Adapting Disaster Risk Management Systems for Health-Related Emergencies:
Early Lessons from the Asia-Pacific Region

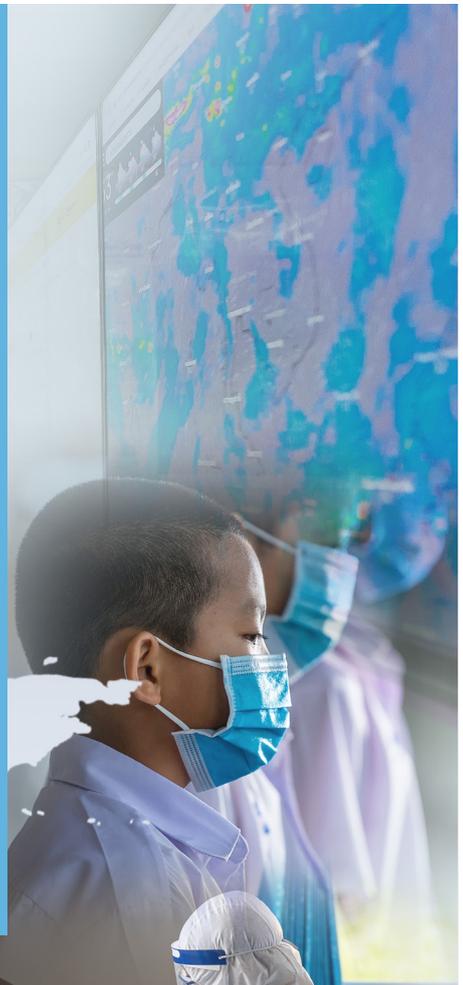**October 2020**

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1.
Summary

On March 11, 2020, the World Health Organization (WHO) declared the first pandemic caused by a coronavirus.[1] Countries around the world moved swiftly to declare states of emergency, closing ports of entry and activating crisis management systems.

This technical note[2] highlights the adaptive nature and flexible application of national disaster management systems in 15 selected Asia-Pacific countries[3] that are responding to public health emergencies resulting from the COVID-19 pandemic. Selecting these countries, which represent a variety of intragovernmental arrangements in the disaster risk management and public health sectors, also made it possible to analyze the efficacy of various coordination strategies. Each country has an established disaster management system (also referred to as its emergency management or civil defense/protection system) and a public health system. However, each country responded differently to the classification of COVID-19 as a public health emergency and to its subsequent escalation to a pandemic. By analyzing early reflections and some lessons learned from these initial responses to the COVID-19 pandemic, this note considers how existing disaster management systems are applied or activated to manage health-related emergencies, focusing on four main aspects:

Abbreviations/ acronyms:

COVID-19 – Coronavirus disease 2019

CDC – Center for Disease Control and Prevention

EWS – Early Warning System

MoH – Ministry of Health

NDMO – National Disaster Management Organization / Emergency Management Agency or Service

01   **State of emergency declaration:** this includes its type, content, and relevant binding legislation, and can apply to a declaration from either (or both) the legal regime for public health or the disaster/ emergency management agency.

02   **National Disaster Management Organization (NDMO):** the roles and responsibilities of a country's NDMO (including disaster risk management and civil protection services) in responding to COVID-19 outbreaks and other health related emergencies at both national and sub-national levels.

03   **Risk reduction, preparedness, and awareness:** the effectiveness of COVID-19 outbreak tracing, the availability of health risk information, the strength of community awareness campaigns, the prevalence of monitoring, and the success of warning services, especially their integration with the country's existing early warning system (multi hazard or otherwise).

04   **Multiplicity of disasters**: preparedness for near-future disasters due to natural hazards during the COVID-19 pandemic situation, handling of multiple disasters with compounding effects, and management of mobility and travel restrictions during emergency response and post disaster recovery activities.

This note summarizes how the selected countries have applied disaster management systems and practices to COVID-19 response, following a multi-hazard approach for both natural and other hazards. Some countries were able to draw on key lessons learned from the region's past experiences with health-related emergencies – for instance, the need to have already established a legal basis for intragovernmental cooperation in responding to such events. Having a legal framework in place allows governments to swiftly make critical decisions, such as declaring a state of emergency and enacting travel and mobility restrictions. The lessons learned during the present emergency, and the resultant technical recommendations, could be valuable for client countries as they prepare for future emergencies that create compounding effects during the ongoing COVID-19 response and recovery period, as well as for other health related emergencies that could arise.

This summary of the countries' responses is followed by three sections covering the four aspects listed above. A final section provides practical guidance for policymakers to enhance disaster risk management (DRM) systems and platforms to better address health related emergencies. It offers six key recommendations:

01   **Review disaster risk management legislation, strategies, and policies.** Enhance interagency coordination; better integrate public health considerations into DRM legislation and policy (and vice versa). Adapt multi-hazard approaches in DRM strategies and plans.

02   **Update national risk analyses and impact-based scenarios via a multi-hazard approach.** Governments can more effectively target particularly vulnerable communities by incorporating epidemiological forecast models into decision support platforms to identify priority vulnerable areas and to update multi-hazard risk modelling.

03   **Monitor feedback on COVID-19 risk and crisis communication, administer performance audits, and improve MHEWS platforms.** This can inform more holistic multi-hazard risk and crisis communication strategies, and suggest approaches for future MHEWS designs that include public health risks.

04   **Build on existing early warning systems for natural hazards.** Develop road maps for MHEWS open data platforms that integrate health surveillance and natural hazard information, incorporate alerts for health-related emergencies, and function with strong interagency coordination between Ministries of Health and National Disaster Management Organizations (NDMOs).

05   **Enhance community-based disaster preparedness programs.** Community-based programs could include preparedness for health-related emergencies – and help with case tracing, relief distribution, and maintenance of public safety.

06   **Adapt emergency management systems.** Update contingency plans and evacuation procedures, and ensure there is no disruption to supply chains for relief and recovery goods and services.

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Managing the crisis: States of Emergency and the role of NDMOs during COVID-19

> **Some countries, like Singapore, the Republic of Korea, and Vietnam, have learned from past experiences with SARS and MERS, and were able to better respond to COVID-19 by applying these lessons.**

The COVID-19 pandemic prompted many countries to declare a state of emergency and mandate travel and mobility restrictions in an effort to limit and contain local outbreaks. The restrictions affected various aspects of economic and social life.

Some countries, like the Republic of Korea, Singapore, Vietnam, and Taiwan, China, have learned from past experiences with SARS and MERS. They were able to better respond to COVID-19 by applying these lessons, which included: having their public health system establish a legal basis for responding to health related emergencies, improving disease surveillance, revising disease outbreak alert systems and response protocols, and ensuring that medical and emergency response stockpiles were sufficient and replenished. In addition, having a legal basis for cooperation already in place helped governments coordinate line ministries; outline clear priorities, mandates, and responsibilities; and respond swiftly with travel and mobility restrictions.

Some of the countries observed in this note integrated emergency declarations made by both disaster management and public health agencies; others relied on standalone executive

order declarations or instructions specific to COVID-19. Similarly, countries chose differing institutional arrangements when structuring their interagency response to the pandemic. This technical note explains **three modalities of intragovernmental coordination that emerged in the responses to COVID-19:** 1) the state directly heading an interagency task force (i.e., leadership by a President or Prime Minister, or another direct line of leadership); 2) the Ministry of Health (MoH) leading or coordinating the response; and 3) the NDMO leading or coordinating the response. There are also countries that have applied a mixture of the above approaches.

Four countries applied Type 1 coordination, with the President or Prime Minister (or their vice or deputy) coordinating the response directly. The advantage of this approach – taken by Japan, Myanmar, the

Republic of Korea, and Vietnam – is that it often produces a more unified and prioritized response across ministries and agencies, particularly if there is strong leadership and vision.

In the **Republic of Korea**, when the national infectious disease crisis level rose to "serious" on February 23, 2020, the government assembled the Central Disaster and Safety Countermeasures Headquarters (CDSCHQ) – which is headed by the Prime Minister – to increase efforts on a government-wide response to COVID 19. The Central Disease Control Headquarters (KCDC) and the Central Disaster Management Headquarters (Ministry of Health and Welfare) assisted in the disease control efforts (figure 1).[4] The figure below summarizes the response system in the Republic of Korea following the Level IV Crisis alert.
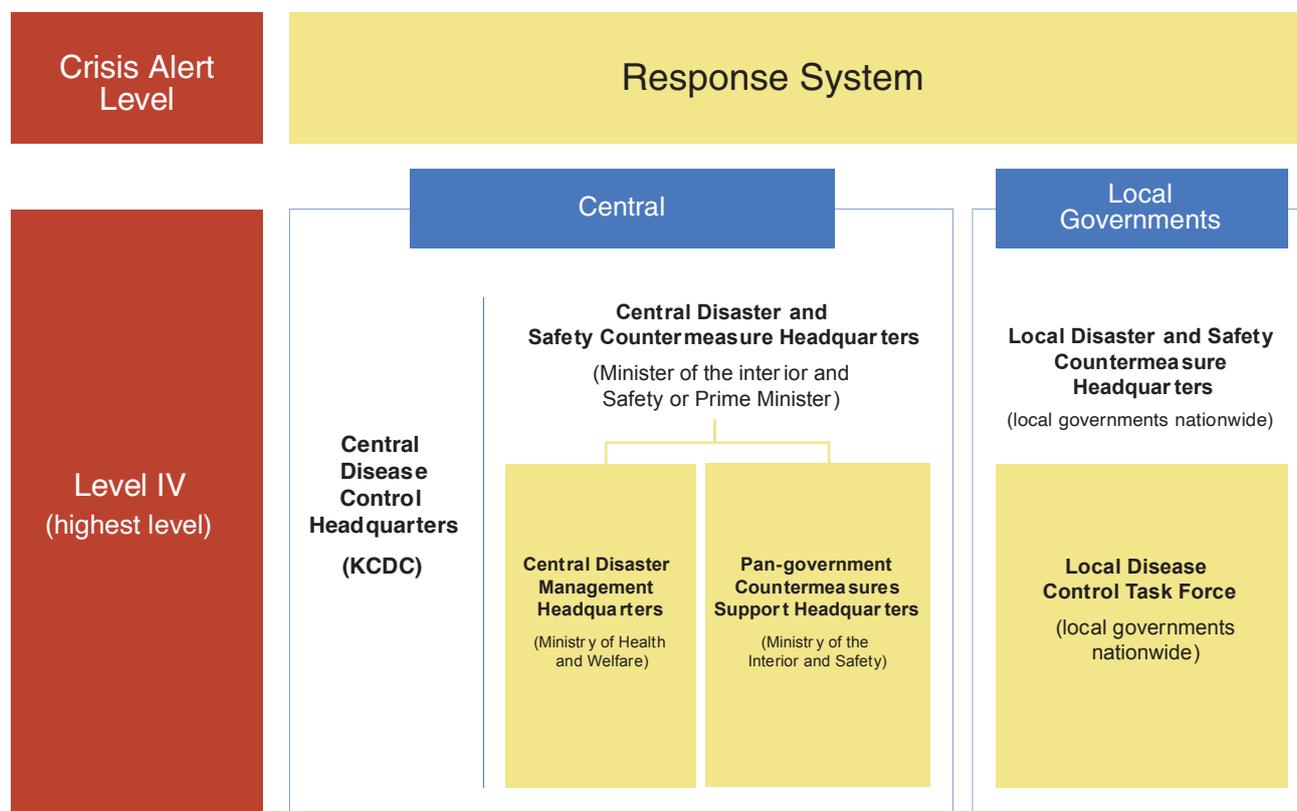

