PERC

Partnership for Evidence-Based Response to COVID-19

Updated June 2021

COVID-19 Tiered Public Health and Social Measure Framework for Africa

Introduction

Tiered public health and social measures (PHSM) systems are a core component of effective COVID-19 preparedness, response and risk communication. These systems use indicators of disease spread to determine the appropriate level of PHSMs at a given time and in a given place, informing targeted interventions that are appropriate for different levels of disease transmission. These systems empower the public to stay safe by keeping people informed about the risk of COVID-19 in their area. If designed and implemented effectively, a tiered PHSM system can help national decision-makers reduce SARS-CoV-2 transmission and save lives while avoiding the implementation of PHSMs that are unnecessarily harsh or disruptive socially and/or economically. Finding this balance is crucial in the ongoing fight against COVID-19.

As of May 2021, few African Union (AU) Member States have implemented tiered PHSM or alert-level systems for COVID-19 at the national level to guide PHSM implementation (Appendix C); these efforts do not address regional or continental level situational awareness. The Partnership for Evidence-Based Response for COVID-19 (PERC) has developed a continent-level dashboard to provide this situational awareness.

This document describes the continent-level PHSM dashboard and explains how this framework can be **adapted to a national COVID-19 tiered PHSM system**.

Proposed tiered PHSM system

At the continent-wide level, the PERC dashboard uses a four-tiered COVID-19 PHSM system. This number of tiers allows adequate targeting of PHSMs to disease transmission levels while avoiding overly complex messaging. To determine the PHSM tier, we use two core indicators that illustrate the burden of COVID-19 within a nation. The overall PHSM tier for each Member State is set by the **higher of the two** proposed core indicators, each of which is correlated with the amount of COVID-19 transmission within a region at a specific time.

The first core indicator, **daily case incidence** is a measure of COVID-19 spread within a community. This indicator's validity is dependent on a country's ability to test and diagnose individuals with COVID-19. In settings where the population has inadequate access to testing, most infected individuals may go undiagnosed; therefore, this indicator may dramatically underestimate the true infection prevalence, resulting in a low case-to-infection ratio. The performance of this indicator may be sub-optimal in countries with low testing rates per capita. Although there is no specific testing target because testing volume should vary at different stages of the pandemic, for the week of 26 April to 2 May 2021, the median testing rate across Member States was 837 tests/1M/week. **Member States with much higher or lower testing rates may benefit from threshold adjustments when tailoring daily case incidence thresholds to a specific country context.**

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 and Novetta Mission Analytics bring market research expertise and years of data analytic support to the partnership.

COVID-19 PHSM Tiers and Thresholds

	Indicator thresholds for each tier			
Core Indicators	**Tier 1** Standard Precautions	**Tier 2** Low Alert	**Tier 3** Moderate Alert	**Tier 4** High Alert
Daily case incidence *(new cases per 1M people per day, 7 day average)*	‹5	5- ‹20	20 - ‹80	≥80
Test positivity rate *(last 14 days)*[1, 2]	‹3%	3% - ‹5%	5% - ‹12%	≥12%
If data is available: *The percentage of hospital beds occupied by COVID-19 patients*[3]	N/A	N/A	N/A	≥20%

We use **test positivity** as a second core indicator because this value will increase as testing strategies change to more specific case definitions when testing capacity is overwhelmed. The accuracy of daily case incidence as an indicator of infection burden can vary depending on the epidemic situation. For example, when COVID-19 testing capacity is overwhelmed by a surge of cases, case counts are more likely to be significant underestimates of the true numbers of infections. In times when testing capacity is stretched, testing strategies may shift to prioritize testing only symptomatic or hospitalized individuals. This may cause an increasing proportion of infections to go undiagnosed, especially mild and asymptomatic infections. Thus, we use test positivity as a second core indicator.

The thresholds for these indicators were determined by reviewing data for all Member States through March 2021. We attempted to set thresholds that could be applied to all Member States, such that Member States would be at Tier 1 when experiencing low levels of transmission and be at Tier 4 when experiencing high levels of transmission, but before hospital capacity is overwhelmed. However, due to differences in testing strategies and capacities between Member States, there was no single set of thresholds that performed optimally for all Member States. Thus, **Member States should review the performance of proposed thresholds for their specific context and adjust them as necessary**. And once thresholds have been set, Member States should assess the performance of their thresholds over time, as testing capacity and factors contributing to disease spread (such as new variants) continue to change.

