Disaster Management and Human Health Risk

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DISASTER MANAGEMENT AND HUMAN HEALTH: REDUCING RISK,
IMPROVING OUTCOMES

Disaster Management

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Disaster Management and Human Health Risk

Reducing Risk, Improving Outcomes

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Foreword

It is a tremendous honour and privilege to write this Foreword for the 'First International Conference on Disaster Management and Human Health Risk: Reducing Risk, Improving Outcomes', and to Co-Chair this conference with my colleague and friend, Dr. Carlos Brebbia.

Both Professor Brebbia and myself thank the 'International Scientific Advisory Committee' for their work in reviewing abstracts and papers, which crossed numerous disciplines – from humanitarian to scientific – and from business to government sectors.

We also thank each of the contributors for their thoughtful research, that resulted in a thought-provoking conference – addressing such areas, as chemical emergencies, natural disasters, pandemics and biological threats, emergency preparedness and planning, risk mitigation, surveillance and early warning systems, and recent incidents and outbreaks.

This Foreword will draw attention to the increasing risk of disasters worldwide, second focus on our most pressing human health threat, namely pandemic influenza, and third focus on our most serious environmental threat, climate change – which will, no doubt, impact both disasters and pandemic influenza.

Disasters

Today, the world faces unprecedented disasters. For example, in 2005, an 'unparalleled frequency and scale of natural disaster' tested the international relief community; Hurricane Katrina, alone, destroyed 300,000 homes, displaced 770,000 people, and cost US$200 billion.

In 2009, the Centre for Research on the Epidemiology of Disasters found that natural disasters killed 235,000 people, affected 214,000,000 people, and cost US$ 190 billion in 2008. The death toll was three times higher than the annual average

for the years 2000–2007 because Cyclone Nargis killed 138,366 people in Myanmar, and the Sichuan earthquake in China killed 87,476 people.

Although these statistics are difficult to conceptualise, each increment matters because it means one household lost a family member, lost a home, or lost an investment. The numbers are not abstract, but rather, represent terrible change in the lives of real people.

This conference is of paramount importance because it focuses on current global risks, and how best to prepare for, respond to, and recover from disasters in order to reduce human health impacts.

Just a few short weeks ago, between June 29 and July 5, 2009, numerous countries around the world responded to: (1) natural disasters, including Benin, China and Viet Nam to flooding; and (2) technological disasters, including Italy and Peru to a train accident and bus collision, respectively.

Today, the world, however, is responding to the first influenza pandemic in over 40 years, and perhaps bracing for a second wave of the novel influenza A (H1N1) virus in the autumn. For the first time, we have two new viruses coexisting – namely influenza A (H1N1) at the World Health Organization (WHO)'s pandemic alert level 6, and influenza A (H5N1) at alert level 3.

I will spend the next several pages discussing the current danger and some of the questions countries, communities and businesses need to be asking in order to be prepared. I will not discuss personal preparedness – but will briefly mention what governments might encourage families to do to be ready.

Pandemic Influenza

As of August 2, 2009, the European Centre for Disease Prevention and Control reported 184,435 confirmed cases of H1N1 influenza and 1247 deaths in 153 countries worldwide – making it the fastest moving pandemic in history. Given that countries are no longer required to report individual cases, the number of reported cases underestimates the real number. Importantly, however, the number of human cases of H1N1 is still increasing substantially in many countries – even in those that have already been affected for some time.

Dr Margaret Chan, Director-General of the World Health Organization (WHO), discussed a key challenge in communication at a high-level meeting in Mexico on July 2nd, namely: 'We cannot be alarmist, as this risks flooding emergency wards with the worried well, creating disruptively high demands for staff, hospitals, and laboratories ... health services need to stay fit for genuinely severe cases. At the same time, if we are overly reassuring, patients in genuine need of treatment, where rapid emergency care can make a life-and-death difference, may be lulled into waiting too long.'

That is, helping people to understand when they need to seek urgent care, and

when they do not need to worry is one key way to help save lives.

A second key measure is to remain vigilant, to learn what the last few months have taught us – with the advantages of scientific tools for data collection, analysis, and communication that are unprecedented in their power – and to prepare for whatever surprises H1N1 might deliver next.

This is because the only certainty about influenza viruses is that nothing is certain. For example, will the infectivity and virulence of the virus change over time, and impact the number of people infected and the number who will develop serious complications and die? How will the virus affect the southern hemisphere, particularly where populations are more vulnerable, and how will it impact populations during the coming influenza season?

