



PAPER 3

Building a Workforce for Present and Future Health Emergencies

1. Background

In February 2016, the High-level Panel established by the UN Secretary General Ban Ki Moon to review the global response to health crises released their final report. Titled “*Protecting Humanity from Future Health Crises*”, the report provided 27 recommendations for urgent and immediate action at all levels of national, regional and international governance, with cooperation and partnership across all sectors of society.¹ The High-level panel was commissioned in the wake of the Ebola Epidemic which had claimed more than 11,000 lives, to provide recommendations for strengthening the international health system response to global emergencies.² The panel concluded, that not only was the “*risk of major health crises widely underestimated*” but that the “*world’s preparedness and capacity to respond is woefully insufficient*”.³

Three months later during the 69th meeting of the World Health Assembly, member States requested and agreed to support the establishment of a new functional arm of the World Health Organization (WHO) called the *Health Emergencies Programme*.⁴ The new programme would enable the WHO to expand its focus and function during global health emergencies from primarily a coordinating and technical organization to an operational response agency.⁵ In conceiving the Health Emergencies Programme, an “all hazards approach” was recommended and adopted as management arrangement. This requires countries and partners to prepare, prevent, respond to and recover from all hazards that create health emergencies, including disasters, disease outbreaks and conflicts.⁶

Adopting an “all hazards approach” represents a significant challenge for both the WHO and most low and middle income countries. The approach requires a comprehensive risk-analysis framework to identify health hazards of greatest risk and the use of risk-based planning to enable the prioritization and allocation of resources to manage and reduce the risks.⁷ While this approach is the most practical and evidence-tested for historical health impact disasters, such as storms, floods, earthquakes and epidemics, it far less compatible for emerging and future public health emergencies, caused by cumulative exposure to a contaminated environment or drug resistant pathogen. Current rates of morbidity and mortality from cumulative exposure events from contaminated environments, like air, water, food and those threats from anti-microbial resistance are hundreds of times greater than those caused by single event natural disasters.^{8,9}

Developing a national and international health workforce capable of effectively responding to public health emergencies requires advanced planning, training, technical guidance, coordination, support, leadership and commitment to long term partnering. All of these elements are core functions of the new Health Emergencies Programme, yet the WHO has neither the operational capacity, nor the emergency response framework to effectively reduce the risks from environmental health disasters and this represents a major conundrum.

1.1 Re-thinking Health risks from Public Health Emergencies

The 2015 yearly analysis of disaster mortality and impact published by the Centre for Research on the Epidemiology of Disasters (CRED) reported the disaster which caused the highest mortality was the Gorkha Earthquake, which killed an estimated 8,831 people.¹⁰ For the following year (2016), CRED reported the 7.8 magnitude Ecuador earthquake was responsible for the highest mortality, with 676 people killed, followed by Hurricane Matthew, which caused 546 deaths in Haiti and 49 in the USA.¹¹ The analysis for 2016 further showed that storms and floods caused 72% of all natural disaster related mortality for that year.¹² Of all deaths recorded and attributed to natural disasters in the 20 years from 1996-2015, over half died in earthquakes (748,621) and the remainder from weather and climate related hazards, while more people died from extreme temperatures

(165,869) over this time period than caused by flood (150,061).¹³ For the period 2000-2016, at least 136,835 fatalities were recorded in Europe alone, due to heat-related health complications, which represents more than 87.1 % of all disaster-related deaths in that area.¹⁴

This data contrasts starkly with pre-mature mortality caused by environmental risk factors. The WHO estimates exposure to “unhealthy environments” caused 12.6 million deaths in 2012 and the region with the highest burden of mortality, was South East Asia and Western Pacific, with 7.3 million deaths.¹⁵ In 2014, the Intergovernmental Panel on Climate change (IPCC) published an evidence based health risk and hazard management blueprint, to prepare for changing health risk caused by climate change. In the report, the authors estimated that the burden of disability adjusted life years caused from air pollution in 2010 was 7.6% of all DALYs lost, higher than all 12 risk factors examined, including those of malnutrition, smoking and high blood pressure.¹⁶

The human health risk caused by incidents or events that increase a population’s exposure to noxious substances will exponentially cause greater harm to people’s health as the time and concentration of the exposure increases. This health impact however, may not necessarily cause a sharp rise in acute health care needs, but rather may create long-term health damage or exacerbate existing health risks, as may be the case for cardiovascular disease or exposure to carcinogenic compounds. For example, in 2015 in Sumatra, the 230 or more fires smoldering for months, exposed whole communities to continuously variable concentrations of peat and forest fire smoke.¹⁷ One study modelling excess mortality from exposure to the smoke estimated the disaster contributed to at least 100,000 deaths across Indonesia, Malaysia and Singapore combined.¹⁸

A different health emergency occurred in Melbourne in 2016, when large concentrations of fractured grass pollens were pushed into Melbourne ahead of a thunderstorm, causing at least 8,500 emergency department presentations and nine deaths.¹⁹ In December 2015, China’s Ministry of Environmental Protection declared a “red alert” from air pollution in Beijing and one year later, Beijing and 21 other cities across northern and central China also declared “Red Alert”.²⁰ One study estimated that 4000 people die *every day* from air pollution in China, which represents *17% of all China’s deaths*.²¹ This University of California study, calculated that based on environmental exposure, life expectancy can be reduced by 20 minutes for every hour of exposure.

