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Risk based assessment and implementation of Public Health and Social measures for control of COVID-19

Proposed Six-Tiered Hazard Model

A paper prepared by the College of Community Physicians of Sri Lanka and the MD Community Medicine 2020/2021 Batch

1. Background

Sri Lanka has been going through an initial slow increase of cases followed by a sizeable and sustained peak of COVID-19, and is currently at a crucial stage of the most devastating rise in cases we have seen so far. The effect of the pandemic on day-to-day life is exponentially increasing. Although small-scale divisional isolations and inter-provincial movement restrictions have already been imposed, there seems to be a lack of scientific basis for the level of interventions. Scientific and evidence-based decision making is of utmost importance at this critical point in time. It is crucial to take into consideration the transmission status and health system response capacity in such decision making.

The purpose of this paper is to propose a scientific approach that could be adopted in making timely decisions with regards to Public Health and Social Measures (PHSM). The framework can be used in decision making at the regional level throughout the pandemic. This framework will help maintain the 'new normal life' in the backdrop of the pandemic, while enabling the maximum level of economic activities in a given transmission status.

As observed in the early stages of the epidemic, the distribution of cases markedly varies in different localities. Case incidence largely depends on the population density and the geographical location (figures 1 and 2).

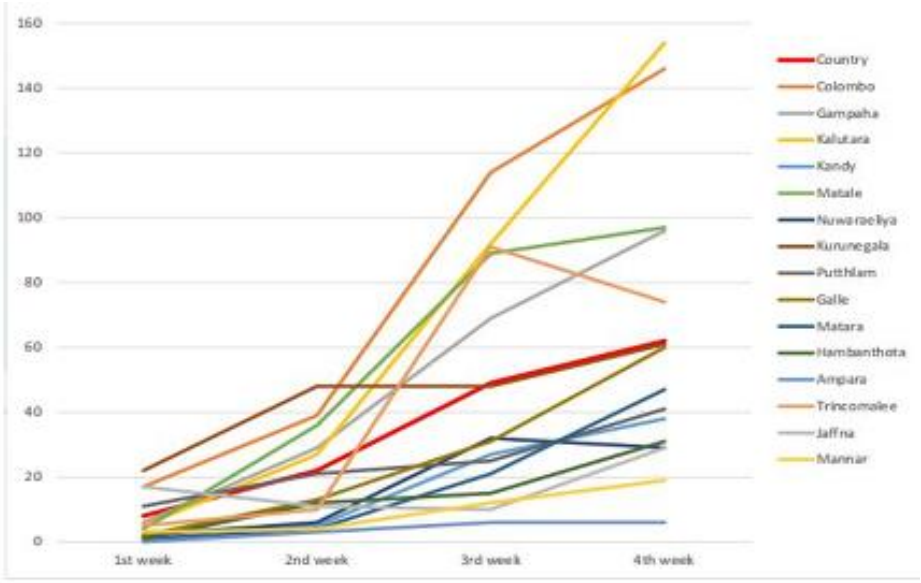

Figure 1. *Weekly cumulative incidence per 100,000 population from 14.04.2021 to 13.05.2021*

