A decision framework for effective, equitable and context-specific public health and social measures during public health emergencies

decision navigator

World Health Organization

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Leadership and coordination

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Abbreviations

COVID-19	coronavirus disease 2019
GPW13	Thirteenth General Programme of Work, 2019–2023
HEPR	health emergency preparedness, response and resilience
IHR	International Health Regulations (2005)
MCM	medical countermeasures
OECD	Organisation for Economic Co-operation and Development
PHSM	public health and social measures
PRET	WHO Preparedness and Resilience for Emerging Threats initiative
RCCE	risk communication and community engagement
SDG	Sustainable Development Goal
SPAR	States Parties Self-Assessment Annual Report
STAR	Strategic Toolkit for Assessing Risks
WHO	World Health Organization

Glossary

Acceptability – the extent to which individuals, communities and populations targeted by PHSM perceive measures to be agreeable and are willing to adopt.

Combination of public health and social measures – a set of public health and social measures that are implemented at the same time.

Community-based initiatives – localized efforts for addressing the specific needs of communities, particularly in mitigating the unintended negative consequences of PHSM, often driven by the communities themselves and sometimes supported by external partners such as governments and nongovernmental organizations.

Community engagement – a collaborative process that involves communities in understanding risks they face and developing health and response practices that are acceptable and workable for them. The goal is to empower communities and develop shared leadership throughout emergency response *(1)*.

Community protection – refers to community-centred actions that protect those who are at risk or affected from the health and social impacts of a health emergency *(2)*.

Decision pathway – a structured, step-by-step process that guides decision-makers through the complex considerations necessary for selecting, implementing and adjusting PHSM during a health emergency.

Enabling functions – actions and interventions to design and promote the uptake of and adherence to PHSM such as risk communication and community engagement and infodemic management.

Feasibility – in the context of PHSM, describes the degree to which a measure can be practically and successfully implemented, considering factors such as resource availability and the political and legal context.

Medical countermeasures – products such as diagnostics, therapeutics, vaccines, medical devices and medical equipment.

Mitigation measures – measures that aim to reduce the unintended negative health and socioeconomic consequences of PHSM implementation, e.g. through introducing or expanding social protection policies and programmes or through community-based initiatives.

Operational aim – a specific objective for an infectious disease outbreak response, clarifying what PHSM intend to accomplish. While the ultimate goal of PHSM is to reduce disease transmission, the particular operational aim (e.g. prevent, contain, control) can vary and even be multipronged, depending on the risks facing the population.

Public health and social measures – nonpharmaceutical interventions implemented by individuals, communities, institutions and governments during health emergencies to reduce the risk and scale of transmission of infectious diseases. PHSM play a critical role throughout the different stages of health emergencies alongside medical countermeasures, and help to reduce the burden on health systems, economies and societies.

PHSM implementation package – the selected combination of PHSM and corresponding mitigation measures to reduce their unintended negative consequences of PHSM implementation.

PHSM Knowledge Hub – publicly accessible digital platform providing access to research and resources on PHSM including four interconnected tools: Bibliographic Library, Living Reviews, Research Atlas and Recommendations Finder.

PHSM Bibliographic Library (accessible through Knowledge Hub) **–** a repository of multilingual, multidisciplinary and multisectoral research articles and resources on PHSM. It is updated through automated and manual searches across multiple electronic databases, preprint repositories, trial registries and other sources.

PHSM Living Reviews (accessible through Knowledge Hub) – supported by artificial intelligence and other technologies, this tool automates screening and streamline selection and reporting to provide timely insights into emerging trends and questions related to the effectiveness, adherence and impact of PHSM so that users can stay informed about the dynamic field of PHSM research, particularly during health emergencies.

PHSM Recommendations Finder (accessible through Knowledge Hub) – a comprehensive repository of PHSM-related recommendations contained in WHO guidelines.

Risk assessment – a systematic process of gathering, assessing and documenting information to assign a level of risk (risk characterization) to human health during an acute public health event and to inform actions to manage and reduce the negative consequences of events *(3)*.

Risk characterization – a systematic process of gathering, assessing and documenting information to assign a level of risk (risk characterization) to human health from an acute public health event and to inform an effective response *(3)*.

Social protection – a set of policies and programmes designed to reduce and prevent poverty, vulnerability and social exclusion throughout the life-cycle. Social protection includes nine main areas: child and family benefits, maternity protection, unemployment support, employment injury benefits, sickness benefits, health protection (i.e. medical care), old-age benefits, invalidity or disability benefits and survivor's benefits. Social protection systems address all these policy areas using a mix of contributory schemes (i.e. social insurance) and noncontributory tax-financed benefits (i.e. benefits that include social assistance) *(4)*.

Threat-agnostic – a broadly applicable and effective approach for any kind of infectious disease outbreak.

Unintended consequences – impacts of PHSM on individuals and societies (distinct from the direct effects of disease transmission), including health, social and economic consequences such as income loss, poor mental health and well-being, food insecurity, increased gender and social inequities and disruption of routine health programmes.

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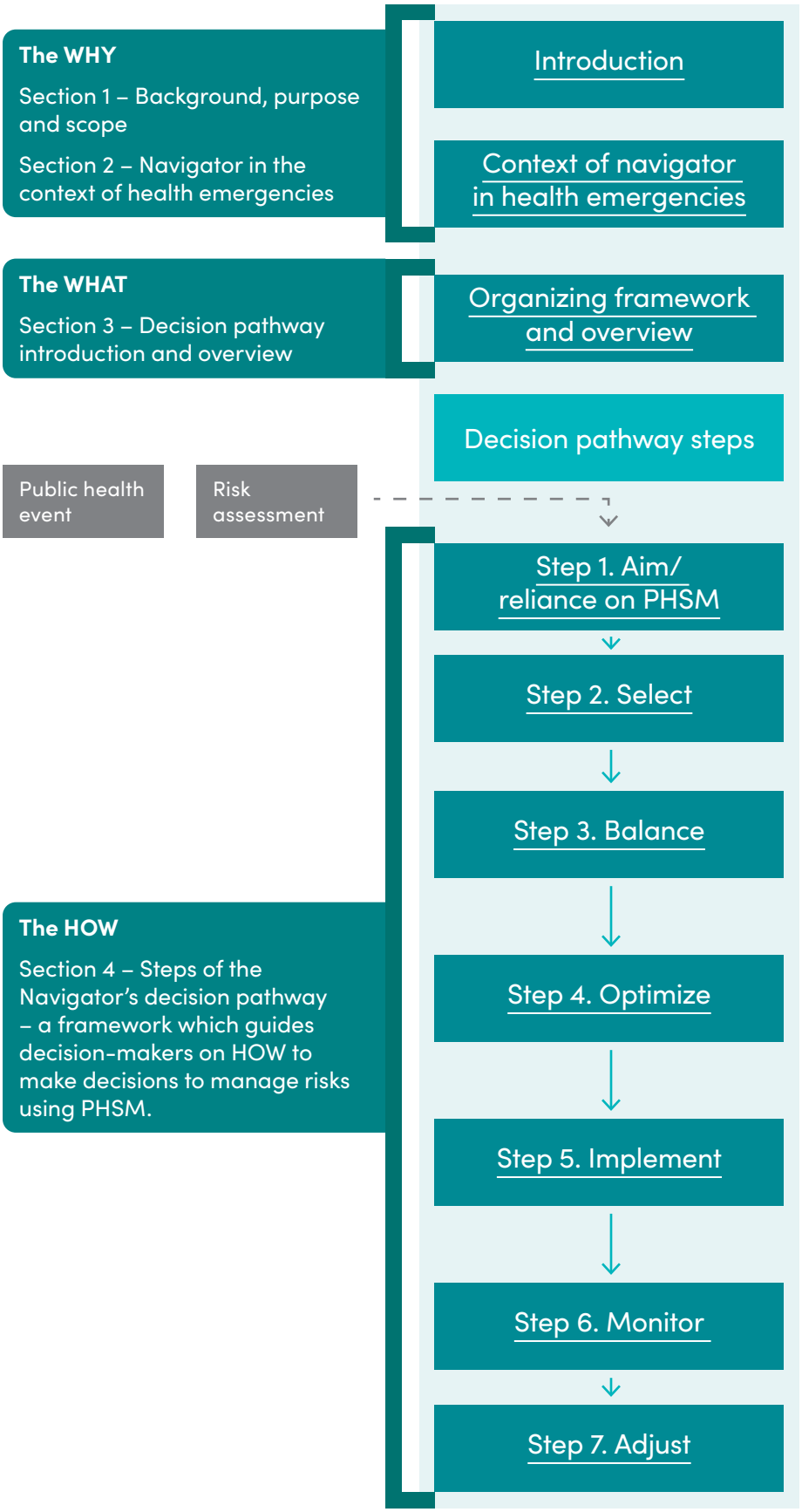
1. WHO benchmarks for strengthening health emergency capacities. Geneva: World Health Organization; 2023 (https://iris.who.int/handle/10665/375815). Licence: CC BY-NC-SA 3.0 IGO.

2. Defining community protection: a core concept for strengthening the global architecture for health emergency preparedness, response and resilience. Geneva: World Health Organization; 2024 (https://iris.who.int/handle/10665/379055). Licence: CC BY-NC-SA 3.0 IGO.

3. Rapid risk assessment of acute public health events. Geneva: World Health Organization; 2012 (https://iris.who.int/handle/10665/70810). Licence: CC BY-NC-SA 3.0 IGO.

4. Role of social protection in reducing the burden of public health and social measures during the COVID-19 pandemic: evidence review. Geneva: World Health Organization; 2024 (https://iris.who.int/handle/10665/379704). Licence: CC BY-NC-SA 3.0 IGO.

A quick reference guide to the Navigator



Go here for an overview of the Navigator and the steps in the decision pathway.

Assess the emergency response's reliance on PHSM (informed by the latest risk assessments) in this step.

Resources to select an initial list of PHSM are available in this step.

Already have the initial list of PHSM selected? Go to the 'Balance' step to assess each measure for its feasibility, acceptability and potential consequences.

Go to the 'Optimize' step to evaluate the overall combination of PHSM and agree on the final PHSM implementation package.

This step outlines considerations on implementing the package, tailored to the local context, using risk communication and community engagement.

Establish systems to track PHSM policies being implemented, monitor their impacts and evaluate the effectiveness.

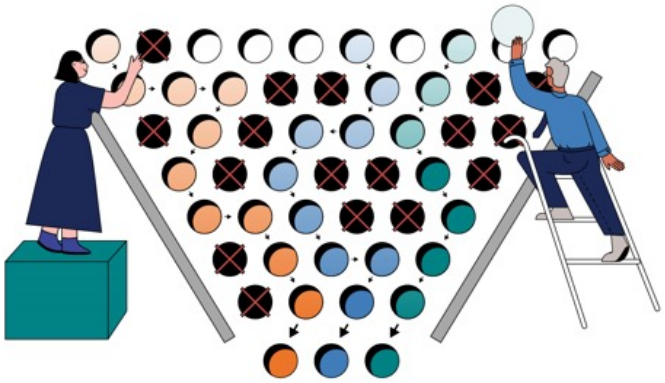
Go here for considerations to adjust PHSM based on triggers.

Executive summary

During public health emergencies, decision-makers face difficult and uncertain situations, requiring them to make decisions about public health and social measures (PHSM) that protect communities and populations while reducing disruptions to societies and economies. Their decisions on selecting and adjusting PHSM during public health emergencies require careful consideration of a complex array of factors, including the epidemiological situation, health system capacity, availability of medical countermeasures, along with resource availability, political and legal feasibility and public acceptance of the PHSM being considered. Recent health crises have underscored the critical need for guidance to make these decisions in a systematic, equitable and balanced manner.

Towards this end, WHO has developed the **PHSM Decision Navigator** (hereafter, the Navigator) which introduces a threat-agnostic decision framework to guide national and subnational governments in systematically considering complex factors to make informed and equitable decisions on selecting, implementing and adjusting PHSM during public health emergencies. The framework outlines a step-by-step decision pathway, promoting a risk-based, evidence-informed, context-specific, equitable and community-centred approach.

The pathway guides decision-makers in defining a **PHSM implementation package** – a combination of PHSM paired with corresponding mitigation measures, which are social protection policies and community-based initiatives crucial for reducing unintended negative consequences of PHSM implementation. This package is crucial for safeguarding both lives and livelihoods, ensuring business and education continuity and bolstering community resilience during public health emergencies.

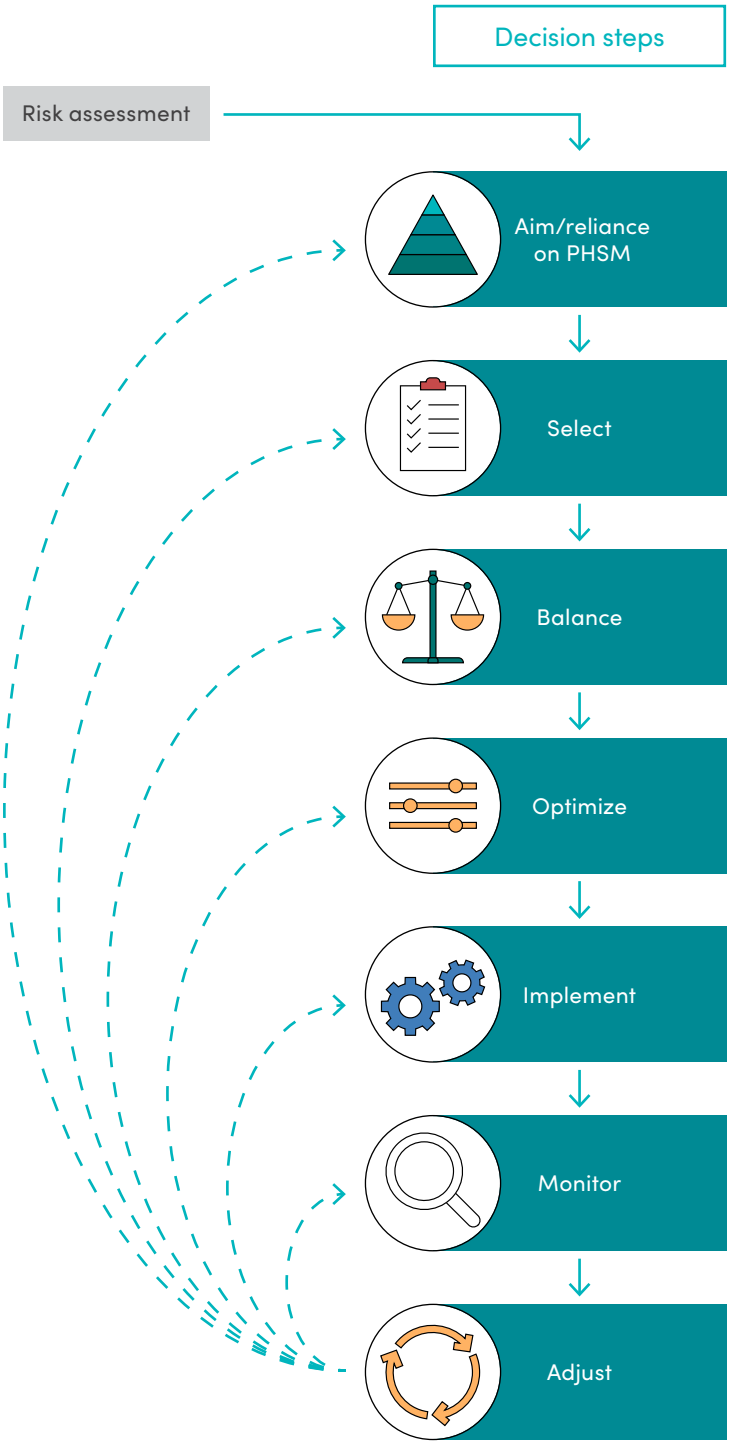


The steps within the Navigator's decision pathway help to select and refine the appropriate set of PHSM for a public health emergency in a systematic, equitable and balanced way.

The Navigator's decision pathway begins once an initial risk assessment and/or public health situation analysis has been conducted and guides decision-makers through a series of interconnected steps. It is presented in a conceptually linear order for clarity. In practice, however, this process is dynamic and cyclical, reflecting the evolving nature of health emergencies. A checklist summarizing the actions for each step of the Navigator is outlined in Annex 1, while Annex 2 details the document's development process.

As a framework that is applicable across a range of infectious threats, the Navigator serves as a comprehensive reference introducing new concepts, decision considerations and resources within each step. Its foundational design will serve as the basis for developing future, more operational versions tailored to specific pathogens (Fig. ES1).

Fig. ES1. PHSM decision pathway steps



1. Determine the aim and reliance on PHSM as a response strategy, based on epidemiological situation and context from risk assessments.
2. Select list of PHSM based on risks and evidence of effectiveness.
3. Balance feasibility, unintended negative consequences of PHSM policies, and corresponding mitigation measures of each PHSM.
4. Optimize and finalize the PHSM implementation package, which consists of a targeted, balanced combination of PHSM and corresponding mitigation measures.
5. Implement PHSM implementation package, utilizing enabling functions such as risk communication and community engagement and infodemic management.
6. Track PHSM policies being implemented, monitor unintended negative consequences and social acceptance, and evaluate PHSM effectiveness.
7. Adjust PHSM as needed based on contextually relevant factors (e.g. epidemiology, health system capacity, population immunity, availability of medical countermeasures, social acceptability).

1. Introduction

1.1 Background

Public health and social measures (PHSM) are nonpharmaceutical interventions implemented by individuals, communities, institutions and governments to reduce the risk and scale of infectious disease transmission and lower hospitalizations and deaths. PHSM play a critical role in reducing the pressure on the health-care system and buying time to develop and/or distribute medical countermeasures (MCM) such as diagnostics, therapeutics and vaccines. Acting in concert with MCM, PHSM form a robust strategy to prevent and control infectious disease outbreaks, and neglecting one weakens the overall effectiveness of the response (Fig. 1).

PHSM operate by either decreasing exposure to biological threats, making exposure safer, or both. Examples include symptom screening, personal hygiene measures, surface cleaning, vector control and modifications to mass gatherings and domestic or international mobility. In addition to controlling human-to-human transmission, PHSM – grounded in a One Health approach – play a critical role in preventing zoonotic spillover by mitigating risks at the human-animal-environment interface.

