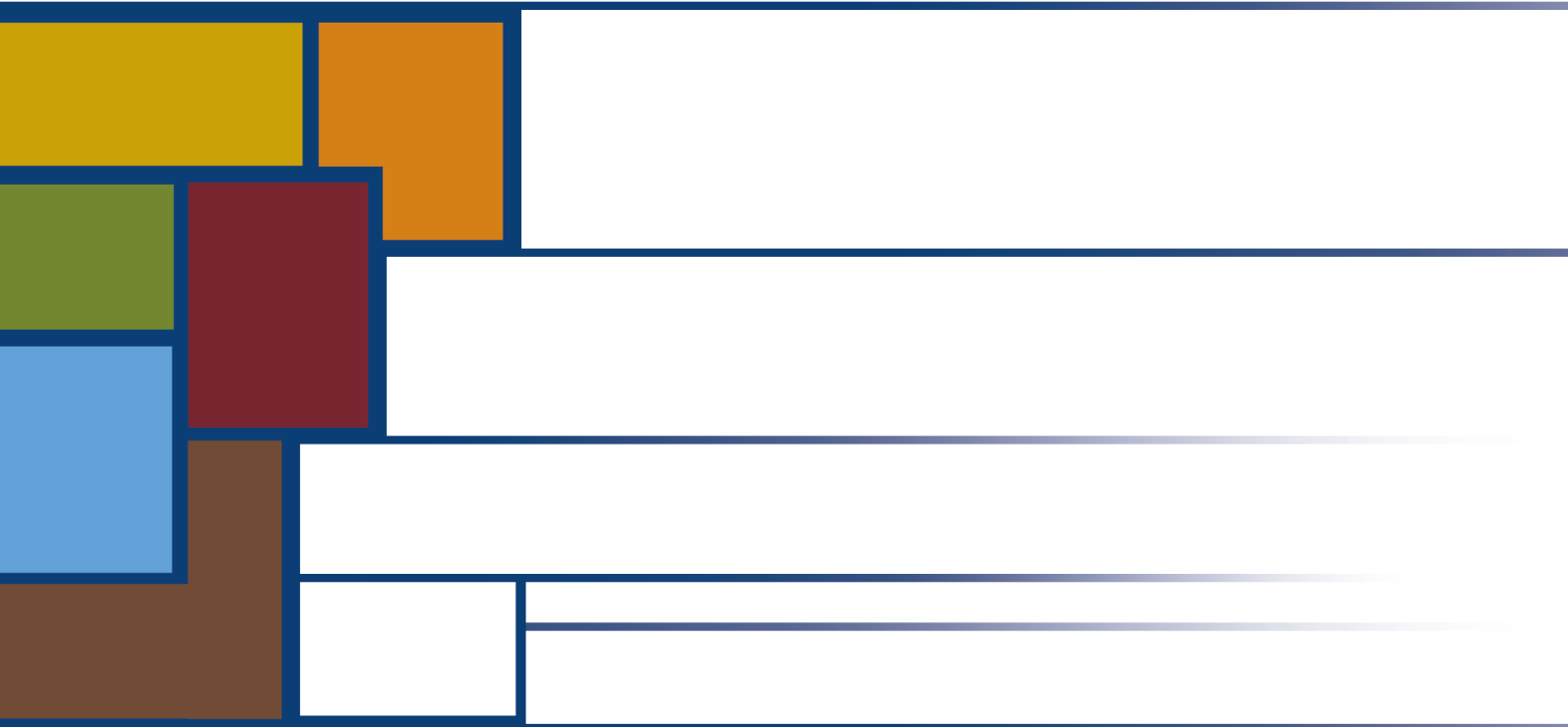


BEYOND PANDEMICS: A WHOLE-OF-SOCIETY APPROACH TO DISASTER PREPAREDNESS





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ACRONYMS

ASEAN – Association of Southeast Asian Nations

FAO – Food and Agriculture Organization

H1N1 – Influenza virus A, subtype H1N1

H5N1 – Influenza virus A, subtype H5N1

HIV/AIDS – Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome

HPAI – Highly Pathogenic Avian Influenza

EPI – Expanded program for immunization

FAO – Food and Agriculture Organization

IFRC – International Federation of Red Cross and Red Crescent Societies

NGO – Non-governmental organization

OIE – World Organization for Animal Health

RNA – Ribonucleic acid

SARS – Severe Acute Respiratory Syndrome

U.K. – United Kingdom

UN – United Nations

UNICEF – United Nations Children’s Fund

UNWTO – World Tourism Organization

U.S. – United States

USAID – United States Agency for International Development

WHO – World Health Organization

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FOREWORD

Between 2005 and 2011, national governments, businesses, local authorities, civil defense and military forces, community organizations and citizens' groups throughout the world became aware of the threat of an infectious and lethal disease pandemic caused by an influenza virus.

The 2005–2011 six-year period of pandemic preparedness involved thousands of different organizations and millions of professional and volunteer workers. It not only focused on actions to reduce risks of infection and its consequences. It also provided a low-cost complement to the essential work of animal health and public health professionals engaged in vital efforts to prevent the emergence of novel diseases, limit transmission between species, and—through biomedical interventions—reduce the risk of individuals being infected and the severity of infections.

During the last six years, it also became clear that the whole-of-society preparedness by multiple stakeholders also helped them prepare for other wide-ranging, unpredictable threats capable of affecting multiple locations progressively over time. Many of those who became engaged in the pandemic preparedness movement have found that the lessons from their experiences have application in other crisis preparedness work.

Launched in September 2010, the Towards a Safer World initiative is a systemic effort to document experiences within different countries, among groups of stakeholders and within different sectors to examine: 1) what has been learnt from six years of worldwide pandemic preparedness, 2) what lessons could be applied as a result of this learning, and where to apply them, and 3) how might these lessons most usefully be applied.

The world experienced an influenza pandemic due to Influenza A (H1N1) in 2009–2010: Towards a Safer World was able to examine ways in which groups of stakeholders responded and to assess the effectiveness of whole-of-society preparedness efforts. Fortunately, H1N1 was mild, but many lessons were learnt from the approaches, tools, and ways of working developed by those involved in pandemic preparedness.

The United Nations system, with generous support from several national governments and in close collaboration with partners from the International Federation of Red Cross and Red Crescent Societies, non-governmental organizations, the private sector, and military actors, has led the analytical phase of Towards a Safer World. The U.S. government, the World Food Programme, the Food and Agriculture Organization, the World Health Organization, and the World Bank contributed

expertise and a range of specialists prepared reports looking at achievements and lessons from pandemic preparedness across 11 thematic areas. These reports are available at www.towardsasaferworld.org and are summarized in this book, which gathers the key findings of each of those 11 individual reports into one coherent whole.

Some of the key themes emerging include: 1) the need for government, civil society, and the private sector to work together in preparedness for major threats, 2) the advances in good practice in business continuity planning and contingency planning that the pandemic movement helped to stimulate, 3) the value of well-designed simulation exercises, 4) the importance of communications in crisis preparedness and response, and 5) the need to invest greater funding in preparedness efforts.

Following the one-year period of analysis, Towards a Safer World's findings will be discussed at a high-level workshop in Rome, 15-16 September 2011, bringing together preparedness leaders and experts from governments, the private sector, civil society, the United Nations, and the military. The analysis and conclusions will be reviewed with a view to addressing the three critical questions above. Key outcomes will be reported on www.towardsasaferworld.org.

After the workshop, different stakeholder groups will continue to disseminate and apply the lessons in wider preparedness efforts. The workshop participants will consider whether to support this effort—for example, through a time-limited network on planning for unpredictable potentially global events that may severely damage people's health, societal resilience, economic systems, and political stability.

We intend that this summary of the workshop papers will help you advance your own organization's disaster preparedness efforts, and sustain readiness for the continuing threat of an emerging infectious disease.

David Nabarro

UN System Influenza Coordination

INTRODUCTION

What is *Towards a Safer World?*

Global biological disasters have occurred several times over the last two decades. The social, political, and economic consequences of previously unknown diseases such as Severe Acute Respiratory Syndrome (SARS) and Bovine Spongiform Encephalopathy served as a major wake-up call to the world. In 1997, a new influenza virus—the Highly Pathogenic Avian Influenza (HPAI) H5N1—burst onto the scene when an outbreak among birds near Hong Kong spilled over into the human population. The extremely high virulence of HPAI H5N1 in birds, and the ability of the virus to infect and severely sicken humans, pushed public health officials in Hong Kong to take swift and dramatic action and to ring a major global alarm—warning that this new virus might pose an especially serious danger. In a successful intervention to control the spread of the virus, the entire poultry population of the territory was destroyed.

For unknown reasons, HPAI H5N1 disappeared almost as quickly as it had emerged and remained hidden for the next seven years, before once again affecting Asian poultry in 2004. The public health world was galvanized to prepare for the possibility that the HPAI H5N1 virus might develop the ability for human-to-human transmission—with consequences as dire as those of the 1918-1920 influenza pandemic that killed more than 40 million people. By 2009, HPAI H5N1 had been reported in 63 countries, with almost 500 human cases and nearly 300 deaths. While all eyes were on South East Asia (and on HPAI H5N1), another pandemic caused by an entirely different virus began in North America—the 2009 H1N1 Influenza. Fortunately its impact was less than had been feared.

To address these potential threats, early investments in pandemic control were focused on intensifying surveillance and on preparing for virus containment. However, it became increasingly clear that if HPAI H5N1 acquired the ability to spread effectively from person-to-person, containment would be extremely difficult. Therefore, mitigating the potential consequences of a pandemic needed more attention. As a result, investments were made in vaccine research and production, and stockpiling of antiviral drugs. However, given the high costs of a pandemic influenza vaccine and the fact that wealthy nations had already contracted with vaccine manufacturers for future supplies, it seemed that most countries would not be able to provide a vaccine to their populations—even if one became available.

In addition, the realization that health systems would not be able to cope with all the consequences of a pandemic led to concern that other vital functions and services might also be paralyzed. With the United Nation’s leadership and close collaboration with the International Federation of Red Cross and Red Crescent Societies, non-governmental organizations (NGOs), and private sector firms, a multi-sector or “whole-of-society” approach to pandemic preparedness was adopted. Pandemic planners looked at the overall architecture of society and engaged a variety of stakeholders in the planning processes.

Forging strong linkages between non-traditional partners from different sectors—agriculture, public health, animal health, military, and the humanitarian community—proved to be a successful approach. International, regional, and national organizations are working to refine the tools and processes to strengthen pandemic preparedness, including the identification and prioritization of critical services that would be affected by a severe pandemic; development of business continuity plans; development of multi-sector preparedness indicators; and the use of simulations and other planning exercises to highlight gaps in pandemic preparedness.

The risk of a future severe pandemic remains. Whole-of-society preparedness for pandemic diseases and for other types of disasters should continue to evolve and strengthen. Just as disasters of biological origin will continue to occur, other disasters with global reach and multi-sector consequences can be foreseen, from climate change to food security crises. In an increasingly interconnected world, even disasters of a local nature will need to be addressed through a multi-sector approach.

Preparing for a New Era

Towards a Safer World is an initiative dedicated to identifying practical approaches for disaster preparedness—focusing on global experiences in preparing for a pandemic from the last five years. Drawing on lessons learned from preparations for recent pandemic threats, *Towards a Safer World* seeks to demonstrate how these lessons might be applied to different kinds of disasters. While every type of disaster has some unique aspects, the basic processes of multi-sector preparedness are the same.

This book captures the lessons learned from a variety of sectors: multi-sector planning, civil-military coordination, global health, communications, community, animal health, logistics, private sector, and travel and tourism—synthesizing key themes and lessons learned. Based on literature reviews conducted by technical specialists, each chapter identifies the most salient characteristics and lessons learned. Not surprisingly, many cross-cutting themes and lessons learned related to pandemic preparedness emerged, specifically:

Networking across silos: Pandemic preparedness highlighted the value of establishing multi-sector networks working across systems and silos to facilitate communication, collaboration and coordination. The best responses to emerging threats are from an inclusive approach that brings together the experiences and resources of the private sector, civil society, the media, and the military—as well as governments—in a concerted, collaborative effort. Preparedness requires coordination, integrated planning, and the management of complex relationships across different sectors and between international, national, and local actors.

It is essential to build trust amongst the diverse community of actors that is needed in a major crisis through having a dialogue before a disaster occurs. Relevant stakeholders have to be brought together to agree on their roles in preparedness and response. Relationships formed through collaborative planning make response more efficient, as connections and working relationships have already been established and tested.

Engagement and commitment from political leaders is a critical prerequisite for effective preparedness. Pandemic preparedness forged linkages between many non-traditional partners. In many cases, ministers from different sectors had never before been in the same room. Governments learned the added value of bringing non-traditional partners to the table. Within the UN system, UN System Influenza Coordination constituted an innovative example of a small, cost-effective, catalytic taskforce building links and strengthening coordination of an informal network.

Planning to maintain critical services: Pandemic planning highlighted the importance of identifying the critical services that will be affected during a disaster, and the ripple effect this has across all aspects of society if they are not protected. Operational and business continuity planning are key. Fear of a pandemic stimulated an upsurge in business continuity planning—a recognition of the importance of planning to deal with

the impact of a crisis on an organization's ability to function. Good continuity planning strengthens an organization's resilience to all threats.

Once the critical services likely to be affected in particular settings are defined, the leaders of those services should be brought in to provide input on how best to prepare. Because different societies have varying degrees of reliance on critical services, analysis of critical services has to be done on a micro level. Preparedness plans need to be adapted to local circumstances and realities. Every disaster is unique and unpredictable, and plans need to be flexible to enable responses to react to the specifics of the disaster. Plans need to be differentiated so tailored actions are triggered according to the evolving severity of the event. This task can be achieved through formal scenario planning techniques.

Learning from simulations: Multi-sector simulation exercises help to refine plans, improve communication and coordination, identify the impact on critical services, find gaps, and clarify roles and responsibilities of different stakeholders. Simulation exercises increase awareness among participants, and serve as good networking opportunities, bringing together individuals from different backgrounds. Simulations and other types of stress tests are a critical tool in getting the whole of society to link up and work together. In many cases, individuals from different sectors that came together for simulations were meeting for the first time. Exercises served as a springboard for continued communication, collaboration, and action on other activities. However, simulations are only successful if participants are committed to learning from them and to taking action to improve deficiencies.

Communication strategies: Communication of scientifically sound risk information is critical, but insufficient for effective disaster response. For example, many farmers did not comply with recommendations to report sick chickens to authorities because die-offs among their flocks were common, or no compensation was paid for culling. Timely risk communication must be supplemented by social mobilization that fosters dialogue among community members and behavior change communication that takes into account differing customer perceptions of risk and cultural and economic barriers to recommended behaviors. Authorities need to communicate continually and openly, including through new social media channels, and to build trusting relationships with key media institutions.

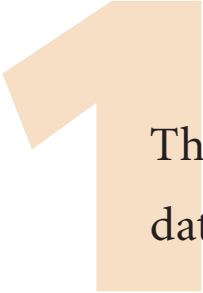
Innovative financing approaches: Preparedness has traditionally fallen between the humanitarian and development stools for funding. Predictable funding is a prerequisite of effective preparedness. Innovative financing approaches have emerged—including the requirement that ministries put a small proportion of their sector budgets into contingency planning.

Authoritative scientific advocacy about the pandemic threat coupled with economic analysis demonstrating the cost of the threat stimulated the private sector to invest unprecedented funding in pandemic preparedness. This approach could be replicated to stimulate private sector funding for other threats. Modest seed financing can stimulate investment in preparedness in low-income countries. The UN Development Programme and the UN Office for the Coordination of Humanitarian Affairs created an innovative seed funding mechanism under the auspices of the Central Fund for Influenza Action to help incentivize and kick-start country-level preparedness processes. This could be replicated for other threats.

Successful fundraising requires greater attention to documenting, detailing, and pricing the consequences of major disasters—and measure preparedness better—in order to stimulate donor investment. The Association of Southeast Asian Nations, the U.S. Centers for Disease Control and Prevention, and the UN Office for the Coordination of Humanitarian Affairs pioneered systems for measuring preparedness, helping to prove impacts of efforts. These systems could be replicated to measure progress in preparing for other threats.

The *Towards a Safer World* initiative continues to take stock of what has been achieved through the coordinated, multi-sector approach used for pandemic planning during the past five years. It is identifying which approaches have proved effective and developing a communications and advocacy campaign to ensure successes from pandemic preparedness are actively replicated in disaster preparedness programs. The experiences, achievements, and lessons from pandemic preparedness planning are important, and the world's nations and global organizations can benefit by putting them to use in better disaster planning, coordination, and response.

For more information about *Towards a Safer World*, visit www.towardsasaferworld.org.



The health chapter reviews global guidelines and recommendations that have been developed for pandemic preparedness and response by the World Health Organization (WHO) and many other international organizations, including the International Health Regulations. This chapter emphasizes the importance of non-pharmaceutical interventions to demonstrate simple and practical measures that can help prevent or delay trans-mission of viruses when introduced early in a targeted and layered manner. Global preparedness must be advanced through research, reliance on a multi-sector approach, strengthened health-care delivery systems, economic development in low- and middle-income countries, and improved health status.

The Global Health Sector

Key Lessons in Global Health for Pandemic Preparedness

- Over the course of the last 10 years, national pandemic preparedness efforts have been led by national ministries of health, which have, in successive World Health Assembly resolutions, sought guidance from WHO on alert levels, prioritization of health interventions, and selection of target groups for response. As national pandemic preparedness efforts advanced, so the health sector increasingly needed predictable relationships with other sectors for effective “whole-of-society” pandemic preparedness planning. WHO’s 2009 Pandemic Preparedness and Response guidance reflected this reality and encouraged close and effective working relationships between different sectors.
- The revised International Health Regulations, approved by the WHO member states in 2005, is an intergovernmental legal agreement that is binding on 194 states across the globe, including all the WHO member states. Their basic purpose is to help the international community prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide (such as pandemics). In January 2010, the WHO executive board requested a review committee to review both the response to the 2009 H1N1 Influenza pandemic and the functioning of the International Health Regulations.
- The review committee’s report (May 2011) noted that decision-making in a public health emergency is often based on incomplete information with uncertainty about the threat and the likely effectiveness of response measures. Plans must be adapted to the actual circumstances of the event within the face of competing demands in different sectors, constraints imposed by limited resources, political scrutiny from legislators, and pressure from the public and media. Informed decisions are required despite the uncertainty dictated by lack of precise information and the speed of events. The committee concluded that pandemic preparedness should rely even more on multi-sector participation and use a risk-based approach that enables a flexible response to different scenarios.

- This Towards a Safer World analysis of national experiences with the whole-of-society approach to multi-sector pandemic preparedness and response complements the findings of a review International Health Regulations. It reveals some of the challenges faced by national ministries of health and both regional and global public health authorities as they provide technical and operational leadership to other sectors. They have the unenviable task of providing continuous and reliable information on the nature of an outbreak, its impact on different aspects of society, especially on the maintenance of critical services, and on the advisability and availability of specific interventions. They are expected to do so without frightening the public by exaggerating the potential consequences and without underplaying the risks, even when information available to it is incomplete and in flux. In practice, the best national responses to the 2009 H1N1 Influenza pandemic reflected decisions that were taken in concert with partners who represented a broad range of societal interests.
- Throughout the pandemic, WHO sought to support national health authorities as they provided technical and operational support to other sectors. The health sector's expected role was challenging. National health authorities were best able to support other sectors when they had invested jointly in effective contingency planning together before the pandemic. That meant building relationships and working practices that would enable the adaptation of responses in the face of differing magnitude and severity. In situations where inter-sector work resulted in rigid protocols—reflecting the mandates and operating procedures of different sectors—such adaptability was lacking.
- Sectors other than health depended heavily on analysis of real-time disease surveillance using demographically and geographically disaggregated data in order for them to adapt their responses and make them as effective as possible. These analyses were not always forthcoming—not least because the disaggregated data were not available.
- Effective whole-of-society responses have depended on different sectors being ready to apply the entire range of interventions, including those aimed at prevention and the reduction of transmission (by the distribution and administration of vaccines and through non-pharmaceutical measures largely based on social distancing) and those aimed at the provision of health-care services both to persons with influenza and those affected by other conditions. Other sectors rely on health authorities to advise them on how these interventions could best be implemented in a prioritized and targeted manner.

The International Health Regulations 2005

The revised International Health Regulations 2005 entered into force in June 2007 as an international legal agreement “to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade.”¹ The revised regulations also require all 194 WHO member states to strengthen national capacities to reinforce public health surveillance and response systems, including communication and reporting mechanisms (including required reporting to WHO within 24 hours after identification and assessment of potential public health threats).

Many countries still lack the capacity to identify, prevent, and respond to health emergencies. The International Health Regulations is a valuable instrument for helping nations to work together when protecting the global public and should continue to be strengthened as a public good. In addition, efforts to establish legal frameworks and agreements for sharing both biological materials and benefits should be sustained given the continuing need for effective response and coordinated action at all levels. As anticipated in the regulations, WHO is increasingly using unofficial reports from other sources to improve surveillance. This effort will allow for faster information exchange, can be facilitated by newer technologies (such as social media), and should help national and global health authorities implement a more effective and efficient response to public health emergencies of international concern.