Call for Preparedness

In 2006, UN Secretary General Kofi Annan warned of the possibility of human-to-human transmission of the H5N1 virus unless the international community pulled together in a massive effort to combat the virus. Michael Chertoff, Secretary of Homeland Security *et al.*, appealed to the American business community on December 6, 2005, to prepare.

However, only 15% of large American companies had a pandemic influenza plan, according to a survey in March 2006, by human capital and financial management consultancy Watson Wyatt Worldwide. A June 2006, survey by The Conference Board of Canada showed that 80% of respondents' executives were concerned about the impact of a pandemic on their organization, but only 4% had developed a preparedness plan.

Today we may have a 'window', an unprecedented opportunity to prepare for a possible, second wave of pandemic influenza, and to reduce economic and social impacts, cases, hospitalizations and deaths.

Every country, community, and organization needs a pandemic preparedness plan to protect its people, society, and the economy.

Country and Community Pandemic Preparedness

Every country should consider asking questions, such as the following, with regard to the current outbreak of new influenza A (H1N1) virus (this is, by no means, meant to be a comprehensive list):

  (a) since swine is an important reservoir for the new virus, what specific measures are being undertaken by animal and human health experts to monitor swine;

  (b) how does the new H1N1 compare with the 1918 H1N1 virus and H5N1, particularly regarding the adaptation markers and virulence, and are the

current human cases of H1N1 similar (in pattern) to the possible cases of influenza between the spring and fall of 1918 and, if so, what lessons can be learnt;

(c) what planning is being undertaken for a worse-case scenario, especially if a more virulent virus emerges during the course of a pandemic;

(d) what specific measures are being taken to reduce the spread of H1N1 in local communities (and particularly in low resource areas) and institutions, and in the future, at what point should affected regions consider activating aggressive containment or mitigation efforts for affected communities;

(e) what new surveillance is taking place in the southern hemisphere, particularly in respect to bird flyways, humans, and pig populations;

(f) what specific preventive and treatment recommendations, if any, will be provided to young adults and pregnant women;

(g) what are the predicted impacts on a country's economy and society should a pandemic occur if illnesses and deaths are concentrated in a young, economically productive age group, and what specific measures can be implemented to reduce these effects;

(h) what underlying medical conditions may make individuals more at risk of complications or more likely to experience severe or lethal infections, and how will this information be communicated to at-risk groups;

(i) how might current disease burden influence the impacts of a possible H1N1 pandemic, and how might these impacts be reduced;

(j) what is the known full clinical spectrum of the disease caused by H1N1, does it impact multiple organs and, if so, which ones, what specific supportive therapies might be given, and will there be resources to provide these;

(k) what specific steps have been taken to engage the private and voluntary sector, what percentage of organizations are prepared for the economic and social impacts of a possible pandemic, and what measures are being taken to better prepare these sectors;

(l) what percentage of companies activated their pandemic response plans because of the H1N1 epidemic, and what are the learnings from these companies;

(m) since the emergence of the H1N1 epidemic, what steps have been taken to evaluate the effectiveness of communications among all stakeholders, including the levels of public awareness, degree of concern, and complacency;

(n) what, if any, steps could have been taken to contain the spread of H1N1 infection, and going forward, what is the decision framework to move from a policy of containment to mitigation;

(o) what will be the decision process for deciding whether to produce and

stock seasonal or new influenza A (H1N1) vaccines;

(p) what specific measures will be taken to avoid complacency about the H1N1 virus and keep the public engaged;

(q) what steps are being taken to monitor antiviral resistance, (i) what alternative therapies, including, new antiviral agents for flexibility in developing prophylaxis treatment, benefits of combination therapies and novel therapies, including, monoclonal antibodies, are being explored to deal with this possibility, (ii) what resources are being provided for these efforts, (iii) how will it be decided who has been exposed and requires treatment, (iv) how will antivirals be distributed in the event of a pandemic;

(r) how quickly will influenza A (H1N1) vaccines be available, (i) what regulatory processes would need to be modified, (ii) what delays might occur in production, (iii) how could these be overcome;

(s) will vaccines being developed now be effective if the virus causes a mild pandemic in the warmer months and changes into something more severe in the fall;

(t) who specifically is likely to receive priority for vaccination with a future pandemic vaccine, and how can decision makers engage citizens regarding ethical choices in order that the public understand the decisions that will have to be made during a pandemic;

(u) what advice is being given to medical personnel and community members regarding masks, (i) what is the stockpile of N-95 and surgical masks, (ii) could a country's companies supply enough of the required masks for a serious outbreak, (iii) what is the country's supply of respirators and does it meet the needs of the government's estimate; and

(v) what is the possibility of a wider clinical spectrum of H1N1, and a longer medical legacy (i.e. long-term sequelae)?