Recent health emergencies have revealed that individuals and communities have experienced unintended negative consequences of PHSM implementation, including unemployment, interrupted education, domestic violence and slowed economic productivity, among others *(1)*. Certain population groups such as women, children and the elderly, including those in vulnerable conditions, are disproportionately impacted by these unintended negative consequences. These experiences underscore the critical importance of implementing mitigation measures such as social protection policies and community-based interventions in parallel with PHSM.

The role of PHSM within community protection, a subsystem of health emergency preparedness, response and resilience (HEPR) *(2)*, goes beyond reducing infectious disease transmission and protecting lives. It also involves safeguarding livelihoods, ensuring business and education continuity and strengthening community resilience to better withstand health emergencies. In this context, community protection refers to community-centred actions designed to protect those who are at risk or affected from the health and social impacts of health emergencies *(3)*.

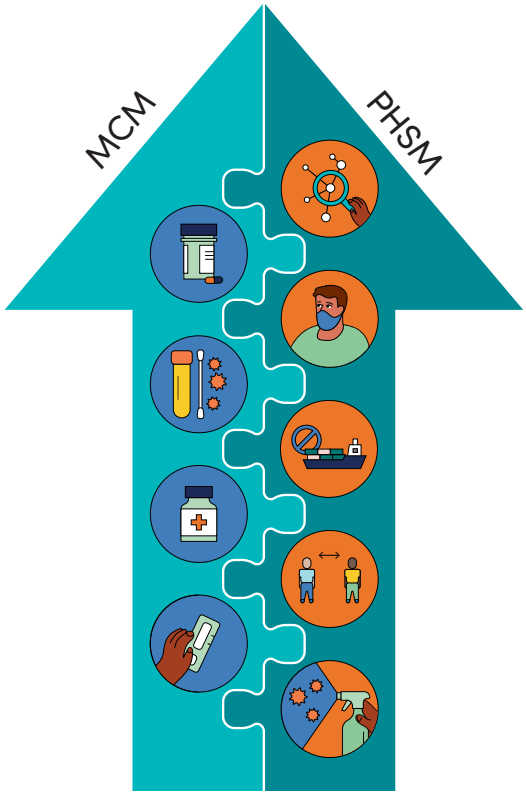


Fig. 1. An effective countermeasure strategy requires both MCM and PHSM to be used throughout a health emergency

With an urgent need to better understand the effectiveness and broader impacts of PHSM and strengthen effective and equitable implementation of PHSM to counter emerging and re-emerging infectious hazards, WHO launched the **WHO PHSM Initiative** – a global initiative on strengthening PHSM during health emergencies *(12)*. The initiative focuses on four strategic areas: global monitoring and review of PHSM data and research, strengthening PHSM research methodology and capacity building, increasing risk-based, evidence-informed and equitable PHSM decision-making and systematically integrating PHSM into existing leadership and governance.

During health emergencies, decision-makers are frequently asked to make swift decisions on containing infectious disease threats with limited information, often in evolving situations or concurrent emergencies, adding significant uncertainty and complexity to the decision-making process. Existing PHSM decision-making tools for health emergencies are limited. Tools such as pathogen-specific *(4)* or rapid risk assessments for acute public health events *(5–8)* may include considerations for control measures, but do not address the complexity of balancing benefits and unintended negative consequences. Tools developed during the COVID-19 pandemic guided initial situational assessment and offered considerations for PHSM implementation based on the situational level *(9)*; however, they did not include assessments of potential unintended socioeconomic impacts. Modelling has been used to predict or forecast the potential effects of PHSM to guide decision-makers *(10,11)* but it faces limitations due to data scarcity, lack of representativeness and were pathogen-specific. While models can provide a useful quantitative approach to evaluate trade-offs in PHSM, the existing models do not account for hotspot outbreaks, deaths outside of facilities, undetected cases, asymptomatic transmission, geographical variability or surge capacity. Moreover, none of these tools provide guidance on how to consider the combined effects of multiple measures or on mitigating unintended negative consequences of PHSM implementation.

1.2 Objective

The goal of effective PHSM decision-making is to maximize the public health benefits of PHSM in reducing infectious disease transmission while mitigating the unintended negative consequences of PHSM implementation and protecting the well-being and social and economic welfare of individuals and communities. **The PHSM Decision Navigator** (hereafter, the Navigator) provides a decision-making framework and resources to guide decision-makers through the complexities of selecting and adjusting PHSM during public health emergencies. It is intended for national and subnational governments, particularly the bodies responsible for health emergency response and PHSM decision-making and implementation.

Its core focus is to enable a systematic approach to PHSM decision-making that is risk-based, evidence-informed, context-specific, equitable and community-centred. This framework particularly stresses the importance of tailoring PHSM to local contexts to maximize their acceptability and adherence.

1.3 Scope

The Navigator:

- ✓ is a threat-agnostic decision framework, which provides a structure, considerations and resources that can serve as a foundational basis for developing future threat-, setting- or population-specific operational modules of the Navigator;
- ✓ is applicable for infectious disease threats, including those of epidemic or pandemic potential;
- ✓ facilitates multisectoral, multilevel decision-making
- ✓ begins once a public health event is detected and an initial risk assessment is conducted, guiding users through the decision-making pathway for selecting, balancing, implementing, monitoring and adjusting PHSM; and
- ✓ is a living document that will be updated and expanded in recognition of the evolving nature of this field, ensuring it continues to provide up-to-date guidance and resources to decision-makers and stakeholders.

The Navigator:

- × is not prescriptive, but rather focuses on facilitating systematic, informed decisions by providing principles, considerations and resources that help users to evaluate their own contextual factors and make decisions based on the best available evidence and structured and ethical reasoning;
- × is not standalone or the sole guidance for PHSM decision-making – its value and usability will be enhanced through a complementary series of modules that address specific threats, settings or populations, ensuring that unique situations and technical specifications are thoroughly considered; and
- × does not provide country-level operational guidance on PHSM implementation but is a global normative product that will be adapted into more operational, disease-specific versions in the future using this framework as a template.

1.4 PHSM decision-making body

Decision-making authority and structure may vary depending on each country's administrative structure and legal framework. Regardless of the administrative level, a dedicated decision-making body responsible for setting PHSM policies requires a whole-of-government approach, with whole-of-society input given the widespread effects of health emergencies on all facets of society.

By fostering a whole-of-government approach together with whole-of-society collaboration, PHSM decisions become more effective, sustainable and reflective of the community's needs.

1.4.1 Government leadership

The government holds the primary responsibility for managing health emergencies and protecting its communities and populations. The PHSM decision-making entity may, however, take different forms, such as a central government authority, interministerial or multiagency taskforce, or a decentralized entity for federalized states. While the health sector has a critical role to play in all health emergencies, it cannot manage complex crises alone. An effective response requires a decision-making body represented by relevant sectors and disciplines such as education, economy interior, transportation and others (Fig. 2).

1.4.2 Local and community leadership

PHSM decision-making also requires diverse actors across society, including from both the public and private sectors. Community partners and leadership, including those from private sector entities, schools and learning spaces, religious institutions, disability advocacy groups, civil society organizations and other community-based organizations, are critical to aligning PHSM with community needs and the level of public health threat they face, minimizing misunderstandings and increasing PHSM acceptance and adherence (Fig. 2). The role of community is to advise, help to adapt and tailor policies and to support implementation. The process of mapping, identifying and engaging with communities always varies, as there is no one-size-fits-all approach; however, some common resources for community engagement are provided in section 4.5 of this document.

Fig. 2. PHSM decision-making body and stakeholders

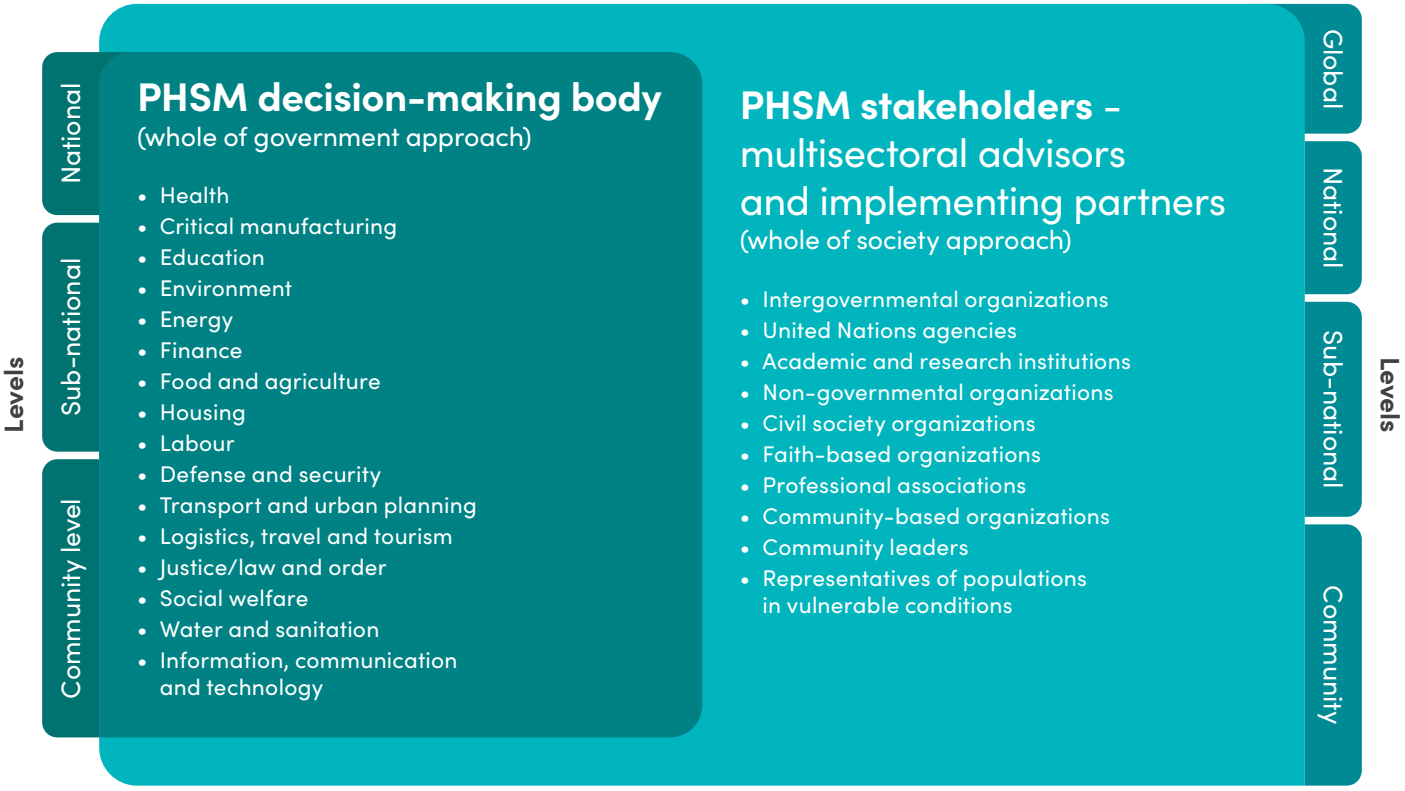


Fig. 2 outlines examples of sectors and stakeholders for adopting a whole-of-government and whole-of-society approach to PHSM. This is further emphasized in the WHO benchmarks for strengthening health emergency capacities *(13,14)*. As a health emergency evolves and control measures are adjusted, the list of key stakeholders to be consulted should be adapted as a part of the ongoing procedure, in order to best represent newly affected communities and incorporate necessary skills or expertise.

2. Context for the PHSM Decision Navigator

2.1 PHSM in operational stages of a health emergency

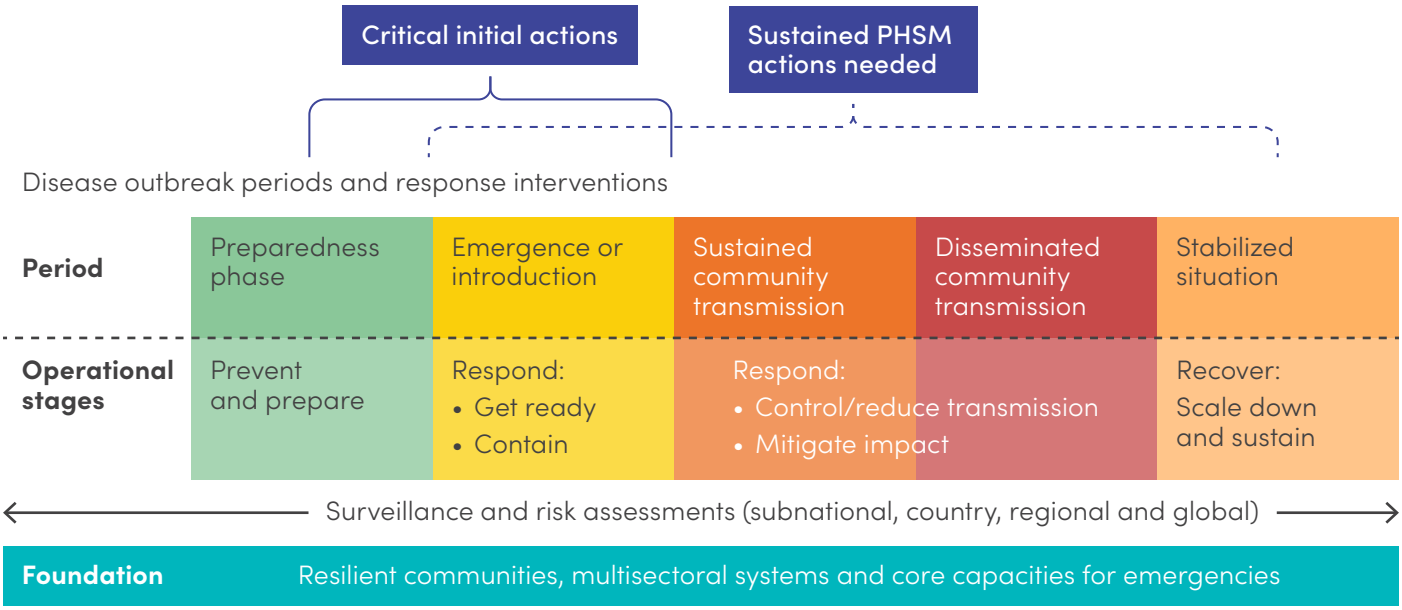
2.1.1 Preparedness

Designed to guide PHSM decision-making across the entire emergency response continuum, the Navigator functions most effectively when supported by adequate preparedness (Fig. 3). This includes familiarization with the Navigator's principles, framework and resources, as well as identification or establishment of essential capacities, infrastructure and information systems vital for guiding PHSM decisions. Many of these capacities and systems are also outlined in relevant guidance on preparedness planning such as the WHO Preparedness and Resilience for Emerging Threats (PRET) initiative, National Action Plans for Health Security *(15)* or the Strategic Toolkit for Assessing Risks (STAR) *(7)*. These essential capacities and systems include:

- **comprehensive understanding of country contexts** beyond basic demographics, including insights into sociocultural norms as well as political, economic and health system conditions;
- **clear governance and coordination mechanisms** with well-defined roles and structures to coordinate multisectoral action during emergencies;
- **effective risk communication strategies and community engagement mechanisms** that are in place or are readily scalable, including established community feedback loops to gain rapid insights;
- **legal and policy frameworks** that support ethical, rapid and effective PHSM implementation;
- **knowledge of the existing social protection policies and mechanisms** to facilitate rapid introduction or expansion of social protection measures when needed; and
- **existence of monitoring systems** that can track PHSM implementation, its impacts and effectiveness.

WHO benchmarks for strengthening health emergency capacities provide guidance to increase capacity levels for implementing the International Health Regulations (IHR) (2005) and include a dedicated PHSM benchmark *(14)* outlining progressive steps to ensure that PHSM are systematically integrated into health emergency management plans, policies, financing, governance and leadership in all relevant sectors and levels across the health emergency actions.

Fig. 3. Disease outbreak periods and PHSM interventions



Source: Adapted from WHO *(16)*

2.1.2 Readiness and early response

A compendium of critical initial actions for PHSM decision-makers, researchers and communities (Annex 3) highlights critical operational and strategic actions pertinent to enhancing readiness for PHSM implementation and enabling agile health emergency responses from their onset. These priority actions are to be taken after an initial risk assessment or situation analysis, with the aim to limit onward transmission and contain an outbreak during the emergence or introduction period.