According to the *Report of the Review Committee on the Functioning of the International Health Regulations (2005) in relation to the Pandemic (H1N1) 2009*, the H1N1 Influenza pandemic was the first public health emergency of international concern since the revision was put into force in 2007. This important review, commissioned by WHO and conducted independently, presented the following conclusions:²

- **Summary conclusion 1:** The International Health Regulations helped make the world better prepared to cope with public health emergencies. The core national and local capacities called for in the regulations are not yet fully operational and are not now on a path to timely implementation worldwide.
- **Summary conclusion 2:** WHO performed well in many ways during the pandemic, confronted systemic difficulties and demonstrated some shortcomings. The review committee found no evidence of malfeasance.³
- **Summary conclusion 3:** The world is ill-prepared to respond to a severe influenza pandemic or to any similarly global, sustained, and threatening public health emergency. Beyond implementation of core public health capacities called for in

1 WHO. (2008). *International Health Regulations (2005)*, 2nd edition. Geneva: WHO.

2 WHO. (2011). *Implementation of the International Health Regulations (2005)*, Report of the review committee on the function of the International Health Regulations (2005) in relation to the pandemic (H1N1) 2009. Geneva: WHO.

3 This conclusion addressed allegations that WHO had exaggerated the threat of an influenza pandemic to benefit pharmaceutical companies.

the regulations, global preparedness can be advanced through research, reliance on a multi-sector approach, strengthened health-care delivery systems, economic development in low and middle-income countries, and overall improved health status.

These are valuable conclusions that are relevant to planning for whole of society pandemic responses. The report attests to the value of a legal global health mechanism like the International Health Regulations, but also demonstrated that the world is still not fully prepared for a severe influenza pandemic or similar global emergency and will not be until stronger global and national disaster preparedness and response plans are developed and are able to be implemented. Helping countries gain the capacity to implement the regulations as they are designed would go far towards rectifying the current situation.

The International Health Regulations is not the only reporting mechanism for infectious diseases. The World Organization for Animal Health has a list of reportable diseases within animal populations. Further work is underway to bring these two communities and reporting mechanisms together—through the tripartite arrangement between WHO, the World Organization for Animal Health, and the Food and Agriculture Organization—to ensure a timelier public health response.

WHO's Role in Helping Member States Prepare

WHO has worked with its member states to help them prepare for an influenza pandemic and other public health emergencies of international concern. WHO has advocated for ongoing global surveillance of influenza as the key to early detection of novel influenza viruses. To accomplish this, WHO has created a network of 136 national influenza centers in 106 countries, helping strengthen their surveillance capacity to ensure more timely and efficient epidemiological and laboratory detection and response.

Additional support from WHO has included technical support in the development of contingency planning through the creation of national influenza pandemic preparedness plans. For the global health community, it has never been a question of whether an influenza pandemic would occur, but a matter of when. In 2009, its fears became a reality with the onset of a pandemic due to the novel 2009 H1N1 influenza virus. According to the Report of the Independent Review Committee on the Functioning of the International Health Regulations (2005) in relation to Pandemic (H1N1) 2009, 74 percent of countries had pandemic preparedness plans in place before the 2009 pandemic.⁴

The investment in pandemic preparedness and the development of plans has proven itself valuable not only in response to influenza outbreaks but also to other threats to

⁴ WHO (2011). *Implementation of the International Health Regulations (2005), Report of the review committee on the function of the International Health Regulations (2005) in relation to the pandemic (H1N1) 2009*. Geneva: WHO.

public health. For example, in early 2007, the island of Jamaica experienced an outbreak of malaria for the first time in many years. Using their national influenza plan, Jamaica was able to use one of the hospitals designated for an influenza outbreak as the main treatment hospital for the malaria outbreak. And by adapting their influenza guidance they were able to treat ill patients and provide communication support to help prevent further cases by educating the public in mosquito control.

However, for the most part existing plans are inadequate in some ways and there is still more work needed in order to strengthen them and, more importantly, to reinforce national capacities to implement them when they are needed. Another review conducted by the Humanitarian Pandemic Preparedness Initiative found that “[e]xisting national plans will be stronger when they have addressed the existing gaps. Typical gaps in plans include a lack of pandemic influenza focus (due to a principal concern with influenza in avian populations), a lack of clarity regarding the role of civil society in government plans, and the lack of promotion of and preparation for non-pharmaceutical interventions, such as social distancing.”⁵

Pandemic preparedness has served to strengthen coordination mechanisms at national and international levels for other emergencies. In many instances countries developed interdisciplinary mechanisms, usually in the form of taskforces at the national and sub-national levels to better coordinate across-the-board responses to the pandemic threat. These taskforces included representatives of non-traditional actors, such as NGOs, the private sector, and the media, all of which would have critical roles to play in the event of a pandemic or other emergency. In some instances these taskforces were used for other public health threats, including the recent 2010 yellow fever and 2011 Ebola outbreaks in Uganda and extreme weather in Europe. During the events in Uganda, the multi-sector national-level taskforce was activated for both outbreaks and brought together key stakeholders, actors, and donors. This action fostered better communication between partners and was instrumental in generating a faster and more effective response.

Key Pandemic Guidance and Resources

Governments, businesses, organizations, and communities looked upon the global health community for leadership and guidance for what to do in the event of a pandemic. WHO released the revised *WHO Global Influenza Preparedness Plan: the role of WHO and recommendations for national measures before and during pandemics* in March 2005 for this purpose in light of the on-going pandemic threat. This document defined “the phases of increasing public health risk associated with the emergence of a new influenza virus subtype that may pose a pandemic threat,” recommended actions for national authorities, outlined what measures WHO would take for each phase,

⁵ Humanitarian Pandemic Preparedness Initiative. (2010). *Humanitarian Pandemic Preparedness H2P – The Program Review*. Geneva: The International Federation of the Red Cross and Red Crescent Societies.

and provided guidance to national authorities for developing the afore mentioned national influenza plans.

After two years of work and an extensive review the WHO released the *Guidance Document for Pandemic Influenza Preparedness and Response* in 2009, shortly after the first cases of the 2009 H1N1 influenza pandemic were detected. This new guidance document had four key revisions or updates to the 2005 document including:⁶

1. Regrouping and redefining the six-phase system, while maintaining its basic structure;
2. Highlighting key principles for pandemic planning, such as ethical considerations, integrating pandemic preparedness within a national emergency framework, and incorporating a whole-of-society approach that emphasizes the multi-sector impact of an influenza pandemic and the importance of a coordinated and collaborative effort by all sectors, not just health;
3. Harmonizing the recommended measures with the International Health Regulations 2005 and the concurrent development/revision of WHO guidance in pandemic influenza surveillance, disease control, rapid containment, and communications;
4. Suggesting general planning assumptions, their implications, and providing selected evidence base to help national-level planning.

The second key revision to the 2005 document shifted consideration of an influenza pandemic from that of purely health issue to that of a broader global emergency. A strong emphasis was put on inter-disciplinary integration and coordination within national emergency preparedness and response frameworks. The new document represented a full incorporation of the whole-of-society approach to pandemic control. The need for such approaches is being increasingly recognized at national and local levels—not only for pandemic influenza but also for all public health emergencies of international concern. If it is applied effectively and plans are reviewed routinely as actors change and science is updated, the approach will bring benefits for other emergencies and events. The key points from this guidance remain relevant and should be emphasized in on-going pandemic planning and preparedness activities (see box).

In December 2007, the U.S. Centers for Disease Control and Prevention and the U.S. Agency for International Development published a brochure entitled *Non-Pharmaceutical Interventions for Use during a Human Influenza Pandemic*. This guidance document was a condensed and adapted version of the Centers for Disease Control and Prevention's Community Mitigation Guidance, in accordance with WHO recommendations. It was developed to provide key information on interventions for use in developing countries to help mitigate the impact of an influenza pandemic without the use of drugs or vaccines, which might be either in scarce supply or difficult to deliver in many countries during the early stages of a pandemic, when they would be most useful.

⁶ WHO. (2009). *Pandemic influenza preparedness and response—A WHO guidance document*. Geneva: Global Influenza Programme.

Adopting a Whole-of-Society Approach

1

A whole-of-society approach to pandemic influenza preparedness emphasizes the significant roles played by all sectors of society.

- The national government is the natural leader for communication and overall coordination efforts. Central governments should work to put in place the necessary legislation, policies, and resources for pandemic preparedness, capacity development, and anticipated response efforts across all sectors.
- The health sector (including public health and health-care services) provides critical epidemiological, clinical, and virological information that, in turn, informs measures to reduce spread of the pandemic virus and its attendant morbidity and mortality.
- The diverse array of non-health sectors must provide essential operations and services during a pandemic to mitigate health, economic, and social impacts.
- Civil society organizations often are well-placed to raise awareness, communicate accurate information, counter rumors, provide needed services, and liaise with the government during an emergency.
- Families and individuals can help reduce the spread of pandemic influenza through adoption of measures, such as covering coughs and sneezes, hand washing, and the voluntary isolation of persons with respiratory illness.

Source: WHO. (2009). *Pandemic influenza preparedness and response—A WHO guidance document*. Geneva: Global Influenza Programme.

The rationale for emphasizing non-pharmaceutical interventions was to demonstrate simple and practical measures that could help prevent and/or delay transmission of viruses when introduced early, and in a targeted and layer manner. This strategy would have the effect of reducing the total number of cases and of spreading cases over a longer period of time, thereby lessening the burden on health systems. At the heart of non-pharmaceutical interventions are measures that limit human interaction through social distancing.

Additional guidance was developed over the years to address the needs of particularly vulnerable populations and to address issues that could have an important impact on the course of an influenza pandemic and its consequences. The following are some of the documents that were produced for the humanitarian community and for low-resource settings within developing nations. The first such document was published in May 2006.

The *Pandemic influenza preparedness and mitigation in refugee and displaced populations—WHO guidelines for humanitarian agencies*⁷ and subsequent summary guidance *Pandemic influenza prevention and mitigation in low resource communities*⁸ provided practical recommendations for community and individual interventions in the event of an influenza pandemic. The guidance highlighted key prevention measures, including the use of non-pharmaceutical interventions, case management of patients at home and within health facilities, and the protection of staff and first responders.

In 2008, the WHO released its *Reducing excess mortality from common illnesses during an influenza pandemic—WHO guidelines for emergency health interventions in community settings*.⁹ The rationale for this document was to provide technical support to poor communities as part of a broader effort to focus not just on influenza, but also to address conditions that usually represent a high burden of disease, including diarrhea, malaria, HIV/AIDS, pneumonia, malnutrition, and tuberculosis. These diseases will continue to occur during the course of an influenza pandemic and must also be managed successfully in order for communities to avoid incurring excess preventable mortality. The emphasis of this document is on how, during an influenza pandemic, health-care services for common conditions could be provided within communities themselves, and even within households. The document presents strategies and recommendations for how best to position the community to address gaps in health-care management during an emergency, reduce demand for health facility-based services, and limit exposure to influenza within health structures.

National authorities that implement such guidelines are in a better position to ensure the proper management and maintenance of a minimum level of service during a pandemic, so that users of health-care services continue to benefit in the event of a temporary interruption of services, care, or supplies. Many governments have recognized that health-care services during an influenza pandemic have to be provided at the household and community levels. By providing these guidelines, WHO demonstrated strategies and recommendations for how best to position the community to address gaps during an emergency, reduce demand for health facility-based services, limit exposure to influenza within health facilities, and, perhaps most importantly, maximize accessibility to care for the greatest number of people possible. The guidelines established the importance and the feasibility of well-prepared community to address common illnesses, both during and in the aftermath an influenza pandemic.

In 2007, the Humanitarian Pandemic Preparedness Initiative began working on a community-based training curriculum for health-care providers and community leaders. Through the technical leadership of the CORE Group (especially Save the Children, CARE, and World Vision International) input from several organizations

7 WHO Disease Control in Humanitarian Emergencies, Epidemic and Pandemic Alert and Response. (2008). *Pandemic influenza preparedness and mitigation in refugee and displaced populations, WHO guidelines for humanitarian agencies (second edition)*. Geneva: WHO.

8 WHO Disease Control in Humanitarian Emergencies, Epidemic and Pandemic Alert and Response. (2008). *Pandemic influenza prevention and mitigation in low resource communities*. Geneva: WHO.

9 WHO Disease Control in Humanitarian Emergencies, Epidemic and Pandemic Alert and Response. (2008). *Reducing excess mortality from common illnesses during an influenza pandemic*. Geneva: WHO.

including WHO, the International Federation of the Red Cross and Red Crescent Societies, the U.S. Agency for International Development, and FHI 360, this health-based curriculum was developed by using the WHO guidance previously cited. The health curriculum provides guidance on how humanitarian organizations could continue to provide essential health services, including community-based management of common diseases, health provider protection and infection control, and health communication during a pandemic.

WHO Pandemic Influenza Preparedness Framework

In May 2011, after nearly four years of negotiations, the World Health Assembly approved the WHO Pandemic Influenza Preparedness Framework. This framework was created to facilitate the sharing of influenza viruses and access to vaccines. This framework is a step in the right direction for the future of pandemic preparedness and response. It focuses on virus sharing in exchange for access to vaccines and other benefits. It would be useful if, in future iterations, it takes account of the emergency nature of a pandemic and its need for a multi-sector approach. It could then bring all actors to the table at the global and national levels to better understand roles and responsibilities, identify and ratify agreements that would be put into force during a public health emergency like an influenza pandemic, and help promote a more coordinated and efficient response of all actors. Such a framework would be beneficial for not only influenza, but other public health emergencies that impact member states.

One Health Movement

The risk of emerging or re-emerging infectious diseases is increasing for a variety of reasons, one of the principal ones being the ever closer proximity of human and animal populations. The one health movement emphasizes the need for close collaboration between animal and human health services so as to better address zoonotic diseases. This would improve preparedness in the form of early detection, control, response (including risk communication), business continuity, and livelihood resilience. Governments and global bodies are increasingly encouraging collaboration between these sectors to ensure that early detection and disease control is integrated within existing emergency preparedness and response plans at national and global levels.

The 2009 H1N1 Influenza Pandemic

The global health community and the world were put on alert in 1997 when the highly pathogenic avian influenza (HPAI) H5N1 virus was first identified in humans in Hong Kong. Nearly six years later, the HPAI H5N1 viruses reappeared in Southeast Asia. Once again, global health authorities began preparing for the possibility of another influenza pandemic.

The cause for alarm within the global health community was created by the sustained persistence of the influenza A (H5N1) viruses in poultry and wild birds, the fact that they were so highly pathogenic in those populations, and the knowledge that an influenza pandemic could prove to be significantly costly, both economically and in terms of human disease and death. An influenza pandemic can create a heavy burden on health systems by placing unmanageable strains on health facilities as a result of shortages of health care personnel due to illness, insufficient pharmaceutical resources including antibiotics, vaccines, and antiviral agents due to production, delivery, and technical obstacles, and inadequate beds for a vastly increased patient population. The consequences could be serious not only for influenza patients, but for those seeking care for other illnesses as well. One of the unique characteristics of an influenza pandemic is that it has the ability to create a global emergency, and to create one very rapidly. And though at its core it is a health-care issue, it can cause multi-sector consequences. In addition, unlike geographically-limited and focal emergencies, external assistance during a pandemic will be limited: every community and country affected will need to look primarily to their own preparedness and resources, leaving those that usually count on external assistance to fend for themselves.

On June 11, 2009 Dr. Margaret Chan, WHO Director-General, declared that an influenza pandemic had begun. A novel influenza A virus had been detected and was circulating efficiently among humans around the world. But, contrary to planning assumptions, the virus did not emerge in Southeast Asia or in areas with avian-endemic H5N1, nor was it even an H5N1 virus. Instead, the H1N1 virus was first detected in April 2009 in Mexico and the southwest United States. However, this new H1N1 virus was different than its predecessors and appeared to have spread to humans from swine. After just two months, the virus was circulating globally and causing some of the economic and social consequences that were originally feared, including affecting travel, tourism, and businesses, due to absenteeism and fear.

Fortunately, the pandemic H1N1 Influenza virus was for the most part mild to moderate in terms of the levels of morbidity and mortality for which it was responsible. Certain locations and populations did experience significant consequences. The pandemic disproportionately affected children, pregnant women, people with pre-existing health conditions, and indigenous populations. This differential impact emphasized the need for health authorities to consider the social, cultural, geographical, and economic factors that might put various groups at heightened risk in the context of a particular disease. But globally the virus did not produce the dire outcomes many had feared.

A key lesson learned from this experience is that each pandemic is unique. The level of severity varies between locations and populations, and public health authorities must prepare for different scenarios. The best pandemic plans prepare for adaptable responses to different pandemic severities. WHO has recognized the need for such adaptability, through the International Health Regulations process, and seeks to help develop methods for assessing severity and tailoring responses to different scenarios.

One of the major areas of intervention employed in responding to the 2009 H1N1 Influenza pandemic was the procurement, distribution, and administration of vaccines. In September 2009, several nations and manufacturers pledged donations of vaccines and related commodities to WHO in support of developing countries. The vaccines were distributed globally for use in specified target groups, including health-care workers (to keep essential health-care services functioning), pregnant women, and those with pre-existing conditions that increased their risk of death from influenza, as recommended by WHO's Strategic Advisory Group of Experts. Limitations in the manufacturing and distribution of adequate quantities of vaccine made it difficult to supply countries in a timely manner. As a result, national governments are seeking to increase their vaccine production capabilities, and WHO is providing assistance. Global and national health authorities inevitably have to plan for the eventuality that only limited pharmaceutical resources will be available on time when they are responding to disease outbreaks and pandemics. WHO pandemic preparedness guidance has emphasized the importance of simple and practical measures like non-pharmaceutical interventions, including social distancing, in limiting consequences: it suggests that these measure be deployed early during the course of a pandemic, as was done in many countries in 2009-2010. Giving communities and households advance knowledge of what constitutes best practices and behaviors in their local context can empower them and help to reduce transmission of disease.

In August of 2010, Dr. Chan announced that the world had moved into the post-pandemic period. In her statement she said that countries needed to remain vigilant as pandemic viruses are unpredictable and certain populations could remain at risk of infection. This statement remains true today, not only for the H1N1 virus, but also for the H5N1 virus that still circulates within avian populations and that still carries the same risk of inducing a pandemic as it did prior to the 2009 H1N1 Influenza pandemic.

A selection of key lessons from the 2009 H1N1 Influenza pandemic in Europe

Preparedness planning

- Countries and plans must be flexible and prepare for a range of scenarios.
- Countries and local areas must undertake more operational planning and preparation at the delivery end. For example, determine how vaccines will be delivered. In Europe, intensive care capacity increased quickly using tools like WHO's checklist and "acid tests" from the European Center for Disease Prevention and Control as a starting point.

Early analyses

- Early assessments should be structured and rehearsed annually for seasonal influenza. The European Center for Disease Prevention and Control and its advisors did this for the 2010-2011 seasonal influenza epidemics in Europe through a structured risk assessment.
- There need to be more sophisticated descriptions of pandemics, reflecting the inherent complexity of the pandemics, their severity, and their countermeasures. The European Center for Disease Prevention and Control is taking a lead in developing this for Europe working with WHO and member states, using seasonal influenza as a model.
- The results of important analyses need to be shared in more timely manner between countries. Problems arose from the need for independent peer-review and authorities producing analyses but not necessarily thinking who else needed to know the results.

Surveillance

- Surveillance needs to be better targeted to answer certain essential questions and particular weaknesses (surveillance in hospitals, mortality surveillance, and seroepidemiology), using seasonal influenza as a model. A general finding was the near impossibility of establishing new surveillance and other systems during a crisis like a pandemic (such as hospital-based surveillance). In contrast, pre-existing systems, primary care, and virological surveillance worked well.

Decision-making during a pandemic

- There should be more formal, if rapid, independent reviews of earlier decisions at national and international levels. This did happen in a number of circumstances learning from earlier recommendations.
- Opinion giving should be transparent, with those advising being identified and with public declarations of interest. An adviser having a conflict of interest does not mean that his/her advice is incorrect or should be discounted. There are certain areas (such as pharmaceutical development) where conflicts of interest are inevitable among those giving advice.

Communication

- Prepare the population and professionals for a range of possibilities. A particular problem was that the public and decision-makers were expecting a severe pandemic. This preparation was done in a few countries, notably the United States. Professionals are especially important for pandemics, as they will deliver the countermeasures to the public, such as early medical treatments, antivirals, and vaccines.
- A disconnect between technical epidemiological and virological risk assessments and the politically driven risk-management process was evident and partially fuelled by the media coverage in early days of the 2009 pandemic.
- Many public health authorities are poorly equipped to deal with the multi-source, two-way communication platforms that the internet and social media allow today. This lack of preparedness was one of the reasons leading to a variable public health response in some countries, especially when it came to vaccinations.

Essential research and development

- It should be more possible to rapidly commission essential research during a pandemic. Some countries were able to do this, but current European Union rules and procedures almost make it impossible to use European Union monies for this.

Source: Nicoll, A. & M. Sprenger. (2011). Learning lessons from the 2009 pandemic: putting infections in their proper place. *Eur J Epidemiol*, 26:191-194.