Figure 1   Republic of Korea's Government's Response System. (Source: Republic of Korea's Central Disaster and Safety Countermeasures Headquarters.)

[4] http://ncov.mohw.go.kr/en/

In **Japan**, the parliament enacted the Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response in March 2020 to provide the Prime Minister, relevant ministries, and prefecture governments with greater authority to respond to the situation.[5] This response was similar to the measures that Japan took in 2012 following the Asian Avian Influenza A (H5N1) outbreak.

Among other measures, the Act provided government leaders the power to request the closure of certain types of businesses and public facilities, the distribution of relief items, and the distribution of mandatory and optional cash assistance.[6] Following this, from April 2020 onwards, states of emergency have been declared in several prefectures.[7] With Special Measures in place, Japan's Ministry of Health, Labour, and Welfare (MHLW) led the medical and primary response to COVID-19. The State Minister for Disaster Management / DRR Bureau of the Cabinet Office supported the State of Emergency Legislation. Other key actors include the prefecture governments and the Ministry of Economy, Trade and Industry (METI). In principle, the MHLW leads the medical response to COVID-19 as the Acting Head of the Novel Coronavirus Response Headquarters (the head being the Prime Minister). This includes maintaining an information system to track cases of COVID-19. However, the MHLW-operated system has no direct feed to the country's natural disaster information platform, which is managed by the Japan Meteorological Agency (JMA).[8] Considering the pandemic, relevant agencies and ministries have also revised their business continuity planning and their early action scenarios to create contingency plans in the event of another emergency during the COVID-19 outbreak.[9]

In **Myanmar**, the COVID-19 taskforce response is led by the Vice President and supported by multiple ministries, including the Ministry of Health and other high-level government ministers, such as the Union Minister for Defence, the Union Minister for Border Affairs, the Union Minister for Home Affairs, and the Union Minister for Labour, Immigration and Population.[10] The COVID-19 taskforce is responsible for a wide range of functions, including the investigation, detection, and handling of persons infected with COVID-19, and the coordination of various governmental and non-governmental organizations responding to COVID-19 cases. The NDMO focuses on prevention, containment, and response plans for COVID-19 in its regular disaster preparedness activities.[11]

Vietnam mounted a highly coordinated COVID-19 response, largely thanks to its One Health Approach, which calls for increased multidisciplinary and intersectoral cooperation and communication. This integrated approach aims to address diseases that emerge at the human–animal–ecosystem interface, often those flagged by the WHO as posing a threat to animal and human health. One Health coordination in Vietnam includes the Ministry of Agriculture and Rural Development (MARD), the MoH, and WHO Vietnam.[12] After the first avian flu outbreak of 2003, Vietnam became an early adopter of One Health and is now a global leader in this approach.[13] It has been one of the key actions for fighting COVID-19 successfully in Vietnam.[14]

[5]
See https://japan.kantei.go.jp/98_abe/statement/202003/_00001.html

[6]
See https://www.mhlw.go.jp/content/10900000/000620733.pdf

[7]
See https://japan.kantei.go.jp/ongoingtopics/_00020.html

[8]
See https://mhlw-gis.maps.arcgis.com/apps/opsdashboard/index.html#/0c5d0502bbb-54f9a8dddebca003631b8

[9]
See https://www.pbs.org/wgbh/nova/article/one-health-vietnam/

[10]
See https://eurocham-myanmar.org/uploads/5d142-notification-%2853-2020%29-formation-of-COVID-19-control--emergency-response-committee---eng.pdf

[11]
See https://www.globalnewlightofmyanmar.com/disaster-management-committee-to-expand-measures-against-COVID-19/

[12]
See https://www.pbs.org/wgbh/nova/article/one-health-vietnam/

[13]
See http://onehealth.org.vn/upload/upload/Partner-ship%20Framework%20ONE%20HEALTH%201.3.16.pdf

[14]
See https://www.ilri.org/news/COVID-19-demonstrat-ing-need-one-health-approach%E2%80%94-approach-ilri-has-long-championedFramework%20ONE%20HEALTH%201.3.16.pdf

Vietnam's response is another example of the Type 1 coordination mechanism. The government established the National Committee for Corona Prevention on January 30, 2020, the same day that the WHO declared the outbreak to be a Public Health Emergency of International Concern. Two days later, on February 1, Vietnam announced a national emergency for COVID-19.[15] The National Committee directs the mobilization of resources, coordinating between ministries, ministry-level and governmental agencies, and People's Committees of provinces and cities. It is led by the Deputy Prime Minister, while the Deputy Ministers of Health are positioned as Deputy Heads within the group. Other ministries and agencies are also participating, supporting the implementation of plans launched by the Ministry of Health.

In recent years, the MoH of Vietnam has invested heavily in preparedness for health-related emergencies. It started with the National Integrated Operational Program for Avian and Human Influenza (OPI) 2006–2010,[16] which was then updated by the Vietnam Integrated National Operational Program on Avian Influenza, Pandemic Preparedness and Emerging Infectious Diseases (AIPED) 2011–2015[17] to cover other potentially serious emerging and re-emerging diseases. The objective of the AIPED was to reduce the risk to humans and animals from the H5N1 avian influenza, but additional guidance outlined how to reduce risk from other emerging infectious diseases, such as the COVID-19 pandemic. The AIPED clearly outlined the following steps for managing outbreaks of emerging infectious diseases: (i) controlling infectious diseases at the source and implementing appropriate measures to prevent disease emergence or re-emergence; (ii) detecting and responding rapidly and appropriately to cases of new and emerging high-impact diseases in both animals and humans; and (iii) enhancing preparations for the health-related and non-health consequences of any severe pandemics. These recommendations strengthened responses and improved preventative measures through Vietnam's One Health Approach, and guided the government's response to COVID-19.

Six of the analyzed countries have implemented Type 2 coordination, i.e., a COVID-19 response led or coordinated by their Ministries of Health with support from other ministries.

These countries are Cambodia, Fiji, India, Papua New Guinea, the Philippines, and Singapore.

In Fiji, the Ministry of Health and Medical Services established and led the Incident Management Team in response to COVID-19, with support from other ministries. The NDMO provides direct support to the MoH through community awareness and prevention measures. In the **Philippines**, the National Disaster Risk Reduction and Management Council (NDRRMC) provides support to the public health–led response as part of a national-level interagency task force, as does the National Disaster Management Authority (NDMA) in **Papua New Guinea**. In **Cambodia** and **India**, the response is led unequivocally by the MoH.

In **Singapore**, as well, the MoH is leading the public health response to COVID-19 and, with the Ministry of National Development, is co-chairing the taskforce for overall COVID-19 response and recovery. Meanwhile, the NDMO provides auxiliary support to MoH-led medical operations. The MoH leads and maintains coordination with other ministries, and produces the primary updates on the COVID-19 response situation.[18] Singapore's public health system is strongly linked with the country's emergency management framework, including through the Disease Outbreak Response System Condition (DORSCON) and Singapore's Declaration of Operations of Civil Emergency Response Plan.[19] On February 7, 2020, the Singaporean Ministry of Health elevated the DORSCON level of the country to orange (the second-highest out of four levels), indicating major disruptions to general public businesses and activities, the institution of public control measures, and the activation of a government response plan. Such measures are commonly known as "circuit breakers" in the context of the current COVID-19 response in Singapore.[20] Singaporean ministries also have prepared business continuity and contingency plans corresponding to the DORSCON Alert Levels.

DORSCON ALERT LEVELS (Disease Outbreak Response System Condition)

	GREEN	YELLOW	ORANGE	RED
NATURE OF DISEASE	Disease is mild **OR** Disease is severe but does not spread easily from person to person (e.g. MERS. H7N9)	Disease is severe and spreads easily from person to person but is occurring outside Singapore. **OR** Disease is spreading in Singapore but is (a) Typically mild i.e only slightly more severe than seasonal influenza. Could be severe in vulnerable groups. (e.g. H1N1 pandemic) OR (b) being contained	Disease is severe AND spreads easily from person to person, but disease has not spread widely in Singapore and is being contained (e.g. SARS experience in Singapore)	Disease is severe AND is spreading widely
IMPACT ON DAILY LIFE	Minimal disruption e.g. border screening, travel advice	Minimal disruption e.g. additional measures at border and/or healthcare settings expected, higher work and school absenteeism likely	Moderate disruption e.g. quarantine, temperature screening, visitor restrictions at hospitals	Major disruption e.g. school closures, work from home orders, significant number of deaths.
ADVICE TO PUBLIC	• Be socially responsible; if you are sick, stay at home • Maintain good personal hygiene • Look out for health advisories	• Be socially responsible: if you are sick, stay at home • Maintain good personal hygiene • Look out for health advisories	• Be socially responsible: if you are sick, stay at home • Maintain good personal hygiene • Look out for health advisories • Comply with control measures	• Be socially responsible: if you are sick, stay at home • Maintain good personal hygiene • Look out for health advisories • Comply with control measures • Practise social distancing: avoid crowded areas

Figure 2   Disease Outbreak Response System Condition (DORSCON) Alert Levels in Singapore. (Source: Ministry of Health Singapore.)