2.2 Guiding principles of PHSM decision-making

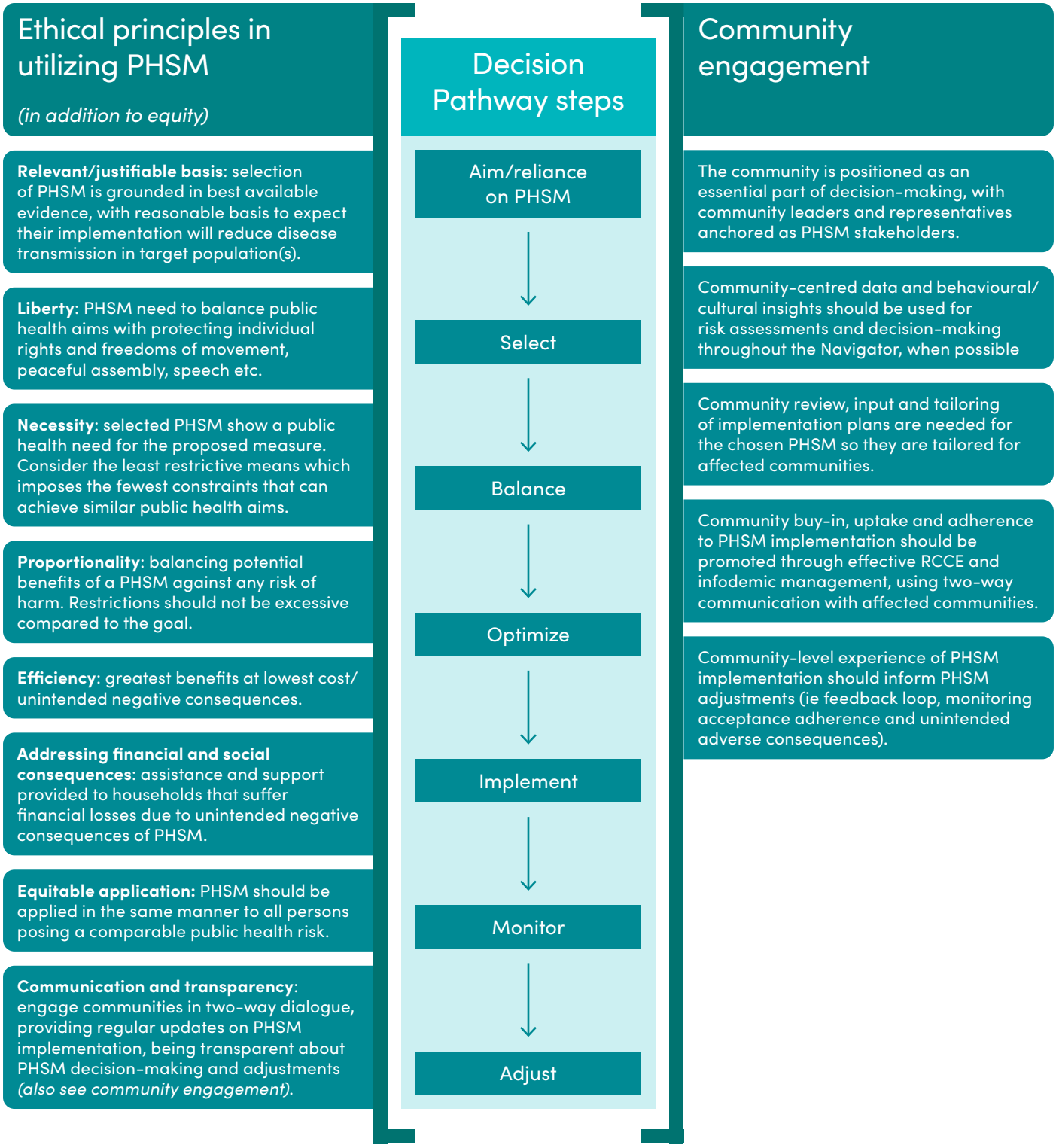
Drawing on lessons from recent public health emergencies, the following guiding principles illustrate the core values which shape how the Navigator is understood and applied. The following principles are not listed in order of importance.

- **Evidence-informed decision-making:** the best available evidence on PHSM effectiveness, unintended consequences of PHSM and determinants of adherence to the measures should inform the decision-making process from the beginning. While many factors influence policy-making; for example, political context, culture and resources, research findings should be prioritized and considered first. It remains important to acknowledge that evidence alone cannot be the sole input to decision-making, particularly at the beginning of an outbreak when the evidence landscape on a novel or rapidly evolving disease may be limited, and may not provide adequate insights required for real-time decision-making.
- **Multisectoral collaboration:** PHSM are inherently multisectoral, with many interventions falling under the authority of ministries and institutions outside of the health sector. Therefore, the PHSM decision-making process needs to be a collaborative effort.
- **Equity:** individuals and communities should have fair access to resources, opportunities and outcomes during health emergencies. Everyone should be equally protected from public health risks and unintended negative health and socioeconomic consequences of PHSM implementation. Particular attention must be given to those in vulnerable conditions as they face increased risks and disproportionate consequences from public health emergencies, and care must be taken to ensure that health and social inequities do not worsen during emergencies.

- **Ethical considerations:** beyond equity, PHSM decision-making should be guided by the ethical principles outlined in Fig. 4.[1] These principles help to select, adjust and balance public health benefits with potential risks of harm for individuals, communities and populations, ensuring that decision-making fully respects the dignity and human rights of people.
- **Precautionary principle**: the "precautionary principle" "enables decision-makers to adopt precautionary measures when scientific evidence about an environmental or human health hazard is uncertain and stakes are high" *(18)*. This is particularly relevant at the onset of an outbreak of an unknown disease or when confronted with low-quality or contradicting research, as was the case during the COVID-19 pandemic. Identifying appropriate PHSM while awaiting new or more meaningful evidence under the "precautionary principle" approach avoids so-called "decision paralysis" and facilitates agile decision-making and action to save lives and livelihoods.
- **Pragmatism and adaptability**: the application of the Navigator to real-life PHSM decision-making is expected to be conducted in a pragmatic and flexible manner, allowing for adaptation to evolving, unpredictable and unknown situations, which is key to an agile response.
- **Consensus-building:** weighing competing factors and principles in high stakes and uncertainty is complex and context specific. Achieving an appropriate balance requires inclusive and transparent dialogues among decision-makers and diverse stakeholders, aiming for consensus whenever possible while recognizing the role of value-based decision-making.
- **Community-centred approach:** outbreaks start and end in communities. Hence, their uptake of and adherence to PHSM is a key determinant of PHSM effectiveness. Continuous, active, nondiscriminatory and respectful engagement of at-risk and affected communities throughout decision-making ensures that these measures are acceptable, feasible and equitable. This is achieved through community leadership and the involvement of community members in identifying implementation challenges and anticipating and mitigating unintended negative consequences of PHSM implementation. Fig. 4 depicts how ethics, equity and community engagement are woven throughout the steps of the Navigator's decision pathway.

1 Ethical principles for PHSM decision-making were adapted from the overall relevant ethical principles highlighted in WHO's Guidance for managing ethical issues in infectious disease outbreaks, as well as the considerations on restrictions on freedom of movement included in the guidance *(17)*.

Fig. 4. Ethical principles and community engagement are woven throughout each step of the Navigator's decision pathway



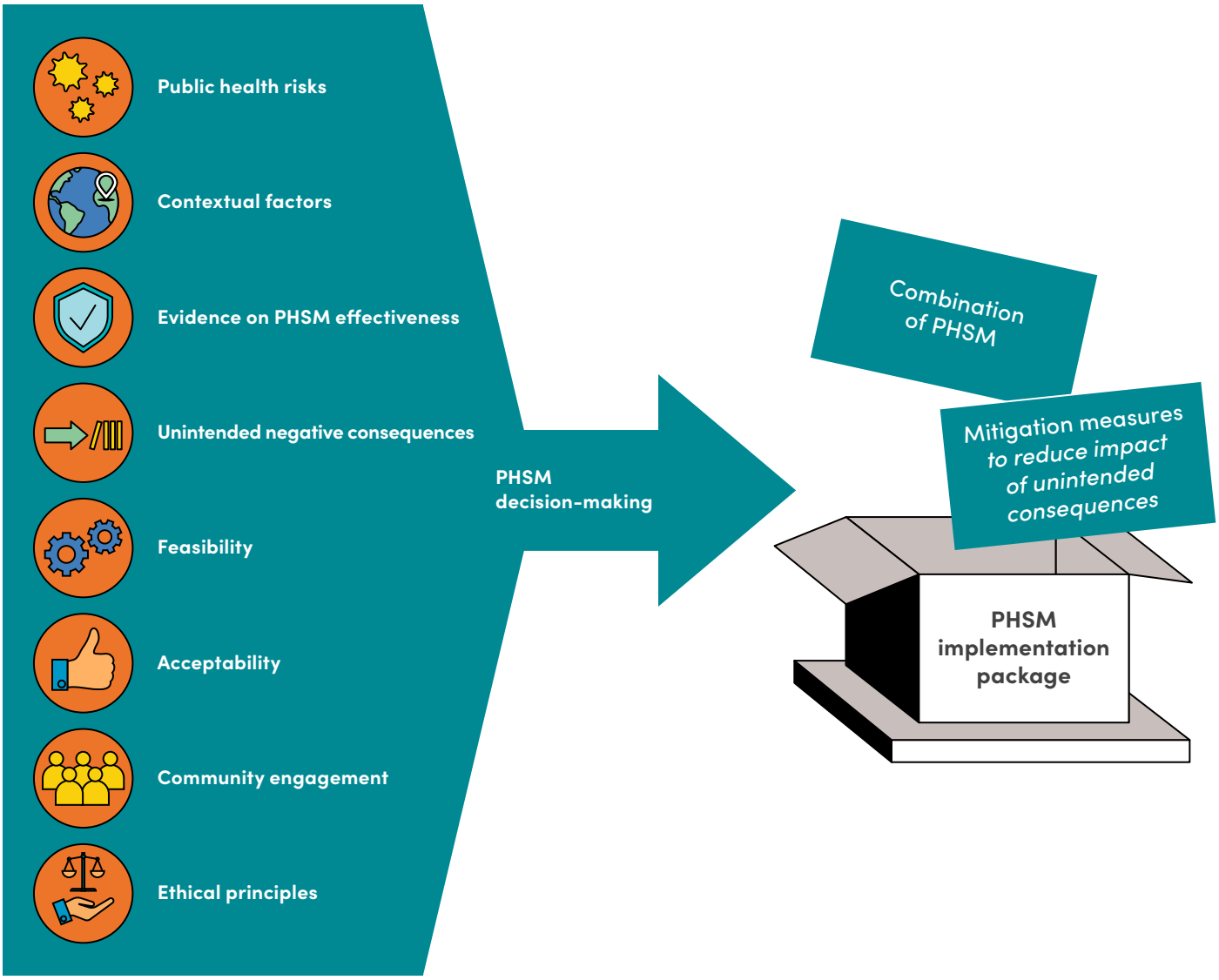
Source: adapted from WHO *(17)*.[1]

3. Organizational framework for the Navigator

3.1 Overview

Recognizing that PHSM decision-making is complex and dynamic rather than simple or linear, the Navigator deconstructs this complexity by presenting its steps (section 4) in a clear, sequential order. At the same time, it acknowledges that in practice, several steps may occur simultaneously or in a different sequence depending on the health emergency context and needs.

Fig. 5. Multiple factors go into PHSM decision-making to define a PHSM implementation package



The Navigator is designed to inform the selection and adjustment of a combination of PHSM by systematically considering several dynamic and interdependent factors. As illustrated in Fig. 5, these factors include:

- public health risks;
- context of the emergency;
- evidence on the effectiveness of measures;
- potential unintended consequences of measures, along with their feasibility and acceptability; and
- corresponding mitigation measures to reduce the unintended negative consequences.

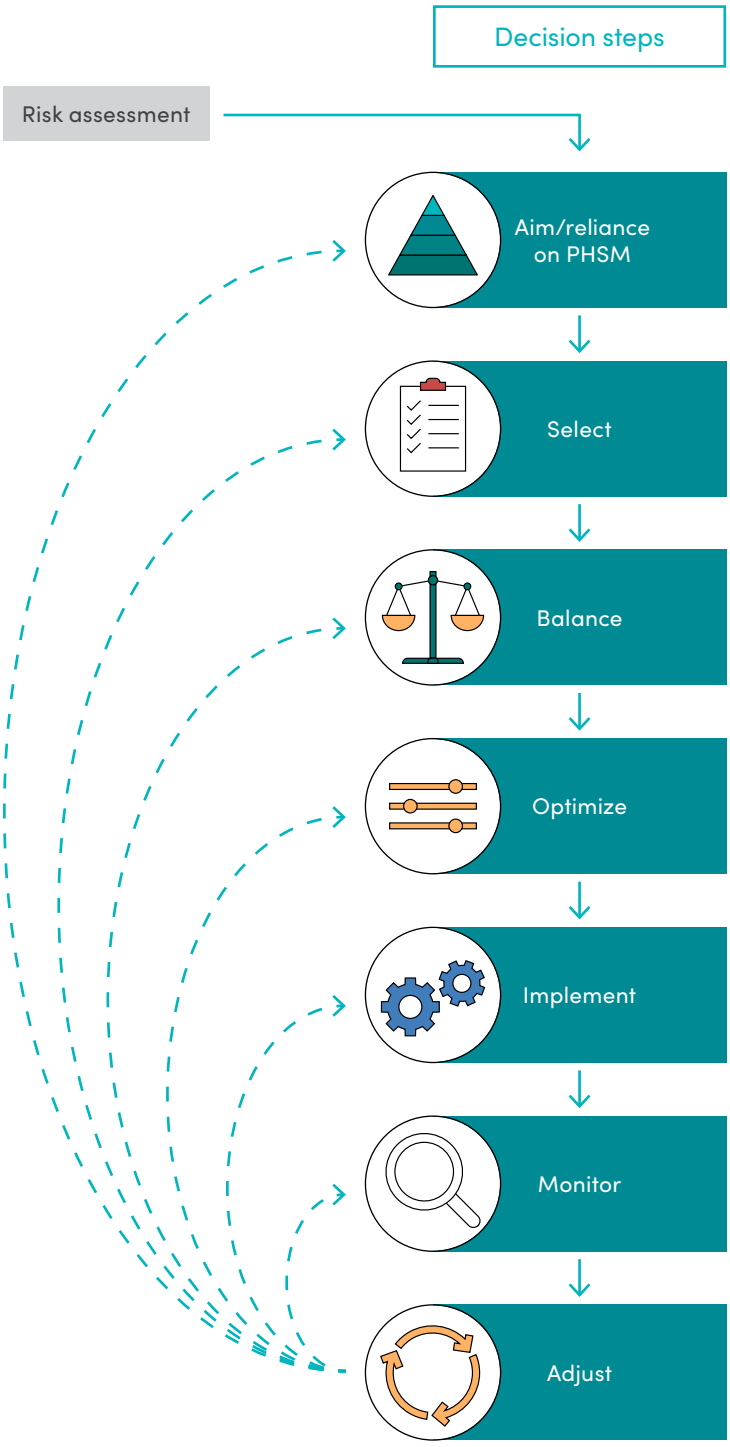
These factors guide the selection of a combination of PHSM and corresponding mitigation measures, which together constitute the **PHSM implementation package**.

The Navigator facilitates this systematic decision-making and emphasizes a qualitative approach based on expert judgement, dialogue and consensus, supporting a pragmatic and consultative process in the face of uncertainty and limited evidence. Each step of the decision pathway has corresponding resources and considerations, based on the best available knowledge from research, WHO guidance and lessons learned from recent health emergencies.

3.2 Decision pathway

Once an initial risk assessment and/or situation analysis has been conducted *(5)* following a public health event, the Navigator's steps begin, directly leveraging the findings to guide the selection of appropriate PHSM that reflect the identified risk and the subsequent steps (Fig. 6).

Fig. 6. Steps of the Navigator's decision pathway



1. Determine the aim and reliance on PHSM as a response strategy, based on epidemiological situation and context from risk assessments.
2. Select list of PHSM based on risks and evidence of effectiveness.
3. Balance feasibility, unintended negative consequences of PHSM policies, and corresponding mitigation measures of each PHSM.
4. Optimize and finalize the PHSM implementation package, which consists of a targeted, balanced combination of PHSM and corresponding mitigation measures.
5. Implement PHSM implementation package, utilizing enabling functions such as risk communication and community engagement and infodemic management.
6. Track PHSM policies being implemented, monitor unintended negative consequences and social acceptance, and evaluate PHSM effectiveness.
7. Adjust PHSM as needed based on contextually relevant factors (e.g. epidemiology, health system capacity, population immunity, availability of medical countermeasures, social acceptability).

4. Steps of the PHSM decision pathway

4.1 Determine the aim and reliance on PHSM

Output

The aim and degree of reliance on PHSM for emergency response defined.

Summary of actions in this step

- ☐ Agree on the operational aim of the response.
- ☐ Assess the degree of reliance on PHSM for the emergency response.

It is assumed that a risk assessment has preceded the use of the Navigator.

A risk assessment provides an analysis of the hazard, exposure and context, including health system capacity and availability and accessibility of MCM. It plays a critical role in determining which population groups to target, where measures should be implemented at different administrative levels (e.g. national, subnational, district) and the extent to which PHSM should be relied upon. Rapid risk assessments should be conducted at the onset and continuously throughout the different stages of an outbreak to inform a dynamic PHSM strategy.

Decision considerations

Operational aims

Defining the operational aim provides the decision-making body with a common objective and also determines the degree of reliance on PHSM for responding to the public health emergency.

While the main objective of PHSM is to reduce infectious disease transmission, the operational aims – prevention, containment and control –[2] vary depending on the context.

The aim of a PHSM response may be multipronged *(20)*; combining a focused, stringent approach for identified clusters and hotspots to break known chains of transmission, with a broader approach for the wider at-risk population. When specific settings, activities or population groups associated with the chain of transmission are known, PHSM can be targeted to stop outbreaks (i.e. contain). A targeted approach may also be appropriate when communities face an imminent risk of experiencing an outbreak (i.e. prevent). In cases of widespread community transmission – often characterized by asymptomatic spread, unlinked transmission chains, increasing strain on the health-care system and/or a lack of effective vaccines and treatments – a large-scale, population-wide PHSM strategy may be needed to limit further spread in affected and at-risk communities and expand protection (i.e. control, protect vulnerable populations).

Defining the operational aim provides the decision-making body with a common objective and also determines the degree of reliance on PHSM for responding to the public health emergency.

2 "Containment aims to stop transmission by reducing the effective reproduction number (R) to below one. This requires highly stringent application of measures, is resource intensive and time sensitive. Containment measures may halt, delay or reduce the spread and overall impact of the pandemic and may be considered as part of a country's national preparedness plan" *(19)*.

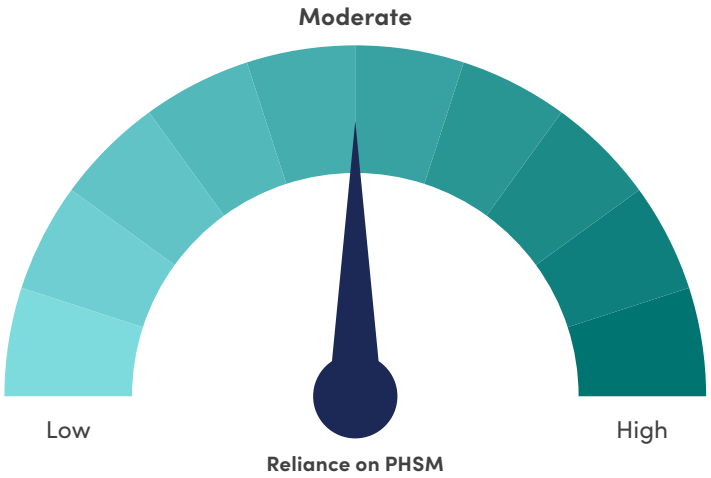
Reliance

Reliance refers to the degree to which a response strategy relies on PHSM, relative to MCM. Reliance directly influences key decisions in PHSM, including the combination of measures, target population and geographical scope and enforcement level of PHSM implementation (i.e. how strictly PHSM are implemented by authorities). Reliance is expected to vary across the different phases of a health emergency and evolves depending on factors such as the epidemiological situation (disease severity, transmissibility), health system capacity, access to MCM and population immunity (Fig.7 and Annex 4).

