PERC

Partnership for Evidence-Based Response to COVID-19

Updated November 2021

Designing and implementing a tiered PHSM framework for African Union Member States

Several key steps are recommended when developing an alert-level system (also known as tiered Public Health and Social Measure [PHSM] framework). PERC's COVID-19 Tiered Public Health and Social Measure Framework for Africa describes what a tiered PHSM framework could look like; this instruction manual should be used as a companion to guide African Union (AU) Member States through the process of creating their own systems customized to their specific country context.

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ABOUT PERC

The Partnership for Evidence-Based Response to COVID-19 (PERC) is a public-private partnership that supports evidence-based measures to reduce the impact of COVID-19 on African Union Member States. PERC member organizations are: Africa Centres for Disease Control and Prevention; Resolve to Save Lives, an initiative of Vital Strategies; the World Health Organization; the UK Public Health Rapid Support Team; and the World Economic Forum. Ipsos bring market research expertise and years of data analytic support to the partnership.

Step 1
Engage stakeholders

Establish a core working group and governance structure

This includes high-level political and health leaders who will be the primary group responsible for conveying the PHSM tiers and explaining how they change. It also includes public health, legal and communication experts who can all support best practices and implementation. Generally, PHSM systems are more likely to be followed if they are built with engagement from a wide range of stakeholders, including members of government, scientists, businesspeople, community leaders and cultural groups, all of whom help create the best possible system and become champions for it. Sound public health principles must underlie the categorization, triggers and implications of each action (see Appendix B of PHSM tiered framework guidance).

Step 2
Define key strategic elements of the system

Define its purpose

Clearly define the purpose of the system. What does success look like?

Define its scope

Determine the scope of the system in terms of content (e.g., communicate risk, inform sectors and individuals, both, other) and administrative unit for implementation (national, subnational). National and subnational systems should be consistent in order to facilitate coherent communication and consolidation of indicators. In some cases, certain geographic areas may have different indicators, depending on need.

Determine when the system will start and end (i.e., COVID-19-specific or in place for future infectious disease and/or other threats).

Identify key leadership to create and manage the system

Identify a lead person/agency and technical leads to design and update the system.

Develop a process to review and change tiers.

Assign a group to manage the system on an ongoing basis. This includes gathering input which can provide insight and lead to less opposition and more champions of the system as levels go up and down and up again.

Step 3
Determine the system parameters

The PERC COVID-19 Tiered PHSM Framework proposes indicators and thresholds that were optimized based on available data from all AU Member States. However, indicators were limited by the available data, and the optimal thresholds are expected to vary between Member States because of differences in COVID-19 testing capacity as well as what surveillance and laboratory strategies are implemented. The section below describes how a Member State can adapt the indicators and thresholds from the PHSM framework for application within a specific Member State.

Determine the number of tiers

Most existing alert level frameworks include four or five levels. However, with the introduction of more infectious COVID-19 variants, and surges that peak more quickly, governments have less time to shift between PHSM levels. Thus, this PHSM framework recommends using four tiers.

Describe each tier, using colors and descriptions

As an example, the PERC *Tiered PHSM Framework's* four tiers are described as Standard Precautions, Low Alert, Moderate Alert and High Alert. The framework also presents a color scheme from light to dark blue.

Identify and monitor the data

PERC's *Tiered PHSM Framework* proposes the use of three indicators: 1) daily case incidence, 2) test positivity and 3) percent of hospital beds occupied by COVID-19 patients.

Member States may include other core indicators in their tiered PHSM system, depending on data quality and availability. Member States should assess and include core indicators that best correlate with COVID-19 transmission levels in their context. This can be determined by retrospectively reviewing Member State data on indicator levels during the most recent COVID-19 surge of cases.