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See https://www.moh.gov.sg/COVID-19

19
The 'Disease Outbreak Response System Condition' (DORSCON) is a color-coded framework that shows the current disease situation. The framework provides the general guidelines on what needs to be done to prevent and reduce the impact of infections. https://www.gov.sg/article/what-do-the-different-dorscon-levels-mean

20
See https://www.gov.sg/article/COVID-19-updates-and-announcements

Five countries are employing Type 3 coordination, using their NDMO as the lead agency for COVID-19 response. They include Indonesia, New Zealand, Samoa, Tonga, and Vanuatu.

There are several reasons why NDMOs might be the preferred lead agency during health-related emergencies. First, NDMOs often have experience handling a variety of emergencies deriving not only from natural disasters but also from various other hazards, including epidemics and pandemics. For example, the government of **Vanuatu** understands that the country's high travel volume and tourism rates create significant risk of disease exposure. Therefore, its NDMO also manages this kind of hazard, in coordination with the Ministry of Health, which is responsible for the monitoring, detection, and treatment of any outbreaks.[21] Second, several countries already require NDMOs and relevant ministries and agencies to operate under one umbrella when it comes to disaster response so that coordination is more effective. In Vanuatu, such coordination occurs through the National Disaster Committee. The NDMO works intensively with relevant ministries and agencies (including the MoH) in the execution of its tasks, and provides technical advice and resource support.[22] The NDMO is responsible for leading the National Coronavirus Taskforce; the taskforce itself includes the MoH and its partners, which focus on COVID-19 prevention and preparedness activities.

The government has also established the Recovery Operations Center (ROC) under the Prime Minister's Office. Its mandate is to coordinate recovery planning for both COVID-19 and Tropical Cyclone Harold, which affected Vanuatu during the pandemic in early April 2020. The ROC will assist in the effective transition from the NDMO's response phase to the post-disaster recovery from both emergencies.

Similarly, in **Tonga**, the National Emergency Management Office (NEMO) is responsible for the coordination of resources during a disaster or emergency, either natural or non-natural, which includes COVID-19 response. This function is being performed in conjunction with the Central Control Group, with the coordination activities based within the National Emergency Operations Centre (NEOC). The NEOC was activated on March 20, 2020, as a result of Tonga's State of Emergency declaration for COVID-19.

Photo: People crossed the flooded street in Jakarta - Indonesia / **Dani Daniar** / Shutterstock

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[21]
See Government of The Republic of Vanuatu (2010). National Disaster Plan, from https://reliefweb.int/sites/reliefweb.int/files/resources/Vanuatu_Final%20Review%20National%20Disaster%20Plan_2010.pdf

[22]
Ibid.

> **Each pattern of intergovernmental coordination for COVID-19 has its own value. An NDMO-led or -coordinated response can enable rapid adjustment of preparedness measures alongside other types of risks in response to the COVID-19 pandemic.**

Photo: Sanitizing streets in Telangana India / **Sujeeth Potla** / Unsplash

Samoa has also activated its National Emergency Operation Centre (NEOC), which is part of the country's National Emergency Response Plan as per the National Disaster Management Plan under the National Disaster and Emergency Act 2007. The NEOC is the focal point of the country's response activities, facilitating collaboration and operational coordination amongst all stakeholders, with advice and technical guidance from the Ministry of Health for the duration of the emergency period. The Ministry of Health is also responsible for implementing awareness programs for COVID-19 prevention.

In **New Zealand,** there are three main legislative acts giving the government authority to take necessary actions in extraordinary situations: the Health Act 1956, the Civil Defense Emergency Management Act 2002, and the Epidemic Preparedness Act 2006. All these acts reference each other and can be invoked independently. The Health Act 1956 (HA 1956) gives broad powers to the Minister of Health and medical officers to deal with the COVID-19 outbreak. The Health Act was also amended as of March 11, 2020, to specify COVID-19 as a notifiable infectious disease and a quarantinable infectious disease.[23] This means that medical officers now have extensive powers to carry out necessary prevention measures, including, for example, closing non-essential premises, ordering medical examinations, and instituting social distancing orders.

The Epidemic Preparedness Act 2006 enables government agencies to try and prevent the outbreak of epidemics in New Zealand. The Act only applies to a "quarantinable disease" – and, as a result of the amendment to the Health Act noted above, COVID-19 now qualifies. For the Epidemic Preparedness Act 2006 to be enforced, the government must

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[23]
See https://COVID19.govt.nz/resources/key-documents-and-legislation/#relevant-legislation

Photo: Medical tents assembled at Emergency entrance of Kiang Wu Hospital, Macau / **Macau Photo Agency** / Unsplash

issue a notice in the gazette,[24] which is the official government notice board. The Prime Minister may issue an epidemic notice if it is recommended by the Director-General of Health, with the agreement of the Minister of Health, and if the Minister is satisfied that an outbreak of a disease is "likely to disrupt or continue to disrupt the central government and business activity in New Zealand (or stated parts of New Zealand) significantly." Accordingly, the Prime Minister issued the Epidemic Preparedness (COVID-19) Notice 2020, which came into effect on March 25, 2020. This notice activated a range of provisions in both the Social Security Act (beginning March 25) and the Immigration Act (beginning April 2) intended to deal with the practical effects of the COVID-19 outbreak.

The declaration of a state of national emergency[25] gave the Director and National Controller the means – in accordance with section 9 and Part 5

of the Civil Defence Emergency Management Act 2002 (CDEM Act) and the National Civil Defence Emergency Management Plan Order 2015 – to manage the COVID-19 emergency and prevent its exacerbation. CDEM Act powers[26] are being used where necessary to slow the spread of COVID-19 by reducing and managing its impacts. The act grants powers of requisition – for example, providing for the conservation and supply of fuel and other essential supplies – to help manage wider impacts, and the authority to close roads, proscribe activities that may exacerbate the emergency, bar people from public places, and prohibit or regulate traffic. On March 29, 2020, following the first declaration of a national emergency, the Director and National Controller Civil Defence Emergency Management issued a "Direction to CDEM Groups and Group Controllers for the duration of the COVID-19 response and recovery" to help localize the control of operations.

24
See https://gazette.govt.nz/notice/id/2020-go1368

25
See https://COVID19.govt.nz/alert-system/state-of-national-emergency/

26
Emergency powers under the CDEM Act 2002 enable the Director of Civil Defence Emergency (and CDEM Group Controllers) to, among other things: (i) close or restrict access to roads or public places; (ii) remove or secure dangerous structures and materials; (iii) provide rescue, first aid, food, shelter, etc.; (iv) conserve essential supplies and regulate traffic; (v) dispose of dead persons and animals; (vi) enter into premises, e.g., to rescue people or save lives; (vii) evacuate premises/places; (viii) remove vehicles, vessels, etc.; and (ix) requisition equipment, materials and assistance. https://COVID19.govt.nz/alert-system/state-of-national-emergency

On May 13, 2020, the New Zealand Parliament passed the COVID-19 Public Health Response Bill,[27] which establishes standalone legislation that provides a different legal framework for responding to COVID-19 over the next two years (or sooner, if the pandemic is brought under control before that time). The Act aims to support a public health response to COVID-19 that

(a) prevents, and limits the risk of, the outbreak or spread of COVID-19 (considering its infectious nature and potential for asymptomatic transmission);

(b) avoids, mitigates, or remedies the actual or potential adverse effects of the COVID-19 outbreak (whether direct or indirect);

(c) is coordinated, orderly, and proportionate; and

(d) has enforceable measures that augment the relevant voluntary measures and public health and other guidance supporting the COVID-19 response.

Photo: (Top) Heatmap by the Center for Systems Science and Engineering (CSSE) / **Clay Banks** / Unsplash | (Bottom) Unsplash

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See http://www.legislation.govt.nz/bill/government/2020/0246/latest/LMS344134.html

In addition, New Zealand has adopted an alert system for COVID-19 that includes four distinct levels. This system enables target populations to prepare and plan for the different kinds of restrictions that will be in place depending on the level of the alert. Each alert level refers to different legislative acts (e.g., the COVID-19 Public Health Response Bill governs Alert Level 2).

In **India**, following the WHO's confirmation on January 25, 2020, of the spread of the novel coronavirus, an interministerial meeting was called by the Principal Secretary to the Prime Minister. In March 2020, the government declared a 21-day national lockdown in 82 districts in 22 states and Union Territories of the country where confirmed cases were reported[28] to combat the spread of COVID-19. This lockdown marked the first time the country invoked these provisions of the National Disaster Management Act 2005,[29] which was enacted to "provide for the effective management of disasters." The National Disaster Management Authority (NDMA) is the lead agency for coordinating disaster management, with the Prime Minister as its Chairperson. The Government of India later announced a complete lockdown.

In **Indonesia**, both the disaster management and health agencies had previously recognized the risk of potential disease outbreak, learning from their experience with SARS in 2003. Law No. 24/ 2007 on Disaster Management describes "non-natural disaster" as a "non-natural event or a series of non-natural events such as technological failure, modernization failure, and epidemic." Before the COVID-19 pandemic, two key regulations had already been enacted: Law No. 6/2018 on Health Quarantine and MoH Regulation 75/2019 on Health Crisis Response. The MoH had also invested in preparing health emergency action plans and other related measures in cooperation with health-related stakeholders.[30]

Photo: Medical students in training, Yogyakarta, Indonesia / **World Bank** / Flickr

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See https://www.hindustantimes.com/in-dia-news/82-districts-under-lockdown-over-covid-19-what-s-open-and-what-is-shut/story-c1AEMZXuuXN6FvmrAdRvsJ.html

29
See https://www.hindustantimes.com/india-news/covid-19-disaster-act-invoked-for-the-1st-time-in-india/story-EN3YGrEuxhnl6EzqrlreWM.html

30
See https://www.who.int/docs/default-source/searo/indonesia/non-who-publications/health-crisis-action-plan-2015-2019-bahasa.pdf?sfvrsn=1b9f18fe_2

On March 16, 2020, two weeks after the country's first two COVID-19 cases (announced on March 2, 2020), the Indonesian MoH published national guidelines for medical workers specifically on controlling the pandemic.[31] The document outlines procedures for medical workers handling the disease. The MoH also published an Operational and Mitigation Response Plan, which describes the coordination line between ministries and agencies managing COVID-19. To coordinate a government-wide response, the National Disaster Management Authority (BNPB, Indonesia's NDMO) is leading the interagency COVID-19 Task Force.