While the PHSM tier dashboard includes only two core indicators, **if the data are available we recommend that countries add a third core indicator based on the percentage of hospital beds occupied**. When this indicator shows that hospitals are approaching capacity, we recommend that it trigger the most restrictive PHSMs – Tier 4. The exact indicator and thresholds may vary based on data available for the Member State, but could include ›20% of all hospital beds occupied by COVID-19 cases to trigger Tier 4. It is up to the discretion of each Member State to determine if they would use a hospital capacity indicator to trigger all PHSM tiers or only Tier 4. This decision can be made by reviewing historical data to assess how hospital capacity changed during previous COVID-19 waves. The main objective is for this indicator to trigger Tier 4 approximately 4-6 weeks before hospitals would become overwhelmed, which would allow time for Tier 4 PHSMs to "bend the curve" and prevent a scenario where patient care is compromised by an overwhelmed health care system.

We recognize that the quality of data on daily case incidence, test positivity and hospital capacity varies across Member States. Considering their specific context, data quality and data availability, Member States may choose to include other core indicators in their tiered PHSM system. For example, death rates could be used to trigger changes in PHSM tiers (this PHSM system does not incorporate deaths because it is a lagging indicator, typically behind cases by two to three weeks).

1 This includes both antigen and PCR tests as described by the WHO case definition and Africa CDC guidelines.

2 We presented this indicator as percent positivity, to be consistent with WHO guidance. If a Member State prefers, it can present an equivalent indicator using the test-to-case ratio with the following thresholds: ›33.3, 33.3 to ›20, 20 to ›8.3, and ≤8.3.

3 This indicator is not included in the PHSM Tiers Dashboard because the data is not readily available in a timely manner for most Member States.

Linking core indicators to PHSM guidance

In this framework, changes in PHSM tier, whether up or down, are determined by data. The prompt to change from one tier to another is a core indicator crossing a pre-specified threshold. Each proposed PHSM tier should link to clear guidance on which activities are permitted and restricted at that level and which PHSMs should be adopted. A simple, clear infographic is the ideal way to communicate this information (Appendix A). The recommendations at each tier should be based on existing scientific evidence around which activities increase risk of COVID-19 spread, and which PHSMs decrease risk (Appendix B). **Our framework includes an example of how PHSMs can be assigned at each tier; this guidance can be adapted to fit each Member State's local context**. Member States may also decide to implement different PHSMs in different settings. For example, rural and urban areas may implement different restrictions at the same tier if their primary venues for COVID-19 transmission vary.

As vaccination coverage increases, Member States may consider implementing individualized PHSMs that vary based on vaccination status. If this approach may be applicable to a Member States' country context, more information is available from WHO. In addition, with the emergence of more infectious COVID-19 variants, it remains critical that everyone continue to wear a mask and socially distance when possible to decrease transmission, regardless of vaccination status, especially when incidence rates are elevated.

Transitioning between PSHM tiers

In this dashboard, the overall PHSM tier for each Member State is determined by the higher of the two proposed core indicators. However, when implementing at country level, the **ultimate decision to change tiers should be made by a multi-sectoral advisory group**. When an indicator crosses a pre-specified threshold, this group should meet and review the disease situation, including the presence of variants of concern, mortality rates per capita, weekly trends in incidence rates, weekly trends in death rates, and health system capacities such as available oxygen supply. Additionally, the advisory group should go beyond health indicators and assess the economic, political and social context, considering societal elements that may be affected by a PHSM tier change. **Member States may define a set of secondary indicators that provide information about the outbreak situation**, such as health care system, health care worker infections, disease control capacity, economic impact and social harm to inform this decision. The advisory group can agree to change PHSM tiers or to defer the change and provide a revised set of conditions for when a change should occur. Decisions should be made with local community input.

To avoid confusing the public and to allow sufficient time for PHSMs to impact COVID-19 transmission, **PHSM tier changes should not occur more than once every two weeks, though Member States may be forced to increase tiers more frequently during a rapid surge in cases.** When decreasing tiers, ideally changes are made even less frequently, to avoid a possible resurgence of cases, though detrimental secondary impacts of PHSMs must be taken into account. In some cases, ascending more than one tier may be necessary (although threshold differences between tiers should be broad enough to make this uncommon). For example, if a Member State is at "Tier 2" but hospitals experience a sudden large increase in COVID-19 cases, ascension to ascension to "Tier 4" may be necessary.