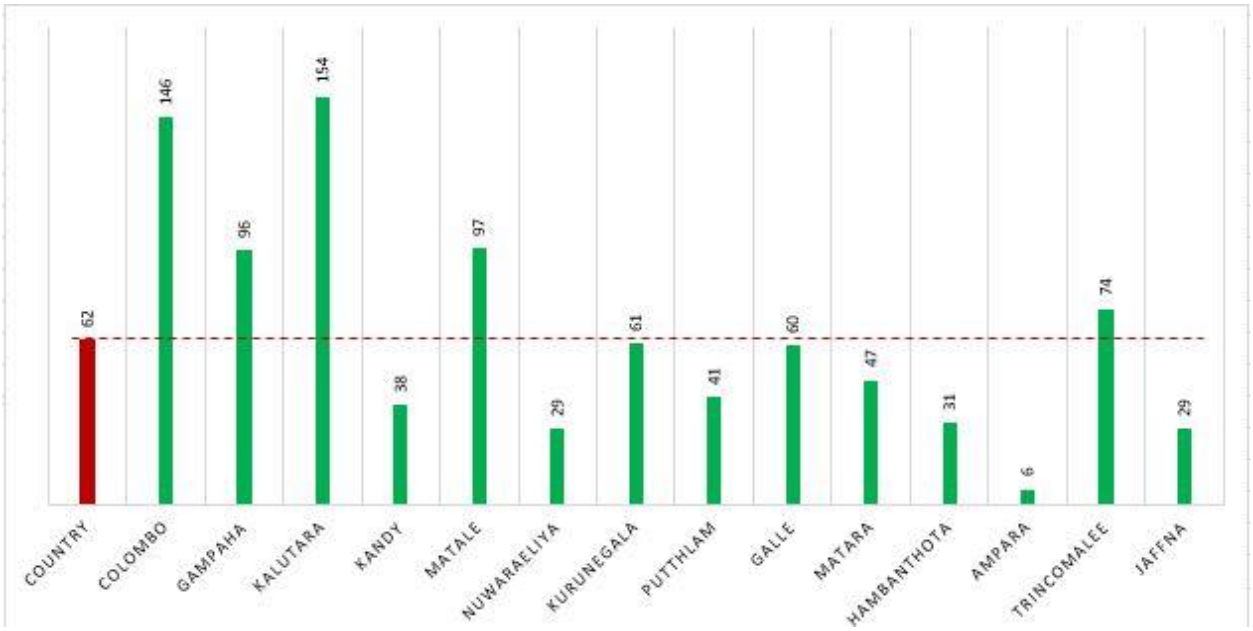

Figure 2 - *Weekly incidence of COVID-19 per 100,000 population* during the last 7 days (05.05.2021 - 12.05.2021)*

** Taken from the 2019 midyear population data*

It is quite apparent that different districts are at various stages of disease transmission, and risk levels vary from district to district. We must calibrate the PHSM according to the risk level of each locality so that context-specific control measures could be applied more effectively. Within our limited resources, health system capacity will be a defining factor for the level of PHSM, irrespective of the stage of transmission. Therefore, it is of utmost importance to monitor the disease trends along with the health system capacity.

2. Justification

We propose a framework that integrates public health information and readiness indicators to support decision-making on the appropriate and safe level of engagement with social and economic activities. This framework expects to assess the continuity and future burden of the epidemic in multiple facets of spread concerning the curative health system capacity and the epidemiological spread-related indicators.

This framework has been designed in such a way that community risk of COVID-19 spread will be assessed based on three main criteria:

1. Disease transmission status (reflected by the caseload)
2. Disease control status
3. Health system capacity

The indicators on disease transmission and control status reflect the disease burden. If the country's public health system collapses owing to a large caseload, successful contact tracing and quarantine of individuals will also be affected. This framework has included disease transmission and control indicators as well as indicators on the health system coping capacity. The prolonged hospital stay (usually around 7-10 days) and extended stay until death for some patients will significantly burden the existing hospital resources, even if the epidemic indicators are declining. Therefore, the proposed indicators will assess the overall degree of COVID-19 risk in an administrative region and be helpful to monitor changes in the epidemic status and the success of our interventions.

The proposed framework on risk-based assessment and public health and social measures to control COVID-19 is based on six hazard levels. It considers the transmission classification and the health system response capacity to arrive at identifying the overall situational level. The proposed framework introduces regional level criteria for decision making of COVID-19 control measures recognizing the importance of maintaining the new normal life. Furthermore, it is expected to facilitate the functions of economic activities in a given area as much as possible even during periods of community transmission, while taking all stringent disease control measures to contain the spread. A particular region will be isolated/locked down only at Hazard level Six, where the intrinsic capacity of that specific region is about to get saturated. Until this final level is reached, a region can maintain their economic activities while obeying all the regional and national health guidelines allowing more space to live the new normal life and to sustain the economy where it is most needed.

There is substantial evidence supporting the effectiveness of government-mandated physical distancing (so-called 'lockdown') measures in suppressing SARS-CoV-2 transmission. The massive economic and social cost of these measures motivated the less socially disruptive tier system. It aimed to provide a consistent set of COVID-19 control measures with geographical flexibility. Tiers consist of multiple non-pharmaceutical interventions (NPIs) that are to be determined by regional and divisional authorities in response to their local transmission intensity.

Estimating the effect of the tiers on the underlying transmission is challenging due to the lag period between their implementation and any change in cases, deaths and results of serological surveys. Therefore, estimating effect sizes by using only raw data can produce

spurious results. Semi mechanistic modelling that combines a transmission model with statistical modelling of transmission provides an alternative.