Before the COVID-19 pandemic, BNPB had developed a National Disaster Response Framework (NDRF), which sets out a Concept of Operations to guide emergency response by BNPB and other ministry-level government agencies. However, the NDRF does not guide emergency responses related to pandemics. Hence, BNPB adjusted to accommodate the establishment of the COVID-19 Task Force with the Head of BNPB as the chairperson. The framework lays out four phases, provides operational definitions and principles of operation, and designates the coordinating authority for each phase (see table 1). The government determines the alert level. Each level stipulates the public health and social measures to be taken against COVID-19, including increasing or decreasing limits on human contact, travel, and business operations. Restrictions are cumulative (e.g., at Alert Level 4, all restrictions at Alert Levels 1, 2, and 3 also apply). Different parts of the country may be at different alert levels.

Table 1   Adjusted National Disaster Response Framework in Indonesia to Concept of Operations for COVID 19 Response (Source: Indonesian Ministry of Health)

	Statement of phase (threshold)	Operational definition	Operations principle	Coordinator / Commander
	(General) Preparedness	Zero COVID-19 cases in Indonesia	Strengthening detection, surveillance, prevention	National: MoH Sub-national: Head of local government
	Emergency Preparedness	Early and sporadic COVID-19 cases	Case detection, contact tracing, and case isolation	National: MoH Sub-national: Head of local government
	Emergency Response	At minimum, two clusters of COVID-19 in Indonesia	Case detection, contact tracing, case isolation, pandemic mitigation, physical distancing, and business continuity plan	National: MoH Sub-national: Head of local government
	Rehabilitation	No new case after two incubation periods, counted from the last confirmed case	Response de-escalation, stringent surveillance, and functional rehabilitation	Head of local government

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Revised on March 27, 2020: https://www.kemkes.go.id/article/view/20012900002/Kesiapsiagaan-menghadapi-Infeksi-Novel-Coronavirus.html

Figure 3 illustrates a timeline comparison of confirmed COVID-19 cases and the first declaration of a state of emergency (SoE) related to COVID-19 for most of the countries studied in this note. In accordance with their respective approaches to managing the crisis, countries declared the SoE through the public health authority (e.g., Republic of Korea, Singapore, and Vietnam) or the disaster management authority (e.g., India, Indonesia, the Philippines, Samoa, and New Zealand). As figure 3 illustrates, countries with public health agencies leading the crisis declared the public health emergency earlier, around the beginning of February 2020 and ahead of the confirmed cases curve (Republic of Korea

and Singapore). This early declaration enabled quick resource mobilization for public health responses (including case tracing and tests) and swift decision-making on social mobility restrictions (e.g., lockdown, large-scale social restrictions, or quarantine) while continuing essential public services (see box 1). Some countries (e.g., India) have even declared nationwide lockdowns without SoE declarations. In Indonesia, following the SoE declaration, while social mobility restrictions were in place during the weeks of March and April, relevant Indonesian ministries developed and released sector-specific protocols.[32]
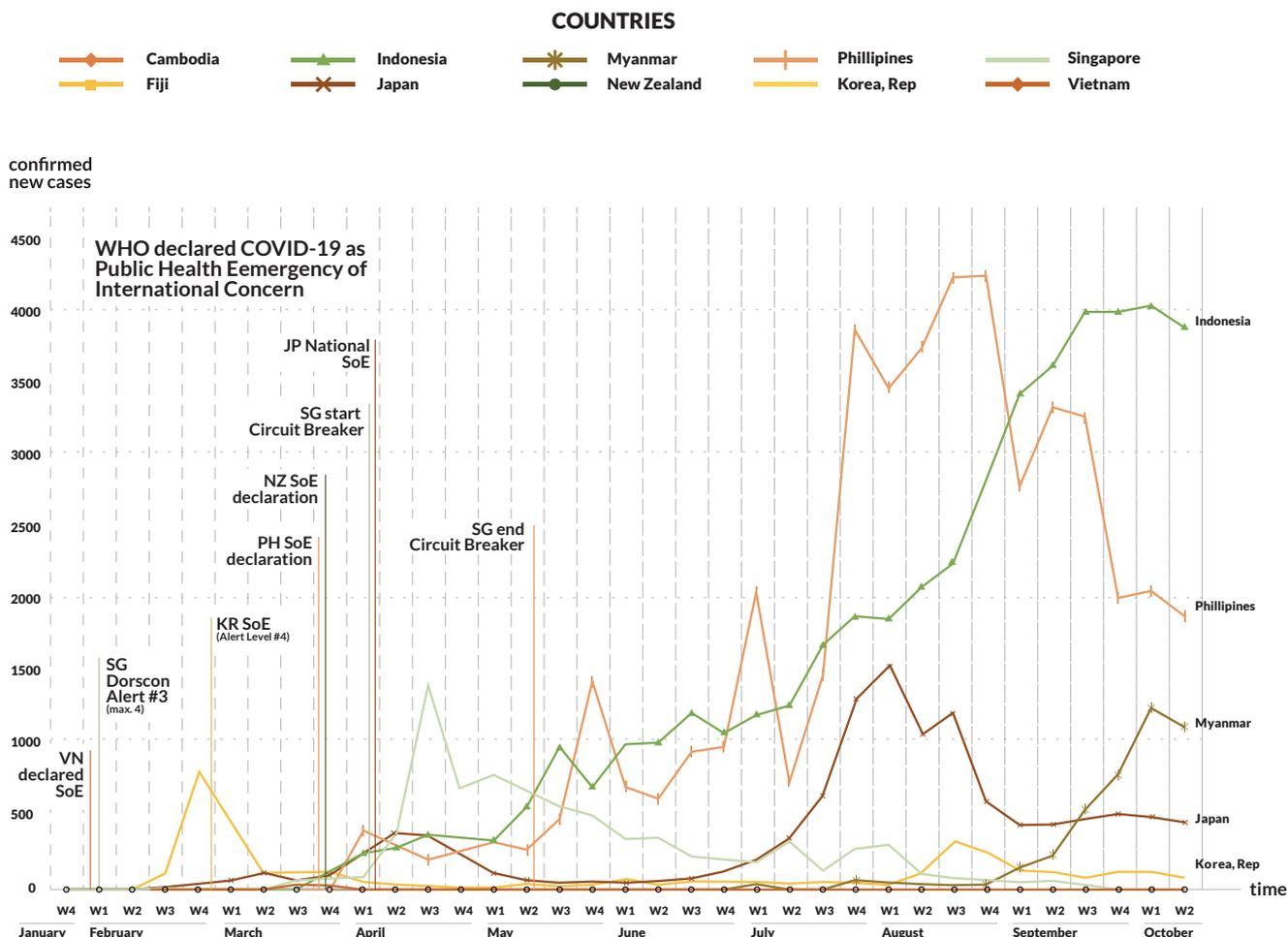

Figure 3   Timeline comparison of COVID-19 weekly confirmed new cases and State of Emergency (SoE) declarations in selected countries. (Modified from WHO COVID-19 Dashboard, as of 15 Oct. 2020)

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See complete list here: https://COVID19.go.id/p/protokol?page=1

BOX 1

Continuity and Digitalization of Public Services during COVID-19

The COVID-19 pandemic has prompted many countries to rethink how they communicate with their citizens and explore how to continue providing services for the community despite the need to limit mobility and interpersonal contact. In sectors such as government services, education, the media, communication systems, and the economy, digital solutions have allowed some day-to-day activities to continue during the lockdown. For instance, Vietnam took the opportunity to accelerate digital transformation and, under direction from the Prime Minister, created digital applications and encouraged business activities to continue in the digital environment.[33] Vietnam had already launched a digital National Public Services Portal in December 2019; by February 2020, nine out of 22 ministries and government agencies, as well as all 63 provinces or cities, had integrated their respective public services into the online portal.[34] By May 2020, the portal included six more government services intended to help businesses and individuals affected by the COVID-19 pandemic.[35]

Other countries, like Singapore, also shifted the provision of public services primarily to digital platforms, scaling down or temporarily closing physical service centers and deferring non-urgent physical service appointments.[36] In New Zealand, the focus is on ensuring that all agencies providing public services can operate at maximum capacity while complying with applicable public health measures.[37] Each government agency is encouraged to determine its own planning to maintain the delivery of public services during the pandemic and is responsible for deciding how to apply these guidelines. At the same time, governments need to ensure that vulnerable populations, including people with disabilities and disaster-affected people, are able to easily access digitized public services.

33
See https://iotbusiness-platform.com/blog/covid-19-challenges-opportunities-and-the-road-ahead-for-vietnams-digital-economy/

34
See http://hanoitimes.vn/vietnams-efforts-towards-e-government-to-help-contain-covid-19-pm-301041.html

35
See http://hanoitimes.vn/more-public-services-launched-online-to-support-people-businesses-hurt-by-covid-19-312061.html

36
See https://www.psd.gov.sg/press-room/press-releases/end-of-circuit-breaker--public-service-adopts-phased-approach-to-re-opening-physical-   service-centres-and-public-facilities

37
See https://www.publicservice.govt.nz/resources/covid-19-workforce-guidelines/

3

Handling public information: COVID-19 awareness, early warning systems

In order to improve their understanding of COVID-19 risks and implications, the countries analyzed in this note have established a range of case tracing, data dashboard, and information management platforms. Most of the COVID-19 platforms analyzed here provide data visualization related to the number and location of COVID-19 cases, rather than projections or forecasting. But a commonality between pandemics, cyclones, floods, and earthquakes is that they become ever more intense and complex in nature.[38] Simply tracking COVID-19 infection rates, contact tracing, and case hotspots in a country is not enough. It is critical to overlay the COVID-19 epidemiological models on risk models of other natural hazards. The inclusion of seasonal events may enable governments to consider worst-case risk scenarios, such as those exhibited in figure 4. Moreover, the dynamic of COVID-19–related policies – particularly decisions to activate and cancel SoEs, large-scale social restrictions, or lockdowns – may increase the probability that diverse hazards will interact with COVID-19 cases and stimulate concurrent and cascading crises.