Reliance on PHSM would be particularly high (i) at the onset of an outbreak; (ii) when an outbreak is caused by a novel pathogen with no effective diagnostics, vaccines or therapeutics and there is no population immunity; (iii) when there are functional changes in pathogen characteristics (i.e. mutations or variants emerge); and (iv) when populations are in vulnerable conditions with a disproportionate increased risk of infection due to their characteristics and circumstances. Annex 4 elaborates on these factors and provides examples of indicators to assess the needed reliance on PHSM. Decision-makers may consider additional indicators depending on data quality and availability. For example, high disease transmissibility and severity combined with limited health system capacity and limited/waned population immunity might require a high degree of reliance on PHSM. Whereas when disease transmissibility is moderate with low severity, and health system capacity is robust with high population immunity, there may be a lower reliance on PHSM.

These indicators can be discussed during the preparedness phase. The selection of indicators and locally available data sources to assess and determine the degree of reliance on PHSM will be unique to each threat, requiring a tailored methodology. These indicators can be discussed during the preparedness phase.

Fig. 7. Degree of reliance on PHSM as a response strategy



Low	Disease severity	High
Low	Transmissibility	High
Low	Burden/impact on health-care system	High
Sufficient	Availability and/or accessibility of medical counter measures	Limited
High	Population immunity (acquired/induced)	Limited/waned

Final note in this step

At the end of this step, decision-makers will have solidified the scope of the PHSM response, determining what PHSM should achieve as part of a coordinated response. This includes decisions on an operational aim of PHSM (prevent, contain, control, etc), where they should be implemented (e.g. District A, southern region, all provinces), for which populations (e.g. children and people over age 65, occupational status) and at what level of reliance (e.g. low, moderate, high) in relation to other countermeasures. These are core elements of decision-making on PHSM. The next step will focus on identifying a range of potential PHSM, while considering the public health risks at hand the best available evidence on their effectiveness.

4.2 Select a list of PHSM based on the risk and the best available evidence

Output

An initial list of PHSM selected based on assessed risks and the best available evidence on effectiveness.

Summary of actions in this step

- ☐ Identify PHSM based on assessed risks, aim and degree of reliance on PHSM for the emergency response.
- ☐ List recommended or suggested PHSM relevant to the identified hazard, leveraging existing guidelines, guidance and best available evidence on effectiveness through rapid evidence synthesis using the PHSM Knowledge Hub.

> ***Note:*** *additional contextual factors for PHSM selection, including resource and political feasibility, acceptability and considerations of unintended negative consequences are systematically evaluated later in the Navigator after an initial list of PHSM has been selected.*

Decision considerations

An initial list of PHSM should be developed based on the risks and the aim and degree of reliance on PHSM defined in the prior step, along with the best available evidence and guidance on the effectiveness of each PHSM through existing guidelines, guidance and technical material or through rapid evidence synthesis.

Risk-based and evidence-informed selection of PHSM

A risk-based approach involves identification of PHSM that are relevant and necessary to the type and level of risk(s) presented (section 4.1, Annex 4).

A risk-based approach should be complemented by evidence-informed selection of PHSM, focusing on measures that aim to reduce the risk of pathogen exposure and transmission. In addition to the efficacy of interventions, evidence on their effectiveness in real-life settings should be considered to get a better understanding of the actual benefit of the measure.

Follow these steps to select an initial list of PHSM.

- ☐ Consider risk characterization in section 4.1 (Annex 4), while taking into account the completeness and certainty of the information used in the risk assessment.
- ☐ Refer to the PHSM taxonomy (Fig. 8) which lists PHSM policies in cascaded categories, starting from a first-level PHSM category – active case finding and contact identification, personal protection measures, environmental measures, social measures and international travel and trade measures. These categories may provide structure in reviewing the thoroughness of the PHSM selection and help to avoid gaps (Box 1).
- ☐ List recommended or suggested PHSM relevant to the identified hazard, based on existing WHO guidelines and guidance documents. The Recommendation Finder included in the PHSM Knowledge Hub facilitates this step by providing a repository of all recommendations in WHO guidelines with relevance to PHSM (Box 2, Box 3).
- ☐ Access the PHSM Bibliographic Library within the Knowledge Hub – a publicly accessible gateway to research and resources on PHSM – to identify PHSM research. The Living Reviews function of the PHSM Knowledge Hub is supported by artificial intelligence and facilitates rapid and partial automation of evidence syntheses, providing summaries of existing primary studies and reviews (Box 3).

Box 1. Where to find categories of PHSM?

The **PHSM taxonomy** *(21)*: a classification matrix that categorizes a wide range of public health and social measures into policy categories and subcategories (Fig. 8).

Fig. 8. Public Health and Social Measures Taxonomy

Active case-finding and contact identification measures

Active case-finding
- Screening for symptoms
- Test-based screening
- Contact tracing

Case-specific measures
- Isolation

Contact-specific measures
- Quarantine

Personal protection measures

Personal protection equipment
- Masks
- Gloves
- Face shields
- Bed nets
- Long or other protective clothing
- Barriers for safer sex
- Repellents

Personal hygiene measures
- Hand hygiene
- Respiratory hygiene and cough etiquette
- Food safety measures
- Safe handling of personal equipment and supplies
- Safe breastfeeding practices

Environmental measures

Physical infrastructure
- Physical barriers (e.g. Plexiglass or Perspex screens, room dividers)

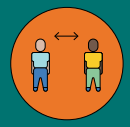
Vector control
- Building and housing modifications (e.g. using window screens, closing eaves)
- Spraying (e.g. indoor residual or outdoor)
- Reservoir control (e.g. draining stagnant and standing water, covering water containers)

Water and sanitation safety
- Disinfecting drinking water
- Modification of access to safe drinking water
- Wastewater management
- Solid waste management

Surface cleaning
- Safe handling of equipment and supplies
- Surface cleaning and disinfection
- Surface decontamination

Indoor air quality
- Ventilation
- Air filtering
- Humidity control

Animal-human interface
- Culling
- Avoidance or safe handling of carrion and infected livestock/animals
- Regulation of animal movement and products
- Livestock quarantine
- Livestock isolation
- Restriction of farming, fishing, hunting and/or selling of animals



Social measures

Social interactions and gatherings
- Physical distancing
- Restrictions or modifications of private gatherings/mass gatherings
- Restrictions or modifications of public gatherings/mass gatherings

Domestic mobility
- Stay-at-home order or curfew
- Restrictions on public transport
- Restrictions on movements (e.g. maximum distance people can be away from their home)
- Entry restrictions (e.g. for districts, zones, settlements)
- Exit restrictions (e.g. for districts, zones, settlements)

Modifications to activities and services
- Modifications to access (e.g. closures of schools or businesses, restricting access to individuals with a vaccination certificate or individuals who test negative, extending holidays for schools)
- Modifications to types of activities (e.g. implementing distance or online learning or teleworking; providing services online or remotely; cancelling school meals)
- Safe burial practices

International travel and trade measures

Trade measures for importation
- Restriction
- Ban
- Inspection

Trade measures for exportation
- Restriction
- Ban
- Inspection

Screening or testing for travellers
- Exit or entry screening for symptoms, or both
- Exit or entry screening for vaccination or immunity, or both
- Exit or entry screening for travel or contact history, or both
- Exit or entry screening for negative test, or both
- Exit or entry testing for infection at PoE (for suspected cases), or both

International border measures
- Ban on entry
- Ban on exit
- Entry restriction
- Exit restrictions

Quarantine upon arrival
- Home quarantine
- Hotel/non-health care-facility/institutional quarantine
- Health care facility quarantine

Travel advice or warning
- Travel advice
- Travel warning

Box 2. What resources are available in the PHSM knowledge Hub?

The **PHSM Knowledge Hub** *(22)* is a publicly accessible digital platform for PHSM research and resources with four interconnected tools.

Where to find recommendations on PHSM?

PHSM Recommendation Finder *(23)*: a searchable repository of PHSM-related recommendations contained in WHO guidelines designed to facilitate swift searches by disease, mode of transmission, PHSM policy category, settings and outcomes of interest.

Where to find research and resources on PHSM?

PHSM Bibliographic Library *(27)*: a repository of global, multidisciplinary and multilingual research articles and resources on PHSM for 23 priority diseases *(24)*. The Library offers an advanced search tool with filtering options and a controlled vocabulary that ensures targeted and specific search results. The PHSM Research Atlas *(25)* provides another way for users to explore PHSM research via the PHSM conceptual framework *(26)* and the global PHSM research agenda.

How to conduct rapid evidence reviews?

Living Reviews *(28)*: supported by artificial intelligence and other technologies, this tool enables users to automate and accelerate the review process for timely insights on dynamic evidence concerning the effectiveness, adherence and unintended consequences of PHSM.

Box 3. How to use the PHSM Knowledge Hub to find research on the effectiveness of PHSM?

Below is an example of a use case of the PHSM Knowledge Hub in the context of a multicountry mpox outbreak, with the aim of identifying effectiveness studies on relevant PHSM.

Start at the PHSM Knowledge Hub homepage *(22)*: visit https://ephsm.who.int/en to explore the full suite of tools.

1. **Search the research evidence using the Bibliographic Library** *(24)*
   - Formulate a search strategy based on your research question as usual for a regular electronic database *(refer to the user guide for search tips).*
   - Alternatively, you can use the pre-developed, artificial intelligence-powered filters to review the globally available evidence sorted by PHSM categories, diseases, settings and outcomes of interest. This saves the time and expertise required for building a complex search strategy. *Example: assuming you are interested in effectiveness studies on PHSM for mpox, you could simply select mpox under the **Diseases** filter and transmission-related outcomes under the **Outcomes** filter. If you are interested in the effectiveness of specific types of PHSM for mpox, you could further select the respective PHSM category among the available filters.*
   - To refine the results, scroll down to **Type of article** to filter by evidence synthesis and/or primary study.
     - **Evidence synthesis** will highlight studies that consolidate existing knowledge, but may not include the latest research, especially in a fast-changing emergency. Selecting **primary study** will provide you with the latest preprints and peer-reviewed articles linked to your search strategy or filters of interest. Often, both may need to be selected for a complete picture of the available evidence.
   - To refine further, apply regular search filters such as publication year or type of publication, *e.g. limit your search to the past five years to focus the results on the most recent mpox public health emergencies of international concern starting in 2022.*
   - If there are very few studies available on the disease of interest, you may want to broaden your search to other diseases with the same or a similar mode of transmission to explore effectiveness research from other areas.
   - Download individual references and articles.

2. **Generate a narrative synthesis of findings across studies using the Living Review** *(28)*
   - You can transfer the search from the Bibliographic Library to the Living Reviews tool and conduct a rapid review – thanks to the latest artificial intelligence technologies, screening, data extraction and synthesis will only take a fraction of the time of a manual review (refer to user guide and explanatory video on the PHSM Knowledge Hub).
   - The Living Review automates a narrative synthesis of findings in both table and text format, as well as a Preferred Reporting Items for Systematic Reviews and Meta-Analyses diagram.
   - Use the readily available template to draft, save and export a summary report.
   - Save the project and come back another day to update the review with the latest research – never lag behind emerging evidence trends on PHSM.

Final note in this step

The initial list of PHSM is identified according to prioritized setting, target population and aim and degree of reliance on PHSM. At this stage, this list should be comprehensive, including all relevant measures as well as alternative options to provide a range for evaluation in the Balancing step below. In addition, the list should specify the minimum set of critical policy elements (i.e. what is the intended aim, where it will be implemented, for whom, when and how stringently it will be implemented) for each measure (see Table 1).

Table 1. Minimum PHSM policy elements

What	A list of PHSM (refer to WHO PHSM taxonomy *(21)*, see Fig.8) e.g. masks, personal protective equipment, personal protection measures
Where	Specific setting(s) and/or location(s) where measures should be implemented e.g. public transport in District X, education settings K-12
For whom	Target population(s) e.g. general population over the age of 12, individuals with underlying health concerns
When	Implementation start and end date (duration) e.g. 4 weeks from 1 June

4.3 Balance feasibility, acceptability, unintended negative consequences and mitigation measures

Output

A refined list of PHSM based on feasibility, acceptability and unintended negative consequences of PHSM implementation, along with corresponding mitigation measures.

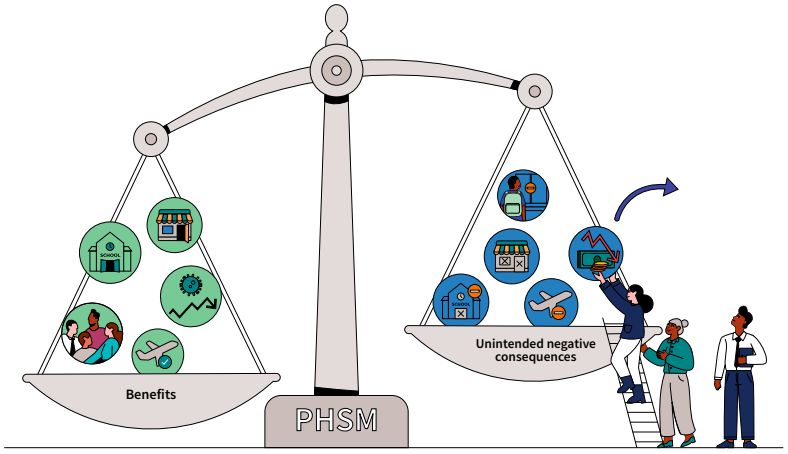
Summary of actions in this step

- ☐ Assess the availability of resources and political and legal feasibility for each listed PHSM.
- ☐ Consider the social and cultural acceptability for each listed PHSM.
- ☐ Anticipate potential unintended negative consequences for each listed PHSM (Table 2) and consider the ethical and equity implications for each one (Table 3).
- ☐ Assess whether adequate mitigation measures, which include social protection policies/programmes and community-based intervention, are in place to reduce the unintended negative impacts of PHSM implementation.
- ☐ Understand and identify gaps in current social protection system and consider introducing or expanding social protection measures and/or exploring opportunities to support community-based initiatives (Boxes 5 and 6).
- ☐ Holistically consider all assessed factors together (e.g. feasibility, acceptability and unintended consequences of each PHSM and mitigation measures) using a matrix to refine potential trade-offs and consider alternatives for

PHSM with feasibility challenges, significant unintended negative consequences and/or impacts on individual liberties and rights, prioritizing options that achieve the same public health goals.

Decision considerations

In the previous step, an initial list of PHSM were selected based on their relevance to public health risks and the best available evidence on their effectiveness. This section focuses on systematically assessing each PHSM individually for its feasibility, acceptability and potential unintended consequences. The objective is to maximize overall public health benefits while minimizing the burden of PHSM interventions on individuals and society, which may require the consideration of alternative measures. Descriptions of feasibility, acceptability and unintended negative consequences can be found later in this step and within the glossary.

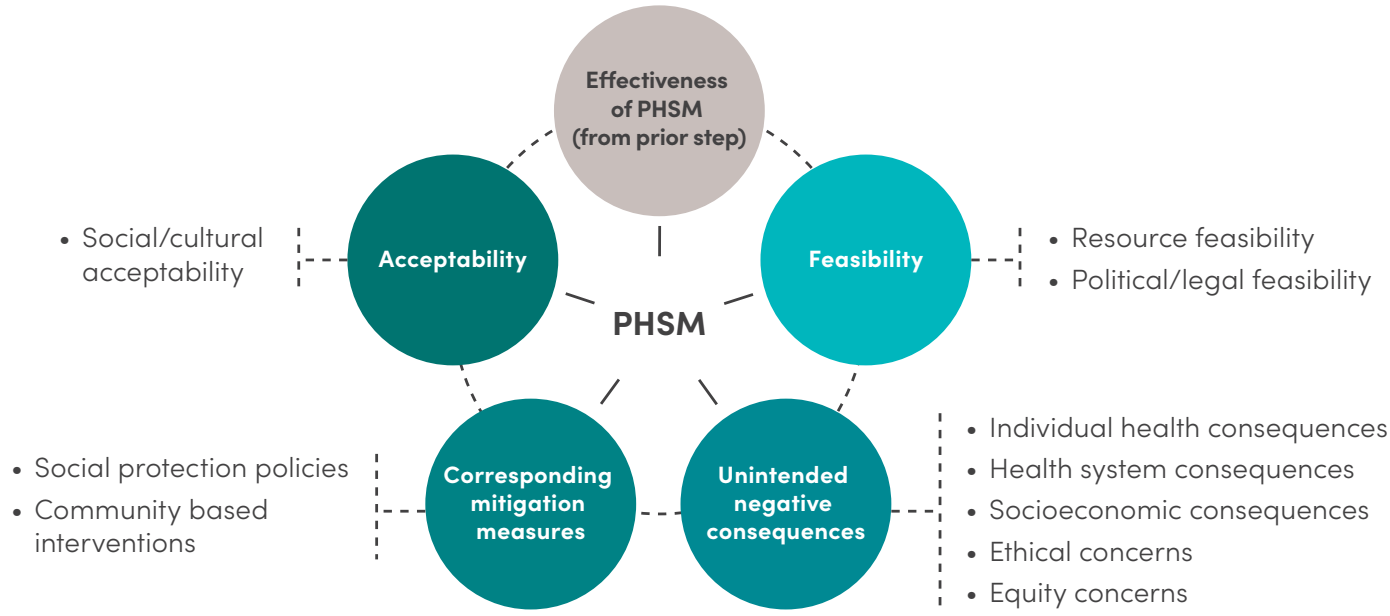


Mitigation measures such as social protection policies/programmes and community-based initiatives - can help offset the unintended adverse impacts of PHSM, thereby improving the balance between benefits of PHSM.