3. Six-Tiered Hazard Model

The proposed model uses five basic indicators. Evidence of epidemic spread is demarcated by the number of incident cases per 100,000 population, change in weekly cumulative incidence and percentage case positivity. Curative health sector capacity will be assessed by way of percentage hospital and ICU bed occupancy rates. Out of many indicators proposed in the WHO Interim Framework for SEAR on Calibrating PHSM in the context of COVID-19 (3), these five indicators were selected due to the feasibility of calculation. All the requirements for these indicators are already in the routine surveillance system.

These indicators have been incorporated to describe six hazard levels 1-6, which reflect the levels of virus transmission within a community. Different levels of mitigation and social and economic activity have been recommended at each of these phases. However, changes in these indicators must be coupled with contextual information on the regional characteristics such as population density, population mobility patterns, compliance to PHSM and other features of the outbreak when deciding on imposing or lifting restrictions.

Category	Indicator	Hazard level 1	Hazard level 2	Hazard level 3	Hazard level 4	Hazard level 5	Hazard level 6
Disease transmission status	Number of incident cases per 100,000 population per day [a]	<3	4	5	7	9	10
	Change in weekly cumulative incidence [b]						
Disease Control	% of Case positivity of random PCR [c]	<2%	<2%	4%	6%	8%	10%
Health system capacity	% of Bed occupancy [d]	<25%	<40%	50%	70%	80%	90%
	% ICU bed occupancy [e]	<10%	<40%	60%	75%	85%	95%

3.1 Definition of Indicators

Incident cases per 100,000 population per day	No of new cases per day x 100,000 Mid-year population of the region
Change in weekly cumulative incidence	No of new cases of current week _ No of new cases of previous week Mid-year population of the region Mid-year population of the region
% of Case positivity rate (of random PCR)	No of positive cases reported per day X 100 No of random PCR conducted for the given day
% of Bed occupancy	No of beds occupied by COVID-19 patients X 100 No of beds available (dedicated for COVID-19 patients)
% ICU bed occupancy	No of ICU beds occupied by the COVID-19 patients x 100 No of beds available

3.2 Calculation of the cut offs for each hazard level -

a. Due to the irregularity in PCR reporting, the daily incidence may vary. A moving three-day average needs to be used as the number of incident cases. At present, the resources (physical and human) available can manage 20,000 COVID-19 patients effectively. Even though the bed capacity is increasing, effective patient care depends on the availability of other resources as well as health manpower. The average duration of hospital stay is taken as ten days. Therefore, the maximum number of patients the system can accommodate per day is 2000 for the whole population (population was taken as approx.20 M).
NB – This number is already exceeded for the total daily cases. However, we assume that with the policy change for home-based care for asymptomatic patients, we can still have 2000 per day as the hazard level 6 threshold.

   We will also have to consider the percentage of symptomatic patients, percentage of patients needing oxygen to accurately define the incidence levels according to the bed capacity and the facilities available. Bed capacity and facilities change from district to district and hospital catchment areas sometimes do not correspond with the geographical demarcations. Therefore, we suggest that the regional teams be given authority to adjust the cut off levels according to the available facilities in their respective areas, while taking all these factors into consideration.

b. Cumulative incidence is a helpful indicator of the estimate of risk as it gives the probability of developing cases over a period of time. However, due to PCR testing and reporting irregularity, we observed that a percentage change in the cumulative incidence would give an erroneous indication. Though the number of

cases continues to rise over time, the percentage may decrease over time. To overcome this matter, we considered the option of using only the change in cumulative incidence rather than the percentage change. However, giving a cutoff level for this is challenging. Therefore, we recommend monitoring the weekly cumulative incidence trends regional wise and use this as a supportive indicator when interpreting other indicators.