Some of the COVID-19 platforms discussed here are managed and operationalized by the country's

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[38]
See https://doi.org/10.1016/j.pdisas.2020.100102

NDMO, some by the MoH; and there is considerable variation in whether a country's COVID-19 data dashboard is linked to its early warning system (EWS) platform (whether multi-hazard or standalone).

In **Cambodia**, the country's Center for Disease Control and Prevention (CDC) provides a COVID-19 tracking website;[39] however, it does not feed into the country's EWS platform (named EWS1294). Similarly, in **Myanmar**,[40] the distribution map of COVID-19 cases was developed by MoH and is not linked to the EWS platform operated by the Department of Disaster Management or to the one managed by the Department of Meteorology. Conversely, in **Vietnam**, although the NDMO's EWS (VnAWARE) provides information on COVID-19, it does not integrate with the monitoring platform provided by the MoH.[41]

In the **Philippines**, on the other hand, the Department of Health−managed COVID-19 tracker feeds into the Emergency Operations Center (EOC) of the National Disaster Risk Reduction and Management Council (NDRRMC).[42] Data and information from the platform, along with contributions from other agencies and local government units, are then compiled by the NDRRMC

in the daily Situation Report of the Inter-Agency Task Force for COVID-19.[43] This practice builds on NDRRMC's standard practice for natural disasters, and provides consistency in terms of structured crisis-management reporting.

The Government of **Vietnam** is providing COVID-19 data to the public that includes the demography, precise locations, and ages of patients. The MoH launched a website to publish information related to COVID-19[44] on February 9, 2020 – two days before the WHO even named the novel coronavirus disease "COVID-19." Once Vietnam declared that the country was entering the second phase of COVID-19 response, the MoH prepared and released a new tool: a mobile application that facilitates a bottom-up approach to tracking the disease. Through the app, communities can report their health status and follow the contact-tracing process. This action was also taken just before the WHO declared a global pandemic on March 11, 2020. The low number of reported infections and deaths in Vietnam may indicate that the government's early efforts to prepare communities and disseminate risk information on COVID-19 may have helped contain local transmissions.

Photo: People riding motorbike and wearing mask in Ho Chi Minh City, Vietnam / **Markus Winkler** / Pexels

[39] See https://COVID-19-map.cdcmoh.gov.kh/

[40] See https://doph.maps.arcgis.com/apps/opsdashboard/index.html#/f8fb4ccc3d42c7ab0590dbb3fc26b8

[41] See https://ncov.moh.gov.vn/

[42] See https://www.doh.gov.ph/COVID-19tracker

[43] See http://www.ndrrmc.gov.ph/9-ndrrmc-advisory/4036

[44] See https://ncov.moh.gov.vn/

Even when a country's NDMO is leading the government's COVID-19 response, case tracing information is not necessarily integrated into the country's EWS platform. In **New Zealand**, the government has developed a dedicated platform for COVID-19 information. While the website of the Ministry of Civil Defence and Emergency Management (CDEM) contains general information on the status of local COVID-19 outbreaks, it remains focused on providing information regarding natural disasters. This means that the four color-coded alert levels in New Zealand (prepare, reduce, restrict, and lockdown) and its advisories for each alert level, as well as guidance on risk assessment and the range of measures to be taken by the public at risk, have yet to be subsumed under the country's existing EWS.[45]

In **Indonesia**, although BNPB is the lead agency of the Task Force for COVID 19 and manages the data dashboard on COVID-19 cases and response,[46] it is not yet apparent whether COVID-19 risk information is considered when updating the country's multi-hazard risk level – that is, it remains unclear whether the process goes beyond the current approach of simply adding risk layers relevant to COVID-19 infections by analyzing additional data (such as vulnerabilities and potential exposure). Similarly, there is currently no indication that COVID-19 case tracing and hotspots are being integrated into the current EWS platforms with other anticipated future risks or potential disasters (e.g., hydrometeorological risks, or disasters caused by geological hazards). Governments could improve preparedness by integrating early warning systems, thereby helping to: prevent medical and governmental emergency-services operations

from becoming overburdened; assess the volume of emergency management items needed more accurately (as a miscalculation could affect logistical strategies); and maximize the capacity of medical services.[47]

In many countries, the NDMO's and MoH's EWS platforms remain independent. In **Singapore**, the NDMO (SCDF) manages the EWS on fire and urban risk, while MetService Singapore operates the EWS on hydrometeorological risk. Nevertheless, both agencies have access to Singapore's MoH and GovTech platforms and capabilities for identifying the exact locations of, and detailed information about, COVID-19 cases.

In **Japan**, the State Minister for Disaster Management / DRR Bureau of the Cabinet Office is in charge of broad disaster risk management policy, strategies, preparedness, and response to natural hazards.[48] As part of the Cabinet Office, the DRR Bureau provided input to the State of Emergency stipulation under the new COVID-19 law. Early warning system operations remained with the Japan Meteorological Agency and related bureaus under the Ministry of Land, Infrastructure and Transportation.

Japan's prefectural governments have significant authority under the law to take effective emergency measures, as they can take into account the characteristics of each area and provide careful explanations to residents.[49] The Government Response Headquarters is coordinating as necessary with designated prefectures, which will help the government inform residents of the difference

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45
See https://doi.org/10.1016/j.ijdrr.2020.101674

46
See https://www.COVID-19.go.id/situasi-virus-corona/

47
See https://doi.org/10.1017/dmp.2020.51

48
According to law, this is limited to heavy rain, typhoons, earthquakes, tsunamis, landslides, volcanic eruptions, flooding, and heavy snow.

49
See for example of a prefectural level policy under the state of emergency due to COVID-19: https://www.bousai.metro.tokyo.lg.jp/_res/projects/default_project/_page_/001/007/698/2020041510.pdf

"Tracking COVID-19 infection rates, contact tracing, and case hotspots in a country is not enough. It is critical to overlay the COVID-19 epidemiological models on risk models of other natural hazards. The inclusion of seasonal events may enable governments to consider worst-case risk scenarios."
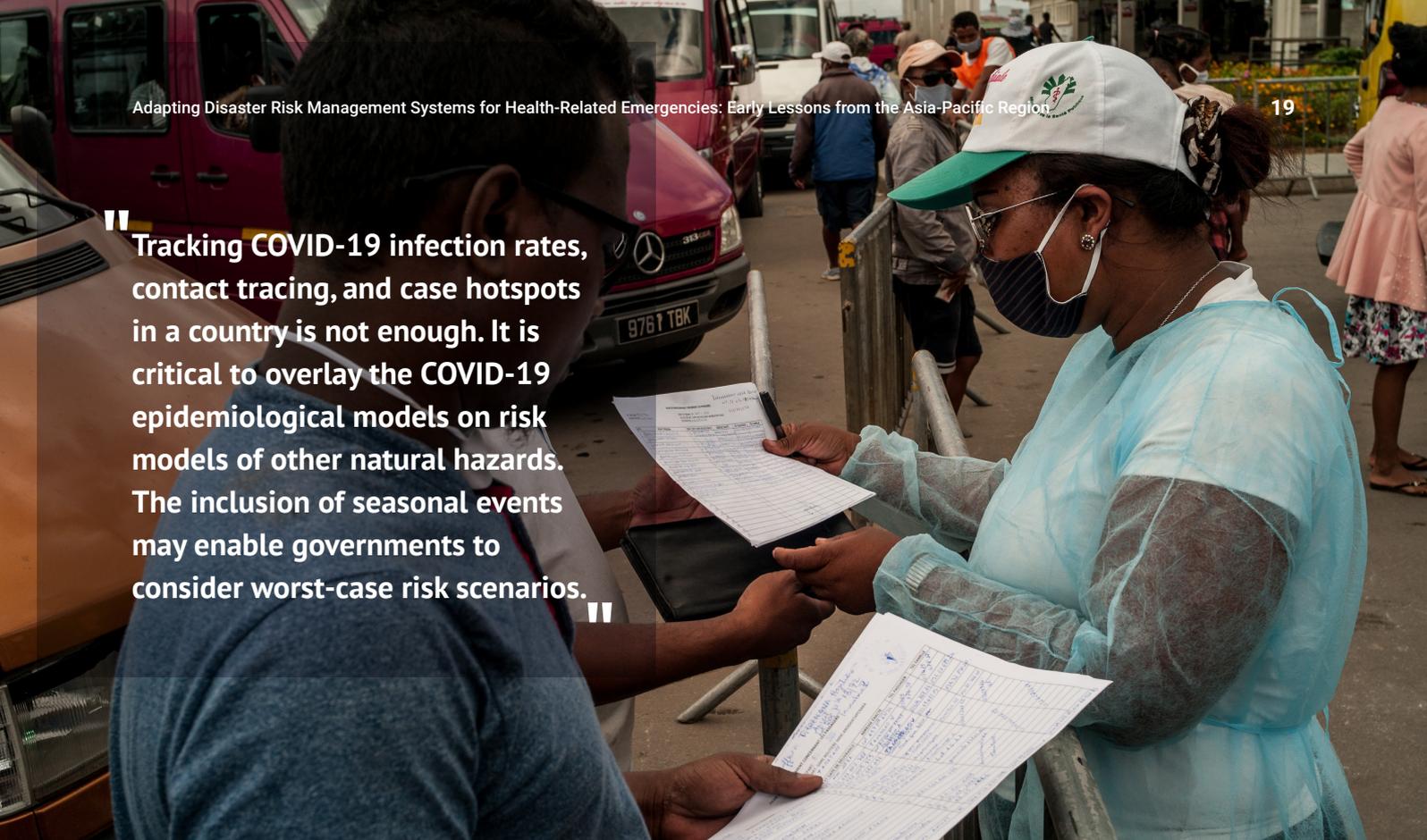
between the emergency measures and "lockdown" procedures. Designated prefectures will also ask people to refrain from travel across prefectures and call for a calm response to prevent confusion (including panic buying of food, medicine, and daily necessities). Government support also included establishing an information-management platform to help the public understand existing cases and tracing,[50] although detailed risk information on COVID-19 is not yet reflected in the country's existing early warning system and public information systems for disasters.[51] By focusing the response and public communication efforts at the prefectural level, Japan can use the extant infrastructure for responding to other types of disasters, including the systems for announcing public information, managing information, and dispatching emergency and medical workers.