PHSM implementation at the subnational level

The dashboard assigns a single PHSM tier to each Member State, providing an overall estimate of the current outbreak severity in each country and indicating the types of PHSMs that may be appropriate. **However, for Member States choosing to adopt their own national tiered PHSM systems, assigning tiers at the subnational level may be more appropriate**, depending on the size and population of the country. Assigning PHSM tiers at the subnational level may permit more precise targeting of PHSMs to the areas facing high levels of COVID-19 transmission. However, overly granular implementation should be avoided where testing numbers are low, as this can lead to unstable and inaccurate estimates of COVID-19 disease spread. Evaluating the performance of the tiered PHSM system using historical data can inform decisions around the appropriate level of geographic granularity for a specific setting; caution is warranted when applying these indicators to regions reporting fewer than 100 tests per week. Applying the PHSM system to regions with inadequate test data can lead to imprecise estimates of the core indicators, resulting in shifts in PHSM tiers that do not track true transmission levels.

Conclusion

A national tiered PHSM framework developed and implemented using the best practices described in this framework can help keep communities healthy and safe while minimizing social and economic disruption. A tiered PHSM system can allow economically and socially important activities to continue while the epidemic is under control, resorting to stronger measures only when necessary. PHSM measures should be evidence-based, geographically targeted, protective of the health care system and supportive of the most vulnerable populations. If designed well and implemented consistently, systems can empower officials to communicate effectively with constituents, guide communities through a cohesive response strategy, build public trust and encourage community support of necessary preventive measures. This will limit both the economic and health damage of COVID-19.

Appendix A: Example PHSM Recommendations by Tier

This is an example of sector-specific modifications that could be introduced at each tier. Modifications can be made to align with country-specific contexts. Other preventive measures that are not specific to context, including universal mask-wearing in public settings, maintaining physical distances of at least one metre in public areas, consistent hand-washing and good environmental ventilation, are not included in the table; those preventive measures should be applied across all sectors in Tiers 1-4.

Activity or Sector	Tier 1	Tier 2	Tier 3	Tier 4
School: Early childhood and Primary	**All in-person**	**All in-person** Students at desks to extent possible; recess in cohorts[4]	**All in-person** Reduced capacity to maintain 2 metres between students with students at desks; cohorting of students at all times	**Staggered[5] or partially remote[6] if possible** Reduced capacity to maintain 2 metres between students with students at desks; cohorting of students at all times
School: Secondary	**All in-person**	**All in-person** If possible, maintain 2 metres between students with students at desks, meals in classrooms, cohorting of students at all times	**Staggered or partially remote, if possible** Reduced capacity to allow 2 metres between students with students at desks; cohorting of students	**Staggered or partially remote, if possible** Reduced capacity so 2 metres between students with students at desks; cohorting of students
Higher Ed	**All in-person**	**All in-person** Maintain 2 metres between students in classrooms and public areas	**Staggered or partially remote, if possible** Maintain 2 metres between students in classrooms; capacity limit in public and recreational areas	**Full remote or consider full-time on campus (i.e., no leaving campus), if possible** Maintain 2 metres between students in classroom; capacity limit in public and recreational areas

4 Cohort and cohorting: a cohort is a small group within which people interact. "Cohorting" in the school setting refers to the practice of forming and maintaining small groups of students (and possibly teachers) throughout the entire school day and over time. If there is a case of COVID-19 in a school and students have been in cohorts, the number of people who may be exposed will be limited, it will be easy to identify all exposed individuals quickly and school-wide disruptions will be minimized.

5 Stagger: the practice of arranging a schedule so that not all individuals are present at once. In the school setting, staggered classroom schedules may be adopted when students are cohorted and there is not enough space to have all cohorts present as well as safely separated from each other. In such a case, some cohorts might attend school in the morning and some in the afternoon. Staggering may also be practiced outside the classroom; for example, cohorts may be asked to arrive and depart from school on different schedules to reduce crowding around the school.

6 Remote: learning by distance. Requires access to distance learning technology and tools. Remote education may be used in conjunction with staggering to allow full-time education without all students physically present at school.