Analyses and Key Lessons

The European Centre for Disease Prevention and Control analyzed the key lessons learned in Europe from the 2009 H1N1 Influenza pandemic and suggested ways in which the lessons may be applied. These are presented in the following box.

The last five years of experience of preparedness for and response to risks associated with pandemic has led public health authorities to derive the following lessons from their experiences:

- The health sector always will need to establish functional links and ways to engage with the other sectors (including the media) that are likely to be involved in responding to a pandemic or other health crisis. This engagement needs to be done in a positive and predictable way. The health sector faces many challenges in trying to guide planning and strategy across multiple ministries and sectors during a major outbreak or pandemic.
- The health sector needs to invest more in being nimble and adaptable in relation to uncertain and rapidly changing infectious events through developing better capacities for advance thinking, contingency planning, and flexible responses. This applies to all sectors, but in relation to pandemics the health sector has a specific and central role because it is the point of reference for all other sectors.
- The health sector has to continue to differentiate the potential impact of infectious disease outbreaks and pandemics on different population and age groups, and to anticipate that these variations may change over time; hence the absolute need for disaggregated real time data harvesting and analysis. This has been greatly facilitated in recent years through the revision of the International Health Regulations, but is hampered by lack of consistent cash for surveillance and for scaling up quickly in the face of new threats.
- The health sector has the unenviable task of being expected to provide continuous and reliable information on the nature of the outbreak, the risks it brings for the public, for different industry sectors and for government, and its likely origins while, at the same time, needing to be extremely careful when commenting on intensity and severity when the data are inconclusive.
- The health sector is expected to provide prescriptions for outbreak and pandemic handling that are adapted to 1) assessments of severity and transmission intensity, and 2) the available in-country resources.

WHO supported national health ministries as they worked hard to develop such attributes in relation to the 2009 H1N1 Influenza pandemic. For many, these are a complex addition to an already heavy workload, especially when the health system is overloaded. Hence, it is absolutely important to ensure high-quality guidance and advance planning by all sectors likely to be engaged in the response. Ensuring all stakeholders receive up-

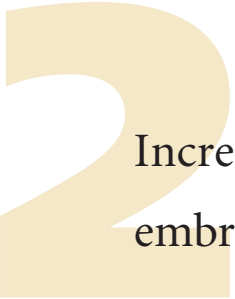
to-date and accurate information on risk—despite inevitable uncertainties—was a critical function for WHO in the recent pandemic, and will continue to be vitally important in future.

Looking Ahead

It is inevitable that the learning and application of lessons will depend on continuous research, risk assessment, analysis, evaluation, and innovation by different stakeholders in pandemic response. Such capacities are routinely employed in all disaster preparedness work, but for health challenges, public health authorities and their ministries play a unique and vital role. To help these authorities better meet the expectations of other sectors, focused research should be commissioned on better systems for real time surveillance, assessing the impact of different interventions, and sharing both knowledge and uncertainty. This should be possible under the International Health Regulations, but is best undertaken as a multi-country initiative. Innovative approaches for new communications tools—such as social networking, podcasting, and blanket text message systems—also need careful analysis. How can they be adapted to ensure more effective and less costly responses? Future evaluation should include rigorous examination of multi-sector strategies for limiting disease transmission, mitigating its impact, and assessing the effectiveness of whole-of-society preparedness. This evaluation would include analyses of different relationship building and networking procedures.

Conclusion

Although there have been important advances in pandemic preparedness over the past decade, with WHO leading the way, the conclusion of the 2011 review of the experience under the International Health Regulations that the world is not adequately prepared for a severe influenza pandemic is sobering. The unfinished agenda extends to preparedness for other global health catastrophes of appreciable magnitude. More must be done to support national governments in improving capacity for preparedness, disease identification, and response. The threat of an influenza pandemic remains and always will, and the time of onset of the next pandemic is unpredictable. Continuing effective communication from authoritative sources about the ongoing threat of a severe influenza pandemic, and the importance of continued efforts to prepare to respond to a severe pandemic at international, national, district, and community levels, will be important for sustaining preparedness work. By adopting a whole-of-society approach and by following the lead of international authorities in the public health sector, all nations can continue to prepare for the next influenza pandemic. The result will be a global society better prepared for such emergencies—even those whose scope cannot, at this stage, be foreseen.



Increasingly, global, regional, and national organizations are embracing a multi-sector view of planning and pandemic preparedness. This chapter describes the frameworks and concepts that have been adopted to support multi-sector preparedness, particularly the World Health Organization's (WHO) whole-of-society approach and the one-health concept. It describes how global, regional, and national organizations are advocating for multi-sector preparedness, also addressing the pitfalls and key challenges that governments face in operationalizing multi-sector coordination. Resources are certainly a recognized constraint for developing country preparedness plans and activities. However, there is increasing recognition of the commonalities involved in pandemic preparedness—and the need to pool resources and planning mechanisms towards an all-hazards approach.

Multi-Sector Pandemic Preparedness

Key Lessons for Multi-Sector Preparedness

- **The whole of society needs to be prepared for threats that have the potential to affect large swathes of the globe and multiple sectors.** Concerted efforts by government, business, and civil society are needed to mitigate the impact of a pandemic on the economy and society. Preparedness requires coordination, integrated planning, and the management of complex relationships across sectors and between international, national, and local actors.
- **Business continuity plans are at the heart of preparing the whole of society for a pandemic.** Countries should develop business continuity plans across sectors to enable the continued operation of essential services.
- **National-level preparedness plans need to be reviewed and strengthened** to ensure that all elements of pandemic preparedness are adequately addressed. Preparedness plans should include guidelines and actions for different phases of pandemic response, detail related to continuity of essential services, non-pharmaceutical interventions, civil society roles and responsibility, leading focal agencies, and funding mechanisms for preparedness and response measures.
- **Financial support and seed-funding proved to be a critical driver of support** in resource-poor countries. Additional resources are required to further strengthen developing country preparedness.
- Support for **multi-sector preparedness needs to be mandated at the highest levels of government.** Political support is crucial to providing a platform for the engagement of all stakeholders, including government, civil society, business, and academia.
- For effective preparedness, **a lead focal agency needs to be identified and ready to take command and coordinate** among the various sectors.

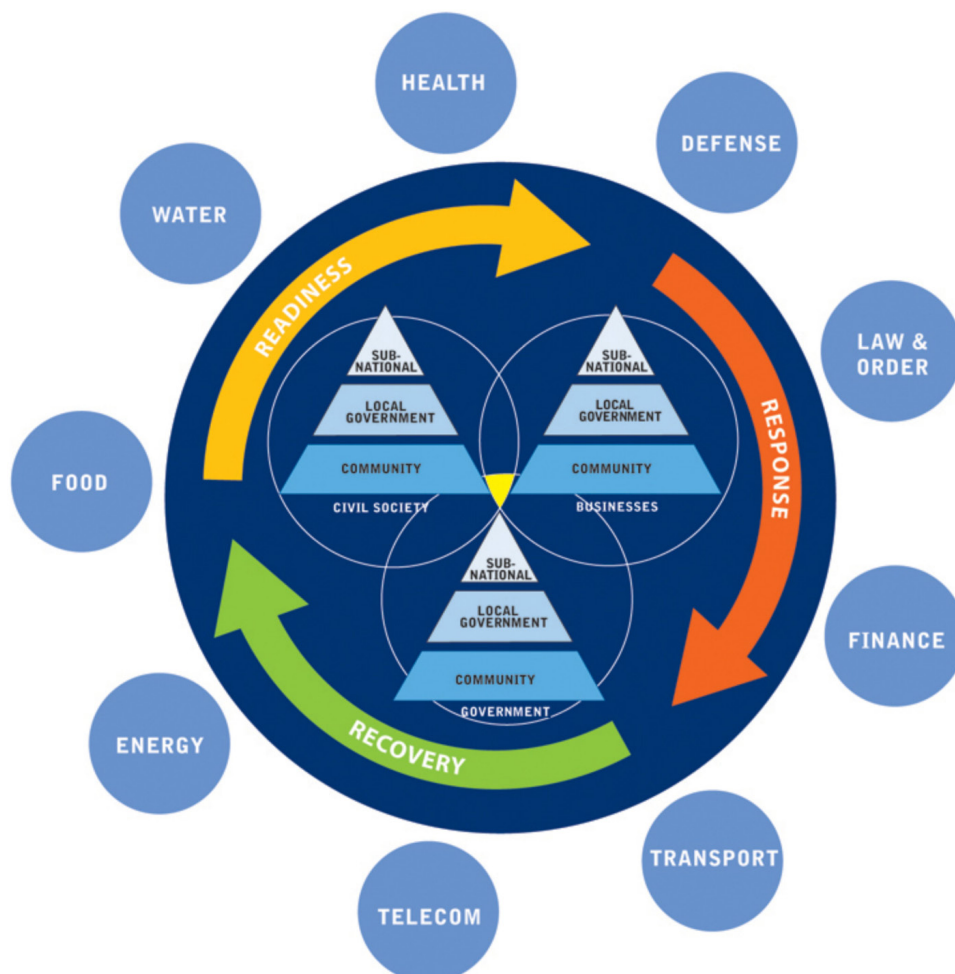
- **Simulations, table-top exercises, and other planning exercises are key tools** for reviewing and validating preparedness plans, engaging stakeholders, building awareness, and generally advancing multi-sector planning—and should be incorporated appropriately into planning.
- **Strategies for pandemic preparedness should build on existing programs using an all-hazards approach.** Emergency preparedness plans that include pandemic contingencies will be easier for governments and organizations to maintain and test during the long intervals between pandemics severe enough to trigger those plans. National disaster management organizations should adopt pandemics as one of the threats for which they are responsible.

Engaging Government, Business, and Civil Society as Planning Partners

Increasingly, global, regional, and national organizations are embracing a multi-sector view of planning and pandemic preparedness

The best responses to emerging threats are driven by multi-sector, inclusive approaches that unify the experiences and resources of government, military, civil society, and the private sector. Effective preparedness requires coordination, integrated planning, and the management of the complex relationships across different sectors—and between international, national, and local actors. All relevant stakeholders need to be identified and brought together to communicate and agree on their roles in preparedness and response. Comprehensive, executable national pandemic preparedness and response plans should be developed to provide guidance for future pandemic preparedness and response operations. Once developed, plans should serve as a guide for the development of lower-level ministerial plans to support both national disaster preparedness and response plans and also national pandemic preparedness and response plans.

The World Health Organization's whole-of-society approach



Increasingly, global, regional, and national organizations are embracing this multi-sector view of planning and pandemic preparedness. Experts agree that the challenge of preparing for pandemics is no longer the principal domain of the health sector. Across many sectors and specialties, there is widening recognition of the need for a more comprehensive view of pandemic preparedness. Multi-sector planning and collaboration requires a concerted effort by government, business, and civil society. In addition, the concept of an all-hazards approach to disaster management and emergency response is increasingly recognized as a way to integrate planning for epidemics and outbreaks into larger emergency planning efforts, as there are many parallels in preparedness regardless of the specific emergency. As a result, epidemics and outbreaks can be incorporated into an all-hazards approach, representing a convergence among communities of practice.

In response to recent pandemic experience, many organizations are advocating for a multi-sector approach to pandemic preparedness. Global organizations have introduced new frameworks for pandemic preparedness that support this view. For example, WHO developed the whole-of-society approach, which emphasizes the role of government, business, and civil society in preparedness. WHO's framework integrates a variety of sectors, including health, defense, law and order, finance, transport, telecommunications, energy, food, and water. Other governments and organizations use a similar term, "whole-of-government," in referring to the need for broader sector support for preparedness. One-health, another concept, advocates for a global strategy to expand collaboration and communications in all aspects of health care for humans, animals, and the environment. This concept has been endorsed by WHO, the World Bank, the World Organization for Animal Health, the Food and Agriculture Organization, the UN System Influenza Coordination, and the United Nations Children's Fund.

Preparedness requires coordination, integration, and management of the complex relationships across sectors—and between local, national, and international players.

In addition, a number of global and regional organizations have been catalysts for multi-sector pandemic preparedness planning. With the support of the UN System Influenza Coordination, various UN agencies and the World Organization for Animal Health created networks of expertise, opened lines of communication for data-sharing, and improved capacity to manage a pandemic at national and regional levels. These networks functioned during the emergence of 2009 H1N1 Influenza and improved response coordination. UN organizations have strengthened their capacity for risk analysis, prediction, prevention, preparedness, and control of zoonotic threats. Within the UN's Office for Coordination of Humanitarian Affairs, a pandemic influenza team developed an interactive online pandemic readiness tracker (at www.un-pic.org) to monitor progress toward multi-sector preparedness of governments and UN country teams, resulting in

a series of quantifiable indicators to assess pandemic readiness and a website to monitor progress on critical measures. This readiness tracker can be easily adapted to monitor progress in preparedness for other threats.

In 2005, WHO revised its International Health Regulations as a binding agreement among 194 countries to prevent, control, and respond to public health events of international concern. The regulations established core capacity requirements for surveillance and response among all countries, including risk communication within national public health authorities. The regulations were not designed to address any specific diseases, but are applicable to health risks irrespective of their origin or source, and they follow the evolution of diseases and the factors affecting disease emergence and transmission. The regulations also requires nations to strengthen core surveillance and response capacities at the primary, intermediate, and national level, as well as at designated international ports, airports, and ground crossings. Subsequently, WHO developed many tools to advocate and support multi-sector preparedness, including their guidelines for pandemic preparedness and response in the non-health sector.¹

At the regional level, the Association of Southeast Asian Nations (ASEAN) embarked on an ambitious task to improve multi-sector pandemic preparedness at the regional level. While other regional organizations have worked on joint programs to improve animal and health sector preparedness for avian influenza, this may be the first instance of a region addressing multi-sector pandemic preparedness and integration of multi-hazard disaster preparedness, and taking concrete actions to further along the disaster preparedness of each of its member states. More details about this effort are in presented the next chapter.

Strengthening National Pandemic Preparedness Plans

Support for multi-sector preparedness needs to be mandated at the highest levels of government.

Strong national-level preparedness plans are crucial to implementing a coordinated, multi-sector response. In the last five years, the number of countries developing national pandemic plans has increased dramatically. In 2005, the World Health Assembly passed a resolution urging all WHO member states to develop and implement national plans for pandemic-influenza preparedness. In addition, WHO's 2007 regulations further pressed the international community to address disease threats. This clearly increased the number of national preparedness plans: 98 percent of the 119 WHO member plans have been written since 2005.²

¹ Global Influenza Programme. (2009). Whole-of-Society Pandemic Readiness—pandemic influenza preparedness and response in the non-health sectors: a WHO guidance document. Geneva: WHO.

² WHO (2011). Comparative analysis of national pandemic influenza preparedness plans. Report WHO/HSE/GIP/ITP/2011.3. Geneva: WHO.

Despite the increase in countries with pandemic plans, there is still a wide variance in the focus, breadth, and depth of the plans. Some national plans focus on specific pandemics (such as plans that focus on HPAI H5N1 versus general pandemics or animal health); others emphasize specific actions over others—for example, pharmaceutical responses (antiviral drugs and vaccines) versus non-pharmaceutical interventions (public education, planning and coordination, isolation/quarantine, monitoring and assessment, health systems response and communications). Several countries emphasize containment in their preparedness plans, focusing on the first weeks of the pandemic and giving little attention to required actions beyond containment.

In addition, multi-sector action plans often do not effectively reach community levels and cannot be implemented at local levels. In many countries, civil society organizations are not sufficiently consulted and engaged in national planning. There is insufficient preparedness for the non-health impacts of a pandemic in poor countries. In many countries, the non-health sectors have lagged in developing business continuity plans and are not prepared for the disruption of supplies and services.

Resources are certainly a significant constraint for developing country preparedness plans and activities. An independent review of national preparedness plans found a correlation between adequacy of national planning and gross national product per capita, and identified several major gaps in preparedness, including insufficient attention to continuity of essential services beyond health.³

Recognizing the need to strengthen national-level planning, international organizations have dedicated seed funding to support national planning exercises. The UN Office for the Coordination of Humanitarian Affairs established a small fund under the Central Fund for Influenza Action to enable UN resident coordinators to bid for seed resources to start up national multi-sector pandemic planning processes. The emphasis on non-health sectors engendered collaboration between different ministries and sectors, which provides a platform for inter-disciplinary collaboration to combat a range of risks. The U.S. Agency for International Development and the U.K.'s Department for International Development supported this facility. The potential finances catalyzed UN country teams to engage and stimulated greater activity. Financial support and seed funding proved a critical driver of planning in resource-poor countries. However, additional resources are required to further strengthen developing country preparedness.

Identifying Focal Agencies

Defining clear roles and responsibilities among collaborating government agencies is a challenge. Few government agencies have a political mandate to work across sectors.

³ Mensua, A, S Mounier-Jack & R Coker. (2009). Pandemic influenza preparedness in Latin America: analysis of national strategic plans. *Health Policy and Planning*, 24:253–260.

While the concept of multi-sector preparedness is well accepted, defining clear roles and responsibilities among collaborating government organizations remains a challenge. In reality, few government agencies have the political mandate to work across sectors, and each sector and ministry is accountable for its own goals and indicators. Legal issues further complicate the scope of inter-sector and inter-ministerial work. In many countries, establishment of national commissions or committees to address multi-sector issues requires an executive order or parliamentary decision. As a result, it may be necessary to strengthen laws, decrees, and regulations. Support for multi-sector preparedness needs to be mandated at the highest levels of government. Political support is crucial to providing a platform for the engagement of all stakeholders including government, civil society, and academia.

For effective preparedness and coordination, a lead focal agency needs to command, coordinate, and communicate with sector agencies and the public. It is crucial to identify and designate a single body to lead and coordinate implementation of the plan at all levels. Governments should identify the functions, responsibilities, and resources necessary to establish their national operations center as a viable entity, capable of exercising command and control of multi-sector disaster response operations. There should be a national command-and-control system to enable decisive decision-making, galvanize resources, and assign duties across the government to respond quickly. The budgetary requirements of these centers should be addressed to ensure their ability to execute these identified functions. Once established, these functions, responsibilities and authorities should be captured within appropriate disaster plans, policies, and procedures. Finally, the lead agency should also ensure that private sector, NGOs, and other community entities are engaged in preparedness planning. During the 2009 H1N1 Influenza pandemic, many countries experienced initial confusion in defining a lead agency, which inhibited response time. The additional time needed to agree on roles and responsibilities delayed response and exposed major weaknesses in existing plans.

Within ASEAN countries, diverse national focal agencies are leading multi-sector planning. These sometimes include two-tier structures, where the national disaster management agency functions under a key government official. In Malaysia, efforts are aligned under national security structures, but are primarily health-led. In the Philippines, a national disaster coordinating council falls within the auspices of the Office for Civil Defense. In Thailand, the Ministry of the Interior has assumed responsibility. In Indonesia, the Coordinating Ministry for People's Welfare has taken the lead role. In Cambodia, efforts are led by the prime minister, through a national disaster committee. In Vietnam, the prime minister assumed a very prominent role, galvanizing efforts around economic and livestock losses, as well as public health implications.

Experience indicates that there also is a need for better coordination among international agencies assisting in the development of national pandemic preparedness plans. Guidance sometimes confused the roles and responsibilities of governmental and non-governmental actors in pandemic preparedness and response. There is often broad

disagreement concerning which ministry or department is responsible for coordination of planning activities and how these roles might change as a pandemic evolves from a health threat to a more general societal threat. For example, the United States has a variety of government agencies involved in pandemic preparedness, including U.S. Agency for International Development, the Department of Defense, and the Centers for Disease Control and Prevention. These agencies need to collaborate more effectively to mutually address the many programmatic challenges associated with public health support to partner nations.

Simulation Exercises Engage Sectors

Simulation exercises should be used as a necessary review and validation of preparedness plans. In addition, simulations and other planning exercises lead to additional benefits, such as improving community and national-level relationships among key stakeholders, building awareness of the breadth of the impact of a pandemic, and engaging stakeholders in shaping plans and building commitment and support for implementation. WHO describes five types of simulations:⁴

- **Orientations:** The disaster plan creator facilitates an introduction of the major elements for stakeholders.
- **Drills:** Exercises that focus on a particular aspect of an emergency plan can help stakeholders develop skills.
- **Table-top exercises:** These low-cost exercises present disaster scenarios to stakeholders in a low-pressure setting to identify weaknesses and garner feedback for improvement.
- **Functional exercises:** These “real response” activities activate command centers and document decisions made. These exercises are more expensive than table-top exercises and require a greater degree of coordination.
- **Full-scale exercises:** Full trial runs of action plans simulate a disaster to test the operational capability of emergency response and management systems. These exercises require a significant commitment of resources.

⁴ WHO Western Pacific Region. (2006). Exercise development guide for validating influenza pandemic preparedness plans. Retrieved from http://www.wpro.who.int/health_topics/pandemic_preparedness/

In Southeast Asia, simulations and table-top exercises were critical in advancing preparedness planning and helping to promote a common understanding of existing regional preparedness and response plans and mechanisms, to confirm essential services and elements that influence the preparedness and continuity of operations by government and civil society at the national and regional level, and to identify gaps in coordination and cooperation among ASEAN members, the UN, and other key international agencies. They also helped to develop strategic options for regional cooperation when the response requires broader efforts, to examine the regional communications strategy, protocols, and plans for possible improvements, and to identify recommendations for improvement to existing operating procedures and plans for interagency and cross-border cooperation.