In addition, Japan has a local government disaster administration wireless broadcast ("goji no chaimu" or "shichōson bōsai gyōsei musen hōsō"), which is

tested daily at 5:00 p.m. The speakers, located on the streets, are linked to a national system that can transmit disaster warnings to local governments throughout the country within seven seconds. This same system is currently being used by municipal governments, broadcasting public announcements that call for residents' collaboration in ensuring physical distancing, avoiding crowded spaces, wearing masks, etc. Ward offices are sending similar messages through internet and smartphone messaging applications, advising citizens to stay home.

In the Pacific, all four countries affected by Tropical Cyclone Harold in April 2020 (Fiji, the Solomon Islands, Tonga, and Vanuatu) have an EWS in place for natural hazards. In Samoa, the Samoa Meteorological Service provides cyclone advisories. The public received COVID-19 information and case updates from government websites, radio, TV, and social media (Facebook and Twitter).

50
See https://stopCOVID-19.metro.tokyo.lg.jp/en/

51
See https://map.bousai.metro.tokyo.lg.jp/en/pc/map.

In **Vanuatu**, the COVID-19 taskforce created an official web page to host information and updates.[52] In addition, the government has created a Health Promotions Vanuatu page on Facebook to disseminate COVID-19 information and updates to the public. The NDMO has taken the lead in overall coordination of the COVID-19 response since the end of March 2020, when there were only suspected cases and none were yet confirmed. Physical distancing and travel restrictions have been in place since then, and the NDMO advised the public to practice good hygiene and physical distancing while it monitored the situation with a suspected COVID-19 case cluster. On March 26, 2020, the Prime Minister declared a two-week SoE. To raise public awareness and increase preparedness, the NDMO, with support from the Emergency Telecommunication Cluster, set up a toll-free number for the public to call to request information regarding COVID-19. Information is also disseminated via SMS.

While there continue to be no confirmed COVID-19 cases in Vanuatu, the NDMO stepped up preventive action by installing several hand-washing stations and enforcing strict social-distancing measures. During the two-week SoE, the public was advised to adhere to the curfew as stated in the SoE order, and a stricter travel advisory was released. On April 3, 2020, the NDMO released a statement detailing the Scenario 2 stage (SoE declaration with suspected or confirmed cases in Vanuatu) of the country's COVID-19 response, and announced a stimulus package.

On April 1, 2020, during the initial two-week SoE period, the NDMO released a public cyclone alert based on the weather outlook of the VMGD Vanuatu Meteorological and Geo-hazard Department. The NDMO also announced three other, non-COVID–related warnings during this period: high potential that Tropical Cyclone Harold would reach Vanuatu in 24 to 48 hours; alert level 2 for ash fall from Mt. Yasur on Tanna; and flooding in Teouma Valley.

On April 5, 2020, the NDMO prioritized the response to Tropical Cyclone Harold. Some areas received red and yellow alerts; people in those provinces were advised to remain alert and listen to Radio Vanuatu to stay updated. Power and water outages occurred in Santo, and people in the northern areas were moved to evacuation centers with support from Provincial Emergency Operation Centers. The NDMO also released Directive no. 37, which stated that the

Photo: Tropical Cyclone / Pixabay

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[52]
See https://COVID-19.gov.vu

regulations restricting social gatherings of more than five people and social distancing for COVID-19 response would not apply to those seeking shelter in safe houses or evacuation centers.

The NDMO once again prioritized Tropical Cyclone Harold response above COVID-19 in its April 7 situation report. The NDMO issued an "all clear" status for northern and central provinces, but still advised people to listen to Radio Vanuatu for the latest updates; it also released a preliminary report on the cyclone's impact on some areas of Vanuatu. Regarding COVID-19, the NDMO changed the national

status from Scenario 2 to Scenario 1 (SoE declaration for preparedness and containment measures, but no confirmed cases) and released Directive no. 39, which lifted all domestic restrictions on air and maritime operations (subject to normal safety and regulatory requirements). This was due to unintended ambiguity in responding to Tropical Cyclone Harold against the backdrop of the pandemic – even with no cases of COVID-19 in Vanuatu – which resulted in the quarantining (for seven days) of relief supplies from other nations. These much-needed supplies were therefore not immediately available to disaster-affected people.

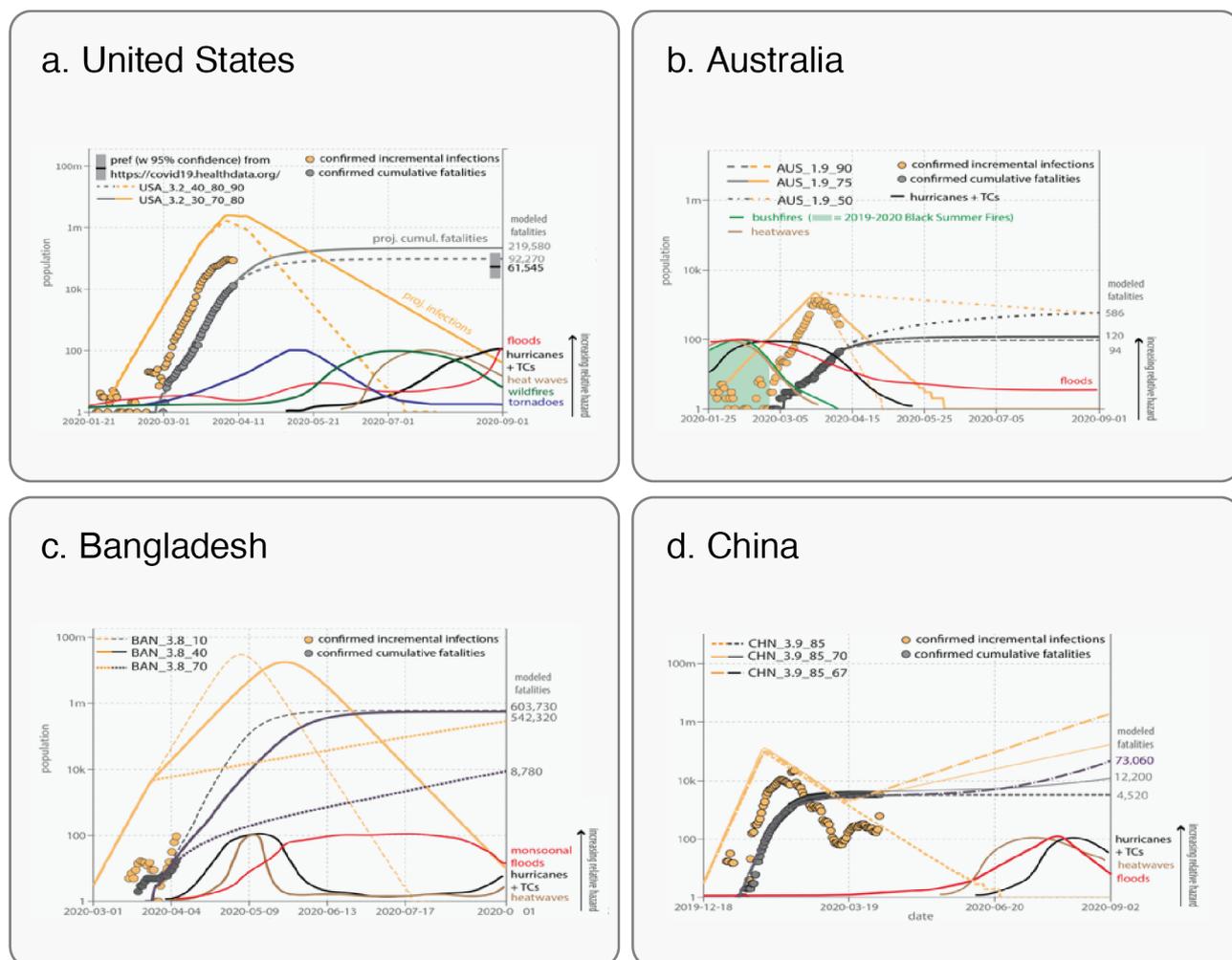**Figure 4** Epidemiological forecast models for COVID-19 fatalities and infections of selected countries relative to the rate of other hazards.[53]

53
See https://www.essoar.org/doi/10.1002/essoar.10502915.2 and https://covid19-scenarios.org/

4

Enhancing emergency management: Multiple risks during health related emergencies

As we begin to understand how the COVID-19 pandemic is multiplying risks and changing the landscape of countries' risk profiles, it has become clear that we must bolster our preparedness for current and future natural hazards and health related emergencies, particularly biohazards. It is critical to understand that disasters can occur at multiple levels simultaneously, and that the response to one hazard (such as the COVID-19 pandemic) can expose further vulnerability problems and raise additional concerns for the response to another concurrent hazard.[54] These concerns include whether the government and other related actors are preparing or revising their contingency plans or other guidelines in response to such situations. Disaster preparedness strategies and resourcing plans should carefully consider the impact of COVID-19 on future response operations. Governments should adapt implementation modalities to account for those impacts, which could include the disruption of critical supply chains, the potential localization of response efforts due to restricted mobility of humanitarian actors, the limited availability of evacuation centers with capacity for social distancing, the constrained capacity of humanitarian workers or volunteers and medical staff to respond to natural disasters in areas affected by COVID-19, and health systems' limited supply of personal protective and medical equipment and their finite capacity to manage large spikes in COVID-19 cases. [55]

54
See https://onlinelibrary.wiley.com/doi/full/10.1111/1469-8676.12890

55
Op. cit.

Photo: **World Bank** / Flickr

For instance, **New Zealand**'s lockdown means that mobilization restrictions are in place. However, the government issued a notification that in the event of an emergency, the protocol for natural disasters would override the lockdown order. Communities are expected to evacuate as necessary, but also to take necessary measures for COVID-19 prevention, including maintaining safe distances and personal hygiene. The Civil Defense Management Authority has not yet issued a separate protocol to address natural emergency situations during COVID-19; citizens are to refer to the existing emergency protocols for different hazards (tsunami, fire, floods, etc.).