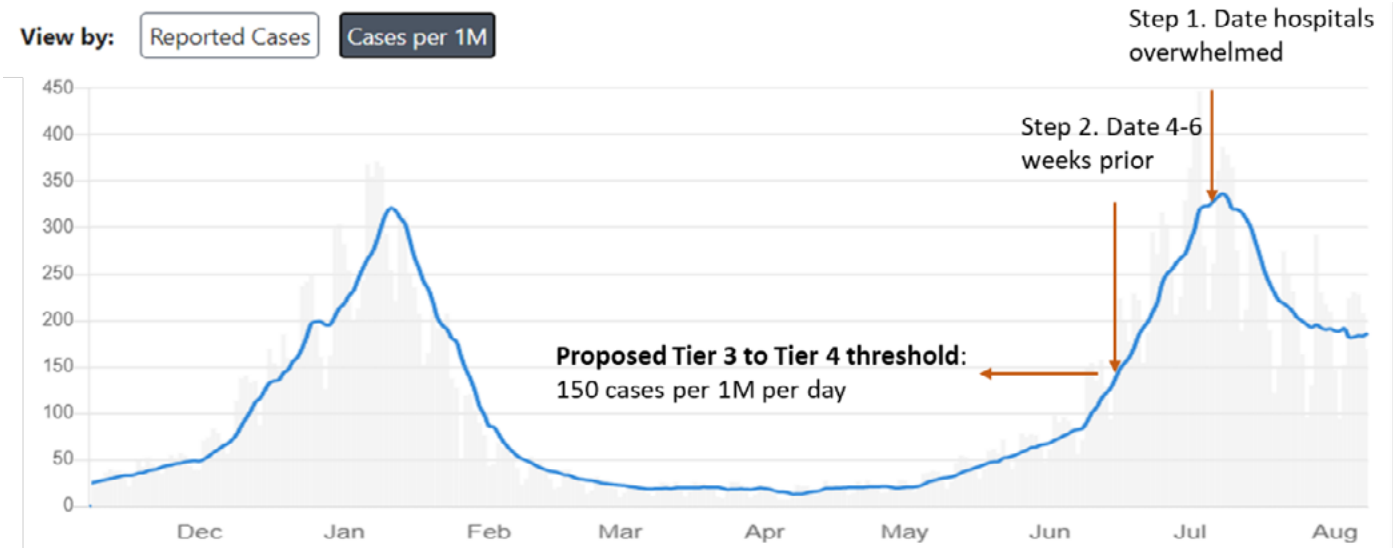
Set indicator thresholds

Thresholds included in PERC's *Tiered PHSM Framework* were optimized for use across all AU Member States. The thresholds can likely be further optimized for use by each specific Member State using data from the most recent surge of cases. The steps below describe how this can be accomplished by first setting the highest, then the lowest, and lastly, the middle threshold. We recommend using round numbers for thresholds to simplify communication to the public.

1. Highest threshold: Tier 3 to Tier 4

- Identify the time-point at which hospitals first reported becoming overwhelmed by COVID-19 cases. This should be the point in time when the quality of patient care began to decline due to the strain on available resources.
- From that date, move backward in time by 4-6 weeks. The value of the indicators at this time point should be used to set this threshold, as the objective is to trigger Tier 4 before hospitals become overwhelmed and allow time for Tier 4 PHSMs to "bend the curve."

Figure 1. An example of how to set the Tier 3 to Tier 4 threshold for the daily case incidence indicator.