Case study: Egypt's Multi-Sector Coordination for Pandemic Preparedness

In partnership with the UN and other development partners, the Egyptian government addressed HPAI H5N1 in a comprehensive manner. In 2005, the prime minister established the National Supreme Committee for Combating Avian Influenza, with a rotational chairmanship. This multi-sector committee included the ministers of agriculture, health, environment, and development as well as representatives from the offices of foreign affairs, interior, information, army, and police, and international cooperation (WHO, the Food and Agriculture Organization, and the UN resident coordinator's office). In addition, governors from the worst affected areas were also represented. The committee led coordination of all HPAI H5N1 efforts, ensuring buy-in and harmonization of interventions; development of appropriate, evidence-based policies; and consensus with all relevant sectors.

To respond to the 2009 H1N1 Influenza event, the Egyptian government activated its national preparedness plan and set up a multi-sector crisis management committee, led by a decision support center that met regularly to provide a rapid response as the pandemic situation evolved. The crisis committee reported regularly to the prime minister with clear action points for each sector, and issued regular press releases highlighting the situation, government measures, and steps for prevention and mitigation. Below are some of the features of Egypt's response:

Multi-Sector Approach: The roles and responsibilities of all concerned sectors were identified, including the involvement and support at sub-national levels. Each governorate developed regional plans, based on a model from the Minufiya governorate. The decision support center provided support to all governorates during the preparedness phase. Reporting and response instruments were established and developed by the decision support center, adopted by the General Secretariat of the Presidency of the Council of Ministers, and sent to all relevant actors. A sub-committee was formed to design training and simulation exercises to test ministry and governorate plans, examine policies and procedures and roles and responsibilities of different directorates, and identify gaps. Simulation exercises were carried out in the Ministry of Health and eight governorates. Plans were reviewed and updated by all governorates.

Health System: The Ministry of Health received the committee's full support, including policy support as well as mobilization of resources. Surveillance activities were enhanced to support successful decision-making regarding preventive and mitigation measures. A standardized severity index for pandemic and public health threats was developed. Laboratory capacity at the central level was strengthened, and five sub-national laboratories were upgraded. Other interventions included ensuring an adequate stockpile of equipment and supplies, designating specialized hospitals to treat patients, developing plans for hospitals, and enforcing infection control measures. However, gaps

were also identified, especially regarding the 2009 H1N1 Influenza vaccine campaign. The procured amount of vaccine was not enough to cover initial needs, and rumors about the vaccine affected its uptake by the public, as well as by health professionals.

Business Planning: Two business continuity workshops were held on measures to be taken by government and private sectors to ensure continuity of services during a pandemic. These were attended by government institutions, civil society, and the private sector. All ministries involved in critical services established business continuity plans for the management of crises and disasters, and submitted them to the National Supreme Committee.

Coordination with Civil Society: The Egyptian government established a forum to identify the role of civil society organizations in the management of the crisis. Coordination with the Egyptian Red Crescent in preparedness and response was done at the beginning.

Communication Strategy: The decision support center prepared a guide for governorates on how to prepare communication plans for confronting the pandemic. The government issued 189 reports to follow the 2009 H1N1 Influenza situation, with information on: the situation in Egypt and globally, follow up and response by ministries, evaluation of community reaction towards the crisis, and recommendations to reduce the impact of the disease. Statements were distributed to newspapers and international media containing information on the global and national situation, public opinion about the crisis, and responses to media enquiries. A monitoring center was tasked to carry out 24-hour monitoring of media coverage and monitor the key messages and concerns raised by the media and the public.

Future Challenges: Egypt's pandemic preparedness experience provides some important lessons learned on how to advance multi-sector planning. The future challenge for the Egyptian government will be in operationalizing the shift from an emergency response to a long-term risk-reduction strategy. The challenge will be to convert a strong multi-sector system for influenza pandemics into an institutionalized, sustainable, and holistic approach for other emerging zoonotic diseases and public health threats. Egypt needs to strengthen its institutional frameworks, incorporate its tools into wider risk reduction frameworks, build on existing mechanisms and coordination platforms, and maintain public and political interest in the face of changing perceptions and needs. To achieve this, risk-reduction strategies must be integrated and aligned, community and industry partners engaged, and long-term investments made in animal and human health and the local-level health delivery systems.

Moving Towards an All-Hazards Approach

There is increasing recognition of the commonalities involved preparing for all emergencies and disasters—and the need to pool resources and planning mechanisms. In many countries, planning efforts are stove-piped for specific outbreaks or pandemics—with different entities leading for different hazards, resulting in conflicting priorities, fragmented resources, and limited coordination. In 2010, at the UN Inter-Ministerial Conference on Animal and Pandemic Influenza, participants advocated for global cooperation and multi-sector collaboration, calling for capacity building and sustainable strategies within existing programs that translate across all hazards. Epidemics and outbreaks can be easily incorporated into larger emergency and disaster planning processes, which represents a significant convergence among communities of practice. An all-hazards approach encourages a more sustainable planning framework that does not depend on the highly uncertain risk of a pandemic, reduces confusion of different structures, and is more easily incorporated into standard operating procedures. To strengthen health system preparedness, efforts have to go beyond pandemic plans to include other incidents that could create a health system crisis. Emergency preparedness plans that include pandemic contingencies will be easier for organizations to maintain and test during the long intervals between pandemics severe enough to trigger those plans.

There is a need for stronger advocacy for all-hazard emergency preparedness actors, plans, and processes to recognize that pandemic is one of the risks that needs to be included.

In the aftermath of recent, relatively mild pandemics, many governments have lost interest in pandemic preparedness. There is concern that if there were a severe pandemic in the next 10 years, most countries would not be as well positioned as they were in April 2009. In order to sustain progress, experts are advocating for an all-hazards approach, stressing the generic nature of emergency planning for all hazards. There is a need for stronger advocacy for all-hazard emergency preparedness actors, plans, and processes to recognize that pandemic is one of the risks that needs to be included. The mandates of many disaster management agencies do not include pandemics. There is a difficult balance to strike between delivering preparedness plans that strengthen resilience to a range of threats without losing the pandemic-specificity that enables preparedness measures to be effective.

3 In 2007, the Association of Southeast Asian Nations (ASEAN) embarked on an ambitious task to improve multi-sector pandemic preparedness at the regional level. Regional associations can support the planning and implementation of specific technical actions, if properly prepared and endorsed by member states through a consultative process. Activities planned and carried out as part of the regional approach have helped participants to successfully advocate to their own governments and other ministries for multi-sector pandemic preparedness planning. Regional activities can get a higher level of political attention within governments and help in promoting their importance. This chapter describes the process that ASEAN nations embarked upon to gradually build consensus, design, and evaluate multi-sector preparedness plans.

ASEAN's Experience with Multi-Sector Pandemic Preparedness

Key Lessons from ASEAN's Experience with Multi-Sector Preparedness

- ASEAN's **indicator system for assessing multi-sector pandemic preparedness is a useful tool** in assessing an individual country's progression to full pandemic response readiness. These indicators may be used by other organizations to compare preparedness levels across countries.
- The **identification and prioritization of essential services** and the business continuity planning of these essential services should be a key element of all preparedness plans.
- **Simulation and table-top exercises helped to improve the preparedness** of ASEAN member countries both individually and collectively.
- The **integration of pandemic preparedness into disaster management and emergency response** is a key element to institutionalizing pandemic efforts.
- The regional nature of **ASEAN's activities created visibility and political support** at high levels of government.

Planning Preparedness from a Regional Perspective

While national-level planning is required to ensure any degree of pandemic preparedness (multi-sector or health-sector specific), the Association of Southeast Asian Nations (ASEAN) regional approach provided significant and valuable boosts for the member states and helped advance in-country activities. In 2007, ASEAN embarked on an ambitious task to improve multi-sector pandemic preparedness at the regional level. While other regional organizations have worked on joint programs to improve animal and health sector preparedness for avian influenza, this may be the first instance of a regional organization addressing multi-sector pandemic preparedness and integration into an all-hazards approach to disaster preparedness.

As recently as 2006 and early 2007, most ASEAN countries considered pandemic preparedness and response a health issue—and therefore to be the sole domain of the ministries of health. In addition, the concept of continuity of operations or business continuity planning was relatively unknown. Today, many Asian governments have not only acknowledged the value and importance of other sectors, including essential services, but have also developed their own preparedness plans, including business continuity plans. Even very poor and under-developed countries, such as Cambodia and Lao People’s Democratic Republic, have undertaken tremendous efforts to familiarize ministry officials—and to some degree even provincial authorities—of business continuity concepts, assigning responsibilities for coordinating all essential sectors and key service providers for future preparedness. While progress has been slow, officials understand the multi-sector preparedness concept and methodology and recognize the value of business continuity planning—some have even managed to develop operational business continuity plans. While these plans have been developed in the context of pandemic preparedness, they also have multi-hazard characteristics that will potentially strengthen preparedness for other hazards.

ASEAN’s effort started with a review of available national pandemic preparedness plans published in English in the Asia-Pacific region. The objective was to explore how existing plans dealt with the non-health impacts of a severe pandemic. The comprehensive review concluded that: 1) existing pandemic preparedness plans dealt almost exclusively with health issues and covered other sectors only when they were linked to a health sector response, and 2) no multi-sector pandemic preparedness plans existed that included relevant essential service sectors. The review also found that within the region, only Singapore had done substantial work involving other sectors and essential services in pandemic preparedness planning. The other nine ASEAN member states had not yet made significant progress in developing preparedness plans to mitigate the non-health impacts of a severe pandemic.

Singapore had developed a national pandemic alert coding system, and its Ministry of Home Affairs coordinated and supported the preparedness planning efforts undertaken by various sectors. The SARS outbreak had taught Singapore two important lessons.

The first lesson was that both health and non-health issues must be dealt with quickly so that the outbreak could be contained. Government officials quickly learned that the Ministry of Health could not oversee and resolve all issues arising during an outbreak. The Ministry of Health’s priority is to provide the medical response, such as administering timely treatment to all patients. Non-health issues—such as enforcement of home quarantine orders, disinfection of premises, and public communications—should be handled by non-health agencies in close collaboration with the Ministry of Health. The second lesson was that a national-level system is required to enable decisive decision-making and galvanizing of manpower and other strategic resources across the government. A ministerial committee chaired by Singapore’s Minister for Home Affairs is the dedicated national crisis policy-making body. Principal members include permanent secretaries from most ministries and heads of departments.¹

Singapore learned from the 2003 SARS pandemic the importance of addressing non-health issues and having a single, national-level mechanism for decisive decision-making.

Strengthening Multi-Sector Preparedness

ASEAN began to advocate for strengthening multi-sector preparedness to demonstrate that its member states could respond effectively to a pandemic—supporting its overall vision to create an open, dynamic, and resilient regional community by 2015. In 2007, ASEAN conducted a member workshop in Lao People’s Democratic Republic, with support from the U.S. Agency for International Development and in partnership with WHO, the UN Office for the Coordination of Humanitarian Affairs, and the UN System Influenza Coordination. As a result of the workshop, ASEAN participants understood how a severe pandemic would have an impact on the operation of various sectors, leading to serious problems for government, health sector, and general public. Participants concluded that ASEAN members should advocate for government support in preparing all relevant sectors for the impact of a severe pandemic, agreeing that future meetings should incorporate national disaster management authorities, in addition to the ministries of health and agriculture. During a follow-on workshop, ASEAN members agreed to promote regional pandemic preparedness to demonstrate that ASEAN countries could effectively respond to a pandemic.

ASEAN identified health, food, water and sanitation, energy, public security and order, finance, telecommunications, and transport as “essential” services during times of emergency.

By March 2008, this collective effort resulted in the “ASEAN Multi-sector Pandemic Preparedness and Response Work Plan,” which defined the vision, goals, strategies, and activities of the effort. Endorsed by all ASEAN members, the work plan outlined

¹ Insert reference to document “Examples from Singapore” and original authors.

the actions to be undertaken by each member state. Representatives from each country participated in a working group to promote multi-sector planning and coordination. After consultation, this working group agreed on eight essential services: health, food, water and sanitation, energy, public security and order, finance, telecommunications, and transport. In this context, the multi-sector preparedness planning integrated all sectors, but emphasized addressing essential services. In early 2011, the working group developed a new work plan, which is to be presented for review and adoption at a meeting of health, disaster, and national security officials later in 2011.

Developing Indicators to Assess Multi-Sector Preparedness

In 2008, ASEAN developed an “indicator system” to assess national multi-sector pandemic preparedness, which defined required structures, policies, and mechanisms to ensure preparedness of non-health impacts. The system identified relevant areas of multi-sector pandemic preparedness at four levels, to be comparable with the WHO system for pandemic preparedness in the health sector. Four main areas of multi-sector preparedness were identified that should be addressed for a comprehensive national preparedness and response to an influenza pandemic: 1) national government planning and coordination, 2) sub-national government involvement, 3) whole-of-society planning, and 4) sector planning and continuity of essential services. These four areas represented the core requirements for multi-sector pandemic preparedness and response. The indicators represent a country’s progression to full pandemic response readiness.

In 2009, a pilot assessment was conducted in Indonesia to test the system and revise indicators as necessary. While there were a number of short-comings identified during the pilot assessment, the overall approach provided valuable insights for pandemic preparedness for non-health sectors, including public and private service providers. The emergence of 2009 H1N1 Influenza interrupted assessment plans for other member states, which were eventually conducted in a different format at the end of 2010 and in early 2011. Although some planned activities of the “ASEAN Multi-Sector Pandemic Preparedness and Response Work Plan”, such as the development of tools and specific in-country assistance, have not yet been carried out, a number of countries have initiated specific measures on their own, supported by the UN’s Central Fund for Influenza Action. The indicator system developed to assess baseline preparedness for ASEAN member states is a valuable approach for multi-sector (pandemic) preparedness, and should be considered for broader all-hazard approaches.

The ASEAN indicator system is a valuable approach for multi-sector preparedness, and should be considered for broader all-hazard approaches.

ASEAN's Multi-Sector Pandemic Preparedness Indicator System

3

Level 0: A country has not yet started preparing non-health sectors for a pandemic or has initiated preparedness activities that do not yet meet the criteria for the other levels.

Level 1: A country has initiated pandemic planning efforts in non-health sectors to be ready and able to respond to an influenza pandemic at a minimum level to mitigate non-health impacts on at least the essential services.

Level 2: A country has completed its planning efforts and begun to implement the non-health sector pandemic preparedness activities laid out in its plans.

Level 3: A country has fully tested and implemented its pandemic preparedness plans, and plans have been institutionalized. This represents the optimal or desired level of multi-sector preparedness.

The ASEAN Region Table-top Exercise

To further solidify its multi-sector preparedness approach, ASEAN conducted a major simulation exercise in August 2010, with financial and planning support from the U.S. Agency for International Development and the U.S. Asia-Pacific Center for Security Studies. The goal of the multi-day exercise was to improve the multi-sector capabilities of ASEAN members individually and collectively to prepare for and respond to a severe pandemic. The objectives of the exercise were to:

- Gain a common understanding of existing regional preparedness and response plans and mechanisms;
- Confirm essential service sectors and identify planning and response elements that influence the preparedness and continuity of operations by government and civil society at the national and regional level, including sector interdependencies that may result in additional effects;
- Determine when an initial health crisis changes to a multi-sector crisis severely affecting the functioning of society and to identify key trigger points for actions by ASEAN (as an organization), ASEAN member states, and other regional and international organizations and assisting states;
- Identify gaps in coordination and cooperation among ASEAN members, the UN, and other key international agencies, including donors, and to develop strategic options for regional cooperation;

- Examine the regional communications strategy, protocols, and plans for possible improvements;
- Identify recommendations for improvement to existing standard operating procedures and plans for interagency and cross-border cooperation.

Participants included approximately 10 officials per member state from different ministries covering essential services, officials of the ASEAN secretariat and Asian Committee on Disaster Management, as well as various UN agencies such as WHO, UNICEF, UN System Influenza Coordination, the UN Office for the Coordination of Humanitarian Affairs, the World Food Programme, the International Labour Organization, the International Organization for Migration, and the International Civil Aviation Organization. In addition, observers were invited from other regional associations, such as the European Union, the African Union, League of Arab States, the South Asian Association for Regional Cooperation, and the Secretariat of the Pacific Communities. Focusing on the non-health impacts of a severe pandemic, this regional multi-sector simulation exercise is thought to be the first of its kind. The table-top exercise tested, among others, the existing “Standard Operating Procedures for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations.”

Integrating Pandemic Preparedness into Disaster and Emergency Response

The “ASEAN Agreement on Disaster Management and Emergency Response” integrates pandemic preparedness into disaster preparedness and underscores the importance of multi-hazard disaster preparedness within a wider development framework.

ASEAN’s Disaster Management and Humanitarian Division continued to play a significant role in the development and implementation of the work plan, including incorporating pandemic scenarios within the scope of all-hazards disaster management. The “ASEAN Agreement on Disaster Management and Emergency Response” was signed into effect in December 2009. Pandemics were integrated into the agreement, officially incorporating pandemic preparedness into disaster preparedness, further underlining the importance of integrating all-hazard disaster preparedness into a wider development framework. It will be important to define and specify the roles and responsibility of the recently established ASEAN Humanitarian Assistance Centre with regards to pandemic preparedness and response to avoid duplication or contradiction with existing structures and mechanisms, especially those within the UN system. The ASEAN Humanitarian Assistance Centre is likely to be the focal point and coordinating body for pandemics and all regional responses to public health emergencies.

The coordinated efforts of ASEAN member states resulted in a regional work plan for 2010-2015, which was adopted during the 15th Meeting of the ASEAN Committee on Disaster Management. The agreement includes pandemic preparedness in its scope of work and work plan. Two strategic component activities specifically include pandemics: 1) to develop other appropriate standard operating procedures to respond to specific disasters, including pandemics; and 2) to develop systems and mechanisms needed to ensure the continuity of essential services when required in a disaster, including severe pandemics. In addition, proposed activities to increased preparedness and response capacity of ASEAN member states, consistent with the “ASEAN Multi-sector Pandemic Preparedness and Response Work Plan,” included:

- Establish a baseline on the overall ASEAN’s level of preparedness and response;
- Propose and agree on preparedness and response benchmarks;
- Develop and conduct capacity development strategy, including support for contingency planning, to achieve the benchmarks;
- Conduct periodic evaluations of preparedness levels and response capacities of members through “after-action reviews” to gather feedback from disaster-affected community, humanitarian agencies, government, and other ASEAN states.

Case Study: Multi-Sector Planning in Vietnam

Vietnam was the first country affected significantly by HPAI H5N1, not only in poultry, but also in human cases with a high fatality rate. While human cases and deaths have declined over the years, the virus is still considered to be active, and the government of Vietnam takes the threat very seriously. Avian influenza occurred just as the SARS outbreak was dissipating, which had had a major impact on Vietnam's human population, health system, and economy.

In 2004, a national steering committee for avian influenza was established, led by the Minister of Agriculture and Rural Development with additional members from the ministries of health, finance, trade, public security, communications, transport, environment, information, and foreign affairs. In 2006, another steering committee on human influenza was established with a multi-sector ministry membership, the National Institute of Hygiene and Epidemiology, the Vietnam Red Cross, and other organizations, such as women's and farmers' unions.

In 2006, 26 signatories, including the Government of Vietnam, the UN, World Bank, other international donors, international NGOs, research organizations, and others, signed the "Partnership on Avian and Human Influenza." In 2009, a national influenza prevention plan described the roles and responsibilities of the various ministries and members of the national steering committee to respond to 2009 H1N1 Influenza. In this document, some references can be found to maintain essential activities and normal operations of various ministries. However, the main focus remained on the health issues and support functions to be provided to the Ministry of Health in order to respond to the outbreak and to limit the spread as much as possible. No specific guidance was provided with regards to continuity of operations planning to maintain essential services.

The following describes the roles and responsibilities of the various ministries:

Ministry of Health: The ministry delivers reports on pandemic prevention and control measures to the central party, the prime minister, and the Government Office. The ministry reports on the pandemic situation in the world to the public and the media, and works with the media to promote prevention and control measures. The ministry implemented the 2009 national plan, and provided direction to local departments of health, preventive medicine centers, and hospitals for controlling the pandemic. It also instructed leaders of provincial and municipal people's committees to hold local committee meetings to implement pandemic-related interventions, and supported localities with medications, chemicals, and personal protective equipment.

Ministry of Foreign Affairs: This ministry coordinated with the Ministry of Health to disseminate information on the pandemic situation to international embassies in

Vietnam, as well as governments of other countries, to ensure information sharing about 2009 H1N1 Influenza in Vietnam, to harmonize actions with other countries and the international community, and to help minimize the socioeconomic impact of the pandemic in Vietnam. The Ministry of Foreign Affairs was responsible for directing passenger entry and exit and international communications to ensure no adverse impacts on diplomatic activities between Vietnam and other countries.

Ministry of Public Security: The Ministry of Public Security worked on border health quarantine and immigration. It coordinated with the Ministry of Health in conducting isolation of suspected patients; providing lists of people coming from outbreak areas so that their health status could be monitored; and monitoring the pandemic situation to prevent inaccurate communications from causing public concern.