Governments may learn from the experience of Pacific countries that responded to natural disasters during the current COVID-19 situation.

For example, Tropical Cyclone Harold had tracked towards **Fiji** as a Category-4 storm. When it caused widespread flooding on April 8, 2020, Fiji's National Emergency Operations Centre was activated. The NDMO worked closely with the MoH to ensure that physical distancing was practiced in evacuation centers. In **Tonga,** the NDMO adjusted its response to Tropical Cyclone Harold to consider the unique characteristics of the COVID-19 setting. Lockdown notice and curfew was lifted to allow people to move to a safe place and prepare for cyclones, but communities were advised to maintain social distancing during evacuation. However, there are still some challenges surrounding how to maintain physical distancing and prevent outbreaks in evacuation centers. The first obstacle is the lack of capacity to conduct sufficient testing. The rapid test kit is not readily available in Tonga, and importing it from abroad is difficult due to limited availability of tests, travel restrictions, and quarantine policies. Without sufficient testing, monitoring the spread of COVID-19 will be very difficult in a post-disaster context. The second challenge is the limited number of evacuation centers, which has resulted in overcrowding. Tropical Cyclone Harold damaged approximately 60 percent of schools, which are usually communities' preferred option for use as evacuation centers. The community now has few options for evacuation centers, and during the aftermath of the cyclone, the government struggled to keep the occupancy rate of evacuation centers at a safe level. [56]

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[56]
See https://www.undrr.org/publication/undrr-asia-pacific-COVID-19-brief-combating-dual-challenges-climate-related-disasters

Photo: Emergency hospital set up in a soccer field / Envato

The challenging dynamic of managing concurrent hazards, as evidenced by the experience of Pacific island countries with Tropical Cyclone Harold, was also at play during Tropical Cyclone Vongfong in the Philippines, Tropical Cyclone Amphan in Bangladesh and India, and Tropical Storms Linfa and Nangka in Vietnam. On May 20, Tropical Cyclone Amphan struck the east coast of India, causing widespread damage in West Bengal and Odisha, as well as in parts of Bangladesh. As a result of past experiences with significant cyclones, both countries have invested in improved early warning systems and preparedness for tropical cyclones. Adopting a "zero-casualty" strategy, Indian and Bangladesh have spent years developing a more accurate forecasting system and generating inundation models that help people to take early action (e.g., decisions about evacuation).[57]

Though the early evacuation of 2.5 million people in Bangladesh and half a million people in India likely helped mitigate the worst effects of the cyclone, evacuating large masses of people during COVID-19 pandemic led to new challenges. However, both countries had disseminated masks and sanitizers to cyclone shelters, and reduced the shelters' maximum capacity to help mitigate local outbreaks. The combination of early warnings for Tropical Cyclone Amphan, an effective disaster management governance structure, sound community-based response strategies, and careful monitoring of migrants' movements[58] enabled disaster-affected areas to contain the spread of COVID-19.[59]

In **Japan**, government agencies preparing for floods and other disasters during the COVID-19 pandemic

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[57] See https://public.wmo.int/en/media/news/cyclone-amphan-highlights-value-of-multi-hazard-early-warnings

[58] See https://www.who.int/india/news/feature-stories/detail/from-governance-to-community-resilience-odisha-s-response-to-covid-19

[59] See https://www.unescap.org/blog/protecting-most-vulnerable-amidst-covid-19-and-cyclone-amphan

have also adjusted their activities accordingly. For example, Tokyo's Adachi ward (population of more than 690,000), a high-risk area for flooding, stockpiled disinfectant and prepared approximately 2,000 face masks for each of its evacuation centers to mitigate the risk of COVID-19 transmission during the typhoon season. Officials also made provisions for checking the body temperature of every person at the entrances to each shelter, and have identified large-scale facilities (including hotels and large stores) that could serve as potential emergency shelters to enable physical distancing. The ward is also urging residents whose homes are high enough to evacuate to top floors instead of seeking shelter elsewhere to reduce the risk of transmission during evacuation.

In **Indonesia**, on the other hand, several ministries have been updating their disaster response protocol independently. For instance, the Ministry of Social Affairs, as the lead government agency for shelter and protection during emergencies, has issued guidelines for evacuation and camp management under COVID-19, and the National Search and Rescue Agency (Basarnas) has issued new guidelines for emergency rescue operations during the pandemic. BNPB and other partners have also prepared guidelines on tsunami evacuation in COVID-19 situations.[60] In formulating this guideline, the agency considered that, in responding to natural disasters, people will tend to be in close proximity – partly due to constrained space, such as in evacuation areas, and partly for a sense of security and comfort. It is challenging to evacuate under COVID-19 conditions in which people must maintain physical distance, but crowded conditions can cause outbreaks and make disease control difficult. The guideline emphasized that when communities are required to self-evacuate, they must pay attention to maintaining physical distancing, wear masks, and follow the policy of large-scale social restrictions in their respective regions (where applicable).

Furthermore, throughout March and April 2020, the Indonesian COVID-19 Task Force and related ministries produced various guidelines and protocols for their respective sectors on how to respond and adapt to COVID-19 and to the everyday conditions that will eventually result from the pandemic.[61] However, considering the risk of concurrent crises, the government needs to regularly update and monitor its relevant preparedness strategies, business continuity planning, and contingency planning to address the potential multiplicity of future disasters.

It is also crucial to fully accept and plan for the likelihood of COVID-19 outbreaks returning in several waves over a protracted period (see figure 5). Disaster risk management policy makers could seize the opportunity provided by transition periods between COVID-19 phases to adjust crisis management and contingency plans for multiple hazards (see box 2). Similarly, public- and private-sector stakeholders alike may have to adjust their business continuity planning. This is also the best period in which to take stock of the impact of previous waves on the nation's economy and communities.

From the perspective of public health operations, there are several factors influencing how future waves of COVID-19 may play out; the most critical of these are the speed of production and distribution of COVID-19 vaccines, and equitable access to rapid Polymerase Chain Reaction (PCR) tests.[62] Both will affect how countries choose to adapt their disaster risk management policy and plans. Some countries may be able to provide vaccines and accessible rapid testing before future outbreaks, while others may have to adjust at later stages.

Whilst this note has focused on the role of NDMOs in health-related emergencies, the role of key emergency responders is equally important. Their

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[60] https://ww w.bmkg.go.id/gempabumi/panduan-evakuasi-gempa-tsunami-situasi-covid19.bmkg

[61] See https://covid19.go.id/p/protokol?page=7 for the complete list of related protocols. .

[62] The diagnosis of COVID-19 requires the use of PCR tests, which were not widely available before the pandemic. The use of PCR tests for everyday diagnosis (and early detection) was therefore not standard in many countries. Only a few laboratories in most countries were able to use them – mostly for research, and with a limited number of samples. Public health laboratory capacities would need to be expanded, decentralized, and maintained in order to scale up PCR testing.

operating environments are highly influenced by institutional arrangements in the DRM sector and by intragovernmental coordination in the handling of health related emergencies. These emergency responders include search and rescue agencies, medical personnel and service providers, and police, among others. Based on the available information in the countries analyzed, legislation pertaining to emergency response agencies was not amended; instead, governments decided to adjust regulations related to operational matters. For instance, the Indonesian Search and Rescue Agency (Basarnas) updated their search and rescue protocols and enhanced their personal protection standards. Similarly, the Japanese Self Defense Force and many of the country's medical facilities updated their standard operating procedures and protection policy for first responders to account for COVID-19 public

health and restriction measures in advance of flooding in southern parts of Japan during July 2020.

The ongoing pandemic increases the burden on and demand for emergency services, a key concern for emergency preparedness and response. For example, hospitals and medical facilities in areas affected by flooding in Indonesia during 2020 reported limited medical supplies and staff. Ongoing health related emergencies can also multiply natural hazard risks due to the risk of disease transmission, hampering efforts for a swift response, particularly if additional resource mobilization is needed from outside disaster affected areas. During the July flooding events in Kyushu, Japan, residents and first responders in affected areas engaged in the relief efforts themselves due to the pandemic and their concerns around accepting external support.
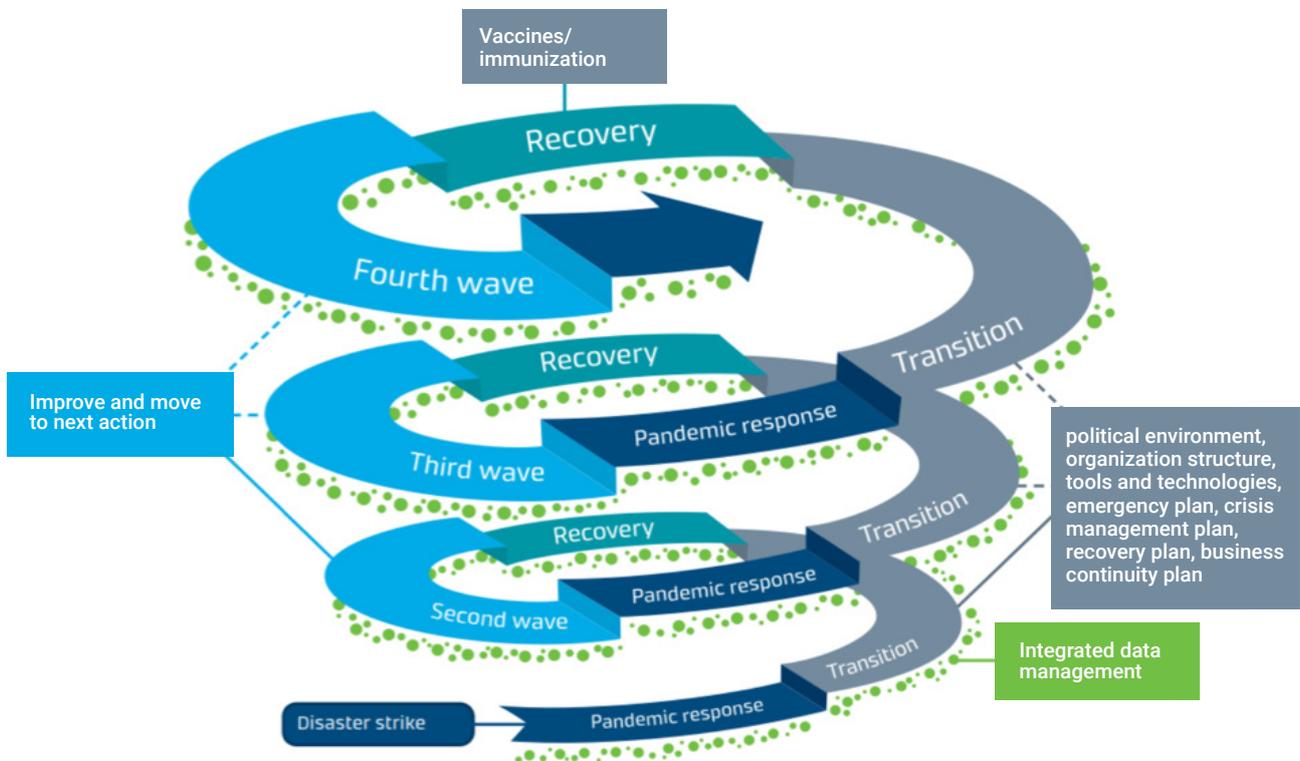