Activity or Sector	Tier 1	Tier 2	Tier 3	Tier 4
Premises where alcohol consumed	**Open**	**Indoor:** Limit capacity and seated only Minimum 2 metres between parties indoor/outdoor	**Indoor:** Closed **Outdoor:** Open with limited capacity, seated only, minimum 2 metres between parties AND early closure	**Closed** (curbside/pick-up/ take-away available)
Restaurants - without liquor sales	**Open**	**Indoor:** Limit capacity Minimum 2 metres between parties indoor/outdoor	**Indoor:** Closed **Outdoor:** Open with limited capacity, seated only, AND minimum 2 metres between parties	**Closed** (curbside/pick-up/ take-away available)
Indoor workplaces *(offices, factories)*	**Open**	**Work remotely where possible** Limit capacity as necessary to maintain minimum 2 metres between people; minimize movement within workplace	**Work remotely where possible, no in-person meetings** Limit capacity to maintain minimum 2 metres between people; minimize movement within workplace	**Remote or closed except essential staff**
Outdoor workplaces *(farms, construction)*	**Open**	**Limit capacity as necessary to maintain minimum 1 metre between people**	**Limit capacity as necessary to maintain minimum 1 metre between people**	**Only essential open** Limit capacity as necessary to maintain minimum 2 metres between people
Indoor retail *(including grocery stores)*	**Open**	**Limit capacity as necessary to maintain minimum 2 metres between people**	**Open for certain hours, specifically open only for vulnerable populations.** **Limit capacity of large indoor venues (i.e., malls) to 50% and maintain minimum 2 metres between people**	**Closed except essential** (curbside/pick-up/take-away available for all) **Capacity for essential** Maximum 20% AND minimum 2 metres physical distancing

Activity or Sector	Tier 1	Tier 2	Tier 3	Tier 4
Outdoor market	**Open**	**Limit capacity as necessary to maintain minimum 1 metre between people**	**Limit capacity as necessary to maintain minimum 2 metres between people**	**Limit capacity as necessary to maintain minimum 2 metres between people; unidirectional foot traffic**
Places of Worship, Weddings, Funerals	**Open**	**Maintain 2 metres distancing between households indoors; outdoors preferred** Masks obligatory if singing indoors	**No indoor services** Limit capacity outdoors AND minimum 2 metres between households; no singing	**Remote or virtual if possible; if not, outdoor services only; no singing**
Gyms/ Fitness	**Open** Full, as long as 2 metres distancing is maintained while exercising	**Limited capacity AND at least 3 metres distancing while exercising** Masks must be worn; no indoor group classes; locker rooms closed	**Closed for all indoor activities** **Open for outdoor exercising with least 3 metres distancing** Masks must be worn; no group classes	**Closed**
Events *(concerts, conferences, exhibitions, elections)*	**Open**	**Indoor venues:** Maintain 2 metres distancing between households **Outdoor venues:** Limited capacity, masks obligatory	**Indoor venues:** All closed **Outdoor venues:** Limited capacity with 2 metres distancing between households Masks obligatory	**Closed**
Cultural institutions *(museums, libraries, zoos, gardens)*	**Open**	**Limited capacity outdoor** **Indoor allowed** if 2 metres distancing is possible and masks are obligatory	**Indoor:** Closed **Outdoor:** Limited capacity if 2 metres distancing is possible, and masks are obligatory	**Closed**

Activity or Sector	Tier 1	Tier 2	Tier 3	Tier 4
Sports and recreation *(includes players and spectators)*	**Open**	**Limited capacity indoor AND 2 metres between spectator parties** Spectators to wear masks **Contact sports *(football, wrestling, rugby):*** professional and amateur *(non-recreational)* athletes only **Recreational teams:** Non-contact only, outdoor only; teams limited to 10 people; no travel	**Individual outdoor exercise allowed** Group sports open only to professional athletes; closed to spectators; limited travel, if possible	**Individual outdoor exercise only**
Personal care *(salon, spa, barber, nails, massage)*	**Open**	**Limited capacity AND 2 metres between patrons** Masks must be worn	**Indoor closed unless 2 metres between patron and service provider possible**	**Closed**
Private social gatherings	**Open**	**Maximum 50 people AND 2 metres distancing between households; outdoors preferred**	**Outdoor only** Maximum 2 households AND 2 metres distancing between households	**Own household only**
Public transport	**Open**	**Mask required for all passengers and drivers; vehicles max 70% capacity**	**Mask required for all passengers and drivers** **Motorcycles:** 1 passenger only **Other vehicles:** Middle seats empty, max 70% capacity for short trips and max 50% capacity for long-distance trips **Private car:** 2 passengers or 1 household max; windows open when possible	**Mask required for all passengers and drivers** **Motorcycles:** 1 passenger only **Other vehicles:** Middle seats empty and max 50% capacity for all trips **Private car:** 1 household max; windows open when possible