These factors will be considered again for the selected combination of PHSM in the subsequent step *4.4 Optimizing and finalizing the PHSM implementation package*. Decision-makers should approach this and the subsequent step as an iterative process to refine the overall PHSM implementation package.

Balancing these factors requires a dynamic approach, varying with the specific PHSM, target population, level of enforcement, etc. For example, in the case of a novel pathogen that is highly transmissible and has a high case fatality ratio, acceptability of restrictive PHSM may be higher and exceptional legal provisions may be extended, particularly in the early phase of an emergency. Additionally, in the case of a known, reemerging threat with effective vaccines and treatments, perceived risk may be low, and acceptability of measures may be limited (Fig. 9).

Fig. 9. Interdependent dimensions that influence selection and balancing of PHSM



4.3.1 Feasibility

☐ Assess the resource, political and legal feasibility of each listed PHSM.

Feasibility, in the context of PHSM, describes the degree to which a measure can be practically and successfully implemented. Feasibility should be assessed continuously, and at the administrative level the measures are being implemented. Key dimensions of feasibility are included below.

Resource feasibility refers to the capacity to mobilize resources, including financial, human, supplies, and logistical resources and the infrastructure needed for implementation.

This applies both to the capacity of the entity implementing the measures and to the ability of the target population to adhere to them (e.g. ability to purchase masks and other personal protective equipment, insufficient capacity for reservoir control such as draining stagnant or standing water).

Legal and political feasibility refers to laws and governance structures which enable or hinder PHSM implementation. Consider whether there is:

- sufficient authority and mandate in legal frameworks to implement the measure or the potential to establish such authority through relevant legislative or regulatory processes;
- potential infringement or violation of personal freedom and rights by the measure; and/or
- political willingness within and across government parties to support the measure.

4.3.2 Acceptability

☐ Consider the social and cultural acceptance of each listed PHSM.

Acceptability refers to the extent to which individuals and communities targeted by PHSM understand the risks and proposed measures, perceive them to be agreeable and are willing to adopt them. This can be influenced by cultural considerations, psychosocial factors and structural and social factors that enable or hinder adherence to the measures. Acceptability is influenced by:

- **cultural, personal and religious considerations** including beliefs and social norms about illness, death, hygiene and social interactions, all of which require engagement with representatives of relevant community groups to fully understand behaviours and attitudes;
- **psychosocial factors** such as perceived self-efficacy, risk perception, social norms and/or trust in science, health authorities and/or governments – concerns about stigma, social exclusion and emotions such as fear, anxiety, stress also play a role; and
- **structural and social determinants** influencing whether target populations can adhere to the measure in view of its unintended negative consequences and mitigation measures (see sections 4.3.3 and 4.3.4); this also includes concerns of the target populations about the influence of measures on their daily lives, (e.g. concerns for a lack of childcare due to school closures, concerns of revenue loss due to culling) and their potential to impede on rights.

4.3.3 Unintended negative health and socioeconomic consequences

- ☐ Anticipate potential unintended negative consequences for all considered PHSM (Box 4, Table 2).
- ☐ Identify vulnerable and marginalized populations who may be affected (Box 4).
- ☐ Consider the ethical and equity implications for the PHSM being considered (Table 3).
- ☐ Consider alternatives for measures with feasibility challenges, significant unintended negative consequences and/or impacts on individual liberties and rights, prioritizing options that achieve the same public health goals.

Unintended health and socioeconomic consequences are the impacts of PHSM implementation, on individuals and communities, distinct from the direct effects of disease transmission. While some unintended consequences can be positive – such as improved air quality during earlier parts of the COVID-19 pandemic due to reduced air travel – negative consequences are more common and are, therefore, the focus of this section. Examples of negative consequences include income loss, poor mental health and well-being, food insecurity, increased gender and social inequities and the disruption of routine health programmes (Table 4).

The health and socioeconomic conditions across the life course – both prior to and during a health emergency – along with their individual characteristics and behaviours (i.e. age, gender, ethnicity) and their access to health care and social services, shape their susceptibility and vulnerability to health and socioeconomic outcomes during health emergencies. Vulnerable and marginalized populations can experience disproportionate and multilayered burden, exacerbating existing inequities. This underscores the importance of anticipating the potential health and socioeconomic consequences (refer to Table 2) of PHSM and maintaining an equity focus throughout the PHSM decision-making.

The anticipation of unintended negative consequences and concerns for certain interventions does not necessarily preclude their use. Decision-makers should carefully consider alternative measures which may serve a similar public health function but may have fewer drawbacks. However, there may be situations where specific PHSM are necessary, despite potential consequences.

While this step considers anticipated unintended negative consequences for each measure, the cumulative burden of consequences for the final set of PHSM will be assessed in the subsequent step, section 4.4.

Box 4. How to anticipate which unintended consequences are likely to occur?

Bibliographic Library *(24)*: the PHSM Bibliographic Library within the Knowledge Hub *(22)* is a repository of research articles on PHSM, including the unintended negative consequences of measures. Results can be filtered by disease and individual PHSM.

The effects of public health and social measures implemented during the COVID-19 pandemic: an overview of systematic reviews *(1)*: is an overview of systematic reviews on the effects of PHSM implemented during COVID-19; the interactive evidence map of the review contains a summary of unintended negative consequences associated with types of PHSM interventions for COVID-19 *(29)*. Infographics based on the findings of this review are also available *(30)*.

Annex 5: contains a summary of results from the overview of systematic reviews *(1)*, along with worked examples of unintended negative consequences for certain PHSM.

Table 2. Domains and examples of unintended negative consequences of PHSM implementation

Domains of unintended negative consequences	Examples of unintended negative consequences
Individual health	• disruption in health service utilization • increased incidence and mortality of diseases (other than the health emergency of concern) • increased mental health problems (e.g. stress, depression, anxiety, social isolation) • increased domestic and gender-based violence • poor nutritional status/dietary behaviour • substance abuse • insufficient physical activity and mobility • increased sleep disturbances • increased accidents and injuries
Health system	• disruption in delivery of essential health services • disruptions in routine vaccination • diversion and burnout of health-care workforce
Socioeconomic	• interrupted/limited social services utilization • reduced social cohesion and unrest • interrupted learning/disruption of educational attainment • increased absenteeism (children and workers) • increased gender inequity (i.e. through increased childcare burden, caregiving roles) • disruption of child development • food insecurity • increased homelessness/decreased access to housing • increased unemployment rates • reduced economic productivity/growth • increased poverty • household/individual financial hardship
Additional unintended negative consequences (e.g. environmental/ ecological)	To be added by PHSM decision-making body based on context: • increased plastic waste • water scarcity • altered wildlife or ecosystems

Ethical and equity concerns

Beyond anticipating potential health and socioeconomic consequences of PHSM implementation, the inherent equity and ethical considerations of PHSM should be evaluated and discussed explicitly and transparently using the guiding questions in Table 3. The Navigator integrates systematic considerations of necessity, proportionality, feasibility and the evidence base (Fig. 4). When a measure being considered significantly infringes on legal rights or individual liberties, less restrictive alternatives that can serve similar public health function should be considered. There may be situations where more restrictive measures that impacts individual liberties may be deemed the only effective or necessary option. According to the Siracusa Principles on the limitation and derogation provisions in the international covenant on civil and political rights, any limitation on human rights must be according to the law, based on a clear aim, and be judged as necessary, proportionate and nondiscriminatory *(31)*.

Table 3. Additional ethical and equity concerns related to each PHSM

PHSM considerations	
Ethical concerns	Review the legal frameworks to assess whether the measure being considered interferes with any of the following: • individual liberty • human rights • due process protections • privacy concerns • protection of the public from harm
Equity concerns (i.e. vulnerable groups)	Does the measure being considered: • lead to stigmatization of communities and individuals? • lead to inequitable/disproportionate burden (e.g. against marginalized populations, first responders, unsalaried workers, etc.)?

4.3.4 Mitigation measures

Mitigation measures aim to reduce the unintended negative health and socioeconomic consequences of PHSM implementation through introducing or expanding using social protection policies and programmes or through community-based initiatives. These measures aim to address individuals' and communities' access to resources, systems, services and living conditions, facilitating their willingness, motivation and ability to adhere to PHSM.

☐ Assess whether existing social protection policies and programmes and community-based measures adequately mitigate unintended negative impacts of PHSM, identifying gaps and opportunities to introduce or expand them (Boxes 5 and 6).

Social protection policies and programmes

☐ Understand whether the current social protection system provides adequate coverage to mitigate unintended negative consequences of PHSM implementation.[3] Through consulting with colleagues responsible for social protection policies and programmes, identify any gaps and consider expanding or newly introducing social protection measures (Box 5).

Social protection, often referred to as social security, is a human right. Social protection is defined as the set of policies and programmes designed to reduce and prevent poverty, vulnerability and social exclusion and shield people throughout their life-cycle, from both predictable and unforeseen life events *(33)*. Social protection can be provided through cash payments to individuals or through in-kind approaches, such as

Box 5. What are the existing social protection policies in the country

World Bank Atlas of Social Protection Indicators of Resilience and Equity *(35)*: an atlas of social protection indicators on social protection expenditure and performance for 140 countries on social assistance, social insurance and labour market programmes.

International Labour Organization Social Protection Monitor *(36)*: tracks policy decisions affecting social protection systems in countries based on media/online publications.

3 A more detailed introduction to social protection in the context of PHSM implementation can be found in Role of social protection in reducing the burden of public health and social measures during the COVID-19 pandemic: evidence review *(32)*.

subsidized child or health care services. Social protection policies and programmes should aim at universal coverage and adequacy of benefits.

Social protection measures are generally financed through contributory schemes (i.e. beneficiary-funded schemes such as social insurance) and noncontributory, tax-funded benefits such as means-tested social assistance. Countries often use a mix of financing mechanisms.

While a set of social protections are intended to be a safety net against poverty throughout the life course, health emergencies and the implementation of PHSM may require an expansion of existing social protection measures or the introduction of new ones (for example, food assistance during quarantine) to ensure people are able to cope with the additional socioeconomic strain during such situations and to avoid the exacerbation of health and social inequities.

As the mandate for social protection policies usually lies outside of the health sector such as social, finance, housing, labour sectors and beyond, multisectoral collaboration is essential to achieve a feasible plan for the scale-up and introduction of emergency social protection measures.

Using social protection for mitigation of unintended negative consequences should begin with a stock take and gap analysis of the current social protection system to assess whether adequate coverage and benefits can be provided to protect people from the additional burden due to PHSM implementation (Box 5). Consult with stakeholders responsible for social protection policies and programmes to identify any gaps in the system – some of this vital work may be conducted in the preparedness phase as outlined in section 2.1.

If gaps are identified, the expansion of existing or introduction of new emergency-specific social protection policies and programmes needs to be considered (Box 6). The purpose of those emergency-specific measures is to (i) reach those most in need, including vulnerable and marginalized populations otherwise excluded from regular national social protection schemes, (ii) provide adequate support, meaning benefit amounts that help to manage the additional hardship caused by the emergency and (iii) be delivered in a timely manner *(34)*.

A WHO evidence review, in technical collaboration with the International Labour Organization, analysed the role of social protection in reducing the burden of PHSM during the COVID-19 pandemic *(32)*. The review found social protection to be beneficial in safeguarding food and housing security, mental health and well-being, as well as financial and employment security.

Table 4 illustrates social protection benefit types that could be considered in order to reduce health and socioeconomic hardship during emergencies.

Table 4. Types of social protection benefits to consider as mitigation measures

Benefit by contingency	Examples (not exhaustive)
In cash: programme providing cash benefits to individuals or households	
Family maintenance	Child allowance
Unemployment	Income support
Sickness	Paid sick leave
Old age	Pension
Disability	Invalidity pension
Other	Deferrals on mortgage payments
Maternity/paternity/parental	Paid parental leave

Benefit by contingency	Examples (not exhaustive)
Education	Tuition fee assistance or deferral of loan payments
Housing	Rent allowance
In kind: programme providing goods, services or vouchers to allow individuals or households to obtain defined goods or services	
Goods	Food distribution
Services	Skills training as part of an employment programme, childcare for frontline workers
Vouchers	Voucher for groceries
General labour and fiscal measures: measures and policies directed at stimulating and regulating the labour market or using taxation and government spending	
Taxation	Value Added Tax decrease
Moratorium on evictions or other rent relief: programmes to protect tenants from being evicted due to unpaid rent or measures to reduce or defer payment of rent	
Moratorium	Rent deferral
Utility or financial fee waiver: programme providing a fee waiver allowing individuals or households to access a defined good or service or reimbursing a defined good or service	
Waiver	Assistance for household electricity costs

Source: adapted from WHO *(32)*.

Community-based initiatives

☐ Assess whether there are adequate community-based initiatives in place to support the mitigation of unintended negative consequences of PHSM implementation (Box 6). Explore ways to support these initiatives by engaging with local decision-makers, civil society organizations and relevant community groups.

PHSM adherence depends on whether communities find the selected PHSM feasible and acceptable. Mitigating unintended negative consequences is likely to improve feasibility and acceptability, which in turn supports adherence.

In addition to national social protection policies or in the face of their absence or inadequate coverage, more localized community-based initiatives play a crucial role in addressing the specific needs of communities in a timely manner, particularly in reducing the unintended negative consequence of PHSM implementation. Community-based initiatives may be driven, managed or funded by the at-risk and affected communities themselves or they may receive support from external actors including governments, nongovernmental organizations and international organizations (for example, mutual aid networks, community food banks,

Box 6. Which mitigation measures to consider?

Role of social protection in reducing the burden of PHSM during the COVID-19 pandemic *(32)*: contains a list of existing, scaled up or new social protection policies and programmes used by countries during COVID-19.

WHO PHSM Initiative Research website *(37)*: is continuously updated and contains summaries of evidence reviews on social protection and community-led initiatives.

peer support groups, psychosocial support services). These initiatives are instrumental in strengthening individual and collective capabilities to adapt to health emergencies.

Through engagement with community leaders, civil society organizations and representatives of vulnerable and marginalized population groups, concerns, needs and challenges community members face with regard to implementation of PHSM (see section 4.5.2 for risk communication and community engagement (RCCE) strategies) need to be assessed. Based on this understanding, existing community infrastructures can then be leveraged to provide required support through multisectoral and public-private partnership collaborations.

4.3.5 Summary of key decision points and considerations in this step

- ☐ Having considered feasibility, acceptability, unintended negative consequences of each PHSM and corresponding mitigation measures, a template can be used to create a matrix that documents insights from research, data and expert knowledge (Table 5). This matrix serves as the basis for further refinement in the subsequent step.

To assist in a holistic assessment and refinements to the trade-offs explored, a matrix can be created to systematically evaluate interdependent factors such as feasibility, acceptability, unintended negative consequences of each PHSM and corresponding mitigation measures (Table 5). This may result in increasing resources or implementing mitigation strategies alongside the measures, amending legislative frameworks or considering alternative PHSM that function similarly but are more culturally accepted, cost-effective or have less severe unintended negative consequences. Decision-makers might also consider adjusting the breath of coverage for PHSM, considering geographical coverage and target populations.

The assessment matrix can also be used to assign scores and weights to these interdependent factors. Thresholds can be agreed upon by multisectoral, multilevel decision-making authorities in order to evaluate and balance these factors transparently and systematically.

> ***Note:*** *integrated modelling offers a quantitative approach to project the health and economic outcomes of different PHSM combinations and weigh the key trade-offs inherent to decision-making. The joint publication* ***Strengthening pandemic preparedness and response through integrated modelling*** *produced by WHO, the Organisation for Economic Co-operation and Development (OECD) and the World Bank describes how countries can build and institutionalize capacities for integrated modelling with local data to simulate scenarios, explore potential outcomes and alternatives before PHSM implementation, and to evaluate and refine measures during the emergency with real-time data (38).*

Final note in this step

The trade-off analysis focuses on individual measures in this step, resulting in an initial set of targeted and balanced PHSM, along with corresponding mitigation measures, forming the foundation of the PHSM implementation package. A similar evaluation of the combined PHSM implementation package follows in the next section. While these steps are presented separately to emphasize the importance of assessing these factors for each measure individually and for all measures collectively, in practice these evaluations are expected to be more integrated and cyclical.

Table 5. Assessment matrix of interdependent factors, worked example for considering school closures as a potential PHSM

Unintended negative consequences					Feasibility		Acceptability	Mitigation measures	Decision to include in PHSM combination
Individual health	Health system	Socioeconomic	Ethical concerns	Equity concerns	Resource feasibility *(Resource availability to implement measure)*	Legal/political feasibility	Social/ cultural acceptability		
For example: • increased mental health problems with students, teachers, staff and caregivers (isolation, stress, anxiety) • increase in domestic violence • deteriorated child nutrition • adolescent pregnancy	For example: • routine vaccination programmes disrupted	For example: • setbacks to child development • reduced educational attainment • increased food insecurity for children (lunch programmes) • worsening gender inequity (increased childcare or caregiving roles often affecting women and girls)	For example: • right to education for children	For example: • concern with lack of childcare for frontline workers • widening of educational inequalities • concerns on digital divide – unequal access to Internet and technology	*Select one: low/medium/ high* For example: Low • Insufficient resources for distance learning (limited laptops, internet connection etc)	*Select one: low/medium/ high* For example: Medium • Individual schools do not have authority to close schools, it rests at subnational level.	*Select one: low/medium/ high* For example: Low • Serious concerns expressed by teachers, parents and the broader learning community about educational disruption, lack of childcare, increased domestic violence.	*Free text – include measures needing to be introduced or scaled up* For example: • Establish distance learning • Arrange catch-up or remedial sessions	*Free text, some options include:* • *Yes* • *Yes, with following modifications* • *No, consider alternatives* • *No* For example: • No, consider alternatives

4.4 Optimize and finalize the PHSM implementation package as a whole

Output

A finalized PHSM implementation package which consists of an agreed combination of targeted and balanced PHSM and corresponding mitigation measures.

Summary of actions in this step

- ☐ Assess the feasibility and acceptability of the combination of PHSM collectively.
- ☐ Anticipate the cumulative unintended health and socioeconomic consequences of the proposed combination of PHSM.
- ☐ Review the application of guiding principles throughout the decision-making process.
- ☐ Modify and finetune the draft PHSM implementation package to ensure practicality, adherence, minimize harm and promote equity.