The emergency management response network, including the health system, must re-align their perceptions of risks and hazards to health from impacts from disasters and emergencies. Without modification, prioritization of hazard reduction and prevention measures desperately needed in the face of increasing risks, will be overlooked for traditional disasters such as storm, flood, fire, epidemic and earthquake. This stark reality is clearly illustrated by the 2016 *State of Health Security Report* and preparatory planning processes led by UN agencies which failed to acknowledge any mention of the growing health threat from changing environmental exposures.²²

1.2 Crisis in Health Workforce Resources

The health system of all low-income and the majority of middle-income countries remain vulnerable to large scale public health emergencies. These countries have an insufficient workforce to adequately meet the primary health care needs of the population, let alone, lead emergency health preparedness and hazard reduction priorities. The WHO created three density thresholds to help inform discussions about the necessary size and skill mix of health professionals (total number of midwives, nurses, and physicians) to meet fundamental health needs per 10,000 population. There are three thresholds of 22.8, 34.5, and 59.4 skilled health professionals per 10,000 population purposively selected to highlight the variation in health workforce availability.²³

From a global perspective, only 68 countries have achieved or surpassed the threshold of 59.4 per 10,000 population.²⁴ For the remainder of the world’s health system, 100 countries fell below the threshold of 34.5 skilled health professionals per 10,000 population, including 83 countries, which fell below the lowest threshold of 22.8 skilled health professionals per 10,000 people.²⁵

The importance of the Emergency Health Programme functions to support national level development, planning and preparedness is accentuated by the fragility of national health systems to manage complex health emergencies with such few skilled human resources. The health risk to hundreds of thousands of people posed, especially those predisposed to cerebrovascular disease, respiratory disease and neoplasms, will be dependent on risk prevention and protection systems developed prior to inevitable large scale health emergencies. The

complexity of effective public health program responses to reduce the risk of harm during cumulative health impact exposure events without a sufficient skilled workforce, will challenge traditional disaster management deployment response protocols.

Reducing the devastating impacts from major public health emergencies by supporting national health systems hazard reduction and response preparedness will require prioritization matrices to be developed as addendums to the ERF. Such prioritization matrices should include variables such as the existing health workforce, operational relationships, policies, workforce mix and coverage (localization) along with the hazard risk analysis.

1.3 Challenge for the New Health Emergencies Program

The new Programme will face two difficult challenges in adopting an “all hazards” approach and effectively responding to cumulative exposure international public health emergencies. The first is the operational capacity within the structure of the programme to respond, and the second is the orientation of the emergency response framework (ERF) to natural disaster events.

Importantly, the programme is not responsible or geared to managing every possible health hazard, this is not the objective of adopting the “all hazards” approach. However the program will need to support national and regional scenario planning, risk assessment and preparation for major public health disasters, such widespread population exposure to noxious compounds within air/food/water. Currently the programme has no operational structure to incorporate this growing international public health risk. The structure has five technical areas and operational departments including infectious disease management; country health emergency preparedness and international Health Regulations (2005); health emergency information and risk assessment; emergency operations and emergency core services.²⁶ All would play critical roles in cumulative exposure health emergencies. The Programme is designed to operate in close collaboration with partner networks, including the Global Health Cluster; Emergency Medical Teams; Global Outbreak Alert and Response Network; Stand-by Partners; and Inter- Agency Standing Committee; to support country health risk assessment, hazard prevention, emergency preparedness, and response planning and execution.²⁷

The WHO’s Emergency Response Framework (ERF) clearly articulates the role and responsibilities of the agency in emergency response and the common approach adopted across hazards. The current ERF also defines WHO commitments, functions, standards, policies and categorizes health emergencies using a grading system, with Grade 1 the least impact and Grade 3 the highest.²⁸ The High Level Panel report recommended that Grade 2 or 3 categorizations must automatically trigger and inter-agency sectoral response.²⁹ In acute trauma and/or mass casualty events caused by conflict, natural disasters or infectious disease outbreaks of known pathogen or transmission dynamics, this framework has demonstrated its effectiveness.³⁰ It enables and allows for the existing organizational structure to manage core functions in the same way, irrespective of the hazard. The framework also provides flexibility in response, especially when the hazard can be controlled or avoided or when there is a clear and unambiguous relationship between the exposure to the hazard and the health effect on a population.

While the current ERF is well suited to historical health emergencies caused by earthquakes, storms, floods and disease outbreaks of known pathogen, its effectiveness has not been tested for cumulative exposure health impact emergencies. The nature, context and evolution of cumulative exposure hazards requires WHO to modify the ERF to provide improved prevention and response capabilities. For example, in events where the environmental exposure has already occurred and large populations have been exposed or in events where the hazard cannot be modified or eliminated and the human population cannot be moved to avoid the risk.

2. Summary and Conclusion

The formation of the Health Emergencies Programme and adoption of an “all hazards approach” is vital to improve the management and response to global health crises and reduce the premature mortality and morbidity they cause. However the WHO will need to discover and develop an operational response capability within the new programme and modified ERF for those public health emergencies whose ongoing or cumulative exposure causes mortality from heart disease, stroke, respiratory failure and cancer. Such health emergencies will typically

involve large population exposure to a hazard not easily controlled, suppressed or mitigated, such as from contamination of air/water/food or from anti-microbial resistance.

As demonstrated by the 2015 Indonesia smoke haze disaster and the 2016 Melbourne thunderstorm asthma emergency, an effective public health response can only be achieved through coordinated and concerted action and intervention from a consortium of organizations. Partnerships between non-traditional emergency response actors are critical to deliver operational strategies and plans. Such partnerships must involve multiple local government ministries, the public and private sector, alongside of emergency management actors. The success of the health system to manage public health emergencies will be dependent on the health workforce trained and experienced in working with and through other duty bearers, authorities and the private sector whom will be essential in delivering a population wide response.

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