Ministry of Information and Communication: The Ministry of Information and Communication regulated the dissemination, communication, and promotion of the situation through the media, and communicated with international organizations to prevent negative impacts on socioeconomic activities, international exchanges, tourism, and public opinion. The ministry kept the public updated on the global and national situation and prevention and control measures through mass media broadcasts, and provided prompt reports to the national steering committee when urgent interventions were needed.

Ministry of Defense: The Ministry of Defense coordinated with the Ministry of Health for land border quarantine, and provided communications about prevention and control measures for people in remote and mountainous areas. The military coordinated with local health authorities regarding establishing field hospitals, and established taskforces and mobile rapid response teams to support localities in emergency care and classification of patients.

Ministry of Finance: This ministry allocated funding for pandemic prevention, control, response, treatment, and isolation.

Ministry of Transport: The Ministry of Transport implemented health screening and surveillance using public transport to help with detection and isolation of suspected cases. It coordinated activities among transport units to support health units in transporting patients and relief supplies, under the direction of the national steering committee. To help ensure staff safety and continuity of services, the Ministry of Transport gave instructions to agencies and the Ministry of Health on applying protective measures for staff who might be at high risk of contact with passengers infected with 2009 H1N1 Influenza.

Ministry of Industry and Trade: The Ministry of Industry and Trade assigned staff to be on duty on a rotating basis to maintain human resources (as stand-ins for ill staff) to ensure people's essential daily needs, such as power and water, were met. It increased stockpiles of food, fuel, and essential equipment to ensure the availability of adequate supplies. It also coordinated with the Ministry of Health to promote the production and import of medical equipment for responding to the pandemic.

Ministry of Education and Training: The Ministry of Education and Training coordinated with the health sector in communicating about outbreak prevention and control measures, and encouraging students to share information with others in the community. The ministry implemented enhanced health monitoring of students through timely notifications to local health authorities as soon as 2009 H1N1 Influenza cases were suspected in a school. This allowed response measures to be undertaken if necessary, such as temporarily closing schools to avoid transmission in the community.

The Government Office: The Government Office coordinated with the Ministry of Health to deliver regular reports to the prime minister on the situation. Advice was provided to the prime minister on allocating resources for pandemic preparedness and response working with the chair of the national steering committee.

Mass Media: The *Nhan Dan* newspaper, the Vietnam News Agency, Vietnam Television, and the Voice of Vietnam were invited as members of a communication sub-committee. These and other press and news agencies coordinated with the Ministry of Health to provide updated information about the pandemic situation and prevention and control measures through mass media channels.

Vietnam Red Cross: The Red Cross deployed mobile relief workers to support health units in transport and emergency care of patients. It distributed information to people in the community to promote detection of suspected cases and application of preventive measures. The Red Cross coordinated with international organizations to support the country with protective equipment and materials and facilities for emergency care, transport of patients, and field hospitals.

In 2011, the Ministry of Health carried out an assessment of the national multi-sector pandemic preparedness status, including a short mission to one province. The assessment confirmed that there is a very strong mechanism and structure to assure a coordinated response to outbreaks, including measures to prevent infection or spread, and hygiene messages and information campaigns filtering through to all sectors and all administrative levels—from national to provincial, district and communes, involving the mass media as well. However, it does not include any specific instructions or guidance on the broader need for continuity of operations planning, which seems to remain an unfamiliar concept.

Conclusion


Regional associations can support the planning and implementation of specific technical actions, if properly prepared and endorsed by member states through a consultative process. Activities planned and carried out as part of ASEAN's regional approach helped participants to successfully advocate to their own governments and other ministries for multi-sector pandemic preparedness planning. It also provided complimentary support for in-country activities of the member states.

Several important lessons can be gleaned from the ASEAN experience:

- While national-level planning is required to ensure any degree of pandemic preparedness (whether multi- or health-sector specific), the ASEAN regional approach provided significant and valuable boosts for member states and helped advance in-country activities. The work of ASEAN created additional national-level motivation and stronger national commitment.
- International organizations can work effectively and successfully with regional associations and provide relevant and important technical advice and assistance. The close, trustful, and good collaboration between the officials of member states and international organizations has helped significantly in the development of the regional work plan and the successful implementation of related activities.
- Inter-regional exchange of information and experiences was a valuable vehicle to motivate and support advancements of preparedness activities at regional as well as national levels.
- Regional activities can get a higher level of political attention within governments and, therefore, help to promote their importance.

ASEAN governments and ministries of health are promoting multi-sector and whole-of-society approaches in future pandemic or emerging infectious disease preparedness. In Thailand, Cambodia, Indonesia, and Lao People's Democratic Republic, pandemic preparedness is linked to the disaster preparedness and response system. These advances are remarkable given that most work initiated only in 2008 and that external support has subsided. Governments are committed to maintaining and continuing these efforts. ASEAN also continues to promote integration of pandemic preparedness into disaster preparedness as a multi-sector and multi-hazard approach. However, currently most ASEAN countries have not sufficiently progressed with business continuity efforts.

For the future, the multi-sector and all-hazard approaches may advance preparedness planning for other types of hazards and slow onset disasters. The multi-sector preparedness and the integration of other line ministries and private sector will require more time and effort so that it may evolve to a point where it is applicable for other disasters. The fact that many ASEAN countries want to continue working with this approach is very encouraging, providing an important and fundamental basis for potential success. In the absence of continued external funding, most work has focused on integrating multi-sector pandemic preparedness and business continuity planning into an all-hazard disaster preparedness approach. The evolution of business continuity planning and the operationalization of plans will help to make the case for the value of this type of approach far beyond pandemics.



Civil-military coordination is widely regarded as a major component of disaster response, particularly for disasters that will have significant societal impact. Militaries have the ability to provide logistics support in the form of supplies, equipment, and transportation and also assist with the maintenance of essential services, security, and surveillance. This chapter describes national planning processes and the notable improvements achieved in dialogue and joint planning between civilian and military actors. It also describes the strategic value of table-top exercises, and the military's role in disease surveillance.

Civil-Military Collaboration in Emergency Preparedness

Key Lessons from Civil-Military Collaboration

- **Table-top exercises proved crucial in improving civil-military collaboration.** These exercises provided an opportunity for military leaders to train in disaster management, humanitarian assistance, and pandemic preparedness; assisted nations in assessing their pandemic influenza preparedness and response baseline; assisted nations in understanding the roles of the international community; and provided a venue for participants to identify national and regional opportunities for the development of multi-country response to pandemics and other hazards. Governments should develop and conduct training in civil-military cooperation.
- Militaries should **develop a force protection plan** to protect their troops and their families before and during an epidemic.
- Military preparedness efforts should include **business continuity planning for all essential services.**
- Militaries can provide important **logistical, organizational, epidemiological, and mobile laboratory resources to support surveillance.**

Military's Comparative Advantage in Humanitarian and Disaster Response

The military's crisis management capacities, ability to deal with varied tasks in sub-optimal settings, logistic resources, widespread presence in the country, and the ability to mobilize people during risky situations are important attributes during a pandemic.

The importance of civil-military cooperation in disaster planning, including planning for a severe global pandemic cannot be overstated. The very nature of disaster response requires that all available resources be employed to mitigate the loss of life and destruction of property. In many developing countries, the military's capability to respond to a disaster situation far exceeds that of the civilian government or the private sector. Simultaneously, within these countries, civil-military cooperation is in its infancy, with historical events inhibiting the building of trust between these key elements of society.

Emergency management is a secondary mission for military forces in all countries. Response to large-scale disasters always includes some level of military involvement as response and recover phases unfold. Specific tasks and instructions that are built into civilian response and recover plans at the national, province, and local levels will save lives and facilitate recovery.

Military forces have become increasingly important as facilitators of government foreign policy—taking part in peacekeeping operations, military exercises, and humanitarian relief missions. The resources available to militaries of developing countries usually exceed those available to civilian disaster managers—and even private sector resources. The military's crisis management capacities, ability to deal with varied tasks in sub-optimal settings, logistic resources (fuel, food, and water), widespread deployment in the country and sometimes in the world, and the ability to operate in hazardous situations are important attributes during a pandemic. In addition to the equipment available within military organizations, the level of training of professional military personnel is often better than that of national, regional, and local disaster management personnel—although this training may not have a specific disaster management focus. With prior planning and exercises, militaries can have the ability to provide logistics support and maintain essential services and security. Effective utilization of these resources is directly tied to the level of civil-military coordination prior to a disaster. To prepare for a societal disaster, a nation must be aware of available resources and the country's vulnerability to an event.

“A severe pandemic would be comparable to a global war.”

In addition, severe pandemics may indeed result in events to which militaries in some countries would typically respond, including civil unrest, large-scale refugee situations,

increased criminal activity, border incursions, and possibly even escalation of existing local, national, or regional conflicts. But beyond these areas of typical military involvement, there are many other pandemic response activities that may require the military to support civilian authorities to maintain essential services outside the health sector. Military forces are also increasingly aware of the impact a pandemic disaster would have on national and international stability: a 2010 U.S. Department of Defense report suggests that a severe pandemic would be comparable to a “global war.”

International Mechanisms for Fostering Civil-Military Collaboration

Inclusion of military assets within national plans provides and defines expectations for military response to disaster events.

The Oslo Guidelines are the primary international guidelines related to military assistance for disaster relief. Signed by all UN member states, the guidelines prescribe the roles and responsibilities of military interventions during disaster relief operations. These interventions can be from foreign or domestic military forces that are requested to provide assistance. The UN’s Office of Coordination for Humanitarian Activities provides the international community with the development and facilitation of guidelines on use of military and civil defense assets, a civil-military coordination training program (called UN-CMCoord), humanitarian support to military exercises, and deployable expertise. The UN’s Office of Coordination for Humanitarian Activities plans, mobilizes, and coordinates emergency response tools in support of humanitarian coordinators and humanitarian assistance operations. It promotes coordination guidelines, deploys skilled humanitarian civil-military coordination officers, and implements training and exercise programs. It recently released guidelines for optimal civil-military coordination, including three essential elements: 1) inventory of civil-military actors, military missions, and mandates; 2) analysis of civil and military relations; and 3) the establishment of civil-military coordination structures and mechanisms.¹

The U.S. Department of Defense’s six regional commands prepare for and response to emergency situations, when requested. The U.S. military is actively promoting civilian-military cooperation for pandemic preparedness, through two of these command centers. The U.S. Pacific Command’s Center for Excellence in Disaster Management and Humanitarian Assistance promotes disaster preparedness and societal resiliency in the Asia-Pacific region. As part of its mandate, this center facilitates education and training in disaster preparedness, consequence management, and health security to develop domestic, foreign, and international capability and capacity. The U.S. Africa Command, responsible for U.S. military relations with 53 African countries, also includes disaster preparedness within its mandate.

¹ UN and Inter-agency Standing Committee. (2008). *Civil-Military Guidelines and Reference for Complex Emergencies*. New York: UN Office for the Coordination of Humanitarian Affairs.

More recently, the U.S. Agency for International Development funded the Pandemic Response Program in collaboration with the two command centers. The program was designed to prepare partner nations' militaries to perform disaster response functions during a severe global pandemic, although each regional command established somewhat differing program methodologies for providing assistance. Both programs sought to work with the militaries of partner nations to enhance their roles in pandemic and disaster preparedness and response and to develop appropriate contingency plans to institutionalize and prepare for these roles. The bilateral contingency planning development and training focus areas of the program were logistics, transportation, security, engineering, public health/medical, regional response in collaboration with NGOs and international organizations, communication infrastructure, strategic messaging, legal framework, military laboratory technician training, and validation of military pandemic response contingency plans.

The U.S. regional command centers' experience in working with other militaries to improve disaster response functions highlighted the usefulness of table-top exercises for civilian-military coordination. Exercise participants noted a lack of comprehensive national pandemic preparedness as a significant gap in pandemic preparedness, including lack of ministerial-level pandemic plans and business continuity plans. National governments were often unaware of the pandemic plans, policies, and procedures of NGOs and international organizations. During several events, it was noted that partner nations relied heavily on NGOs to support national pandemic response operations, but were unaware of the plans of these organizations. Several nations identified inadequate critical infrastructure and resources inhibiting the ability to respond effectively to a disaster, including a severe global pandemic. Some disaster managers in partner nations believed that the functions, responsibilities, and authorities of national disaster operations centers were not sufficiently delineated, nor understood by all stakeholders. In general, partner nations identified an overall lack of training in civil-military cooperation as a shortfall to disaster preparedness. Civilian authorities were largely unaware of the capabilities of the military and therefore were unsure of what roles and responsibilities to assign military forces during disaster response.

Key Achievements in the Asia-Pacific Region

The U.S. Pacific Command's Center of Excellence in Disaster Management and Humanitarian Assistance conducted more than 50 events focused on preparing for, responding to, and recovering from complex pandemic events. The original curriculum used WHO's Rapid Response Training materials, first presented in Thailand in June 2005. U.S. Pacific Command recommended four tasks to strengthen the capacity of Asian militaries to respond to a complex pandemic event, specifically:

- Develop a force protection plan to protect troops and their families from infectious disease before and during a pandemic;
- Develop strong working relationships with the national-level government agency that will be the focal agency for pandemic preparedness and response;

- Develop relationships with international agencies that militaries will most likely be working with during a pandemic, such as WHO, the World Food Programme, and such NGOs as the IFRC;
- Develop and exercise business continuity planning based on recognized pandemic planning assumptions. Potential national security, civil security, and stability tasks during the time of social and economic disruption are also part of the business continuity plan.

In the Asia-Pacific region, militaries are now included within the multi-sectoral committees and councils that exist in all partner nations, a relatively new development that did not exist five years ago. In addition, in some countries, military rapid response teams are working directly with their ministries of health, or in some cases as stand-alone military response units. Examples of improved civil-military collaboration include:

- **Malaysia:** The laboratory division of the Ministry of Health collaborated with U.S. Pacific Command to train military and civilian laboratory technicians in H5N1 and H1N1 diagnostic testing, using a curriculum developed by the U.S. Centers for Disease Control and Prevention.
- **Vietnam and Cambodia:** In 2010, Vietnam and Cambodia hosted province-level pandemic training, which included military and ministry of health providers and planners. The training in Vietnam included representatives from 80 percent of the provinces; in Cambodia, all provinces were represented. National authorities assigned additional planning tasks for participants to complete upon return to their provinces.

Key Achievements in the Africa Region

The U.S. Africa Command's program supported a series of workshops and table-top exercises with participants from participating countries' governments and national militaries. Participating countries in table-top exercises included Benin, Mali, Ghana, Togo, Kenya, Botswana, Malawi, Burkina Faso, Namibia, Burundi, Nigeria, Rwanda, Ethiopia, Senegal, Tanzania, Liberia, Uganda, and Egypt (in conjunction with the U.S. Central Command). Other activities included the participation of the Regional Disaster Management Center of Excellence, the Kofi Annan International Peacekeeping Center, and the African Union and its eight Regional Economic Communities. The key results from these exercises included:

- Providing an opportunity for senior and mid-level military leaders to train in disaster management, humanitarian assistance, and pandemic preparedness;
- Assisting partner nations in assessing their pandemic influenza preparedness and response baseline;
- Assisting the national-level authorities and military in their validation of roles and responsibilities within their national pandemic response plans;

- Assisting partner nations in understanding the roles of the international community in the management of a pandemic response;
- Promoting inter-operability and enhanced capability of partner nations to respond to complex humanitarian emergencies;
- Providing a venue for participants to identify national and regional opportunities in multi-country responses to pandemics and other hazards.

Several examples of improved civil-military collaboration in the Africa region include:

- **Ghana:** To address pandemic and disaster preparedness, Ghana's National Disaster Management Organization was legally mandated to coordinate preparedness response activities. This organization analyzed all hazards in the country and identified all partners whose individual and collective roles will assist risk reduction for each hazard. In addition, technical committees were formed with public, private, and civil society agencies and organizations, including NGOs and the military. These committees ensure a multi-sector approach to preparedness and response activities.
- **Uganda:** There has been identification and military integration into the national and regional preparation plans for heavy airlift capabilities for high mountainous regions during disaster response capabilities, such as the UN airlift of heavy equipment to Mount Elgon and the U.S. Africa Command's ground support during the 2010 landslide. Also, the National Emergency Coordination and Operation Centre was established with training support from the U.S. Africa Command.
- **Kenya:** One of the best examples of cross-sector collaboration was provided by Kenyan authorities and involved the military's involvement in quelling the violence following recent post-election violence. This civil-military collaboration in a difficult disaster situation was accomplished through effective communication and with a careful adherence to impartiality, allowing the Kenyan military to step in when necessary to prevent loss of life and destruction of property without being perceived as partial to either side. The collaboration necessary to accomplish this delicate balance involved a wide array of Kenyan governmental agencies and representatives of neighboring countries.
- **Tanzania:** The Kilosa flood was a good example of cross-sector collaboration and coordination between government and military, both within and outside of a country. Organizations involved included every sector, including the national government; the Tanzanian military; private sector food, telecommunication, and transportation companies; and all of the major UN organizations and NGOs. This incident provided the opportunity to conduct cross-sector coordination on a scale that exceeded any previous disaster response effort. These cross-sector organizations worked together to provide a very successful disaster response, creating a cross-sector synergistic effort that saved lives and property.

Case Study: Kenya's National Pandemic Response Table-top Exercise

The purpose of Kenya's National Pandemic Disaster Response Table-top Exercise was to harmonize efforts of various ministries and agencies so that the national disaster response plan could move forward quickly and smoothly. Following two days of informational briefings and training on international health regulations, crisis communications, and humanitarian assistance guidelines, representatives from the Kenya Armed Forces and ministries of the Kenyan government tested their ability to work together and respond to potential disaster scenarios. Also included were experts from key international agencies, including WHO, IFRC, the UN's Office of Coordination for Humanitarian Activities, the U.S. Agency for International Development, the U.S. Centers for Disease Control and Prevention, the World Food Programme, the International Organization for Migration, and the Food and Agriculture Organization.

Participants were grouped into four cells—communications, logistics, health, and security—replicating the traditional model of a national disaster operational center. These groups were presented with various disaster and health scenarios and were required to work together among their units to develop appropriate responses. Members of the Ministry of Health's national influenza taskforce comprised the health cell, which supported the national disaster operations center. A member of Kenya's Office of the President acted as the liaison for the security cell, and worked with each of the other cells for security support, such as providing security in the movement of materials, medicine, and food and monitoring entry points into the country.

Participants noted the importance of the exercise in providing key information on how to respond to a disaster, strengthening teams, and fostering collaboration.

The U.S. Africa Command's experience with these table-top exercises provides some important lessons. The exercises provided a firsthand look at the multi-sector, whole-of-government response for a complex emergency event—pointing out some important weaknesses in the pandemic and disaster preparedness of participating countries. Participants reported being challenged in numerous exercises that tested their ability to communicate and request assistance from local, regional, national and international players—and the exercises facilitated initial key contacts and relationships for development of national multi-sector pandemic response and mitigation plans.

Remaining Needs in Civil-Military Coordination

Through the process of conducting the preparedness and response activities, the following areas of civil-military collaboration in pandemic preparedness that are in need of improvement have been identified:

- *Need for both national and military pandemic preparedness and response plans.* Participants in table-top exercise identified the lack of a comprehensive national pandemic preparedness and response plan as the most significant gap in pandemic preparedness. Participants believed that existing plans often did not adequately address pandemic preparedness and response. In addition, participants noted the lack of ministerial-level pandemic plans and continuity of operations plans as a shortfall. Also noted was the lack of military contingency plans to support civilian pandemic preparedness and response operations.
- *Lack of understanding of existing national plans.* Participants in several exercises were extremely knowledgeable in their areas of expertise, but were largely unaware of existing national disaster response plans, policies, and procedures. This lack of institutional knowledge was considered a major impediment to effective national disaster response capabilities.
- *Clarify authority of national disaster operations centers.* Some disaster managers believed that the functions, responsibilities, and authorities of national disaster operations centers were not sufficiently delineated and understood by all stakeholders, a shortfall they recommended be addressed as an immediate priority. They stated that the function of these critical centers should be clearly delineated in applicable national plans, policies, and procedural documents to ensure an understanding by all disaster and pandemic stakeholders. These managers widely agreed that these centers should exercise command and control of national disaster response operations during major disasters, including a severe global pandemic. They further suggested that to be effective, the centers should have a standing budget sufficient to perform their assigned functions.
- *Military participation in critical infrastructure and key resources identification and protection.* Several nations identified the lack of an adequate compilation of critical infrastructure and resources as an issue that would inhibit effective disaster response, including a severe global pandemic. It was noted that the tendency was to identify critical infrastructures during a response, but that compiling a better, more comprehensive listing during the preparation period would provide more thorough analysis

of national infrastructure and resources, using input from key subject matter experts, to determine the most effective methods of protecting and utilizing these resources.