Decision considerations

This step shifts the focus from individual PHSM to the combined, synergistic (or potentially antagonistic) effects of the PHSM implementation package as a whole, ensuring that the selected combination collectively addresses the public health risks of the emergency, reflects community needs and strikes a balance between public health benefits and the adverse consequences of PHSM implementation.

Assessing the cumulative impact of unintended consequences, as well as the ethical and equity considerations of the targeted combination of PHSM can reveal unforeseen effects that evaluations of individual measures might miss

4.4.1 Assess the impact of combined PHSM and their interdependent factors

- ☐ Assess the feasibility and acceptability of the selected combination of PHSM as a whole.

Measures that might be individually feasible can become logistically impractical, unacceptable or even counterproductive when combined for implementation. For example, screening prior to a mass gathering event could cause congregation of people at the testing site, increasing risk of transmission. This is due to amplified resource needs, compounded negative consequences and reduced acceptability and motivation to adhere to PHSM, all of which are expected as the scale of measures increases.

Resource feasibility
Consider the cumulative costs of implementing the combination of PHSM, for both the entities implementing and those adhering to the measures. Are there sufficient resources or can they be scaled up?

Political/legal feasibility
How might the combined PHSM lead to challenges for current legislation? Will the political climate allow for implementation of the combined PHSM?

Acceptability
What is the impact on the daily life or lifestyles, caused by the combination of PHSM on the community and is it acceptable to them? Note that a community is not a single, uniform entity and PHSM will affect its different groups in varied ways.

Overall

What strategies or adjustments can be made to increase the feasibility or acceptability of the implementation package without compromising PHSM effectiveness?

☐ Anticipate the unintended health and socioeconomic consequences of the selected combination of PHSM to consider the cumulative impact of multiple PHSM.

The probing questions listed below can be used to facilitate discussions within the PHSM decision-making body regarding the PHSM implementation package (Table 6). These questions are intended to guide decision-makers but are not prescriptive, nor exhaustive.

Table 6. Examples of probing questions to consider unintended negative consequences for PHSM implementation package

Conflicts or interference	• If implemented together, does the potential combination of PHSM conflict or interfere with each other? For example:
	  - implementation of a curfew together with restrictions of public transport – can lead to crowded transport during peak hours before the curfew; or
	  - closure of schools/learning spaces or daycare while on-site work requirements have not changed.

Individual health	• How might the combination of PHSM impact mental health – (e.g. cumulative stress from isolation due to school closures combined with economic hardship)? • Are there potential interactions between the PHSM and existing health conditions that could worsen outcomes (e.g. limited access to healthy food due to economic disruptions)? • Could the combination of PHSM impact physical health (i.e. decreased physical activity/mobility)? • Could they lead to increased rates of domestic or gender-based violence?
Health system consequences	• How will these PHSM affect health-care workforce capacity? • Could the combination of PHSM restrict/reduce access to essential health care or treatment?
Socioeconomic consequences	• Could the cumulative effect of the PHSM implementation package lead to increased social isolation, polarization or unrest? • What are the potential financial implications of adhering to the combination of measures for individuals and households? • Could the combination of PHSM lead to increased unemployment or increase poverty levels? • How might the combination of PHSM affect economic productivity and growth (e.g. business operations, supply chains and consumer spending)? • How might they impact food insecurity? • Could they lead to disruptions in child development or educational outcomes?
Additional criteria (e.g. environmental/ecological)	• Are there potential cumulative impacts from the combination of PHSM on the environment and ecology (e.g. air pollution, increased waste from single-use items, ecosystem disruption due to changes in human behaviour)?
Unintended positive consequences	• Could there be synergistic effects of the combination of PHSM in reducing transmission of other infectious disease (i.e. reduced circulation of other infectious diseases due to PHSM)? • Could the implementation of a combination of PHSM leads to other unintended positive consequences such as cleaner air, thriving wildlife, greater family cohesion, etc?

4.4.2 Assess the integration of guiding principles in PHSM decision-making.

☐ Assess the integration of guiding principles in the selection of the PHSM implementation package.

The following guiding questions are designed to prompt further critical analysis of the draft PHSM implementation package, based on the key guiding principles outlined in section 2.2. These questions are not an exhaustive set on their own; they are intended to facilitate further reflection and identify areas where modifications may be required to improve the package at this stage.

Evidence-informed decision-making
Are there any gaps in the data and evidence used to inform the current implementation package? Given the evolving nature of the situation and limitations with local data, are there any additional insights from the evidence that should be considered to modify the package and enhance its effectiveness?

Multisectoral collaboration
Have all relevant sectors been adequately engaged in the decision-making process, not only in selecting the measures but also in anticipating and addressing unintended negative consequences, along with identifying corresponding mitigation measures?

Equity
Does the draft PHSM implementation package adequately consider resources, opportunities and outcomes of at-risk and affected communities, particularly individuals in vulnerable conditions, in an equitable way? Has the potential risk of PHSM implementation exacerbating inequity been sufficiently considered?

Ethical considerations
Are there any ethical considerations such as relevance, necessity or proportionality (see Fig. 4 for complete list) that were overlooked in selecting PHSM and balancing their public health benefits with anticipated unintended negative consequences?

Community-centred approach
Have at-risk and affected communities been engaged to ensure community needs, values and views are reflected in decision-making? Has their advice on enhancing acceptability and adherence been taken into account?

Final note in this step

By the end of this step, decision-makers will have a well-calibrated PHSM implementation package with carefully weighed trade-offs, resulting from a thorough assessment of public health risks, the best available evidence, feasibility, ethical considerations, equity and potential unintended negative consequences. They will also have identified appropriate mitigation measures, including social protection policies and programmes, to minimize any anticipated unintended negative consequences of PHSM implementation. With this foundation in place, they can now shift their focus to implementation through a whole-of-government, whole-of-society approach.

4.5 Implement the PHSM implementation package

Output

A plan to implement the PHSM implementation package (combination of PHSM and mitigation measures), using a whole-of-society, whole-of government approach.

Summary of actions in this step

- ☐ Continue engaging with communities to solicit feedback on the PHSM implementation package (Box 7) to tailor its implementation strategy.
- ☐ Consider which enabling functions, such as RCCE and infodemic management strategies, can be used to promote uptake and adherence to the PHSM implementation package (Boxes 8–10).

Decision considerations

This section involves developing a strategy to implement the PHSM implementation package that was finalized in the previous step. The focus of this section is not on the specific development or execution of implementation, but rather on ensuring a collaborative, participatory approach is taken when planning implementation, engaging decision-makers across relevant sectors as well as community leaders to finalize and validate the package.

In addition, enabling functions such as RCCE and infodemic management are vital to promote uptake, acceptance and adherence to PHSM. These functions are critical to ensure that the PHSM strategies being implemented reflect community needs and values, allowing local knowledge and experience to inform PHSM implementation.

Box 7. Where to find information on community engagement?

Engaging with communities in health emergencies: building readiness, response and resilience *(39)*: contains examples from the WHO Regional Office for Europe on the central role that community engagement has played during the COVID-19 pandemic and other emergencies.

Participation as a driver of health equity *(40)*: contains examples from the WHO Regional Office for Europe that outline strategies and evaluation methods for social participation or population involvement in decisions that affect their health.

The WHO **10 steps to community readiness** *(41)*: while this was developed with medical countermeasures in mind for COVID-19, the RCCE principles outlined are broadly applicable.

The United Nations Children's Fund **Minimum quality standards and indicators for community engagement** *(42)*: provides guidance towards high quality, evidence-based community engagement in development and humanitarian contexts.

The International Federation of Red Cross and Red Crescent Societies' **Community Health Strategy 2020–2030** *(43)*: provides direction for national societies on how to deliver community health work.

4.5.1 Engage with communities to plan and manage implementation

☐ Continue engaging with communities to solicit feedback on the PHSM implementation package (Box 7).

☐ Tailor an implementation strategy for the PHSM implementation package with community input.

Community participation in PHSM decision-making is a key driver of acceptance, effectiveness and sustainability of PHSM implementation. Inequitable and poorly tailored PHSM that do not align with community needs or the level of public health threat they are experiencing can lead to misunderstanding, resistance and reduced adherence. This, in turn, erodes public trust and weakens overall community protection efforts.

The contextual analysis of at-risk and affected communities within risk assessments or situation analyses in the previous steps helps identify community risks, needs, practices, behaviours and vulnerabilities. This analysis, combined with the direct engagement of community partners as key stakeholders to the decision-making, is essential to ensuring that the PHSM implementation package remains community-centred. Engagement with community partners can include working with community leaders, civil society organizations and representatives of vulnerable and marginalized population groups.

The aim of this step is to reach agreement on participation and engagement of community in implementation. Specific guidance on developing a PHSM implementation plan is outside the scope of the Navigator; However, the following outlines high-level considerations for implementation plans, and where relevant, community input should be incorporated to ensure the plan places communities at the centre:

- **roles and responsibilities** in informing the public health risks and priority activities, championing community-led approaches to implementation;
- **risk communication:** developing clear, consistent, culturally appropriate and audience-specific messages about PHSM and mitigations measures, their rationale and their expected benefits;
- **operational cost:** allocate necessary resources, including personnel, supplies and funding, for effective implementation;
- **enforcement considerations:** depending on the level of enforcement needed for the targeted set of PHSM, develop a clear and fair enforcement strategy that respects individual liberties and rights and is appropriate for the context;
- **adaptability and scalability:** plan for regular reviews and updates of the situation (risk assessments) and for ability to adjust depending on the scale of the outbreak; and
- **monitoring and evaluation**: establish mechanisms to monitor PHSM policies being implemented and use data for further decision-making, research or to meet IHR reporting obligations (discussed in next step in further detail).

4.5.2 Enabling functions for implementation

☐ Consider which enabling functions, such as RCCE and infodemic management strategies, can be used to promote uptake and adherence to the PHSM implementation package (Boxes 8–10).

A critical part of the implementation strategy for the PHSM implementation package is enabling functions such as RCCE and infodemic management, as well as implementing partners such as community health workers, (Box 8) to promote acceptability, uptake of and adherence to PHSM in communities.

Box 8. Enabling functions: community workers as implementing partners

Community health workers play a key role in connecting communities with the health sector, using their understanding of local dynamics to build trust and promote the adoption of PHSM by encouraging so-called "buy-in" and ownership of PHSM during health emergencies.

In addition to their public health roles, community health workers often support welfare, education, and livelihood initiatives, which can help reduce the adverse effects due to PHSM implementation as well as the emergency itself, helping enhance PHSM adherence.

Community health workers can also connect with, and mobilize other community workers, including social and environmental workers, to manage and monitor community-centred PHSM and health services, truly applying a whole-of-society approach.

Risk communication and community engagement

Public trust and support are essential for successful PHSM implementation. By actively engaging communities to become cocreators of the implementation strategies and fostering open communication, RCCE builds trust and understanding, ultimately promoting healthy and protective behaviours including the adherence to PHSM.

WHO has published several disease-specific RCCE readiness and response toolkits that can be used to guide RCCE activities during infectious disease outbreaks (Box 9).

Box 9. Where to find resources for risk communication and community engagement?

WHO RCCE research and publications website: the WHO risk communications portal *(44)* contains links to multiple resources on RCCE for various health emergencies *(45)*.

Communicating risk in public health emergencies: a WHO guideline for emergency risk communication policy and practice *(46)*: provides evidence-based guidance on how risk communication should be practiced in an emergency.

The WHO policy brief **Building trust through risk communication and community engagement and infodemic management** *(47)*: provides an overview of key actions for countries to take on RCCE based on WHO COVID-19 technical guidance and strategies.

Risk communication and community engagement for Marburg virus disease outbreaks *(48)*: provides recommendations for planning and implementing RCCE activities that protect and empower communities during Marburg outbreaks.

Additionally, WHO provides RCCE readiness and response toolkits on Zika virus *(49)*, dengue fever *(50)*, mpox *(51)* and yellow fever *(52)*.

WHO further recommends below actions to build trust and engage with affected populations *(46)*.

- **Trust:** to build trust, risk communication interventions should be linked to functioning and accessible services, be transparent, timely, age appropriate, easy-to-understand, acknowledge uncertainty, address the needs of affected populations, link to self-efficacy and be disseminated using multiple platforms, methods and channels.
- **Communicating uncertainty:** communication by authorities to the public should include explicit information about uncertainties associated with risks, events and interventions and indicate what is known and not known at a given time.
- **Community engagement:** identify people that the community trusts and build relationships with them. Involve them in decision-making to ensure PHSM implementation is collaborative, contextually appropriate and that communication is community-owned.

Further information on recommended RCCE practices can be found in Communicating risk in public health emergencies: a WHO guideline for emergency risk communication policy and practice *(46)*.

Infodemic management

An infodemic is defined as an overload of information (including false or misleading information) in both the digital and physical environments during a disease outbreak. Infodemics lead to confusion and risk-taking behaviours that can harm health. They also lead to mistrust in health authorities and undermine public health responses, including acceptance of and adherence to PHSM. An infodemic can intensify or lengthen outbreaks if people are unsure about the best ways to protect their health and the health of people around them.

The application of infodemic management strategies and tools facilitating the systematic use of risk- and evidence-informed analysis and approaches to manage the infodemic, together with RCCE efforts, is critical to raise awareness about the infectious disease risk among affected populations and inform them about the actions including PHSM they can engage in to protect themselves and others.

Box 10. Where to find resources on infodemic management?

WHO policy brief: building trust through risk communication and community engagement and infodemic management *(47)*: while developed for COVID-19, this document outlines essential RCCE and infodemic management actions that can be taken to reduce and mitigate harm from misinformation.

Managing infodemics in the 21st century *(53)*: an open access book on the evolving field of infodemic management.

OpenWHO infodemic management series *(54)*: provides an overview of strategies, good practices and tools for infodemic managers.

Final note in this step

By the end of this step, decision-makers will have a community-validated implementation plan for the PHSM implementation package, tailored to the relevant at-risk and affected communities. The plan should outline clear roles, responsibilities and resource allocations, ensure culturally appropriate risk communication strategies are used and include methods to adjust the package based on the evolving situation and community feedback. This step emphasizes the use of enabling functions, namely RCCE and infodemic management, to foster public trust, promote adherence and combat misinformation to implement PHSM effectively with communities at the centre.

4.6 Monitor and evaluate implementation and effectiveness of the PHSM implementation package

Output

Enhanced understanding and ongoing assessment of PHSM policy implementation, acceptance, impact and effectiveness, based on the established systems to monitor and evaluate the PHSM implementation package.

Summary of actions in this step

☐ Establish monitoring systems to track PHSM policies (Box 11), monitor their unintended negative health and socioeconomic effects (Box 12), public acceptance of and adherence to PHSM (Box 13) and evaluate the effectiveness of PHSM (Box 14).

Decision considerations

Given that PHSM are integral components of government strategies alongside other public health strategies, a holistic approach is needed to monitor and evaluate the PHSM implementation package.

Monitoring is critical in assessing how well a PHSM implementation package is rolled out and how it evolves over time. A high-quality and reliable monitoring system is also essential for evaluating outcomes and effectiveness. Repeated data collection enables the detection of trends and changes over time, while standardized data collection tools facilitate comparisons within and across countries.

Detailed guidance on developing a monitoring and evaluation framework for a PHSM implementation package is outside the scope of the Navigator; however, this section provides a basic outline of key monitoring and evaluation approaches.

4.6.1 Tracking PHSM policies

☐ Track PHSM policies that are being announced and implemented by governments using a standardized methodology (Box 11).

WHO's global guidance on monitoring PHSM policies was published based on the lessons learned during the COVID-19 pandemic and the PHSM Conceptual Framework *(56)* to:

- provide a framework for monitoring and selecting key PHSM categories and associated indicators for measuring and reporting on PHSM policies;
- provide flexible and customizable tools that can be used to set up a tracking system applicable to various hazards at the national and subnational levels to assist in systematically tracking, analysing and reporting data on PHSM policies;
- accelerate the availability and use of timely and context-specific data about PHSM policies to allow for continual adjustment as necessary; and

Box 11. How to systematically track PHSM policies?

Global guidance on monitoring PHSM polices during health emergencies *(55)*: contains step-by-step guidance on establishing a monitoring function and outlines a process for consistent and transparent data collection on PHSM policies being implemented during a health emergency. A digital database for tracking PHSM policies for future health emergencies based on the global guidance is in development.

- enable the analysis and interpretation of temporal correlations with other response measures, such as MCM, by highlighting potential points and resources to consider.

Tracking PHSM policies serves several critical purposes, including supporting evidence-informed decision-making during health emergencies, informing further research and helping Member States meet additional reporting obligations under the IHR (2005).

Monitoring unintended health and socioeconomic consequences

☐ Monitor unintended negative consequences of PHSM implementation across health and socioeconomic domains (Box 12).

Any unintended negative consequences such as health and socioeconomic outcomes (Table 2) that are not the primary objective of PHSM implementation need to be actively monitored throughout health emergencies. This enables ongoing adjustment of the PHSM implementation package, including measures and mitigation efforts such as social protection policies and programmes and community-based initiatives (section 4.3.4). While acknowledging that it may be challenging to separate the health and socioeconomic consequences of PHSM implementation from the broader impacts of health emergencies themselves, there are approaches to gaining meaningful insights for decision-making (Box 12).

As outlined in section 1.4, multisectoral collaboration and the sharing of insights are paramount to this step, as many PHSM are implemented outside of the health sector with impacts across the social, economic, human rights and environmental domains.

Box 12. How to monitor unintended effects of PHSM implementation?

Annex 6: provides routine data sources to assess baseline or medium- to long-term consequences. Real-time emergency data sources such as ad-hoc surveys and polls, focus groups, community discussions and expert consultations, or nontraditional proxy sources (sales data, phone mobility data, etc.) can also monitor short-term consequences of PHSM implementation.

The WHO **Operational framework for monitoring social determinants of health equity** (specifically, Table ES.1) *(57)*: contains an overview of indicators and data sources by social determinants of health domains.

- The monitoring of unintended consequences can be informed by routine data on socioeconomic status, health and social inequality and other sources tracking developments in the social determinants of health (Box 12).
- In addition, ad hoc monitoring, e.g. using household surveys, are often conducted during health emergencies to identify the health and socioeconomic status and needs of different population groups.