Appendix B: Evidence base for recommendations

Any activity involving close contact between persons can increase risk for transmission of SARS-CoV-2, the virus that causes COVID-19. This risk can be decreased through a variety of public health and social measures (PHSMs) that individuals, establishments and communities may adopt. Public health and social measures include protective measures that individuals can observe such as mask-wearing, physical distancing and hand-washing, as well as environmental controls such as improved indoor ventilation and disinfection protocols. Some of these PHSMs may be more relevant to certain activities and settings than others, but all of them play a role in making activities safer during the COVID-19 pandemic. For example, the risk of transmission on public transportation can be reduced by limiting non-essential travel, maintaining physical distancing in queues and on vehicles, wearing masks especially when distancing cannot be maintained, and disinfecting high-touch surfaces. Similarly, the risk of transmission associated with indoor gyms can be reduced by improving ventilation, disinfecting equipment, wearing masks and enforcing capacity limits that allow for physical distancing. Risks associated with private social gatherings can be mitigated by reducing the number of people involved, socializing outdoors, maintaining physical distance and wearing masks.

The following is an overview of PHSMs that can be used to mitigate risk and the scientific evidence supporting their application to reduce morbidity and mortality from COVID-19. This should serve as a foundation for decisions around risk mitigation during various activities and in various settings during the COVID-19 pandemic. Some PHSMs may be thought of as universal, and some PHSMs are more critical during specific activities. One factor that impacts COVID-19 risk across all activities is the prevalence of the disease in the community. Where COVID-19 is highly prevalent, temporary suspension of some social or economic activities may be prudent to reduce disease spread.

Masks

The correct use of non-medical face masks in the community to prevent transmission of SARS-CoV-2 is recommended by public health authorities. Studies have shown that cloth masks can filter droplets of many sizes. Some cloth masks, especially those made of high thread-count materials that include multiple layers, can efficiently filter even very small droplets. Such masks can be made at home. The benefit of widespread community mask wearing is derived from a combination of two approaches to reducing the spread of COVID-19: "source control," where the emission of virus-laden droplets from those who may or may not be aware of their infection is blocked, and personal protection for the mask-wearer. The fact that viral loads are high during presymptomatic phases, and that asymptomatic and presymptomatic people may significantly contribute to transmission, provides the theoretical basis for widespread community mask use. Studies have shown that people with COVID-19 who wear masks before they develop symptoms are less likely to transmit the disease to others in their household. There is compelling evidence that masks also protect the people wearing the masks from infection. Studies show that non-medical masks significantly reduce wearer exposure to aerosols, and observational data suggest that masks protect wearers from infection. There is evidence from a variety of settings that widespread mask use in the community, in combination other personal protective measures, reduces the spread of SARS-CoV-2. Mask use is most important indoors, especially in poorly ventilated areas, and when physical distancing cannot be maintained.

Mask use is also important within households when the risk of transmission is higher such as when a household member has been diagnosed with COVID-19, has symptoms of COVID-19 or has been exposed to someone with COVID-19. In these situations, both the patient and caregiver should wear masks correctly when near each other.

Physical distancing

Physical distancing can decrease the spread of COVID-19. Contacts of people with COVID-19 are at risk of infection in large part because they may be exposed to virus-laden respiratory droplets. Transmission is facilitated by proximity, duration of exposure and number of contacts; physical distancing can reduce these risk parameters. Although it can be difficult to disaggregate the effects of physical distancing from the effects of other mitigation measures, a systematic review and meta-analysis found that physical distancing of at least one metre is associated with a 70% reduction in SARS-CoV-2 infections, and that risk of infection decreased over longer distances. Physical distancing should be widely practiced in the community because presymptomatic and asymptomatic infected people can transmit COVID-19. Within households, living with someone who has been diagnosed with COVID-19 is a significant risk factor for infection, and physical distancing is recommended to prevent transmission. Physical distancing is particularly important indoors, especially where ventilation is limited, many people are present or masks are not consistently worn.