- *Limited military knowledge of NGO collaboration.* Various national and international NGOs participated in many pandemic preparedness events sponsored by the two commands. These NGOs often are relied upon to provide critical disaster response support. However, host nations often were unaware of the pandemic plans, policies, and procedures of these organizations and whether their internal disaster and pandemic plans would support identified national requirements.
- *Lack of disaster training and exercise programs.* There was a lack of disaster management training and exercises at all levels of government. It was the opinion of most nations that additional training in this area would significantly enhance the ability of all stakeholders to provide timely and effective disaster response in complex humanitarian emergencies, including severe pandemics. In addition, the lack of a formal exercise program to periodically assess response training plans was identified as a shortfall. Many national disaster management representatives believed that this program should not only address national plans and training, but be disseminated to lower levels of government to truly assess the ability of the nation to respond to a major disaster.
- *Lack of training in civil-military cooperation.* An overall lack training in civil-military cooperation was seen as a shortfall inhibiting disaster preparedness. Civilian authorities were largely unaware of the capabilities of the military and therefore were unsure of what roles and responsibilities to assign military forces during disaster response. [In addition, many participants in table-top exercises believed that the perception of military capabilities held by civilian authorities exceeded the actual capabilities of the military. It was also pointed out that civilian authorities have a tendency to “back off” once military forces become involved in any disaster, believing the military takes charge and no longer requires the same level of civilian involvement in disaster response. On the other hand, military participants were unaware of the support requirements that civilian authorities would have during a major disaster, including a pandemic event, and how civilian and military disaster response components would interface and maintain a coordinated response.
- *Need for military business continuity planning.* The lack of formal business continuity plans was a major issue that would hamper the ability of key ministries and other stakeholders to respond to a severe global pandemic. Military forces have numerous resources that would be useful in maintaining the continuity of business operations. While participants in table-top exercises strongly recommended the development of national and ministerial response plans, these plans were seen as ineffective without the development of appropriate business continuity plans to ensure response capacity is retained by key response stakeholders.
- *International standards for assessing impact.* In its work, the U.S.’s Pandemic Response Program is initiating some key quantitative impact indicators in the assessment of civil-military collaboration training and programming, but other

quantitative indicators may still need to be developed. In the past, military aid efforts have lacked standardized and well-accepted impact assessment indicators that other international relief and development organizations commonly use in their work. In addition, there are some existing systems of planning checklists and tools (such as those from WHO or the UN Office for the Coordination of Humanitarian Affairs), which host nations should incorporate into their planning.

The Military's Contribution to Disease Surveillance

There remains a need for more resources and funds to be invested into surveillance of emerging and re-emerging diseases in the country and region. Surveillance mechanisms in the human health sector are still very poor, especially the early warning systems, and strategies for surveillance are not well developed. Surveillance is not only needed at the local level, but more importantly it should be integrated into the overall health system of the country. Civil-military collaboration is one way to improve surveillance and expand capacity within existing systems.

In humanitarian emergencies, well-equipped militaries may use their logistical, communication, organizational, epidemiological, and mobile laboratory resources to establish surveillance for populations vulnerable to epidemics. Following the Indian Ocean tsunami in 2004, the U.S. Department of Defense worked with WHO and with the Indonesian government to establish a field laboratory in the heavily affected Indonesian city of Banda Aceh. The laboratory provided reference services that confirmed some epidemics, thus facilitating timely intervention for outbreaks and allaying concerns about other infectious diseases. After several months, the United States turned the laboratory over to the Indonesian government, who continued to use the facility.²

Some militaries maintain advanced laboratory and epidemiological capabilities to protect the health of their forces and share these assets with civilian health organizations. For example, German and U.S. military medical organizations are partners in a WHO-led technical collaboration of institutions and networks, which pools human and technical resources for the rapid identification, confirmation, and response to outbreaks of international importance (called the Global Outbreak Alert and Response Network). Three U.S. Department of Defense overseas laboratories are WHO collaborating centers, which frequently assist ministries of health and WHO in the surveillance of and response to epidemics.

Developing country militaries might not possess sophisticated public health capabilities, but if they maintain awareness for unusual disease occurrences, they may provide valuable early warning for epidemics of global importance. Within some developing countries, militaries already support civilian health authorities by providing health services for civilians in remote areas and reporting military surveillance data to the ministry of health. When forces collaborate with civilians to conduct military and

² J-P Chretien (2007). The importance of militaries from developing countries in global infectious disease surveillance. *Bulletin of the World Health Organization*, 85 (3).

civilian infectious disease surveillance, these partnerships enable compliance with WHO's 2005 regulations, which require that WHO be rapidly notified of infections that may constitute a public health emergency of international concern—irrespective of whether the infections are in civilian or military populations.

Case Study: Peru's Military Surveillance System³

The Peruvian military includes more than 200,000 personnel in its army, navy, air force, and national police. The Navy maintains dozens of training facilities, ports, and other bases across the country—from modern facilities in Lima to remote bases in border areas. In tropical areas, navy units are at risk of malaria, yellow fever, dengue, and other vector-borne diseases. Outbreaks of infectious disease have had a significant effect on the Peruvian Navy's ability to carry out its mission. Crowded living conditions and difficulties in maintaining hygiene contribute to outbreaks of respiratory and diarrheal diseases among Peru's Navy personnel.

In Peru, as in many countries, the military complies with disease reporting policies established by civilian health authorities. The Ministry of Health has identified 45 nationally reportable infectious and non-infectious diseases. The Navy monitors these diseases in its active duty personnel (about 25,000 people) and their family members (about 100,000), and reports surveillance data to the ministry. With many units in remote locations, the Navy provides the ministry with information on disease burden and outbreaks in areas where there is little civilian public health infrastructure.

Before 2002, the Navy relied on a paper-based reporting system that did not facilitate rapid detection and control of infectious disease outbreaks, especially in remote locations. Mailed reports could take weeks to reach Lima from the border areas, by which time outbreaks often were well advanced or over. Several unexpected deaths in units in the Amazon region—likely the result of infectious diseases—drew attention to surveillance deficiencies. The Navy and the U.S. Navy Medical Research Detachment developed an electronic disease surveillance system that has transformed public health surveillance and response in the Peruvian Navy. The system allows reporting and tabulation of reportable diseases, as well as others important in military populations, such as influenza-like illness and training injuries. Units report to the surveillance hub at the U.S. Navy Medical Research Detachment by internet, telephone, or radio-relay. The Navy has assigned an officer to the hub to facilitate communication with surveillance sites. The system covers more than 95 percent of Navy forces and family members in all Navy regions. It has identified 31 disease outbreaks, including Peru's first confirmed cyclosporiasis epidemic, and has frequently initiated rapid epidemiologic investigation and control.

³ J-P Chretien (2007). The importance of militaries from developing countries in global infectious disease surveillance. *Bulletin of the World Health Organization*, 85 (3)

Conclusion

Across regions, there is a need to strengthen civil-military coordination in national, multi-sector preparedness, and develop military contingency plans to support civilian pandemic preparedness and response operations. In many cases, civilian authorities are largely unaware of the capabilities of the military and therefore unsure of what roles and responsibilities to assign military forces during disaster response. Similarly, military leaders sometimes are unaware of the support requirements that civilian authorities would have during a major disaster, including a pandemic event and how civilian and military disaster response components would interface and maintain a coordinated response. Government authorities should develop and conduct additional training in civil-military cooperation and conduct periodic exercises to reinforce this training as part of a regular disaster response exercise program. And pandemic response plans should reflect the interaction between civil and military disaster response components and institutionalize applicable policies and procedures.

The efforts of the U.S. regional commands focused on building the necessary relationships and expanding capacity to support the use of military resources to support civilian response to major disasters, including that of a severe global pandemic. These efforts have been very successful, but much work remains to be done. Both commands have plans to continue their support of partner nation civil-military cooperation efforts, which will expand the capability of national militaries to effectively support civilian authorities during preparedness and response to severe global pandemics and other disasters.

5 Most experts agree that countries with resilient, community-based systems will respond best to the shocks caused by global events, such as food crises, climate change, and pandemic diseases. This chapter discusses strategies being used for community-based disease management and surveillance, and also summarizes the innovative Humanitarian Pandemic Preparedness Initiative, which focused on engaging communities in pandemic preparedness. It describes the effective guidance and tools that have been developed and disseminated.

Community-Level Pandemic Preparedness and Humanitarian Support

Key Lessons in Community-Based Preparedness

- Preparedness **plans are incomplete and ineffective if they do not take into account the risk specific to vulnerable communities** where pandemic preparedness may not be a priority. Given that emergencies are primarily experienced at the local level, plans need to be refined so that they are **operational and achievable at the local level**.
- Community-based disaster management has been successful in many parts of the world. A strategic **framework for sustainability of community-based disaster management should be established** and best practices widely disseminated.
- Community-based surveillance can be successfully applied to increase ownership and capacity of communities to detect and respond to disease outbreaks. **Community-based surveillance has shifted from a passive to an active, participatory process**. However, these systems often rely on volunteers, and roles and responsibilities need to be clearly defined.
- Pandemic **preparedness efforts are producing collateral benefits in reducing the transmission of other common illnesses**. These are important considerations for countries where factors such as surge capacity and distance to local facilities may impede access to medical care.
- Moving from **planning to implementation to activation requires political and community commitment**. Communities and local administrations need to continue to test and update their plans so that they are effective when activated. Partnerships are essential for advocacy and acceptance among local communities.

Humanitarian Agency Support for Pandemic Preparedness

Humanitarian organizations support the most basic needs of vulnerable communities the world over. Vulnerable communities face major challenges in meeting the everyday needs of their inhabitants. Undoubtedly, a severe pandemic would further disrupt access to critical services, particularly in the poorest countries. Emergency preparedness plans are incomplete and ineffective if they do not take into account the risk specific to vulnerable communities where pandemic preparedness may not be a priority. National-level plans are not necessarily directly implementable and sustainable at the community level. Therefore, a multi-sector, whole-of-society approach is critical to formulating both top-down and bottom-up approaches. This chapter focuses on the lessons learned from those humanitarian organizations that are working to meet the challenges that a severe pandemic would create in these communities. Some of these important actors include CARE, UNICEF, the IFRC, Save the Children, the World Food Programme, and the UN Refugee Agency. The U.S. Agency for International Development has also provided support through funding to the Humanitarian Pandemic Preparedness Initiative and the Central Fund for Influenza Action.

With this support, key humanitarian agencies have sought to strengthen the capacity of the humanitarian community to continue to deliver humanitarian services in pandemic. Agencies have found that preparing effectively for pandemic strengthens readiness for a range of threats. The table below summarizes six key lessons that the humanitarian community has identified during its pandemic preparedness work.

The power of funding and ambition	Through adequate funding, donor drive, and motivation of partners, preparedness efforts can move rapidly. If this was replicated for all disaster preparedness, all-hazard preparedness would be strengthened. Where there is funding and ambition, preparedness can be an urgent priority.
The need for an all-hazards approach	It is less effective to focus on just one threat. It gains more traction to emphasize that pandemic preparedness strengthens resilience to a range of threats. Knowing how to prepare for one disease makes regions and countries better prepared for any threat. Pushing pandemic as a separate vertical risk risked undermining government disaster management processes.
Business continuity planning is key	Business continuity planning is a key priority. The process by which contingency and business continuity plans are formulated is invaluable for preparedness, including threats beyond pandemics.
The value of simulation exercises	Simulation exercises proved a valuable tool for strengthening preparedness. Multi-sector simulation exercises helped to identify roles and responsibilities of different stakeholders and improve communication and coordination in the event of a pandemic or any crisis.
High level commitment facilitates collaboration	Bringing together senior representatives from 23 agencies across the humanitarian community to sign a high level declaration committing to work together early in the process provided impetus, legitimacy and momentum to the Humanitarian Pandemic Preparedness Initiative and Humanitarians in Pandemic networks and to a collaborative approach.
Innovative coordination methodologies	The UN System Influenza Coordination has taken an innovative approach, using a small, cost-effective, catalytic taskforce to build links and strengthen coordination of an informal network. This approach has relevance to other complex areas of multi-sector work, where there is a major global political profile, a wide range of stakeholders, and an urgent need to work in a more coordinated way.

Pandemic Preparedness at the Community Level

Applying the principles of emergency and disaster risk management at the community level can improve the safety and resilience of communities by ensuring access to essential services, such as food, health, safe water, sanitation and hygiene .

Most experts agree that countries with resilient, community-based systems will best respond to the shocks caused by global events, such as food crises, climate change, and pandemic diseases.¹ Community preparation strengthens the ability of households and communities to prevent, mitigate, respond, and recover from emergencies and disasters. Applying the principles of emergency and disaster risk management at the community level can improve the safety and resilience of communities by ensuring access to essential services such as health, food, safe water, and sanitation and hygiene.²

As governments have developed and revised their national pandemic preparedness plans, there has been a paradigm shift from medical and pharmaceutical management of pandemic influenza to an approach that includes many other interventions, such as communication, public education, social distancing, isolation, and quarantine. However, implementing national strategies at the local level can be challenging. For example, national or sub-national authorities anticipate the need to close schools, but the triggers for school closure need to be adopted by local authorities to inform decision-making at the local level.³ The thresholds for these triggers will vary according to different local contexts (urban, rural, and frontier communities). If emergencies are primarily experienced at the local level, then strategies to limit the risk of exposure need to be refined so that they are operational and achievable—and that they reflect the local situation and give real consideration to resource constraints.⁴ Local buy-in is essential and community leaders need to be identified and involved from the outset.

Community-Based Disaster Risk Management

Communities are the first to experience the effects of any disaster and the first to respond.

Disaster is defined as a serious disruption of the functioning of a community or a society causing widespread human, material, economic, or environmental losses that

1 WHO. (2008). *Primary Health Care*. Cairo: Regional Committee For The Eastern Mediterranean.

2 WHO. (2010). *Community Resilience in Disaster: How the Primary Health Care Made a Difference in Recent Emergencies in the WHO South-East Asia Region*. India: SEARO.

3 Klaiman, T., JD Kraemer & MA Stoto. (2011). Variability in school closure decisions in response to 2009 H1N1: a qualitative systems improvement analysis. *BMC Public Health*, 11:73.

4 Ortu, G., S Mouneir-Jack & R Coker. (2008). Pandemic influenza preparedness in Africa is a profound challenge for an already distressed region: analysis of national preparedness plans. *Health Policy and Planning*, 23(3), 161-9.

exceed the ability of the affected community or society to cope.⁵ Communities are the first to experience the effects of any disaster and the first to respond. Top-down approaches to disaster risk management fail to address the specific local needs of vulnerable communities. A key aspect of a successful community-based initiative is partnership with, empowerment of, and ownership by the local communities—factors that underpin sustainability.

Disaster management requires a planned and systematic approach towards understanding and solving problems in the wake of disasters. It involves the systematic observation and analysis of measures relating to disaster prevention and risk reduction, emergency response, recovery and development. Therefore disaster management is a function of community preparedness.

The Asian Disaster Preparedness Center has been involved in the community-based management of pandemic influenza in Asia, working to integrate pandemic influenza into their all-hazards assessment potentially increasing the visibility of biological hazards into risk assessments—and therefore into emergency planning as a whole. Its project partners included CARE, the IFRC, and the International Rescue Committee. Supported with funding from the Canadian government through the Asian Development Bank, the project strengthens the partnerships between communities, NGOs, governments, UN organizations, the private sector, and academic institutions in their efforts to manage pandemic influenza in communities in Asia.

There have been many community-based disaster management initiatives in different parts of the world—many producing tangible results. A strategic framework for the sustainability in community-based disaster management should be established, and the best practices should be widely disseminated among various stakeholders—through training programs and follow up to support ongoing implementation.

Community-Based Surveillance

Surveillance, diagnosis, and response are crucial at the community level in limiting the transmissions of diseases with pandemic potential.

Community-based early warning and surveillance contributes to early detection and prevention and control of disease at all levels. It allows for the mapping of hazards, trends, risks, priority setting, vulnerable populations, resources, and evaluation of policies and programs. There are a variety of models for community-based surveillance; however most models share the following common objectives: to improve the sensitivity of the existing formal surveillance system; to move towards an active system of detection and reporting; and to link local mobilization for case detection, early warning, and response to formal surveillance systems. Surveillance, diagnosis, and response is

⁵ UN International Strategy for Disaster Reduction. (2009). *2009 UNISDR terminology on disaster risk reduction*. Geneva: International Strategy for Disaster Reduction Secretariat.

crucial at the community level, yet without an active local surveillance and response mechanism, the opportunity to respond to new and re-emerging infectious diseases is lost. Examples of community-based surveillance systems in Asia clearly demonstrate that linking international protocols to local realities leads to improved sustainability.

The principles of community-based surveillance can be successfully applied to increase the ownership and capacity of communities to detect and respond to disease outbreaks. In areas where community-based surveillance projects have been implemented, there has been a shift from passive to active participatory surveillance, leading to increased multi-sector coordination in report and response to disease outbreaks at the community level. However, many community-based surveillance programs rely on volunteers and maintaining a core group of trained volunteers takes local commitment. The role of volunteers in the community-based surveillance needs to be clearly defined and described to the community to avoid any confusion or false expectations. Clear guidance on roles and responsibilities should be developed and shared as part of the implementation of any community-based surveillance model to ensure that the community is clear on the roles of all parties.

Case Study: Community-Based Surveillance in Vietnam

5

Since 2005, CARE has been implementing programs for avian and pandemic influenza in nine countries. One of the core elements of these programs was to improve national and community-based surveillance for avian influenza and other diseases of public health importance. Their model established an active volunteer network within every community to fill the gap between community households and the lowest level reached by the national passive surveillance system. By strengthening collaboration across sectors and all levels of government, the time between detection and response can be reduced, ensuring a more comprehensive and effective effort in reducing transmission. The volunteers, who are themselves part of the communities, act as the eyes and ears of the community-based surveillance system; they also assist village and animal health workers, who are linked to the commune and district levels of the system. This model encourages established surveillance systems to shift from passive to active community-level participatory surveillance. Community-based surveillance networks cover a wider population with greater intensity than centralized health authorities, due to their size and the relationships that volunteers have with their communities. The model has also contributed to increased multi-sector coordination in the reporting and response to disease outbreaks at the community level. In addition, the model highlighted the value of interpersonal communication as a way to move from awareness to behavior change.

CARE Vietnam has been mobilizing communities to take action against the threat of avian influenza at the village level. Since 2007, CARE Vietnam, in collaboration with the U.S. Centers for Disease Control and Prevention, has shown that by training local volunteers to routinely look for avian influenza among poultry and humans and preparing them to take charge, communities can more efficiently identify cases and respond to prevent transmission. CARE's Training and Response for AI Now (TRAIN) project has transformed a passive surveillance system into an active one, closing the gaps between commune-level authorities and households. Community volunteers participate in a train-the-trainers workshop, in which they learn disease reporting and prevention and control messages. Volunteers are assigned a set number of households in their village to visit each week. In addition to completing reports, the volunteer teams attend monthly village-level meetings where they discuss challenges. These steps link their network to the existing national surveillance structure. Any signs of avian influenza are reported to health authorities and the local committee for avian influenza, which immediately trigger the local response measures.

Although highly effective, the project's experience provides some additional lessons. Vietnam's volunteers were recruited from women's and youth unions. However, a wider recruitment process is required, as it was difficult for young and female volunteers to be taken seriously by older, male farmers. In addition, volunteers found it difficult to maintain weekly visits to 40 households. Therefore, visits should be varied according to the

seasonal risk of outbreaks, with more frequent visits during peak seasons. To keep the network active, refresher trainings and meetings need to be maintained.

The experience suggests that the principles of community-based surveillance can be successfully applied in any community around the world to increase the ownership and capacity of communities to detect and respond to disease outbreaks.

Community Awareness and Education

A variety of community assessment initiatives for animal and human influenza have been undertaken to identify existing beliefs, attitudes, and behaviors. One important lesson identified from community-level assessments and research is that community perception influences individual behavior. An individual's behavior is formed in the context of their community and society. Therefore planned interventions must include efforts to change the norms of community-accepted behaviors. Behavior change communication has a role to play in influencing community and societal change. Changing public health policy, allocating resources to make behavior change easier, and legitimizing new norms of health behavior, especially those requiring societal adoption (such as social distancing), are needed to be effective.⁶ Discrepancies between levels of awareness and actual behavior change often relate to the degree of a population's perceived risk and identifying change managers within a community. Therefore, to strengthen prevention and control of pandemic influenza, wider societal and community-level agreement and commitment to the change is required to facilitate successful adoption at the individual level.⁷

6 Breslow, L. (Ed.) (2002). *The Encyclopedia of Public Health*. New York: MacMillan Publishing Co.

7 Marshall, H., P Ryan, D Robertson, J Street & M Watson. (2009). Pandemic influenza and community preparedness. *American Journal of Public Health*, 99(Suppl 2), S365-71.

Case Study: Collaborating with the Vietnam Women's Union⁸

The U.S. Agency for International Development's Avian Influenza Behavior Change and Communication Project's collaboration with the Vietnam Women's Union has been cited as a success in mobilizing communities to take action in preventing and controlling avian influenza. In 2006, few avian influenza interventions were directed at rural women, even though women comprise a large portion of small-scale poultry farmers in Vietnam. With more than 13 million members in 64 provinces, the Women's Union seemed to be a logical conduit through which to reach these backyard poultry farmers to promote avian influenza prevention activities.