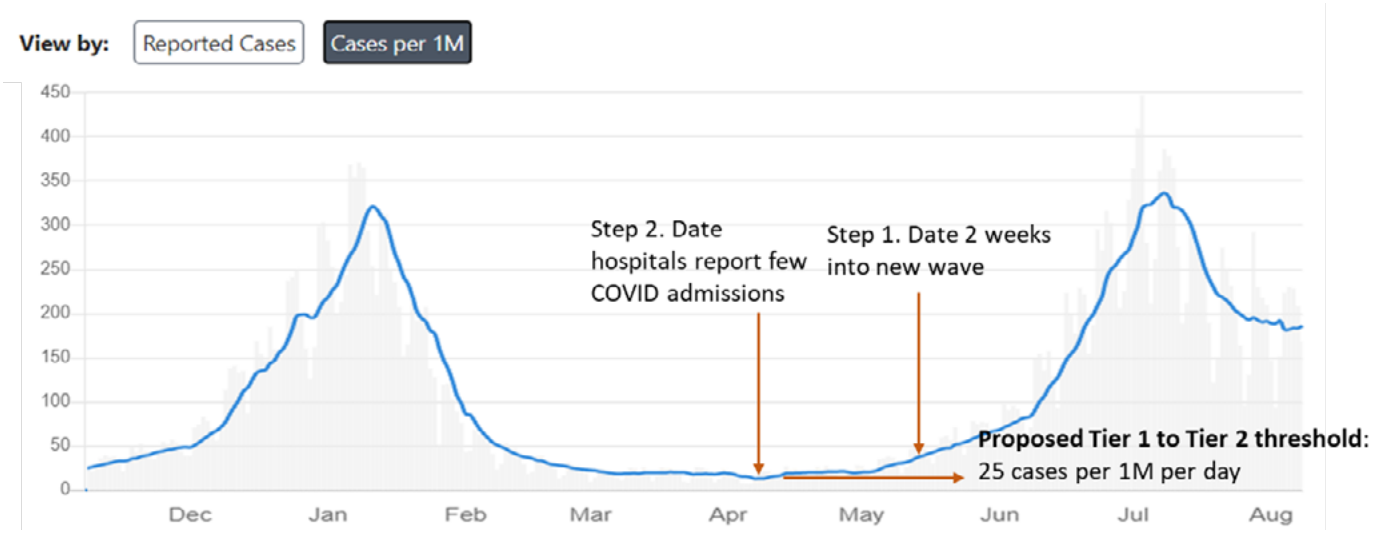


2. Lowest threshold: Tier 1 to Tier 2

- Setting the exact value for this threshold requires a subjective judgment. This threshold should be set at a level at which:
  - Local transmission is limited;
  - Hospitals report very few to no COVID-19 cases;
  - Response capacities are not under strain; and
  - Contact tracing can be done for all cases.
- As a starting point, consider setting this threshold around indicator levels observed during a recent low point in transmission. Review transmission levels and response capacities during this time and consider if Tier 1 PHSM implementation would have been appropriate.

- This threshold should be set lower than indicator levels observed two weeks after the start of the most recent surge, to permit Tier 2 PHSMs an opportunity to reduce transmission at the start of a new surge.
- It is possible that a Member State has not seen transmission levels appropriate for Tier 1 PHSM implementation since the start of a pandemic. PERC still recommends that these Member States include a Tier 1 with few PHSMs in the framework as a goal that should become achievable as vaccination coverage increases.

Figure 2. An example of how to set the Tier 1 to Tier 2 threshold for the daily case incidence indicator.



3. Middle threshold: Tier 2 to Tier 3

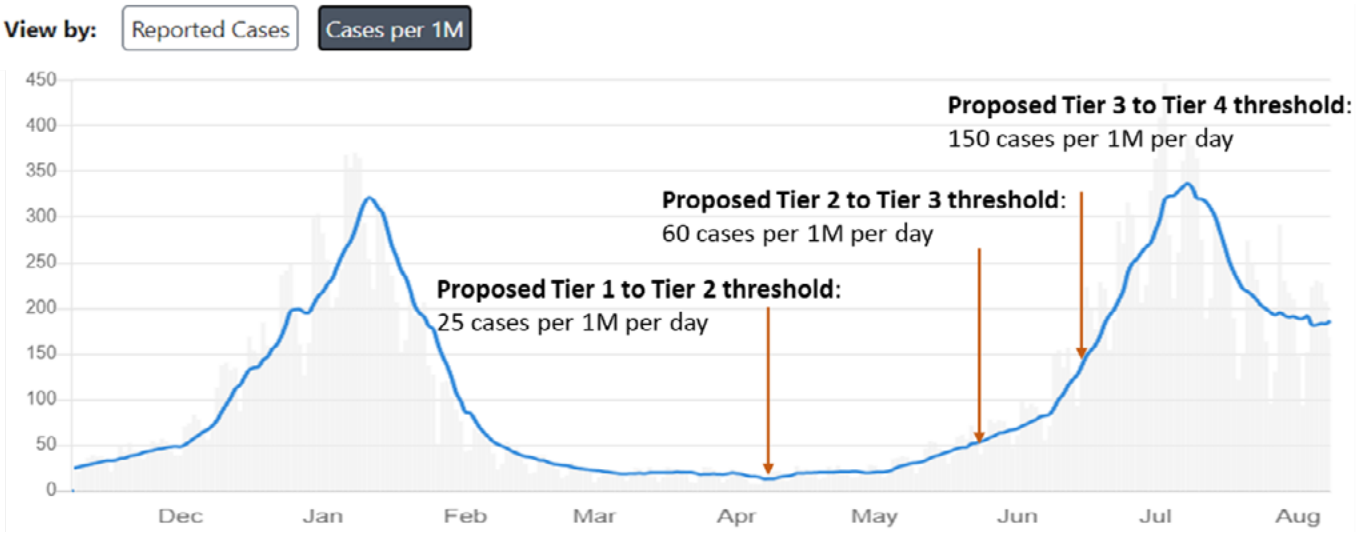
- This threshold should reflect a point at which local transmission is increasing, cases are being identified without known exposures, and localized outbreaks are starting to emerge.
- As a starting point, we suggest setting this threshold at approximately the mid-point between the Tier 1/Tier 2 and Tier 3/Tier 4 incidence thresholds using a logarithmic scale (see equation in Box 1). The mid-point using a logarithmic scale is recommended because it represents the mid-point in time assuming that incidence is increasing at a constant rate, evenly dividing the time Tier 2 and Tier 3 PHSMs have to reduce transmission before proceeding to more restrictive Tier 4 PHSMs.
- To determine the threshold for other indicators (e.g., percent positivity) , identify their value at this same time-point.