Hand hygiene

Public health authorities recommend that hand hygiene be used in the community to stop the spread of COVID-19. There is a wealth of evidence that hand hygiene can reduce the spread of infectious diseases including those caused by respiratory viruses. In addition, there are data that suggest that SARS-CoV-2 can survive for prolonged periods on human skin. For those who are infected with SARS-CoV-2, including those who are presymptomatic or asymptomatic, hands may be contaminated with virus by breathing or coughing on them and/or by touching contaminated body parts. For those who are susceptible, hands may be contaminated by touching infected people or contaminated surfaces (see "disinfection," below), and in this way, virus can be transferred to parts of the body where infection can be seeded. This body of evidence makes a compelling argument for the simple practice of hand hygiene which can be practiced effectively by washing hands thoroughly with soap and water or using an alcohol-based hand rub.

Ventilation and outdoor environments

COVID-19 is spread mainly when an infected person breathes out respiratory droplets and particles that contain the SARS-CoV-2 virus. Ensuring good environmental ventilation is recommended by the World Health Organization as an evidence-based strategy to reduce COVID-19 transmission. Multiple studies have shown evidence of increased transmission of respiratory viruses, including SARS-CoV-2, indoors. Ventilation has been shown to decrease the concentration of SARS-CoV-2 in indoor air samples. Enhanced ventilation may be particularly important in crowded indoor spaces, when masks are not worn, or when activities that may generate more respiratory particles are performed (e.g., singing, exercising or speaking loudly). Indoor environments with overcrowding and less ventilation may also be more conducive to superspreader events. Ventilation in indoor environments may be improved by opening doors and windows, and fans may be used to increase the effectiveness of open windows. However, recirculation of indoor air in poorly ventilated spaces should be avoided. Moving activities outdoors when possible is a very effective way to minimize exposure to respiratory particles. In a study of 318 outbreaks in China, no outbreaks involving at least three cases were linked to open-air environments. A review of evidence on SARS-CoV-2 transmission linked to outdoor environments found few examples of outdoor transmission among approximately 25,000 cases considered, suggesting that the risk of outdoor transmission is low. When outdoor transmission did occur, it was often associated with reduced physical distancing, increased crowd density, physical contact and extended durations of contact.

Transmission of SARS-CoV-2 associated with primary and secondary schools

The closure of schools and related programs can detrimentally affect the education and general health and well-being of children. Unfortunately, in the months since many schools have reopened for in-person learning, there has been a surge in COVID-19 cases across the world. However, data suggest that in-person education does not necessarily contribute to the spread of COVID-19 in communities when PHSMs are implemented and that, within school settings, students and staff can be kept relatively safe. Decisions on whether and how to conduct in-person education when there is community transmission of SARS-CoV-2 should consider the local epidemiology of COVID-19, the community control measures in place, the capacity of schools to operate safely and the impact of school closures on the education and general wellbeing of children. There are some evidence-based principles that may be used to guide such decisions. Children under the age of 18 have accounted for a relatively small proportion of cases relative to their population. Fewer cases of severe disease and fewer deaths have been reported among children compared to other age groups. Younger children do not appear to transmit SARS-CoV-2 as efficiently as adolescents or adults. A review of current data on the role of schools in COVID-19 transmission and a summary of epidemiologic data from Europe suggested that community transmission is an important driver of school transmission rather than the reverse; that when school-associated outbreaks occur they typically include few cases; and that the risk of transmission from children, especially primary school-aged children, within school settings is low. In addition, the implementation of PHSMs appears to limit COVID-19 spread within schools, and the school-associated outbreaks that have occurred have been associated with lack of PHSMs in the school setting. Among school-age children, a number of cases have been linked to extra-curricular activities such as overnight camps, high-contact extra-curricular sports and social activities. Households are also important risk environments, as illustrated by contact tracing studies showing that school-attending children with COVID-19 are more likely to have acquired the infection within their households than at school In terms of the risk to school staff, evidence suggests that transmission in schools is more likely amongst adults than children, but teachers may not be at increased risk of COVID-19 relative to adults working other jobs. Ultimately, when there is transmission of SARS-CoV-2 in the community, it may be safe for children, staff and the community to keep schools open as long as appropriate safety measures are in place.

Appendix C: African Union Member States with tiered PHSM or alert-level systems

Country	Website
South Africa	https://www.gov.za/covid-19/about/about-alert-system#