The other alternative could be the trend and the slope of cumulative incidence. The thresholds could be qualitative with tiers to be decided at 10^0 intervals from a horizontal line. (level 6 is at 60^0)

c. The maximum number of PCR tests performed in the country is considered to be approximately 30,000. Once the exit PCR are excluded, ~20,000 are for new suspected patients (primarily for high risk and suspected). With the health system mentioned in (a) above, the maximum number of patients that can be allowed per day is 2000. Anything more than 10% will lead to collapsing of the system. However, due to limited PCR testing capacity and the high caseload, the PCR testing is currently done on a district quota basis and only among the 1st contacts. So, this may not be a robust indicator in the current situation.

d. As per the WHO interim framework,>90% bed occupancy was considered the limited capacity level of the red zone alert level. Therefore it was taken as the cutoff for hazard level 6. <75% bed occupancy was considered as adequate capacity. The rest of the cutoffs were set accordingly (3).

e. Since the proportion of cases needing critical care is small, 95% of ICU bed occupancy was taken as the level 6 cutoff. However, due to the unpredictable and varying length of ICU stay, defining precise cutoff levels for this indicator is difficult. The available ICU beds (absolute number) for COVID-19 could be an alternative at the provincial level. E.g., Western province three beds, Central, Southern and North Western 2 beds and other provinces one bed as the threshold for level 6

3.3 Data availability at each administrative level

a / b, c – Grama Niladhari (GN) division level upwards

d - District level upwards

e - Country level only

3.4 Monitoring frequency

Hazard level 1 and 2 : 14 days

Hazard level 3 and 4 : 7 days

Hazard level 5 and 6: 3 days

When downgrading the hazard level, we will have to monitor for a period of 14 days to lift the restrictions.

3.5 Determining the hazard level

a. If any category is red, then the category indicator is red.
b. If none are red, then use the highest alert level to determine the overall level.
    - For example, if the disease situation is red, then the overall alert level is red
    - If there are a mix of non-red category levels, then the highest level reached should determine the overall level
c. All category levels must be green for the overall system alert level to be green.
    - Jurisdictions may decrease the overall level if there is an openly made societal decision that the economic and/or social harms from the restrictions outweigh the benefits on control of Covid-19. Consider the heterogeneity and population density of the setting when determining risk level.
    - If an isolated confined outbreak or rural area, this generally has lower transmission risk than if a distributed pattern throughout community or a dense area
    - In this case, it is especially important to ensure widespread adherence to physical distancing and safety practices.
    - Before increasing a level and implementing measures, the potential impact on economic and social harms should also be considered.
    - In the absence of reliable data on new cases, daily trends in new hospitalizations and/or deaths should be monitored.

*Other options available to determine the hazard levels is to make a scoring system considering all the indicators by giving weights to each indicator or to develop a risk stratification matrix with a colour coding.

4. Implementation of mobility restrictions according to hazard levels

Implementation of public health and social measures including both individual and societal interventions is observed globally with the intention of minimizing morbidity and mortality associated with COVID-19. With the impending crisis, it is essential that such public health and social measures are reviewed and adjusted based on ongoing situational analysis at the local administrative level and such adaptations are evaluated for their effectiveness in controlling the disease transmission.

The mobility restriction is a globally adopted evidenced-based strategy which is effective in immediate reduction of disease transmission, and resulting in reduction of the disease burden and related case fatality (Zhou Y. et al.,2020; Lima L.L & Attman A.P.F, 2021). Hence, the implementation of mobility restriction by following the proposed six-tiered hazard model within the geographical setting of divisional secretariats in Sri Lanka is considered in this proposal, while ensuring minimal disturbance to public life and economic development.

The divisional secretariat, the smallest administrative division is considered the geographical demarcation on implementation of the model, due to the availability of proper geographical demarcations, easy stakeholder collaboration and convenient access to required data. However, it must be emphasized that categorization of divisional secretariats based on “Hazards Levels'' is on an indicator-based approach; while other factors which include the trends of altering transmission, social demographic factors resulting in increased or reduced spread, population movements patterns, etc. in accordance with the geographical location should be considered by the team (collaboration between the consultant community physician of the district, medical officer of health (MOH), divisional secretariat, and other relevant stakeholders) prior to the declaration of the hazard levels. Thus, in consideration of the level of hazard, the imposition of mobility restrictions could also be implemented at a much smaller geographical setting (such as GN division or MOH division) with the consensus of the team. These “hazard levels'' could also be utilized for use at district or provincial levels with the consensus of the district and provincial teams. The district and provincial teams should meet regularly (at least once a week to evaluate the situation) to revise and revisit the decisions taken. The decisions taken should be communicated to the Ministry of Health regularly.

It is imperative that within all the hazard levels, people should follow the DReAM* guidelines along with other measures stated below.