The project trained members at the national and provincial levels on participatory training methods for communication. These trainers then conducted workshops for district- and commune-level staff on how to disseminate avian influenza prevention behaviors through group discussions, club meetings, and individual communications. By September 2007, 3,833 district and commune women were trained in 24 provinces deemed at high risk for avian influenza outbreaks, and these trained women were able to promote prevention practices regarding poultry to more than 88,000 women farmers through additional group discussions and club meetings. A follow-up study confirmed that nearly all of these trained women continued to communicate influenza messages.⁹

The project continued to collaborate with the union to train women leaders on communication and provide support to avian influenza communication activities in communes. Applying lessons from the previous year, trainings have included more time to hone the women's skills in facilitating group discussions and club meetings, and more support has been provided for village theatre showings.

This project also embarked on a participatory action research activity, tapping into the union's reach into sometimes-far-flung communities to facilitate the information collection and collaboration. The study intended to gauge the feasibility of changing behaviors related to biosecurity based on the concept that village poultry are bound together in risk as "one village = one poultry flock." The participatory process provided a win-win scenario: it offered insight into villagers' interests and concerns about their lives, and it also served to create community communications activities that were realistic and achievable for the target audiences.

⁸ de Guzman, E., LT Hai & L Mai. (2008). Women spark behavior change: collaborating with the Vietnam women's union. *Snapshots from the Field*. Washington, DC: AED. Retrieved from <http://avianflu.aed.org/docs/Snapshots.pdf>

⁹ conducted by AC Nielsen for AED

Reducing Risk

Animal and human influenza is especially challenging as there are a myriad of behaviors necessary to protect human health and another set of behaviors required to reduce vulnerability of household poultry and livestock from becoming infected. Partnerships are essential for advocacy and acceptance of these behaviors among local communities.

To reduce the spread of influenza viruses that have pandemic potential, individuals, households and communities need the information and resources necessary to decrease the likelihood of transmission. Information to mitigate the impact of a pandemic—such as hand washing, respiratory etiquette, avoiding contact with infected persons, and staying home when ill—need to be made available in formats that are culturally acceptable and adapted to local needs. For these actions to be successfully implemented, active engagement with the community, including marginalized groups, in the development and delivery of public health messaging is required. Further analysis is currently being undertaken to determine if the non-pharmaceutical actions implemented by local health authorities, either individually or in combination, in the early stages of local outbreaks, reduced community transmission or the impact on marginalized or vulnerable populations for 2009 H1N1 Influenza. Analyses should also focus on the implementation of these strategies to determine the degree of acceptance and compliance at the community level, given local demographic, socio-cultural, and geopolitical factors.

Many of the prevention and mitigation behaviors for pandemic influenza (such as hand washing and safe food preparation) are similar to those used to prevent and mitigate other epidemics or unknown biologic threats and vice-versa. Thus, adapting new messages to previously known risks can improve their overall adoption. Furthermore, in the aftermath of emergencies or disasters, similar behaviors can reduce the spread of communicable diseases in vulnerable populations exposed to overcrowding, lack of safe water and sanitation, breakdown in vector control programs, lack of proper nutrition, and reduced access to health and essential services.

Humanitarian Pandemic Preparedness Project

In 2007, several agencies came together to start the Humanitarian Pandemic Preparedness Initiative to reduce the risk of excess mortality from an influenza pandemic by focusing on humanitarian coordination and community-level preparedness. The IFRC was the overall coordinating agency, also providing technical and financial support to national Red Cross societies to develop and implement pandemic preparedness activities. Other NGOs—the CORE Group (CARE and Save the Children), InterAction, and U.S. Agency for International Development’s Avian Influenza Behavior Change and Communication Project—engaged organizations at the global and country level in materials development, communications, capacity-building, and coordination around pandemic preparedness and response. The IFRC had Initiative teams on

every continent, as well as tools, trainings, and educational material that had been translated and adapted locally according to the different local contexts. The Initiative's three objectives were to:

- Support the development of influenza pandemic preparedness plans, protocols, materials, and tools for communities in the areas of health, food security, and livelihoods in designated countries;
- Strengthen the in-country capacities of staff and volunteers of humanitarian and civil society organizations to carry out influenza pandemic preparedness plans and protocols;
- Ensure functional coordination between global-, national-, district-, and community-level stakeholders in the preparedness and response of the humanitarian section.

The Ugandan Red Cross and CARE implemented the Initiative in Uganda to increase the capacity of communities to respond to many different diseases beyond pandemic influenza. The Ugandan project promoted simple hygienic practices that were the very practices used to control cholera, hepatitis, Ebola, and other diseases. The pictorial approach used in tools developed by the project made the tools useful despite potential language barriers, cultural and religious differences, and literacy levels.

Collateral Health Benefits of Pandemic Messages

When providing households with home care management messages before a pandemic, it is important to adapt the messages for the community and to ensure that they are understood and meaningful to the members of that community, especially those who are most vulnerable. Targeted activities to raise awareness of and how to access health-care for influenza-like illnesses has demonstrated that it is possible to reduce over reliance on hospital structures and increase community access to primary health care.¹⁰ These are important considerations for countries where factors such as surge capacity and distance to local hospitals may impede access to medical care during an emergency. Furthermore, home care and prevention messages used for pandemic influenza are in many cases transferrable to other common illnesses. For example, hygiene messages can also be applied to diarrheal diseases and other respiratory-born infections; while messages on how and when to seek medical assistance can be applied to preparing communities for disruption of health systems during other emergencies. Behavior change communications and training can also reduce the spread of other common diseases, if behaviors are widely accepted and adopted by society.

¹⁰ Hanvoravongchai, P, W Adisasmito, PN Chaun, A Conseil, J de Sa, R Krumkamp, S Mounier-Jack, B Phommasack, W Putthasri, CS Shih, S Touch & R Coker. (2010). Pandemic influenza preparedness and health systems challenges in Asia: results from rapid analyses in 6 Asian countries. *BMC Public Health*, 10(1):322.

Case Study: Collateral Benefits of H1N1 Influenza Messages in Bolivia

If any good has come of the 2009 H1N1 Influenza pandemic, it may have started with Nayeli, a second-grader from the impoverished hillsides of La Paz, Bolivia. Prompted by a massive campaign to contain the spread of the new influenza virus, Nayeli and millions of other Bolivian schoolchildren have been washing their hands a lot more than usual—after recess, before meals, and every time the animated dancing hands pop up in public-service announcements on television. Starting in April, sudsy cartoon hands were everywhere, promoting hand-washing on billboards, at soccer games, in classrooms, and in the media. “[Nayeli] would remind us to do it at home,” said Nayeli’s mom. Within her family, she thinks the public health campaign has been a success: “Normally both Nayeli and my three-year-old son have constant stomach aches or diarrhea. But in the last few months, they just haven’t had those issues,” she says. That’s exactly how the campaign is supposed to work, says a senior adviser for UNICEF. “Kids are the key because they are great at carrying messages.”

Experts now say that the increase in hand washing across the country may have had some collateral benefits: reducing the spread of other common diseases. Epidemiologists estimate that they have seen a 10-15 percent drop in the incidence of acute diarrheal diseases in all age groups in 2009, compared with the previous year. Diarrheal diseases are the biggest killer of children under age five worldwide. In Bolivia, 30,000 children die each year from such illnesses. Diligent washing, especially at critical times (like after going to the bathroom and before meals) helps reduce the rate of diarrheal disease by more than 40 percent.

As these descending rates of diarrheal disease are from short-term data, it remains to be seen whether the trend continues. There is limited data regarding reduced rates of diarrheal or other diseases due to 2009 H1N1 Influenza activities from other countries, although a news report suggests that increased hand washing due to H1N1 Influenza led to a sharp reduction of pinkeye cases in Korea.¹¹

11 Friedman-Rudovsky, J. (2009). H1N1: Swine flu’s collateral health benefits in Bolivia. *Time*. Retrieved from <http://www.time.com/time/health/article/0,8599,1931223,00.html#ixzz1QsDzIBmM>

Operationalizing Pandemic Plans at the Community Level

Moving from planning to implementation to activation requires political and community commitment. A recent study of health system challenges in six Asian countries highlighted the importance of operationalizing existing preparedness plans, particularly at the regional and local levels. Communities and local administration offices need to continue to test and update their plans so that they are effective when activated.¹²

Community members, such as health workers and volunteers, are often the first to respond to an emergency, playing a vital role in disaster preparedness, response, and recovery. When essential systems are overwhelmed, destroyed, or disrupted, communities can be left to care for themselves for a number of days. Frontline health workers, volunteers from humanitarian organizations, households, and communities may need to manage increasing cases related to pandemic influenza or cholera, injuries, or malnutrition due to food insecurity or drought. Other emergencies also may occur at the same time as a pandemic, which may be unrelated or occur due to associated factors (sometimes referred to as second- and third-order effects). Multi-sector preparedness and response at the community level is critical for a rapid and effective response.

Many of the actions taken to increase local capacity for pandemic preparedness have included multi-sector involvement to ensure that essential services will be available in the event of any disaster or emergency. For example, CARE Vietnam's evaluation of jointly developed commune and civil society pandemic preparedness and response plans showed strengthened capacity and capability to conduct situational analyses and activity planning—including defining responsibilities of government and community and mobilizing local resources for pandemic and other disasters. Projects funded by the Central Fund for Influenza Action trained more than 10,000 health workers and migrant community leaders in health promotion, social mobilization, pandemic awareness, counseling, and communications in Egypt and across Africa. One of the most important outcomes of the trainings was participants could transfer the tools and skills they learned to other crises and everyday life. Projects in Lao PDR, Vietnam, and Cambodia showed that the main challenges that local participants faced were the lack of support from senior management in the workplace and disseminating information to mobile populations (especially in border areas), emphasizing the need for greater community-based involvement and cross-border cooperation and programs.

Resources Available for Community-Level Pandemic Preparedness

A number of guidelines, manuals, and tools were created to reflect the insight and knowledge of those working within communities. The IFRC's "Community-Based Health and First Aid in Action" is a community-based approach to long-term capacity building for improved health programs and community development.


¹² Hanvoravongchai, P., Adisasmito, W., Chaun, P.N., Conseil, A., de Sa, J., Krumkamp, R., Mounier-Jack, S., Phommasack, B., Putthasri, W., Shih, C.S., Touch, S., & Coker, R. et al., (2010). Pandemic influenza preparedness and health systems challenges in Asia: results from rapid analyses in 6 Asian countries. *BMC Public Health*, 10(1):322. doi: 10.1186/1471-2458-10-322

The program includes an implementation guide, a facilitator guide, a volunteer manual, and community tools. The IFRC's "Epidemic Control for Volunteers" training manual and toolkit focuses on the management of epidemic disease outbreaks. It was conceived to familiarize volunteers and trainers with the most common epidemics that cause the most death and suffering; teach them how they could help limit the number of victims; act quickly and effectively; and define their role in their communities before, during, and after an epidemic.

Humanitarian organizations and other NGOs have also created numerous materials for dissemination to community members. The community tools consist mainly of illustrations, so that they can easily be used by volunteers, regardless of literacy. It would be difficult to identify another disease that in recent times resulted in the same volume of guidance and tools. The only drawback to this is that decision-makers need to stay abreast of what is current and most useful for their populations.

Conclusion

Emergency preparedness plans are incomplete and ineffective if they do not take into account the risk specific to vulnerable communities where preparing for pandemic influenza may not be a priority. A multi-sector, whole-of-society approach is critical to sustaining and enhancing national, institutional, and individual capacity to respond to an influenza pandemic and promote community resilience to a number of other public health threats. Leveraging existing programs to integrate pandemic preparedness activities, especially at the local level, will assist in sustaining activities and messages. Consistency is needed across preparedness plans to influence local leaders and communities of the importance of planning. Using an all-hazards approach to risk reduction and preparedness will help avoid duplication of efforts and planning. It has been demonstrated that interventions that target community and households to enhance early detection and reduction can be harmonized across vertical disease control and applied to other emergencies.



The intensification of livestock production, the concentration of production systems in close proximity to urban population centers, and husbandry practices with inadequate biosecurity all contribute to the emergence of diseases and their transmission—both among animals and to humans. This chapter shows how HPAI H5N1 preparedness enhanced multi-sector collaboration in many countries, and illustrates the critical importance of effective collaboration between the animal health and human health sectors. It emphasizes the importance of partnerships, inter-disciplinary collaboration, and national ownership, and describes significant improvements in planning for and tracking diseases.

Animal Health

Key Lessons in Health Preparedness and Biosecurity

- While international and national preparedness has progressed well, **cross-border preparedness still needs further development**. Regional coordination has been difficult to achieve, and more efforts are needed in this area.
- **Simulation exercises have been critical to strengthening in-country capacity** for the prevention and control of zoonotic diseases at the human-animal-environment interface. Initially developed for HPAI H1N5, they now are a powerful tool for addressing other zoonotic threats.
- Efficient surveillance requires close collaboration among all actors: government, business, and civil society. **New technologies** are speeding outbreak investigations and confirmations, and **participatory disease surveillance effectively integrates civil society into surveillance**. However, there are still important obstacles in surveillance and reporting of disease, such as the lack of formal reporting mechanisms at the national level.
- Many tools have been developed for collection and dissemination of animal health information. Today, information on disease can be tracked instantly as a result of improved use of technologies such as electronic mail, the web, and the geographic information systems—all tools that are becoming more and more accessible to all. These systems exist and should be maintained. However, **there lacks sufficient data analysis of the impact of animal diseases**, such as the value of animal losses and the economic impact of animal disease.

Understanding the Linkages between Animal Health, Ecosystems, and Global Public Health

There is global recognition that more animal-borne diseases can be expected in the future, and the unpredictable nature of these pathogens increases the seriousness of their pandemic potential.

There have been a number of significant pandemics recorded in human history, but the frequency and impact of emerging and re-emerging animal diseases have increased over the past decades. It is estimated that 75 percent of emerging infectious diseases in humans originate in animals (and of these, wildlife represents the vast majority). More animal-borne diseases can be expected in the future. Increased threats to human and animal health are triggered by multiple, interrelated global factors driven by human behavior (including processes in human and animal population demography, climatic change, increased mobility and globalization, amplified urbanization and land degradation, misuse of pharmaceuticals leading to microbial resistance, and monoculture of domestic breeds over previously genetically diverse populations). The intensification of livestock production, the concentration of production systems in close proximity to urban population centers, and husbandry practices with inadequate biosecurity all contribute to the emergence of diseases and their transmission—both among animals and to humans. These factors influence the dynamics of viral pathogens that adopt new behaviors, such as expanding their geo-ecological range, jumping species, and changing to a higher level of virulence. Human and veterinary medicine have a long history of collaboration, but the emergence of SARS and HPAI H5N1 cemented the realization that these two disciplines needed close interaction, and contributed to the development of the “one health” concept, which advocates for collaboration in all aspects of health care for humans, animals, and the environment.

As global public health is repositioned in international agendas, it is imperative that disease emergence not be looked at in isolation, but systematically viewed alongside dynamic changes in farming landscapes, animal agriculture intensifications, natural resource depletions, land utilization patterns, trade globalization, human behaviors, food consumption, and evolving trends in agricultural production, distribution and marketing systems. Attention to and analysis of these changes will reveal the feasible and viable options to address the root causes that underpin pathogen evolution, establishment and persistence.

Global, Regional, and National Collaboration for the Prevention and Control of Animal Health Emergencies

In an unprecedented effort to combine knowledge and harmonize response to a global threat, HPAI H5N1 triggered a movement of partnership and collaboration that had not existed previously. Improved coordination through partnerships among public, veterinary, and ecosystem health agents depends on various measures: consultation on priority setting, joint preparedness planning, communicating consistent messages, strengthening education, providing the appropriate incentive framework, advocacy, funding and strengthening research capacity. Through this partnership approach, it is envisaged that further linkages among expert institutions and global networks within both the animal and health sectors will enable new real-time systems where methodology, data availability and responsibilities are shared both horizontally and vertically.

The establishment of national taskforces or committees with technical sub-groups has improved mechanisms for coordination to ensure the inclusive and coherent involvement of all necessary actors and sectors in the definition and implementation of national strategies. Such tools have been adopted almost worldwide and have significantly enhanced:

- High-level political involvement, with direct links to prime-ministerial level, in times of emergency;
- Collaboration between ministries of agriculture and health and a comprehensive approach from the animal and public health sectors;
- Additional attention to the need for effective and harmonized public and program communication;
- Nationally-owned strategies to tackle a multi-sector problem, where there is room for support from all actors, while avoiding incoherency and duplication.

Both political drivers and the UN system strongly supported these processes. In Asia, for example, the UN resident offices, supported by the UN System Influenza Coordination, have been instrumental in helping government and partner taskforces with coordinated and inclusive approaches, as well as improve information sharing between them. In this context, avian and pandemic influenza has been used as a case study to define best practices and guidance for UN support to coordination at country level. With the help of the UN, the World Bank, and other partners, national plans were budgeted in detail and response partners invited to pledge to ensure cost efficiency through coordinated financial support. Within countries, there has been a level of inter-sector collaboration and coordination between national entities and response partners that had not existed before.

Ideally, pandemic planning should be coordinated at regional levels because of the cross-border impact of disease. However, while international and national preparedness has progressed well, cross-border preparation still needs further development. Regional coordination has been relatively difficult to achieve, and more efforts are required in this area. Meanwhile, international organizations have joined forces in a way that did not exist before. For example, in 2004, the Food and Agriculture Organization (FAO) and the World Organization for Animal Health (OIE) signed an Agreement on a Global Framework for Progressive Control of Transboundary Animal Diseases. In 2006, FAO signed an agreement with WHO on Global Early Warning and Response System for Major Animal Diseases. Another more recent successful initiative based on a willingness to work together towards a common solution was the launch in April 2009 by OIE and FAO of the new joint scientific worldwide network to support the veterinary services in the control of animal influenza—the OIE-FAO Network of Expertise on Animal Influenzas. Members of the network collaborate with the WHO influenza network on issues relating to the animal-human interface, including early preparation of human vaccine.

THE OIE-FAO NETWORK OF EXPERTISE ON ANIMAL INFLUENZAS

6

Through active and permanent scientific cooperation, the network develops and harmonizes synergistic research projects in different parts of the world, shares updated scientific information and expertise on efficient methods for controlling animal influenzas, and provides a pro-active approach in helping affected countries to eliminate the disease.

In 2010, the network made significant progress in identifying and addressing technical gaps, and in establishing linkages among leading veterinary institutions. Its membership now includes all 11 OIE and FAO reference laboratories and collaborating centers for influenza, other diagnostic laboratories, research and academic institutes, and experts in the fields of virology, epidemiology, vaccine science, and molecular biology.

The network's interaction with the WHO Global Influenza Programme is also a critical component, and mechanisms for permanent interaction are being developed. Network technical activities, led by scientists from OIE and FAO reference institutions and coordinated by OIE and FAO focal points, cover the following seven areas:

- Compilation of an inventory of commercially available kits for diagnosing avian influenza;
- Applied epidemiology to review efforts contributing to surveillance and control and explore options for linking epidemiological and virological data;
- Draft guidance on minimum biosafety standards for handling avian influenza viruses in veterinary laboratories, particularly to provide advice to low-resource laboratories in developing countries;
- Evaluation of vaccine efficacy and quality in Indonesia and Egypt, where network projects are being implemented;
- Assessment of avian influenza proficiency testing coordinated by reference laboratories and development of recommendations to support harmonization between national laboratories;
- Development of standardized reference materials for sera and viral RNA;
- Establishment of a formal mechanism for coordination, collaboration, and information exchange at the human-animal interface.

The networks' activities aim to improve the coordinated assessment of influenza zoonotic/pandemic risks, bridge gaps between the animal and human health sectors, promote research at the human-animal health interface, and improve linkages between regional laboratory networks.

Crisis Management

In view of the global repercussions of transboundary animal diseases on animal and human health and trade, response efforts must be fast, well-coordinated, and strategically planned to help stop diseases before they spread. To this end, FAO and OIE created a crisis management center for animal health in 2006 to help countries respond to transboundary animal disease emergencies. The center provides technical and operational assistance to help governments develop and implement immediate solutions to prevent or stop disease spread. By late 2010, the center had supported more than 30 countries, with 50 missions deployed for HPAI H1N5 and other diseases.

The center can field a rapid deployment team within 72 hours of an official request for assistance. Teams are composed of emergency response and animal health experts, and key activities include assessment, control, emergency action plan, emergency funding package, communication and compensation policies, coordination, and resource mobilization. The hallmarks of the center's response mode are close consultation, rigorous approach, and focus on high-quality assessment and rapid advice. To achieve this, the center has integrated the principles of an incident command system—an approach that is used in a wide variety of international emergency situations. This approach paves the way for more traditional responses, which utilize FAO's global and national resources and OIE's development of standards.

Constant collaboration is the basis of all center operations. While the center provides assistance to countries facing national or regional animal disease threats, WHO ensures quick and appropriate technical support to populations affected by human disease epidemics at a national, regional, or international levels. For the control of animal disease epidemics with a public health dimension, the center and WHO collaborate closely to provide a global response network.

Simulation Exercises

As have other international organizations and agencies, FAO, the OIE, and WHO have developed simulation exercises (both real-time and table-top) to help strengthen in-country capacities in relation to emergency preparedness and response for the prevention and control of zoonotic diseases at the human-animal-environment interface. Although initially developed to improve HPAI H5N1 preparedness, they constitute a powerful tool to address emerging zoonotic threats beyond HPAI H5N1. Simulation exercises bring together representatives of different disciplines and sectors involved in addressing outbreaks of zoonotic diseases (such as central-, provincial-, and district-levels of the ministries of agriculture and health, veterinary and public health epidemiologists, laboratory diagnostic specialists, communication experts, environmental services, civil defense, farmers' associations, and so on).