BOX 1: Calculating the logarithmic midpoint between lowest and highest thresholds

Logarithmetic midpoint = $(\text{Lowest Threshold} * \text{Highest Threshold})^{0.5}$

Using example in Figure 3: **Logarithmic midpoint: $(25 * 150)^{0.5} = (3750)^{0.5} = 61.2 \approx 60$**

Figure 3. An example of how to set the Tier 2 to Tier 3 threshold for the daily case incidence indicator.



Determine at which administrative level tiers will be assigned

Member States with larger populations may consider implementing the tiered PHSM system at sub-national levels if data are available, indicator performance is meaningful when analyzed at sub-national level, and if populations within sub-national areas are sufficiently self-isolated that recommending different PHSMs is logical. Before implementing at sub-national level, consider the following:

1. **Data availability at sub-national level.** Determine if all indicators can be calculated at sub-national levels on at least a weekly basis.
2. **The performance of indicators and thresholds at the sub-national level.** Review data from the last few months and determine if the PHSM tiers assigned at sub-national level reflected the reality of the epidemic. If indicators shift up and down too often, and in ways that do not correlate with true increases in case incidence, it may be the result of small counts of available data in each sub-national unit (e.g., too few tests done per district). If this is the case, implementation at sub-national level is not recommended.
3. **The ability to communicate PHSM guidance at sub-national level.** Determine if it is possible to communicate different PHSM messages to populations living in different sub-national areas. If different sub-national areas contain common media platforms, assigning these areas different PHSM tiers may confuse the public, which should be avoided.

Determine when and how tiers will be updated

Indicator values and PHSM tier assignments should be reviewed against the latest data at least weekly. When an indicator crosses a threshold, PERC's Tiered PHSM Framework recommends that a multi-sectoral advisory group meet and make the ultimate decision whether to change tiers.

1. As described in *the Tiered PHSM Framework*, this decision should be based on a review of a set of secondary indicators that provide information about the broader outbreak situation, including the health care system, health care worker infections, disease control capacity, economic impacts and social harms. Secondary indicators should be identified through a review of available data and should be routinely reviewed.
2. Ideally, PHSM tier changes should not occur more than once every two weeks, though Member States may be forced to ascend by more than on tier during a rapid surge in cases.

Step 4
Provide clear guidance to support adherence to each tier

At each PHSM tier, clear guidance should be available to describe the implications of the level on routine activities, with specific actions people can take to minimize their risk of infection (see Appendix A for guidance from PERC).

Consider general approaches to reducing risk

- Encouraging outdoor activities (as long as there isn't crowding)
- Reducing density of people and number of interactions
  - Lower occupancy
  - Staggered shifts
  - Working remotely
  - Reinforcing physical distancing at work
- Reducing introduction of infected people
  - Separating customers from employees
  - Screening employees
  - Reducing travel risk of employees
  - Working in lower transmission geographic areas
- Reducing risk to vulnerable groups

Conduct an analysis to determine the sectors that can open using three key considerations

- Risk of transmission
  - Sectors with lower risk of transmission can open first. This includes places where risk can be mitigated easily.
    - Consider the following for each sector (adapted from South Africa)
      - % of employees who can work remotely or out of doors
      - % of workforce that is older than 60 or vulnerable
      - % of workforce in high transmission locations
      - Ability to physically distance 6 feet (2 meters) or more at work
      - Ability to provide masks to all employees
      - Ability to screen all employees
      - Ability to isolate all employees
      - % of employees who use public transportation
      - % of employees who must cross a state, provincial or international border to work
- Impact of continued closing on the sector
  - Sectors that will irreversibly close or fail should be prioritized to open.
- Societal value of the sector
  - Higher value sectors should be prioritized to open.

Develop additional specific guidance

- Sector-specific best practices to prevent transmission (e.g., hygiene, social distancing, masks)
- Modifications to typical practice (e.g., reduced occupancy, telework, takeout food only, redesigned settings, prohibited behaviors)
- Clear directions on what is allowed/not allowed, open/closed

Step 5
Develop the implementation package

Create key communication pieces

- Create simple tools, templates, documents and key messages.
- Create summary and detailed documents describing PHSM tiers for a variety of audiences (i.e., government officials, general public).
- Create translated versions relevant to target populations.
- Develop a website with up-to-date information on the tiered PHSM system.

Create a rollout plan

- Develop a communication plan for the initial release of the tiered PHSM system.
- Include media and community engagement.

Develop ongoing updates including changes in tiers

- Develop an ongoing communication plan.
- Include PHSM tier updates in the existing system for situational updates (e.g., press briefings, written updates).