Annex 6 outlines examples of routine and emergency data sources that can be used for this step.

Monitoring acceptability of and adherence to PHSM

☐ Monitor acceptability and adherence of PHSM among individuals and communities (Box 13).

Public support for PHSM is critical to avoiding policy-implementation gaps, increasing adherence and ensuring the effectiveness of measures. The level and dynamic trends of public knowledge, risk perception as well as acceptability of and adherence to measures can be measured through monitoring and evaluation using a social-behavioural science approach.

Examples of tools to generate these insights include infodemic insights, community listening and feedback and repeated cross-sectional surveys (see Box 13). These insights can be used to further tailor RCCE and infodemic management strategies and inform adjustment of the PHSM implementation package and its implementation.

Box 13. How to monitor acceptability of and adherence to PHSM?

How to build an infodemic insights report in six steps *(58)*: an easy-to-use manual to generate an infodemic insights report tailored to your questions and context (e.g. "What are the primary concerns that [population X] have regarding [disease] infection and the implemented PHSM?").

Monitoring acceptance of PHSM can also come from national pulse surveys, social media sentiment analysis, or media monitoring. Examples include:

- national cohort studies like Germany's **COVID-19 Snapshot Monitoring** *(59)*
- the **WHO tool for behavioural insights on COVID-19** *(60)*
- the **World Bank Group Household Poverty Monitoring System** *(61)*
- **United States Centers for Disease Control and Prevention health-care surveys** *(62)*
- **European Commission Eurobarometer public opinion surveys** *(63)*

Community listening and feedback mechanisms: establishing feedback loops and two-way communication channels with communities and community leaders can provide insights into the social acceptance/rejection of PHSM within the community.

Monitoring adherence: requires a multi-faceted approach to accurately measure adoption of PHSM since there is often a gap between reported attitude/acceptance and practice. In addition to the methods mentioned above, direct observation of behaviours, and indirect proxy data (e.g. anonymized phone mobility data, anonymized administrative or health-care records, public event attendance), can be used for monitoring adherence for relevant PHSM.

Evaluating PHSM intervention effectiveness

☐ Evaluate the effectiveness of PHSM interventions and generate context-specific evidence (Box 14).

The effectiveness of PHSM refers to their ability to reduce the risk and scale of transmission of epidemic- and pandemic-prone infectious diseases in real-life settings.

The evaluation of PHSM effectiveness can be complex, due to methodological, ethical and logistical challenges linked to studying multicomponent interventions in emergency contexts. A mixed-methods approach, combining insights from different study designs, can be helpful to achieve an understanding of the indicative effectiveness of interventions when randomized trials cannot be conducted. These research approaches include natural experiments and other observational study designs and modelling and simulation studies.

Box 14. How to evaluate PHSM effectiveness?

PHSM study protocols *(37)*: WHO is developing study protocol templates that can be adapted to specific contexts and facilitate the timely evaluation of PHSM effectiveness; both during and prior to health emergencies. These will be published on the WHO PHSM Initiative research page.

When randomized trials are feasible, their use provides a robust and reliable evidence base concerning the effectiveness of PHSM, which can inform future decision-making. The advantage of randomized studies lies in the approximation of the true effect of the intervention, regardless of circumstances or other potentially confounding factors. To aid this effort, WHO is developing study protocol templates (Box 14) for a variety of PHSM and disease contexts that can be adapted to the specificities of an outbreak in a timely manner.

Final note in this step

At the end of this section, decision-makers will understand the critical role monitoring plays in assessing and refining the PHSM implementation package through the use of standardized methodologies and tools for PHSM policy tracking, routine and real-time data for monitoring consequences, along with social-behavioural insights for assessing community acceptance. Additionally, evaluation of implemented PHSM interventions through research expands the knowledge base on PHSM effectiveness. This comprehensive approach towards monitoring empowers decision-makers to make evidence-informed adjustments to PHSM strategies, mitigate negative impacts, foster public trust and ultimately enhance the overall effectiveness of their response to health emergencies.

4.7 Adjust PHSM: scale up/down, alter components or phase out

Output

Iterative adjustment of the PHSM implementation package (combination of PHSM and corresponding mitigation measures) in response to evolving contexts, with sustained attention to equity and ethical considerations.

Summary of actions in this step

- ☐ Identify and monitor contextually relevant thresholds for epidemiological and other contextual factors that can act as triggers for adjusting the PHSM implementation package (Box 15).
- ☐ Determine which step in the PHSM decision pathway requires revisiting for adjustment.

Box 15. Where to find information on triggers for adjusting PHSM?

Annex 4: contains suggested data sources or resources to review for each of the trigger factors listed.

Annex 6: contains potential emergency proxy data sources for monitoring shorter-term unintended health, health system and socio-economic consequences of PHSM implementation, which may influence social acceptance of PHSM.

Community listening and feedback mechanisms: establishing feedback loops and two-way communication channels with communities and community leaders can provide insights into the social acceptance/rejection of PHSM within the community.

Monitoring acceptance, fatigue, or rejection with PHSM can also be accomplished through national pulse surveys, social media sentiment analysis, media monitoring or infodemic insights reports. See examples listed in Box 13.

Decision considerations

Adjustment of a PHSM implementation package is a continuous and integral step in the cyclical decision pathway, ensuring that PHSM remain responsive to evolving contextual factors. It prompts decision-makers to revisit and refine previous steps – whether selecting, balancing and optimizing the implementation package or designing the implementation strategy. Modifications to both the PHSM implementation package and strategy may be triggered by predefined schedules or locally relevant triggers and thresholds for evolving contextual factors in the country.

4.7.1. Triggers for adjustment

Set schedules for adjusting PHSM

Periodic review may be set by a regular timetable (e.g. weekly or bi-weekly) which may be particularly frequent during the early, evolving phases of a health emergency. As the situation stabilizes, the review schedule can be less frequent or be transitioned to triggers defined by threshold changes.

Review and adjustment of PHSM can also be triggered when risk assessments are updated.

Set thresholds for adjusting PHSM

☐ Identify and monitor contextually relevant thresholds for epidemiological and other contextual factors that can act as triggers for adjustment of PHSM implementation package (Box 14).

Reviews for adjustment may be triggered by changes in thresholds observed in the following contextual factors (see Boxes 12 and 14, Annex 4):

- disease severity, transmissibility, variants
- health-care system capacity
- availability and delivery of MCM
- population immunity
- public acceptance

Real-time data on epidemiological and other contextual factors are essential for detecting when changes cross these thresholds. The thresholds should be reviewed and modified throughout the stages of the health emergency as appropriate. During the preparedness phase, it is important to discuss and agree upon appropriate thresholds for specific threats or modes of transmission, as well as identify data sources and methodology for monitoring these thresholds.

☐ Determine which step in the PHSM decision pathway requires revisiting for adjustment.

Based on the necessary adjustments identified, determine which step in the cyclic PHSM decision-making pathway requires revisiting. For example, adjustment might necessitate a change in the multipronged approach to PHSM response and the level of reliance on PHSM (link to Step 4.1), particularly when hazard and exposure assessments undergo significant updates. Alternatively, an adjustment may require revisiting the balance step (link to Step 4.3) when individual and community acceptability and adherence to PHSM are declining or limited, prompting the selection of alternative measures and/or scaling up mitigation measures to enhance uptake and adherence to PHSM.

Final note in this step

Using schedules or contextually relevant indicators and thresholds, decision-makers can iteratively refine the PHSM implementation package. Reviewing and adjusting the PHSM implementation package alongside updated risk assessments ensure that it remains responsive to the evolving context.

5. Conclusion

Decision-makers face difficult, strenuous and uncertain situations during health emergencies, where they must prioritize and navigate the complexities of PHSM decision-making. For example, they must balance measures that are effective but socially disruptive, cost-effective but logistically burdensome, beneficial for public health but economically disruptive or practical but inequitable or unethical. These decisions require careful calibration, considering interdependent and competing scientific, social, political, operational and local factors in PHSM implementation.

The PHSM Decision Navigator supports decision-makers to evaluate risks, alongside-effectiveness, acceptability, political feasibility, resource constraints and any unintended negative consequences of PHSM prior to implementation, while accounting for evolving epidemiological and contextual factors for adjustment. With the Navigator, they can bridge evidence and action, balance public health benefits and unintended negative consequences of PHSM implementation, strengthen equitable, ethical considerations and improve responsiveness and adaptability of decision-making in dynamic and uncertain contexts.

By adopting a threat-agnostic approach, the Navigator both strengthens preparedness for a range of potential scenarios and enhances the capabilities to respond flexibly and dynamically to evolving crisis, ensuring decisions are grounded in science, equity, ethics and the local, real-time context. The Navigator's systematic process enables decision-makers to comprehensively assess known gaps and uncover critical questions they may not have considered. As a foundational framework, it supports the adaptation and application of decision-making strategies tailored to specific threats, modes of transmission, populations or settings.

In conclusion, the Navigator is a vital tool that supports governments and communities in managing outbreaks, protecting lives and livelihoods, maintaining continuity of business and in-person learning and strengthening community resilience to better withstand future health emergencies.

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Annex 1. Decision pathway steps: summary checklist of actions

☐ 1. Determine the aim and reliance on PHSM for the health emergency response

- ☐ Agree on the operational aim of the response.
- ☐ Assess the degree of reliance on PHSM for the emergency response.

☐ 2. Select a list of PHSM based on the risk and best available evidence

- ☐ Identify PHSM based on assessed risks, aim and degree of reliance on PHSM for the emergency response.
- ☐ List recommended or suggested PHSM relevant to the identified hazard, leveraging existing guidelines, guidance and best available evidence on effectiveness through rapid evidence synthesis using the PHSM Knowledge Hub (Boxes 1, 2 and 3).

☐ 3. Balance feasibility, acceptability, unintended negative consequences of each PHSM being considered, along with corresponding mitigation measures that can reduce adverse consequences

- ☐ Assess the availability of resources and political and legal feasibility for each listed PHSM.
- ☐ Consider the social and cultural acceptability for each listed PHSM.
- ☐ Anticipate potential unintended negative consequences for each listed PHSM (Table 2) and consider the ethical and equity implications for each one (Table 3).
- ☐ Assess whether adequate mitigation measures, which include social protection policies/programmes and community-based intervention, are in place to reduce the unintended negative impacts of PHSM implementation.
- ☐ Understand and identify gaps in current social protection system and consider introducing or expanding social protection measures and/or exploring opportunities to support community-based initiatives (Boxes 5 and 6).
- ☐ Holistically consider all assessed factors together (e.g. feasibility, acceptability and unintended consequences of each PHSM and mitigation measures) using a matrix to refine potential trade-offs and consider alternatives for PHSM with feasibility challenges, significant unintended negative consequences and/or impacts on individual liberties and rights, prioritizing options that achieve the same public health goals.

☐ 4. Optimize and finalize the PHSM implementation package (combination of PHSM and corresponding mitigation measures) as a whole

- ☐ Assess the feasibility and acceptability of the combination of PHSM collectively.
- ☐ Anticipate the cumulative unintended health and socioeconomic consequences of the proposed combination of PHSM.
- ☐ Review the application of guiding principles throughout the decision-making process.
- ☐ Modify and finetune the draft PHSM implementation package to ensure practicality, adherence, minimize harm and promote equity.

☐ 5. Implement the PHSM implementation package using a whole-of-government and whole-of-society approach

- ☐ Continue engaging with communities to solicit feedback on the PHSM implementation package (Box 7) to tailor its implementation strategy.
- ☐ Consider which enabling functions, such as RCCE and infodemic management strategies, can be used to promote uptake and adherence to the PHSM implementation package (Boxes 8–10).

☐ 6. Establish monitoring systems to track announced PHSM policies, monitor their unintended negative consequences and public acceptance and evaluate the effectiveness of PHSM interventions.

- ☐ Track PHSM policies that are being announced and implemented by governments using a standardized methodology (Box 10).
- ☐ Monitor unintended negative consequence of PHSM implementation across health and socioeconomic domains (Box 11).
- ☐ Monitor acceptability and adherence of PHSM among individuals and communities (Box 12).
- ☐ Evaluate the effectiveness of PHS M interventions and generate context-specific evidence (Box 13).

☐ 7. Adjust PHSM (scale up/down, alter components or phase out) based on contextually relevant factors (triggers) and thresholds

- ☐ Identify and monitor contextually relevant thresholds for epidemiological and other contextual factors that can act as triggers for adjusting the PHSM implementation package (Box 15).
- ☐ Determine which step in the PHSM decision pathway requires revisiting for adjustment.

Annex 2. Methods for developing this tool

To develop this Decision Navigator, WHO undertook a multistage process to understand the lessons learned from recent pandemics, analyse gaps and priorities and gather input and feedback from technical experts and key stakeholders in making decisions for PHSM during health emergencies.

- A literature review and landscape analysis were conducted in early 2023 to identify existing PHSM decision-making tools and resources up to February 2023. This review drew on a combination of institutional and academic sources (Google, Google Scholar, WHO official website, along with consultations with other WHO teams). The review identified 12 frameworks and tools, ranging from high-level assessments, risk-based contextual-assessments to effect simulation tools - originating from a mixture of global, regional and national sources primarily from WHO, Europe, Africa, the United States of America, and Australia. Most of these tools were disease-specific rather than threat-specific, and none provided guidance on how to systematically translate risk assessment results into control measures or recommendations for response planning, nor did they address unintended negative consequences or equity. This analysis provided the current landscape of available PHSM decision-making resources.
- A concept note and annotated outline were shared with the PHSM Steering Group representing six regions and three levels of the Organization, internal technical staff and external partners in May 2023.
- The initial concept and scope of the Decision Navigator were discussed with stakeholders from 21 countries during the meeting *Building Coalitions for Strengthening Public Health and Social Measures during Health Emergencies*, held on 14–15 June 2023.
- The proposed decision-making pathway and steps were reviewed and consulted with technical experts from 25 countries during the *Second WHO global technical consultation on public health and social measures during health emergencies,* held on 21–23 November 2023.
- An internal review by the PHSM Steering Group and technical staff, representing the three levels of the Organization, was conducted in September 2024.
- Individual consultations and document reviews with external experts and internal staff – primarily in regions and countries – were undertaken from September 2024 to May 2025.

External experts engaged in the above-mentioned process submitted a declaration of interest to disclose potential conflicts of interest that might affect or might reasonably be perceived to affect their objectivity and independence in relation to the subject matter of this guidance. WHO reviewed each of the declarations and concluded that none could give rise to a potential or reasonably perceived conflict of interest related to the subjects discussed at the meeting or covered by the guidance. Additionally, some external experts were engaged through a project collaboration agreement with WHO through their institutions, such as UK Health Security Agency, ensuring that the collaboration remains compliant with WHO policies.

Annex 3. Critical initial actions for leadership, governance, research and monitoring

Critical initial actions for PHSM refer to priority actions that are to be taken after an initial risk assessment or situation analysis, with the aim to limit onward transmission and contain *(1)* an outbreak.[1]

While initial and early actions may be pathogen and context specific, there are some cross-cutting critical actions and milestones that can be taken during the initial stage of any health emergency in two response domains (Table A3.1):

- **leadership and governance** – actions needed to put in place the mechanisms required for collaboration on PHSM policy-making and research; and
- **research and monitoring** – actions necessary to plan for and implement rapid research and monitoring activities related to PHSM, including novel approaches to gathering and interpreting the scarce data available during the initial stages of PHSM implementation by considering sources that may not be traditionally utilized.

Table A3.1 Milestones and early actions during health emergencies

Milestone	Early actions
PHSM leadership and governance: these actions relate to what is needed to put in place the mechanisms required for collaboration on PHSM implementation and research	
A. Governance and collaboration mechanisms for PHSM implementation are **cross-sectoral** (e.g. human health, animal health, environment, transport, private, industry) and **multilevel** (e.g. global, regional, national and subnational).	• Activate the (public health) emergency operations centre at the appropriate administrative levels with embedded PHSM leadership and expertise to: – engage relevant government agencies and other partners from the health and non-health sectors to define joint strategies; – initiate systematic exchanges of data to monitor changes in epidemiological dynamics and to review health system capacity and contextual factors relevant to PHSM policy. • Activate an advisory board that has a specific mandate to ensure inclusiveness and equity in PHSM policy and implementation; include representatives from diverse communities, local leaders and experts from across sectors.
B. **Communities**, particularly affected and vulnerable groups, **co-lead** decision-making and implementation.	• Identify communities with a disproportionately increased risk of infection and negative impacts of a health emergency and organize and integrate engagement with these communities from risk assessment through PHSM implementation. • Engage with and support civil society organizations in developing PHSM strategies, plans and guidance; include community- and faith-based organizations, and community health care workers.

1 Containment aims to stop transmission by reducing the effective reproduction number (R) to below one. This requires highly stringent application of measures, and is resource- and time-sensitive. Containment measures may halt, delay or reduce the spread and overall impact of a pandemic and may be considered as part of a country's national preparedness plan. Operational decisions need to be based on risk assessments that account for pathogen, exposure and contextual factors including health and socioeconomic capacities and vulnerabilities.