Government must also make the public aware of the potential magnitude of a pandemic, and the means by which individual citizens can lessen the impacts on their families. Families might consider storing food and water, as shops could lack supplies, or restrictions and sickness could prevent travel. Families might also have medicines, non-prescription drugs, and other health supplies (e.g. fluids with electrolytes, pain relievers, prescribed medical supplies such as glucose monitoring equipment) on hand. Families should review public health measures to reduce the risk of contracting or spreading influenza during a pandemic (e.g. avoiding non-essential travel and large crowds whenever possible, maintaining good basic hygiene, etc.). Finally, families might also consider recording health information for each member (e.g. allergies, blood type, current medications/dosages, emergency contacts, family physicians, past/current medical conditions, etc.) in case of emergency.

Business Pandemic Preparedness

Every organization needs a plan to maintain functionality. What is an organization's anticipated demand for services? What are its core activities, key employees, and necessary supplies? What insurance and security measures are necessary?

Consequently, what centralized, coordinated services might be available to an organization, its employees and the communities it serves? Has an organization undertaken a risk analysis and a review of business continuity plans? What delivery, quarantine, trade, and travel restrictions could impact an organization?

Has an organization developed pandemic-specific continuity procedures? How will it communicate with government, staff, and suppliers? How will it protect employee health and well being – personal hygiene, policies for preventive measures and sick employees, social distancing, and workplace cleanliness? Has the organization tested its plan, and up-dated it based on drills, or according to lessons learned during April-June of this year?

Summary of H1N1

Guarding against complacency is a major risk. During the 20th century, influenza threatened the world in 1918–19, 1957–58, and 1968–69. The latter two pandemics killed a total of three million people. In stark contrast, the Spanish influenza of 1918 killed an estimated 50 million people – even though eighty percent of patients suffered only the usual three- to five-day illness. Twenty percent of all influenza patients developed pneumonia, and half of those died.

Although most cases of novel H1N1 cases have been mild, this situation might change, and possibly rapidly.

Expecting the unexpected is essential, and keeping the public appropriately engaged will be a considerable challenge. Countries, communities, and organizations must recognize that choosing the least cost, effort, and time is a choice – and they must decide how to protect employees and the community. 'Afterwards, history will judge today's leaders on how well they took decision on the ethical challenges they faced in the midst of the crisis.'

Climate Change

While pandemic influenza remains the most pressing human health threat, climate change remains our most daunting environmental threat – as considerable time lags in the climate system mean that many impacts are already locked in over the coming decades.

Global climate change will, for example, increase sea level by 0.09 to 0.88m. Currently, some 46 million people experience flooding due to storm surges (an abnormal rise in sea level along a shore primarily due to the winds of a storm). A

half-metre sea-level rise would increase the number of vulnerable to 92 million; a one-metre sea-level rise would increase the number of vulnerable to 118 million.

What must be done globally, nationally, regionally, corporately and personally to slow emissions of greenhouse gases? What must countries do to adapt to rising sea levels – for example, in Vanuatu, where in 2005, an entire coastal village in the northern region had to be relocated to higher ground.

What are the potential health impacts of extreme weather in Vanuatu or other small island states? Are they physical injury, impacts on mental health, increased risk of water-related diseases as a result of disruption of water supply or sewage systems, release and dissemination of dangerous chemicals from storage sites and water disposal sites into flood waters? And what should be done to prepare for each identified impact?

Globally, climate change will certainly impact the frequency and intensity of extreme weather events, such as droughts and floods. And population growth, poverty, and urbanization will likely increase the number of people who are vulnerable to these natural hazards.

Failure to limit climate change to 2°C above pre-industrial levels will make it impossible to avoid potentially irreversible changes to Earth's ability to sustain human development. We have a five in six chance of maintaining the 2°C limit, if worldwide greenhouse gas emissions are reduced by 80% by 2050 relative to 1990.

Conclusion

As we debate the important work examining the links between disasters and human health, keep in mind our most overwhelming challenges, namely, pandemic influenza, climate change, and the global economic crisis – which will have, no doubt, impacted funding for preparedness and response for disasters.

Finally, we must heed the words of 12-year-old Severn Suzuki who, at the 1992 Rio Earth Summit, was fighting for her future and who challenged us to fight for all future generations when she said:

> *"Do not forget why you are attending these conferences who you are doing this for. We are your own children. You are deciding what kind of world we are growing up in. Parents should be able to comfort their children by saying, 'Everything's going to be all right. It's not the end of the world. And we're doing the best we can'. But I don't think you can say that to us anymore."*

Kirsty Duncan
Member of Parliament, Canada
University of Toronto, Canada

The New Forest, 2009

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