D- Practice physical **Distancing**
Re- Practice **Respiratory etiquette**
A- Practice **Aseptic procedure**
M- Wear **Face Mask**

The mobility restrictions imposed at level 3 of this proposed indicator based hazard model has been set under the current restrictions of mobility imposed nationwide at alert level III according to the guideline on 'revised restrictions on permitted functions - with effect from 12.05.2021 until 31.05.2021 issued by the Ministry of Health, thus declaring hazard level 3 as the baseline mobility restrictions imposed at any given geographical location, during current disease spread. It is further emphasized that no divisional secretariat will be declared at either hazard level 1 or 2 during the current state.

The restrictions imposed on proceeding levels of 4 and 5 are gradually made stringent in adherence to the indicator based analysis while the final tier (level 6) in the hazard model corresponds to the declaration of 'isolation state' with maximum restriction of mobility in the demarcated geographical setting.

Final decision making and technical expertise on declaration and implementation of "hazard level" will lie with the district team. When implementation is done at provincial level, decision making lies with the provincial team.

The activities to be allowed and restricted at each hazard level in the geographical setting of the divisional secretariat are categorized under 3 broad domains;

- Personal restrictions
- Gatherings and events
- Service continuity

Table 2.1 Guidance for implementation of mobility restrictions for each level of hazard

Activities	HAZARD LEVELS				
	Level 3 (according to current RA level 3)	**Level 4**	**Level 5**	**Level 6 (Isolation)**	**Relevant points**
Personal Restrictions					
Stay at Home	Encouraged to stay at home.	Should stay at home as much as possible. Should leave for only specific purposes	Should stay at home as much as possible. Should leave for only specific purposes	Should stay at home (except for emergencies, e.g. medical emergency)	
Number of people allowed outside the home (from a house)	Only 1 person is permitted to go out of the house on a given day (preferably based on the NIC number or according to specific instructions). [People with the NIC ending in even numbers can leave home on even number days & those with odd numbers can leave home on odd number days. If the last digit is zero, it will be considered an even number] Exceptions are for	Only 1 person is permitted to go out of the house once in three days (preferably based on the NIC number) You can go out only for work purposes and health services.	Only 1 person is permitted to go out of the house once a week (preferably based on the NIC number) Exceptions include those engaged in essential services.	Only 1 person is permitted to go out of the house once a week to fulfil urgent family needs. Exceptions include those engaged in essential services.	The 1 person who is going out for the family needs should ideally be a healthy person (without chronic illnesses) and should aim to fulfill essential needs such as purchasing food items and medicines with a prior plan in place.

	work purposes and health services.				
Walkways	Open only to walk by self in your own locality and no crowding allowed.	Open only to walk by self in your own locality and no crowding allowed.	Open only to walk by self in your own locality and no crowding allowed.	Closed.	
When meeting with others in neighborhood and public outdoor places	Only spending time in your house with family members OR meeting up with 3 people at a time in public outdoor places DO NOT invite or visit family members / friends you don't live with, over to your house.	Only spending time in your house with family members OR meeting up with 2 people at a time in public outdoor places DO NOT invite or visit family members / friends you don't live with, over to your house.	Only spending time in your house with your family OR meeting up with one person in public, outdoor places. NOT allowed to invite / visit family / friends you don't live with, over to your house.	Only spending time in your house with immediate family members. NOT allowed to meet other people outside the house. NOT allowed to invite / visit family / friends you don't live with, over to your house.	***Upto two carers for children under 5 or someone with a disability** ***DREAM measures should be followed when meeting people outside.**
When travelling and transport	Travels should be minimized. You can go to shops, essential works and venues which are open by public transport. Avoid travelling to level 4,5,6 areas unless for a medical reason or essential work. You can cross higher hazard levels without getting down.	Travels should be minimized but you can go to shops when necessary. You can use your personal vehicle or secure transport media for essential services. Avoid travelling to level 5 & 6. If you are entering level 5 - follow the level 5 rules.	Allow only those who provide essential services. One person can go to shops if necessary. Avoid travelling to level 6, if you are traveling to level 6 follow rules of level 6 area. If you travel to lower hazard levels, you should still follow rules of	One person can go to shops if necessary, but should not travel out of their geographical zone. Travelling outside the zone is allowed only for those who provide essential services (e.g. health, security forces) and during medical	