Milestone	Early actions
C. **Legal frameworks** enable PHSM policy development and implementation.	• Initiate and implement PHSM protocols in national and subnational emergency management plans. • Review policy frameworks, legislation, regulations and clear mandates for PHSM policy implementation.
PHSM research and monitoring: these actions relate to what is needed to plan for and implement rapid research and monitoring activities related to PHSM	
D. **Research infrastructure and capacity** are in place to conduct studies of the effectiveness and uptake of and adherence to PHSM and of the health, social and economic consequences of PHSM.	• Activate a scientific committee representing various disciplines and administrative levels to inform decision-makers by synthesizing the best available evidence (e.g. situation analyses, risk assessment, emerging local and international research evidence). • Mobilize researchers to measure the effectiveness and uptake of and adherence to PHSM and the health, social and economic consequences of PHSM. • Adapt existing data collection tools (e.g. study protocol templates), analysis plans and data-sharing systems to the specific disease and context of the outbreak. • Activate accelerated ethical approval for research based on previous agreements and preapprovals. • Pool human and financial resources from existing research infrastructure to prioritize PHSM research during the emergency phase.
E. **PHSM policy monitoring** is initiated.	• Design data collection methods (e.g. disease- and context-specific indicators, data sources) in alignment with WHO's PHSM monitoring guidance to ensure comparable and harmonized monitoring. • Set up a monitoring platform and an analysis and dissemination plan, as well as data-sharing mechanisms.
F. **Feedback loops** are established to inform implementation, uptake and adherence.	• Integrate feedback from at-risk and affected communities, especially those in vulnerable situations. • PHSM policy monitoring insights are disseminated to policymakers, the public and other relevant stakeholders. • Review complementary data (e.g. behavioural or infodemic insights and epidemiological data) to provide a comprehensive interpretation of policies monitoring the results of PHSM.
G. **Data collection and analysis** for infodemic insights are initiated.	• Track narratives for evidence of emerging, re-emerging and persistent trends. • Generate infodemic insights through social listening, both offline and online.
H. **Data collection and analysis** for behavioural insights are initiated.	• Gather evidence to understand the drivers of desired behaviours (e.g. resources people may have access to or need that influence their opportunity to take up PHSM).
I. **Data-sharing mechanisms** are in place between researchers and data holders.	• Review and adapt existing research and data-sharing mechanisms to facilitate multidisciplinary and multisectoral exchanges and the inclusion of all relevant stakeholders.
J. Formal and informal **evidence-to-policy networks and mechanisms** to integrate PHSM evidence and insights into the decision-making process are initiated.	• Convene an interdisciplinary, multilevel expert advisory group at the national level to review the best available evidence and guidance on PHSM or employ precautionary principles to advise on PHSM policy, or both.

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2 All references were accessed on 18 June 2025.

Annex 4. Risk factors relevant to determining the degree of reliance on PHSM

The risk factors outlined in this table can also serve as triggers for adjustment of PHSM, with the addition of social acceptance/rejection of PHSM as trigger for adjustment. For more details on PHSM adjustment, refer to section 4.7.

Table A4.1. Review of risk factors relevant to determining degree of reliance on PHSM*

Categories	Risk factors and sample indicators	Where to find information

Epidemiological situation*	• Transmissibility*
	  – i.e. incidence rate, test positivity rate, hospitalization rate for disease of concern, additional proxy for incidence rate
	• Severity*
	  – i.e. hospitalization rate of cases, intensive care unit admission rate among cases, case fatality ratio
	• Modes of transmission
	• Incubation period and other disease characteristics
	  – i.e. instantaneous reproduction number, epidemic or pandemic potential of pathogen, etc.
	• Epidemiological triad
	  – person/place/time of health emergency
		• Risk assessments
		• If data gaps exist, consider estimates from the same hazard in previous events

Exposure and susceptibility	• Population immunity
	  – i.e. either through prior infections or immunization
	• Exposed and susceptible populations
	  – i.e. affected, at-risk groups or settings, or proportion of population/area affected
	• Vulnerable populations within larger affected, at-risk populations
	• Conditions in which affected population exists that increase population vulnerability
	  – i.e. demographics, underlying health conditions, living conditions, etc.
		• Risk assessments
		• Routine health information system data
		• Data on immunization rates within the country
		• Existing demographic data from the country

Categories	Risk factors and sample indicators	Where to find information
Health system capacity: the ability of a health system to effectively deliver primary health care and effectively scale health services in response to increased demands due to the health emergency	• Health-care system readiness – i.e. current occupancy of hospital beds, intensive care unit beds (for all, not just disease of concern); hospital bed and intensive care unit bed occupancy of patients with disease of concern • Health-care workforce capacity • Availability of essential supplies (personal protective and other equipment, medicines) • Concurrent events that could strain capacity • Testing and diagnostic capacity • Surveillance and reporting capacity • Accessibility of health care services	• Risk assessments • Routine health information system data • PRET planning results • STAR results

Availability of MCM: timely, sufficient and equitable distribution of effective MCM (diagnostics, therapeutics and vaccines)	• Concurrent events that could strain capacity
	• Licensed or WHO prequalified vaccines and vaccine candidates
	• Licensed therapeutics or therapeutic candidates
	• Diagnostics to promptly identify, track and manage potential and confirmed cases
	To assess at national level
	  – stock levels (availability)
	  – distribution efficiency
	  – access (e.g. percentage of regions with adequate supplies, proportion of high-risk populations receiving appropriate MCM)
	  – utilization rates (e.g. percentage of available MCM administered within a specific time frame)
		• National and international stockpile data
		• WHO global procurement and distribution mechanisms
		• PRET planning results

* Additional information on indicators for transmissibility, severity and health system capacity along with their rationale and descriptions can be found in Considerations for implementing and adjusting public health and social measures, WHO *(1)*.

References[1]

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1 All references were accessed on 18 June 2025.

Annex 5. Examples of potential unintended negative health and socioeconomic consequences by PHSM categories

Table A5.1 contains both worked examples of potential unintended consequences of PHSM and a summary of research findings from an overview of systematic reviews that examine the effectiveness and unintended health and socioeconomic consequences of PHSM during the COVID-19 pandemic *(1)*.

Worked examples are presented in *italics* and findings from the overview of systematic reviews on PHSM are shown in **bold**.

The overview of systematic reviews examined single and multicomponent measures within five PHSM categories: active case finding and contact identification, personal protection measures, environmental measures, social measures and international travel and trade measures, along with combinations of measures. This is used to structure the table; additional worked examples have been added to prompt consideration of potential unintended negative consequences pulled from real-world experiences and insights.

The table below is not an exhaustive list of potential PHSM interventions nor all possible unintended negative consequences associated for the listed PHSM. Instead, it is meant to serve as an added resource to aid decision-makers as they consider the potential consequences of certain PHSM.

Table A5.1. Potential unintended consequences mapped by PHSM policies

First-level category of PHSM	Types of PHSM	Health consequences	Health system consequences	Socioeconomic consequences
		Bold = findings from PHSM overview of systematic reviews (number of reviews) *Italics* = worked examples of potential consequences		
Active case finding and contact identification measures Refer to essential strategies that (i) identify, (ii) track and (iii) manage potential and confirmed cases of diseases (e.g. case finding, contact tracing, testing, isolation and quarantine).	Quarantine	• **Decreased mental health and well-being (5 reviews)** • **Disrupted sleeping pattern (4 reviews)** • **Increased alcohol use (2 reviews)** • *Increased substance use* • *Decreased physical activity* • *Difficulty accessing ongoing care services (i.e. dialysis)* • *Domestic violence* • *Increased risk of violence against children* • *Increased risk of temporary child separation and child protection concerns*	• *Staffing shortages when health-care workers are affected*	• **Extended work absences (1 review)** • *Job security (particularly low-wage or gig economy)/financial concerns* • *Extended school absence and learning disruptions* • *Stigmatization against quarantined individuals*
	Isolation	• **Decreased mental health and well-being (4 reviews)** • **Increased alcohol use (1 review)** • *Increased substance use* • *Domestic violence concerns* • *Increased risk of violence against children* • *Increased risk of temporary child separation and child protection concerns*	• *Staffing shortages* • *Strained health-care system and workers (if isolation is in health-care facilities)*	• *Extended workplace absences; job security; financial concerns* • *Extended school absences/learning disruption* • *Stigmatization of individuals in isolation*
	Hand washing	• **Increased risk of dermatological problems (e.g. hand eczema) (1 review)**		

First-level category of PHSM	Types of PHSM	Health consequences	Health system consequences	Socioeconomic consequences
		Bold = findings from PHSM overview of systematic reviews (number of reviews) *Italics* = worked examples of potential consequences		
Personal protection measures Involve personal protective equipment and personal hygiene behaviours (e.g. mask-wearing, hand hygiene and respiratory etiquette).	Mask-wearing	• **Intensified physiological responses (e.g. headaches, increased heart rate, perceived exertion) (1 review)**	• *Reduced mask availability for health-care workers (if supplies are limited)*	• *Reduced social interaction/communication for those who rely on facial cues/lip reading*
	Use of hand sanitizers	• **Increased risk of intoxication due to absorption of disinfectant (1 review)** • *Increased dermatological problems*		
	Personal protective equipment	• **Increased risk of dermatological problems (e.g. hand eczema) (1 review)**	• *Reduced personal protective equipment availability for health-care workers (if supplies are limited)*	
Environmental measures Involve targeting the physical environment through (i) modifications, (ii) repurposing &/or (iii) appropriately maintaining structures (e.g. ventilation, surface cleaning, physical barriers).	(Modified) ventilation schedules	• **Increased thermal discomfort (1 review)** • *Reduced air quality (depending on air pollutants)* • *Increased respiratory problems (depending on air quality/pollutants)*		
	Use of disinfectants	• **Increased skin irritations and respiratory problems (1 review)** • *Allergic reaction*	• *Concern for increased risk of antimicrobial resistance if antimicrobial agents are used*	

First-level category of PHSM	Types of PHSM	Health consequences	Health system consequences	Socioeconomic consequences
Bold = findings from PHSM overview of systematic reviews (number of reviews) *Italics* = worked examples of potential consequences				
Social measures Involve the modification or restriction of (i) social interactions, (ii) services or activities and (iii) movement within and across settings and national borders (e.g. school and business measures, physical distancing).	Physical distancing	• **Decreased mental health and well-being (8 review)** • *Reduced physical activity concerns (if gyms and fitness groups are modified)*		• Economic insecurity/financial distress concerns due to business modifications • Disruption in educational and learning (classroom management, limited space, staffing, etc.) • Reduced social interactions
	Stay-at-home orders	• **Decreased mental health and well-being (8 reviews)** • **Decreased physical activity and diet quality (1 review)** • *Sleep disturbances* • *Domestic violence concerns, including gender-based violence* • *Increased violence against children*	• **Decreased access to emergency health-care services (1 review)** • *Decreased access/disruptions to routine health care (i.e. immunization programmes)* • *Health-care staff availability affected by school or childcare closures due to stay-at home orders*	• *Economic and employment concerns; individual/household financial distress* • *Food insecurity* • *Housing/homelessness concerns (if employment and finances are affected)* • *Reduced social interaction and weakened social bonds* • *Impaired educational and learning outcomes with school closures/modifications/online learning* • *Exacerbation of inequalities with digital divide for students for online learning* • *Increased inequality concerns for low income or marginalized communities or those in informal sector* • *Impaired access to social programmes (for adults and children)*
	School and business closures	• **Decreased mental health and well-being (3 reviews)** • **Decreased physical activity and diet quality (3 reviews)**	• *Health-care staff availability affected by school or childcare closures due to stay-at home orders*	• **Impaired academic achievements and access to social programmes (2 reviews)** • *Exacerbation of inequalities with digital divide for students for online learning* • *Economic and employment insecurity (due to business modifications/closures)*

First-level category of PHSM	Types of PHSM	Health consequences	Health system consequences	Socioeconomic consequences
		Bold = findings from PHSM overview of systematic reviews (number of reviews) *Italics* = worked examples of potential consequences		
	Visiting restrictions (in long term care settings)	• **Decreased mental health and well-being (8 reviews)**		
	Extended physical distancing measures	• *Decreased mental health and well-being, isolation* • *Reduced physical activity concerns (if gyms and fitness groups are modified)*	• *Disruption of routine care if health services need to be modified*	• **Increased economic and employment insecurity (2 reviews)** • *Educational and disrupted learning concerns (classroom management, limited space, staffing, etc.)* • *Reduced social interactions*
International travel and trade measures These adopt a risk-based approach to reduce the travel- and trade-associated exportation, importation and onward transmission of a pathogen across borders (e.g. entry and exit screening, travel bans, upon-arrival quarantine).	Cross-border travel restrictions	• **Decreased mental health and well-being (1 review)**		• *Increased economic and employment insecurity concerns (effects on wages and incomes)*
	Extended implementation of travel restriction measures			• **Economic and employment insecurity (e.g. reduced wages and overall income) (1 review)**

First-level category of PHSM	Types of PHSM	Health consequences	Health system consequences	Socioeconomic consequences
Bold = findings from PHSM overview of systematic reviews (number of reviews) *Italics* = worked examples of potential consequences				
Combinations of interventions Refer to the simultaneous implementation of multiple PHSM on a large-scale (e.g. so-called lockdowns). These interventions mainly include a combination of active case-finding and contact identification measures, social measures and personal protection measures.	Combined interventions	• **Decreased mental health and well-being (16 reviews)** • **Decreased physical activity and mobility, particularly among children and adolescents (13 reviews)** • **Increased violence, particularly among women and children (5 reviews)** • **Deteriorated health outcomes for cancer (3 reviews)** • **Increased sleep problems among children and adolescents (5 reviews)** • **Increased substance use (4 reviews)** • **Unclear effects on food intake and eating behaviours (10 reviews)**	• **Decreased access to both emergency and routine health care services (7 reviews)**	• **Economic and employment insecurity (4 reviews)**

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1 All references were accessed on 18 June 2025

Annex 6. Routine and real-time data sources for monitoring unintended negative consequences of PHSM implementation

To assess unintended negative health and socioeconomic consequences of PHSM implementation and hardship arising from health emergency itself, decision-makers can refer to two types of data.

- Routinely collected data on social determinants of health and broader economic indicators are especially useful to monitor medium to longer term changes in comparison to baseline values such as burden of disease estimates, health inequality and poverty monitoring, Sustainable Development Goal (SDG) indicators and gross domestic product estimates.
- Real-time data sources using ad hoc monitoring are useful to understand the immediate needs and concerns of affected population groups and the health and socioeconomic impacts that affect them. Data sources can include household surveys, pulse surveys and machine learning-informed real-time poverty monitoring, among others.

The WHO Operational framework for monitoring social determinants of health equity *(1)* (specifically Table ES.1 within the framework) provides indicators and identifies routine data sources for monitoring many of the consequences listed below in Table A6.1, many of which are from the United Nations SDG Indicators Database *(2)* and the WHO Global Health Observatory *(3)*. Supplementary and more specific SDG sources are also included in the table below. It is important to note that these data are often collected at global level and disaggregated only to national level. In health emergencies, it is crucial to utilize more granular country- and local-level data on monitoring consequences and associated indicators whenever available.

It should be noted that the sources included in the table are current as of July 2025 and may change or become unavailable without notice. It is essential to verify the accuracy and accessibility of these sources before use.

Table A6.1. Routine and real-time data sources for unintended negative consequences

Unintended negative consequences domains	Range of consequences	Routine data sources*	Real-time data sources
Health consequences	• Interrupted/limited health service utilization (including essential health services at all levels and routine vaccination)	• Electronic IHR States Parties Self-Assessment Annual Reporting Tool *(4)* – trusted and utilized health services (section SPAR C8.2)	• HeRAMS health facility surveys *(5)* during emergency response (health service provision, disruptions in delivery of essential health services, etc.) • National population-based surveys/ household surveys • National health system data who receive treatments, accidents and injuries, mental health services, substance use treatment services, etc. • Population-level mobility data • The Dynamic Preparedness Metric risk index *(6)* for ongoing hazards, vulnerabilities and capacities, updated quarterly
	• Change in incidence and mortality of diseases (other than health emergency of concern)	• WHO Global Health Estimates *(7)* - burden of disease estimates	
	• Mental health and well-being problems (e.g. stress, depression, anxiety, social isolation)	• WHO Mental Health Atlas *(8)*	
	• Increased domestic violence, including gender-based violence	• SDG Target 5.2.1 on intimate partner violence *(9)*	
	• Poor nutritional status/dietary behaviour		
	• Substance abuse	• United Nations Office on Drugs and Crime – Drug use and treatment guidance *(10)*	
	• Insufficient physical activity and mobility		
	• Increased sleep disturbances		
	• Increased accidents and injuries	• SDG Target 5.2.1 on road traffic deaths *(11)* • GPW13 Healthier populations tracer indicator *(12)*	

Unintended negative consequences domains	Range of consequences	Routine data sources*	Real-time data sources
Health system consequences	• Disruption in the delivery of essential health services	• Electronic IHR States Parties Self-Assessment Annual Reporting Tool – continuity of essential health services (section SPAR C8.3) *(13)*	
	• Disruptions in routine immunization programmes	• WHO Immunization Data Portal *(14)* • United Nations Children's Fund immunization coverage estimates dashboard *(15)* • WHO GPW 13 prevent index *(16)* • Immunization Agenda 2030 scorecard *(17)*	
	• Health workforce diversion and burnout	• Electronic IHR States Parties Self-Assessment Annual Reporting Tool – workforce surge during a public health event (section SPAR C6.2) *(18)*	
Socioeconomic consequences	• Interrupted/limited social services utilization		• Pulse/household surveys • School absence data (for children/staff) • Food bank usage/food insecurity surveys • Usage rates of social safety net programmes – food assistance, unemployment claims, etc. • Transactional data – credit card spending, retail sales, etc. • Gross domestic product, industrial production, investments (updated quarterly)
	• Social cohesion/unrest	• World Bank worldwide governance indicators *(19)*	
	• Interrupted learning/disruption of educational attainment	• United Nations Educational, Scientific and Cultural Organization Institute for Statistics Data for the Sustainable Development Goals *(20)*	
	• Absenteeism (children and workers)	• United Nations Educational, Scientific and Cultural Organization Institute for Statistics Data for the Sustainable Development Goals *(20)*	
	• Disruption of child development		
	• Increased gender inequity (increased childcare burden, caregiving roles)		
	• Food insecurity		

Unintended negative consequences domains	Range of consequences	Routine data sources*	Real-time data sources
	• Increased homelessness/decreased access to housing	• OECD affordable housing database *(21)* • OECD housing prices indicator *(22)*	
	• Increased unemployment rates	• International Labour Organization ILOSTAT *(23)*	
	• Reduced economic productivity/growth		
	• Increased poverty	• International Labour Organization ILOSTAT *(23)* • World Bank poverty and inequality platform *(24)* – data for high income economies are mostly from the Luxembourg Income Study database	
	• Household/individual income/financial distress	• WHO GPW13 universal health coverage financial burden estimate *(25)*	

- GPW13: Thirteenth General Programme of Work, 2019–2023; SPAR: States Parties Self-Assessment Annual Report.

* In addition to the United Nations SDG Indicators database and WHO Global Health Observatory, which will contain relevant indicators and data for these consequences, the table lists supplementary and more specific data sources.

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