Figure 5   Transitioning from pandemic response to recovery in a spiral fashion.[63]

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See https://doi.org/10.1016/j.pdisas.2020.100102, noting that many countries are still in the first segment of the first level at the bottom of this diagram and the number of waves and impacts of vaccines is not yet clear. It is indeed possible that countries could even start vaccine interventions earlier than indicated in this diagram.

BOX 2

Early Warning, Early Action

The COVID-19 pandemic is not the first time the world has seen a concurrence of natural disasters and disease outbreaks, and governments have adjusted their disaster management policy based on lessons learned. In 2018, the state of Kerala in India was affected by one of the biggest floods in the state's history. The floods directly impacted the lives of one-sixth of the total population of Kerala, killed 483 people, and forced about a million people to be evacuated.[64] In the same year, the state also experienced an outbreak of the Nipah virus, with a full third of India's cases occurring in Kerala. The outbreak was managed successfully by central and state government agencies due to the strength of Kerala's health system and the presence of existing interagency coordination mechanisms; however, disease surveillance and data collection could have been improved, and the state could have strengthened public awareness of signs and symptoms through more effective information campaigns.[65]

Kerala's preparation for COVID-19 began before the state even registered India's first case of the virus on January 30, 2020. Four days previously, the Government of Kerala had released novel coronavirus–specific guidelines that established case definitions, screening and sampling protocols, hospital preparedness, and surveillance.[66] In the following weeks, a series of comprehensive measures were rolled out. Within a short period of time, the Health Department acquired the skills for contact tracing, often in partnership with different agencies and individuals. Once the number of cases started increasing, the Health Department was able to scale up the intensity of contact tracing, learning on the job. Its effective preparedness processes laid the foundation for the state's effective response.[67]

The WHO[68] underlined several key actions taken by the Kerala State Government to control COVID-19, including maintaining active surveillance, establishing district control rooms for monitoring, building the capacity of frontline health workers, and addressing the psychosocial needs of vulnerable populations. Other notable lessons relate to the government's community-based approaches and effective risk communication. Both helped gain public trust, which is critical to successfully handling a major crisis.[69]

64
See https://indianexpress.com/article/india/483-dead-in-kerala-floods-and-landslides-losses-more-than-annual-plan-outlay-pinarayi-vijayan-5332306/

65
See https://www.who.int/southeastasia/outbreaks-and-emergencies/health-emergency-information-risk-assessment/surveillance-and-risk-assessment/nipah-virus-outbreak-in-kerala

66
Kerala Response to Covid-19, see https://ndma.gov.in/images/covid/response-to-covid19-by-kerala.pdf

67
See https://www.ideasforindia.in/topics/governance/kerala-s-management-of-covid-19-key-learnings.html

68
See https://www.who.int/india/news/feature-stories/detail/responding-to-covid-19---learnings-from-kerala

69
See https://ndma.gov.in/images/covid/response-to-covid19-by-kerala.pdf

5

Recommendations to enhance disaster risk management systems

Governments around the world are on the front lines of COVID-19 response, combating its spread through their NDMOs and MoHs. Other disasters that have occurred during the ongoing pandemic, such as Tropical Cyclone Harold in the Pacific, have highlighted the importance of preparing for all disaster shocks – both natural and non natural – and of integrating the management of health-related emergencies and biohazards into the country's existing disaster risk management system. Based on the observations and experiences of these selected countries in the Asia-Pacific region, several practical recommendations are outlined below.

Photo Copyright: ©GFDRR / World Bank Disaster Risk Management (DRM)

1.

Review national disaster legislation and disaster risk management strategies and policies. Although the COVID-19 pandemic is still ongoing, we will have the opportunity in the future to learn from effective institutional coordination and implementation of DRM policies. For instance, Vietnam's successful One Health Approach helped the country implement a highly coordinated COVID-19 response that allowed the government to make swift decisions early during the pandemic. Although many countries' national disaster management laws already include references to non natural disasters, there is room for stronger institutional coordination, and for updated policies related to community awareness (e.g., integration of public health considerations), emergency management (e.g., physical distancing in evacuation centers during health related emergencies), and preparedness (e.g., incorporation of health surveillance and monitoring of epidemics or pandemics in multi-hazard early warning systems). Two other key aspects deserve further attention: the (timely) enactment of a national state of emergency when it comes to pandemics; and a national pandemic strategy to coordinate efforts and resources for future shocks, including international resources and financing mechanisms.

2.

Update national risk analyses and impact-based scenarios of all hazards via a multi-hazard approach that factors in risk information related to the COVID-19 pandemic and other health-related hazards. There is a general perception that we are transitioning to the "new normal," but this sense must not lead to complacency – particularly since, as shown in figure 3, some countries are seeing a rise in new COVID-19 cases. On the contrary, now is the time to recalculate the effect of COVID-19's "first wave" on each country's risk model, and to prepare for both continued natural hazards and the potential of a COVID-19 "second wave," in addition to future biohazards. Epidemiological forecast models (similar to figure 4) could be carried out with appropriate validation against the field dynamics of COVID-19 transmissions and assumptions about policies and public behavior. This process may also include identifying priority vulnerable areas, updating multi-hazard risk modeling and probabilistic analyses, and revising strategic contingency plans for disaster hotspots and priority areas. Countries such as Indonesia, Myanmar, and the Philippines could integrate their geospatial COVID-19 data platforms with their disaster risk information platforms, helping governments to identify vulnerable communities that need enhanced programs for disaster preparedness, health, and social protection.

3.

Monitor feedback on COVID-19 risk and crisis communication, administer performance audits, and improve MHEWS platforms. By looking at this data in the aggregate, governments can see how frontline response time relates to the public's understanding of the co-existence of COVID-19 and natural hazard risks. At the moment, some countries are reacting with sporadic innovation and piecemeal approaches. For instance, Indonesia's "InaRISK" disaster risk information platform now includes an additional layer of COVID-19 information and advisories; however, despite these scattered updates to public health surveillance tools, there has not yet been a concerted effort to coordinate the resultant data. As we begin the partial transition to the "new normal," it is imperative to evaluate the performance of COVID-19 crisis communication as part of overall MHEWS practices. This can inform more holistic multi-hazard risk and crisis communication strategies and suggest approaches for future MHEWS designs that include public health risks (including potential second waves of COVID-19 outbreaks).

4.

Build on existing EWS and alert systems for natural hazards, integrating alerts for health-related emergencies. Many countries' COVID-19 experiences, including their implementation of mobility restrictions, demonstrate that there may be a need for health emergency alert levels with clearer, more stringent parameters and indicators, similar to the Alert Level in New Zealand and DORSCON in Singapore. Governments should consider developing roadmaps for, and investing in, open data platforms for MHEWS that integrate health surveillance and natural hazard information, institutional arrangements (including coordination with MoH), and robust legal frameworks for responding to complex emergencies involving diseases and other biological hazards. Learning from the tropical cyclone experience in the Pacific, governments could update existing databases and geoportals for natural hazards to provide the locations of COVID-19 outbreaks and hotspots, offer information about surrounding populations and communities, and indicate the locations of testing, quarantine, and treatment facilities (including occupancy rates and capacities) to inform community evacuation. Such improved health surveillance and health-related early warnings, however, would also require expansion of public health laboratory capacities to scale up rapid PCR testing.

5.

Enhance community-based disaster preparedness programs – which often have significant success in raising risk awareness – to incorporate preparedness for health related emergencies. As long as the community is educated and aware of disaster risk, community-based programs can also help accelerate case tracing, absorb the vulnerable groups emerging due to indirect impacts of COVID-19, and support distribution of relief items and services (e.g., disinfectant spray, temperature checks, hand-washing facilities). In addition, by investing in community-based approaches, countries can help community members maintain order, which supports mobility screening during periods of restrictions.

6.

Adapt national and local emergency management systems to incorporate health related emergencies, building on existing mechanisms for response, logistics, monitoring, and communications. Currently, both government and non-government actors are using various techniques, platforms, and ongoing innovations in big data to track COVID-19 and its impact. To leverage these experiences, countries must assess the interlinkages across Emergency Operations Centers (EOCs) and identify the capacity-building needs of EOC officials, whether they are based at the NDMO, sub-national DMOs, or the Health EOC of the MoH. At all levels, having a coordinated response and incident-management structure is critical. In addition, contingency plans, evacuation procedures, and emergency response procedures need to be updated to consider the impact of social distancing and travel or mobility restrictions on emergency response and post-disaster recovery activities. Such measures have already been implemented in countries such as Indonesia to update tsunami evacuation guidelines. They could be further institutionalized in countries (such as Fiji, Samoa, and Tonga) that revised mobility restrictions due to the urgent need for evacuation during Tropical Cyclone Harold.

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