	If entering level 4 area - follow rules as of Level 4. If you are travelling to 1st or 2nd hazard level areas, you should still follow the rules of level 3. You should not travel at night between 11 pm - 4 am.	If you are traveling to 1 st ,2nd ,3 rd levels - you should still follow the rules of level 4. Should not travel at night from 11 pm - 4 am and have strict travel restrictions on weekends.	level 5. You should not travel at night time from 11 pm - 4am daily and have strict restrictions on weekends.	emergencies. The level 6 rules should be followed by such personnel.	
Mode of transport (Private taxi services)	Maximum number of passengers are limited to 2 for cars and trishaws For other types of vehicles, it is limited to transport seated passengers only.	Maximum number of passengers are limited to 2 for cars and trishaws For other types of vehicles, it is limited to 50% of the seating capacity	Minimum number of passengers limited to one for cars and trishaws. For other types of vehicles limited to 25% of the seating capacity	Minimum number of passengers limited to 1 for cars and trishaws. For other types of vehicles limited to 25% of seating capacity. (Alterations considered only during a medical emergency)	
Public Transportation	Only allowed to transport seated passengers of the bus/ train	Only allowed to transport seated passengers of the bus/ train	Only allowed to transport 50% of the seating capacity of the bus/ train	Only allowed to transport with 25% of seating capacity of the bus/train. Considering the population movement patterns, the regional team should decide the inter- regional and	At level 6, it should be ensured that the minimum public transportation services are available for essential and emergency use.

				intra-regional transportation	
Going to work	You should work from home when possible. Exception include those working in essential services. Provide all essential services with minimum staff.	You should work from home when possible. Exception include those working in essential services. Provide all essential services with minimum staff.	Region needs to declare work from home as a policy Exception include those working in essential services. Provide all essential services with minimum staff.	Region needs to declare work from home as a policy Except for those working in essential services with minimum staff.	Should abide by relevant departmental instructions (State sector/ Private sector)
Leisure activities (Carnivals, musical shows, beach)	Prohibited Beach parties and gatherings - not allowed	Prohibited	Prohibited	Prohibited	
Exercise and sports activities	Can engage in individual physical activity within the household area & close surroundings only. Team sports ARE NOT allowed. Gyms/ sports halls (indoor & outdoor) closed.	Can engage in individual physical activity within the household area & close surroundings only. Gyms / sports halls (indoor & outdoor) closed.	Can engage in individual physical activity within the household area & close surroundings only. Gyms/ sport halls are closed.	Can engage in physical activity within household areas only. Gyms/ sport halls are closed.	
If you are at higher risk for	Other than for exercise, try to stay at	For exercise - try to avoid places which have	Stay at home as much as possible	Stay at home as much as possible	*Higher risk for COVID -

COVID*	home as much as possible. Avoid going to shops / pharmacies or ask your immediate family members to pick things up for you.	lots of people. Otherwise, try to stay at home as much as possible. Avoid going to shops / pharmacies or ask your immediate family members to pick things up for you.	unless for medical emergencies	unless for medical emergencies	underlying medical conditions eg NCD, cancer, CKD, Lung diseases,DM / over 70 years / smokers / pregnant women
Gatherings and Events					
Religious activities	No collective activities or gatherings. Number of devotees at a given time should be restricted to a maximum of 15 people at any given time.	No collective activities or gatherings. Number of devotees at a given time should be restricted to a maximum of 10 people at any given time	Engage within household only	Engage within household only	
Weddings / Parties / Events / Gatherings (indoors & outdoors) and public gatherings (in-house & outdoor)	Prohibited (Please refer relevant notes)	Prohibited (Please refer relevant notes)	Prohibited	Prohibited	At level 3 & 4 marriage registrations will be allowed with immediate family members up to a maximum of 15 participants. At level 5 & 6 registrations are prohibited

Funerals (except for COVID -19	Should be held within 24 hours after releasing the dead body. All possible precautions to minimize number who are attending to a maximum of 15 persons at a given time adhering to the instructions given.	Should be held within 24 hours after releasing the dead body. All possible precautions to minimize number who are attending to a maximum of 15 persons at a given time adhering to the instructions given.	Should be held within 24 hours after releasing the dead body. All possible precautions to minimize number who are attending to a maximum of 15 persons at a given time adhering to the instructions given.	Should be held within 24 hours after releasing the dead body. All possible precautions to minimize number who are attending to a maximum of 10 persons at a given time adhering to the instructions given.	
Service Continuity					
Public services (e.g. essential public services)	Adherence to national or departmental guidelines issued by the Ministry of health				
Health Services	Adherence to national or departmental guidelines issued by the Ministry of health				
Supermarkets	Are kept open. A maximum of 25 % of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given. (1.5m2 of available walking	A maximum of 25% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given. You are advised to use delivery services as much as possible.	Can be kept open for online or delivery services only. Should avoid supermarket visits as much as possible.	Should remain closed. Can provide online and delivery services.	The capacity i.e. the number of people to be accommodated within supermarkets should be displayed at all entrances.

