientific and technological innovations. While the report does not explicitly address the balance between the health and economic outcomes of policies, it mentions the various trade-offs in deciding on economic policy to counter the effects of the pandemic, including targeted vs universal household subsidies, speed vs accountability in delivering assistance and essential vs equitable economic assistance.

RAND Corporation has developed a tool for states in the USA to determine the health and economic impacts of different non-pharmaceutical interventions (82). It includes economic and epidemiological models for determining the impacts, with qualitative assessment on seven criteria to provide a map for decision-makers to use in assessing the impacts on different dimensions: barriers to implementation, cost of implementation, cultural and social barriers, economic cost, impact on equity, impact on social well-being and political barriers. The tool effectively combines both health and economic considerations while providing a qualitative assessment of these criteria. It thus allows conclusions to be drawn about the balance among the different impacts and impacts over different times.

The United Kingdom Strategic Advisory Group for Emergencies has provided a country-specific example of a framework, which includes tables of evidence for the impacts of different policies on COVID-19 transmission, COVID-19 deaths and severe disease, non-COVID-19 impacts (socioeconomic and psychological) and implementation (87).

Another framework that was identified was developed by the Institute for the Future of Knowledge at the University of Johannesburg (88). This framework uses a matrix of dimensions which include: health, food security and nutrition, education, economy and unemployment, vulnerable groups, and governance and enforcement. For an identified policy, a score out of 10 is given in each of the dimensions and a weighting is also applied as a percentage. The author propose that the scores and the weights are then multiplied to provide an overall weighted score for each policy.

The frameworks identified in this review informed the development of our proposed decision framework. As many of these frameworks did, we put together the assessment of the health components with the non-health components so decision makers can look across a broad range of dimensions when assessing evidence. We also found that the frameworks converged on a structure, listing the interventions in rows and the assessment of the health and non-health impacts in the columns. This structure is adopted in our extended assessment matrix, which serves as an aid for understanding impacts across several dimensions during deliberation. In our review we also found that several frameworks highlighted that the decision-making process should not be a static or technocratic process, and we have incorporated a component of iteration to update decisions as the pandemic progresses and as new information becomes available.

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