	space can be considered as adequate for 1 person)				
Grocery shops, Bakery, Pharmacies	A maximum of 50% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given.	A maximum of 50% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given.	A maximum of 25% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given.	A maximum of 25% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given.	
Open markets, Fairs, Economic Centers	A maximum of 25% of the total number customers that could be accommodated in the space available, can be allowed at a given time adhering to the instructions given	A maximum of 25% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given	Should remain closed.	Should remain closed.	
Financial Institutions (Banks, Finance companies, Pawning centers etc.)	A maximum of 25% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given	A maximum of 25% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given.	A maximum of 10% of the total number customers that could be accommodated in the space available can be allowed at a given time	Should remain closed.	Maximum number of customers allowed should be displayed outside by the institution prior to entering.

			adhering to the instructions given.		
Schools, Daycare and Preschools, Higher education centers including universities, Tuition classes	Should remain closed.	Should remain closed.	Should remain closed.	Should remain closed.	
Personal services (e.g. barbers and beauty salons)	A maximum of 50% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given.	A maximum of 25% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given.	Should remain closed	Should remain closed.	
Restaurants	Restaurants function with a maximum of 25% of total seating capacity. Group dining is restricted to a maximum of 8.	Should remain closed. Can remain open for takeaways, drive through with maximum 2 people and delivery services.	Should remain closed. You can obtain delivery services.	Should remain closed. you can obtain delivery services.	
Pubs / Bars / Casino / Night Clubs / Betting centres	Closed	Closed	Closed	Closed	
Public venues (e.g. libraries,	Should remain closed.	Should remain closed.	Should remain closed.	Should remain closed.	

museums, cinemas, theatres playgrounds, markets)					
Business venues (eg: Furniture, electrical, hardware, tailors and dressmakers, laundry, communications and photocopy shops)	A maximum of 50% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given.	A maximum of 25% of the total number customers that could be accommodated in the space available can be allowed at a given time adhering to the instructions given.	Should remain closed.	Should remain closed.	Maximum capacity should be displayed on entrance to the facility.
Shopping Malls, Clothing/Textile shops	Maximum of 25% of total number of customers that can be accommodated in space available at a given time (while adhering to instructions given).	Functional for online services & deliveries.	Functional for online services & deliveries.	Closed.	
Boarding Houses	Can remain at full capacity adhering to the instructions given. However no new persons should be given accommodation.	Can remain at full capacity adhering to the instructions given. However no new persons should be given accommodation.	Can remain at full capacity adhering to the instructions given. However no new persons should be given accommodation.	Can remain 50% of capacity adhering to the instructions given. However no new persons should be given accommodation.	

Hospitality venues (Hotels, rest houses, guest houses)	A maximum of 25% of total capacity can be allowed at a given time adhering to the instructions	A maximum of 25% of total capacity can be allowed at a given time adhering to the instructions	Should remain closed	Should remain closed	
Wine stores	Strict adherence to DReAM.	Closed	Closed	Closed	
Street and mobile vendors	Allowed with strict adherence to guidelines and DReAM. Movement restricted to divisional secretariat setting.	Allowed with strict adherence to guidelines and DReAM. Movement restricted to divisional secretariat setting.	Allowed with strict adherence to guidelines and DReAM. Movement restricted to divisional secretariat setting.	Closed.	
Agricultural based	Normal operations with strong adherence to DReAM.	Normal operations with strong adherence to DReAM.	Normal operations with strong adherence to DReAM.	Normal operations with strong adherence to DReAM.	
Construction sites	Allowed with strict adherence to DReAM	Allowed with strict adherence to DReAM	Allowed with strict adherence to DReAM	Closed	

5. Consideration of the distribution of hazard levels according to the proposed 6-tiered model in intra and inter district mobility restrictions

The divisional secretariat is considered the smallest geographical setting for implementation of hazard levels. The technical expertise and decision making on mobility restriction among the district and the mobility restriction of crossing district and provincial borders will be provided by the district and provincial teams on consideration of the geographical distribution of hazard levels, behavior patterns of the localities, population movement patterns and the trend of disease spread.

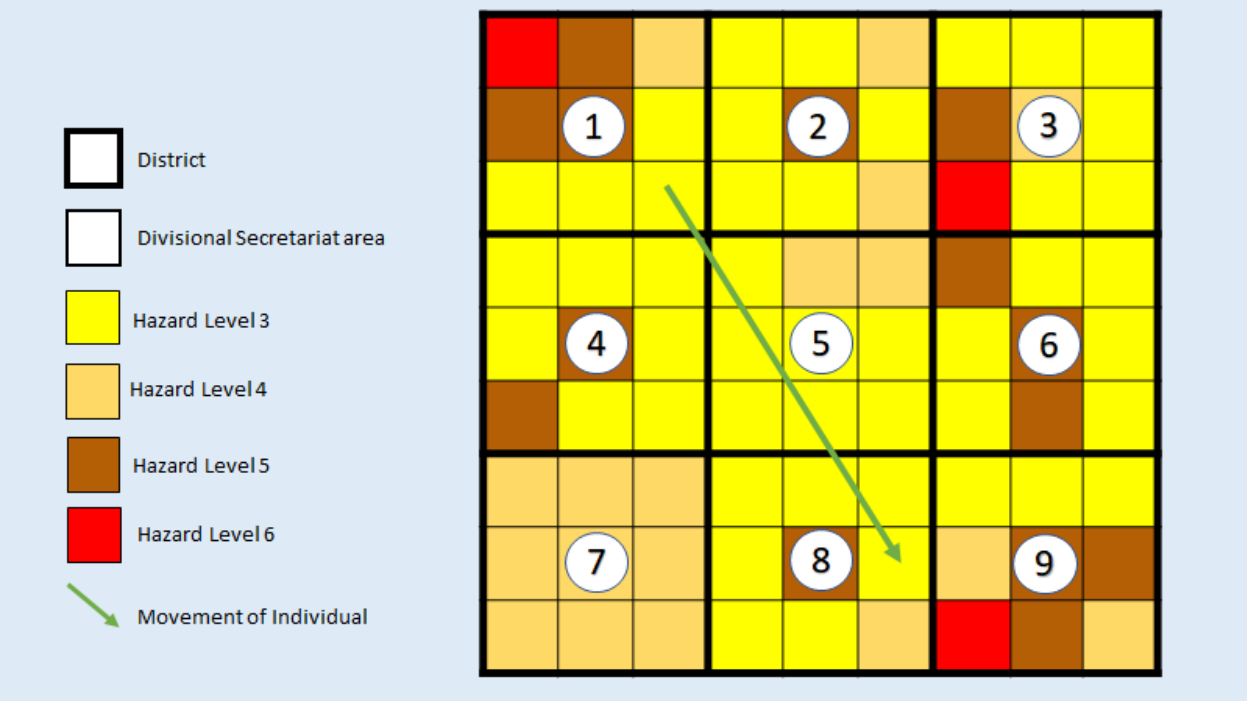

Figure 3: Hypothetical geographical distribution of hazard levels according to proposed 6-tiered model

The above figure shows the postulated hazard level distribution at a district setting which elaborates the variety of hazard levels that can coexist in different divisional secretariat settings. Increased population mobility between areas of low hazard levels can also increase the risk of disease transmission due to their proximity to areas with high hazard levels. This same phenomenon is observed in mobility between the borders of the districts and provinces. This is shown by the example denoted by the green arrow in Figure 3.

Therefore a collaborative team led by the district team will decide on the alterations of the regulations on entry and exit into each adjacent district based on the above factors.

For the general public to gain information on the alterations of levels and therefore adhere to the mobility restrictions set at each hazard level, it is essential that the information of alteration of declarations is updated in a timely manner on a platform with public access. The maintenance of a dashboard in an official website (MoH, Epidemiology Unit, Health Promotion Bureau etc) should be considered in the dissemination of such information.

Nevertheless, specific regulations should be implemented to meet the basic requirements of essential service providers (Eg: supply of essential grocery items, daycare facilities for dependents). In addition, a regulatory mechanism for daily paid workers in engaging in work and access to everyday needs at Hazard level 6, with minimal financial losses, should also be considered.

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