FAO simulations are based on scenarios describing a fictional outbreak, from suspicion to control of the outbreak. The simulation activities evaluate the national capabilities in controlling an outbreak of a zoonotic disease, and explore the communication,

coordination, and institutional cooperation among the different sectors involved in addressing outbreaks in animal and human populations. The strengths, weaknesses, and gaps identified are used to develop an action plan with the authorities of the country to improve their preparedness and response capacity to face outbreaks of zoonotic diseases.

Global Surveillance

In recent years, many tools have been developed for the collection and dissemination of information on animal health. For example, OIE member countries report outbreaks of notifiable animal diseases occurring in their territories and provide regular follow-up reports. This information is stored in the World Animal Health Information Database. In 2006, the OIE launched an online application called the World Animal Health Information System, which interfaces with the database and a disease notification system for member states—constituting a major achievement in the worldwide use of information technology and modem communication techniques and their applications. Capacity building of country focal points for disease notification has improved transparency and the quality of data. In 2010, 192 alert messages from 79 members about 51 different diseases were disseminated. Currently, the OIE's online information system uses only officially reported information.

FAO manages the EMPRES Global Animal Disease Information System—another web-based application that compiles, stores, and verifies animal disease outbreak data (including zoonoses) from numerous sources, including country or regional project reports, field mission reports, NGOs, cooperating institutions, OIE's database, agriculture and health ministries, in-country representations of FAO or other UN, public domains, the media, and other web-based health surveillance systems. For verification purposes, FAO's system uses both official and unofficial sources of information (such as in-country assistance projects and personal contacts with NGOs and other institutions). This information is used to generate and disseminate early warning messages, but it is also disseminated (when confirmed or denied) in a structured and comprehensible format to the public.

Another system, WHO's Global Early Warning System, combines information available on animal diseases with information available on human diseases. WHO's system builds on the added value of combining the alert mechanisms of FAO, OIE, and WHO through an agreement signed in 2006, thus enhancing early warning capacity for the benefit of the international community. Through sharing of information on disease alerts, duplication of effort is avoided, and the verification processes of the three organizations is combined and coordinated. For zoonotic events, alerts of animal outbreaks can provide direct early warning so that human surveillance can be enhanced and preventive action taken. Similarly, there may be cases where human surveillance is more sensitive and alerts of human cases precede known animal occurrence of disease. The system really came into use with the outbreaks of HPAI H5N1, but rapidly became recognized as an important instrument for reporting other diseases.

In 2009, the U.S. Agency for International Development launched the Emerging Pandemic Threats program to build on disease surveillance, training, and outbreak response, particularly for addressing avian and pandemic influenza. The focus of the program is to pre-empt or combat, at their source, newly emerging diseases of animal origin that could threaten human health in hotspots. One component of program, called PREDICT, aims to help fill the gap in surveillance of animal diseases that can infect humans. PREDICT was launched online to enable scientists and the public to track outbreaks of animal diseases that might jump to humans. It monitors data from 50,000 websites, WHO alerts, online discussions by experts, wildlife trade reports, and local news. Project partners include the Ecohealth Alliance, Global Viral Forecasting Inc., the Wildlife Conservation Society, the Smithsonian National Zoological Park, and the University of California at Davis School of Veterinary Medicine.

There have been some significant improvements in terms of pandemic preparedness thanks to surveillance and early warnings systems. A European Commission funded study on the outcome and impact assessment of the global response to the avian influenza crisis reported the following:¹

- Countries have an increased probability of detecting cases of avian and, to a lesser extent, pandemic influenza.
- Countries have benefited from faster reporting systems.
- The routine surveillance systems of countries are stronger, which also has an impact on surveillance of other communicable diseases beyond influenza.
- The capacity to quickly confirm suspected cases of HPAI H5N1 through diagnostic tests (specifically, reverse transcription polymerase chain reaction) has significantly increased and therefore improved the capacity for early detection and confirmation of human cases of avian influenza nationally, regionally, and internationally. This diagnostic capacity could be easily extended to other infectious diseases.
- In countries with national laboratory capacity, the time between the identification of a suspected case, the reporting to central level, and the laboratory confirmation of HPAI H5N1 infection through diagnostic testing has been significantly reduced.

Despite these advancements in information systems for tracking and finding disease, there are serious shortcomings in the official statistics on the impact of animal diseases. There are no compiled statistics on the numbers of animals actually affected by diseases, on the value of these losses, or on the total economic impacts of animal diseases. While there are special studies of high-profile outbreaks, these results do not appear in official datasets produced by international agencies. For instance, the number of poultry lost due to HPAI H5N1 and the attendant economic costs have not been estimated by any official agency. For other diseases, there is similar neglect, so the total global burden of

¹ Wilsmore, A, A Ancia, E Dieleman & N Faiz. (2010). Outcome and impact assessment of the global response to the avian influenza crisis, 2005-2010. Luxembourg: European Commission. Retrieved from www.eeas.europa.eu/health/docs/health_grai_en.pdf

diseases is at present largely unknown. This information is key to inform policymakers for decisions about how much and where to invest. Data on the incidence of animal diseases must be supported by studies to estimate their dual health burden on people and on livestock and identify communities and groups at risk. The magnitude of the problem is not yet fully understood.

Building Local Surveillance Capacity

Factors such as rapid communication channels, the internet, and other information technology have improved the capacity of disease surveillance systems to rapidly communicate disease events worldwide.

Early and accurate detection is a key component of strategies to contain, halt, or mitigate disease transmission. Efficient diagnosis of diseases such as HPAI H5N1 and other emerging and transboundary diseases is essential to protect animal and human health in the event of a major outbreak. Overall capacity to detect new disease threats has increased: technological progress has led to improved diagnoses in field conditions, increased use of rapid diagnostic techniques, and the development of surveillance systems for diseases in animals and humans. At the same time, there has been a substantial increase in community awareness about reporting of animal diseases, and there has been a proliferation of informal and formal surveillance programs over the last 10 years, which facilitate the timeliness of disease reporting. Other factors such as rapid communication channels, the internet, and other information technology have improved the capacity of disease surveillance systems at the global, regional, and national levels to rapidly communicate disease events worldwide.

The ability of a country to rapidly detect and respond to an incursion of zoonotic disease depends on the presence of surveillance systems that ensure reporting suspicions of disease, and collection and processing of samples to produce a reliable diagnosis. Achieving such a surveillance system requires an alert and engaged community at all levels, trained and equipped staff to investigate reports and collect samples, and a well-equipped laboratory with trained staff to conduct reliable testing. Effective surveillance systems often include a risk assessment component to identify particular areas that deserve close monitoring (such as markets or poultry near wetlands in the case of avian influenza).

As a result of improved use of technologies, information on diseases can be tracked almost instantly. Email, the internet, and the use of geographic information systems are tools that are becoming increasingly accessible to many. Technological developments are also revolutionizing disease surveillance. For example, digital pen technology is being used in Southern Africa, and disease notification via text messaging has been tested and is being used in many countries, including Bangladesh.

There is also recognition that efficient surveillance requires close collaboration among all actors – government, business, and civil society. Participatory disease surveillance integrates civil society into surveillance activities. This participatory approach relies on traditional livestock owners’ knowledge of the clinical, gross pathological, and epidemiological features of diseases that occur locally. Participatory processes build trust among stakeholders—among animal health workers and local communities, as well as between national and local governments. Participation facilitates more inclusive decision-making within a decentralized political system, and mobilizes veterinary services in a manner that empowers communities to prevent and control disease. The approach has gained respect for its ability to understand disease patterns and identify effective intervention strategies. The approach was refined as an accurate and rapid method to understand the distribution and dynamics of rinderpest in pastoral areas in Africa.

FAO launched a participatory surveillance program in Indonesia in early 2006, with financial support from Japan, Australia, and the United States. The system was applied by provincial and district livestock services and has strengthened the capacity of Indonesia’s local animal health services. It injected a new lease of life into the understanding of, and responsiveness to, the animal health constraints of many rural and urban communities.

Obstacles still remain in the surveillance and reporting of diseases with or without pandemic threat. Such challenges include the absence in many countries of a formal mechanism for reporting local outbreaks to regional and international organizations, the failure of surveillance systems to gather disease outbreak data in standard formats—notwithstanding the availability of standardized forms for disease notification—and an unwillingness to report outbreak events to the international community (often through fear of potential repercussions on trade), or unwillingness to report animal diseases that are not a national priority.

There are many gaps that still need to be filled in the quality and efficiency of information systems. Challenges remain related to the sensitivity of surveillance systems to capture information on the emergence of new pathogens. The increase in new diseases observed in the last few years is the result of an increasingly efficient use of new technologies. But it also comes with new requirements for data and the need to harmonize standards. Cross-data sharing between national, regional, and global information systems is not uncommon; often data must be entered at these different levels, resulting in frequent duplication of work.

Developing National Laboratory Capacity

The world’s capacity to find diseases relies heavily on the diagnostic capacity of national laboratories, which is based not only on resources and equipment, but also human capital. In most countries, national veterinary diagnostic laboratory capacities are still poorly developed and resourced. However, in a number of countries they have been

Case Study: Text Message Reporting in Bangladesh

Bangladesh is conducting active HPAI H5N1 surveillance in 150 of its 487 sub-districts, as part of an FAO project, funded by the U.S. Agency for International Development. About 450 community animal health workers, 50 veterinary surgeons, and 150 sub-district livestock officers are using a short message service gateway system (a method of sending and receiving text messages between computers and mobile phones) to collect data and report on poultry diseases and deaths.

The reporting structure is simple: at the end of the working day, each community animal health worker sends a message to the gateway system with the total number of all investigated poultry (chickens, ducks, and other birds) and their health status (the number of sick and dead birds). The system automatically contacts the area's livestock officer, who initiates an investigation by visiting or sending a veterinary surgeon to any suspected outbreak. After the investigation, the livestock officer or veterinary surgeon sends a message back to the gateway server to declare the suspect outbreak as negative or to report that it requires further diagnostic tests.

Specialized staff monitor the number of suspect cases, the results of the investigations carried out by livestock officers and veterinary surgeons, the changes in mortality and morbidity rates, and perform spatial and temporal analysis against concurrent HPAI H5N1 outbreaks. The results are submitted to the chief veterinary officer, used in workshops to sensitize staff and farmers, presented to donor meetings, and documented in periodic project reporting.

This real-time reporting using a messaging system has contributed to effective HPAI H5N1 outbreak response and control in Bangladesh. The key to the success may be its simple approach and clearly defined work-sharing through the use of a familiar instrument (the mobile phone). Since 2008, 21 out of a total of 35 HPAI H5N1 outbreaks were detected through this active surveillance program.

strengthened considerably over the last five years. The OIE matches its reference laboratories or collaborating centers in a method called “twinning”, which helps national laboratories improve their diagnostic capacity and expertise and provides support to other countries in their region. The aim is to eventually ensure an even geographical distribution of expertise and reference laboratories, allowing easier access to experts and rapid detection and diagnosis of disease. The ultimate aim is for candidate laboratories to reach OIE reference laboratory status.

Networking among laboratories has already proven to be an excellent tool to increase capacity for diagnosis. For example, one of the most significant achievements claimed

by the West and Central Africa Veterinary Laboratory Network for Avian Influenza and other Transboundary Disease, set up by FAO, has been that it has reduced the time necessary for laboratory confirmation of HPAI H5N1 from an average of 30 days in 2006 to two days (in Togo) and one day (in Nigeria) by 2008, thanks to the local collaborative arrangements it put into place.

Improving Capacity to Prevent New Outbreaks

Until recently, approaches to animal disease prevention and control were based mainly on disease transmission disruption. These approaches do not confront the root causes of disease emergence. There is a need to include approaches and tools in addition to conventional health protection measures, particularly in the case of zoonotic diseases. Prevention of animal diseases can be and has been addressed through better management practices on farms and along marketing chains, with biosecurity as a major area of work. The term ‘biosecurity’ in this chapter refers to the strategic and integrated approach to analyze and manage risks in food safety, animal and plant life and health, and biosafety.

Prevention is also addressed through more efficient use of vaccines. In combination with the implementation of effective biosecurity measures, vaccination can prevent the introduction of viruses, or alternatively reduce their spread, minimize the negative impact on production, and decrease potential economic losses. Moreover, vaccinating animals may reduce the risk of human exposure to viruses with zoonotic potential and the consequent human cases. Finally, prevention also requires efficient and effective veterinary services.

Biosecurity

Increased concerns about security threats worldwide—as well as the recent outbreaks of HPAI H5N1 and 209 H1N1 Influenza—have led recent efforts to focus mainly on biosecurity for national security and global control and prevention of emerging pandemic threats. Biosecurity is the implementation of measures that reduce the risk of the introduction and spread of disease agents on a farm or along a value chain. The three principle elements of biosecurity are segregation, cleaning, and disinfection. The details of how biosecurity is applied will depend on the type of production system in question. Designing feasible biosecurity programs requires working with all stakeholders to ensure that those who will implement the measures accept and see the need to do so and the benefits in doing so. Animal health and production specialists, socio-economists, and communications specialists working with farmers and traders at all levels along the market chain develop and implement appropriate measures. Including all levels creates responsibility for those involved in production and marketing for more biosecure animal production and marketing through greater public awareness and improved capacity for appropriate technical responses.

Biosecurity encompasses the provision of a policy and regulatory framework to improve coordination and take advantage of the synergies that exist across sectors, helping to enhance protection of human, animal and plant life and health, and facilitate trade. Australia and New Zealand, for example, have developed units within their ministries in charge of agriculture to work on biosecurity issues across sectors (animals, plants, food, emergency preparedness and outbreak response).

In recent years, major efforts have included the development of community-based training, reaching out to both private and public sectors, and collaborating with producer associations or cooperatives to improve biosecurity. Collaboration with industry was also strengthened, including the development and implementation of auditable biosecurity standards for industrial farms, and systems for demonstrating freedom from HPAI H5N1. Simple, low-input systems have been developed and tested that result in the rearing and sale of healthy poultry from small farms, with special emphasis on local poultry and grazing ducks.

Vaccination

Much has been learned about poultry vaccination strategies since the HPAI H5N1 outbreaks began in 2003. While a number of commercial vaccines have the potential to reduce the level of circulating virus in poultry flocks, there are a number of challenges to vaccination. In order to achieve significant reductions in circulating virus, a sufficiently high vaccination coverage level must be reached (50 to 90 percent immunization of at least 50 percent of all flocks at risk of infection) with a vaccine that protects against most circulating viruses. This proves difficult for technical, logistical, and cost-related reasons, and calls for careful targeting of vaccination spatially, temporally, and by production system to maximize its impact and cost-effectiveness. Effective targeting, however, requires sound risk assessments, for which data and expertise are often lacking. Strengthening of the epidemiological capacity of national animal health systems is a major prerequisite for large-scale use of vaccination to control HPAI H1N5.

Vaccine banks have been used for better preparedness: for example by OIE and by FAO's Animal Production and Health Commission for Asia and the Pacific. Vaccine banks ensure the rapid supply of emergency stock of vaccines to infected countries to vaccinate animal populations at risk. Through the creation of virtual rolling stocks, vaccine suppliers either produce vaccines when needed or retain stocks of vaccines at their own risk, which are renewed on a rolling basis under contractually defined terms and conditions.

At the start of the wave of avian influenza outbreaks in the mid-2000s, the OIE set up a regional vaccine bank for avian influenza vaccines in Africa, funded under the European Union Pan African Programme for the Control of Epizootics. The Canadian International Development Agency also funded a global vaccine bank. In addition to avian influenza, the Asia regional vaccine bank has been extended to cover rabies, foot and mouth disease, and other pathogenic emerging and re-emerging transboundary

diseases. A portion of the budget for vaccine banks has been set aside as a reserve for other vaccines for non-identified highly pathogenic emerging and re-emerging animal diseases. This concept of banking vaccines for an array of diseases represents an important development in moves to counter the spread of transboundary animal diseases globally.

Strengthened Veterinary Services

Traditionally, formal animal health services in developing countries were provided largely by government veterinarians employed within the public sector. However, during the 1980s, growing fiscal constraints on government spending, together with public concerns regarding the efficiency and accountability of state intervention, resulted in privatization of economic activity. In both developed and developing countries, greater reliance was placed on private enterprise and market forces for the provision of animal health services, as in the supply of other goods and services. However, privatization of veterinary services have brought few improvements in service provision and private veterinarians have often avoided rural constituencies, concentrating instead on the more lucrative urban markets, among other weaknesses. Also, experiences with recent outbreaks of transboundary animal diseases such as HPAI H5N1 have emphasized the importance of public veterinary services. Tasks such as surveillance, prevention, control, and eradication of highly contagious diseases with serious socioeconomic, trade, and public health consequences, quarantine and movement control, emergency responses, disease investigation and diagnosis, and vaccination and vector control require public intervention and are unlikely to be adequately provided by the private sector alone.

Conclusion

The international community is increasingly converging on a multidisciplinary approach to addressing disease threats, called “one health” and based on a collaborative, cross-sector way of reducing risks of infectious diseases at the animal-human-ecosystem interface. It is no longer just a question of adopting a veterinary or medical (or combined veterinary-medical) approach to animal-based disease. It is necessary to widen perspectives to involve all sectors affected or potentially affected by outbreaks of disease with pandemic potential.


Early warning and early detection are of paramount importance for reducing the risks and consequences of disease outbreaks, and global and regional early warning systems are highly dependent on the quality of the animal disease data. Today, information on disease can be tracked instantly as a result of improved use of technologies such as electronic mail, the internet, and the use of geographic information systems. Technological developments are also revolutionizing disease surveillance. In recent years, there has been a multiplication of tools developed for the collection of information on animal health, and all have made a significant contribution to timely reporting of animal disease events. These systems exist and should be maintained.

In preparedness, prevention, and response, an effective partnership between the public and private sector is essential. There has been a substantial increase in the awareness of communities regarding the reporting of animal diseases. Participatory disease surveillance has been developed to integrate civil society into surveillance activities. Biosecurity has also gained in importance as a way civil society can prevent and prepare for animal diseases of pandemic potential. Creating opportunities for stakeholders to own and drive the process for improving preparedness (rather than just contributing to government processes) has contributed markedly to the success of preparedness initiatives that have involved elements of behavioral change at the grass-roots level. Integral to this process is a willingness from government agencies to engage stakeholders in a way that facilitates their leadership.

The drivers of disease emergence and pandemic risks await clarification to be able to prevent public health threats (upstream action to combat the emergence of disease) and restore sustainable and safer animal agriculture and associated feed and food supplies. This implies understanding the dynamic evolution of pathogens of animal origin circulating in livestock and wildlife, the modalities of their transmission and the underlying agro-ecological and socio-economic factors favoring their emergence and persistence.

The numerous challenges faced by the international health community are daunting, yet not impossible to overcome. A principal obstacle is to rightly position the impacts of emerging zoonotic diseases on animal and human populations as a salient theme

in global agendas, especially as it competes with other equally important and pressing priorities weighed by influential countries. Fortunately, the last decade has witnessed an upsurge of narratives and discourses calling for a paradigm shift from selfish divergence towards unified, coordinated, and interdisciplinary mechanisms across agricultural, ecological, nutritional, public health, scientific, and veterinary communities worldwide, with the goal of making our world a safer place in which to live.



By 2004, multiple outbreaks of different infectious diseases—including SARS, HPAI H5N1, and 2009 H1N1 Influenza—demonstrated to global business leaders the seriousness of pandemic threat in an increasingly interconnected and globalized economy. As a result, many large businesses prioritized pandemic preparedness, investing seriously in establishing or improving business continuity plans. This chapter describes the evolution of private sector efforts to incorporate pandemic preparedness, noting how unprecedented resources were invested by the private sector, and describes best practices in public-private sector coordination, simulation exercises, and scenario planning. The chapter advocates for improved public health partnership with the private sector and warns of the risk of growing complacency about pandemic.

Private Sector Preparedness & Business Continuity Planning

Key Lessons from Private Sector Preparedness

- Understanding why the private sector mobilized such substantial resources for pandemic preparedness can help mobilize resources to future threats. A compelling tide of public health warning and **credible economic analysis cemented the seriousness of the pandemic threat in the minds of global business leaders and catalyzed commitments to take real action in response.**
- Fundamental to an effective response to global threats is enhanced collaboration and cooperation between governments, businesses and civil society. **Developing sustainable cross-sector networks of government, business and civil society actors** on a domestic and international level provides critical advantages in enabling effective planning, communication and consultation.
 - Significant levels of **senior management commitment and investment** are required for companies to develop effective, flexible, well-integrated plans to ensure the continuity of business operations. Businesses must address not only the human toll of a pandemic, but also deal with the impact of fear and actions taken by government, other institutions and general public.
- Strong **partnering opportunities exist with private sector actors to further the development of tools to help society prepare for emerging threats.** For example, the private sector has adapted standard business continuity planning strategies for pandemic planning, which may be useful to the public and NGO sectors. In addition, there is scope for WHO and other public sector agencies to partner with the private sector on packaging public health knowledge and expertise into internet-based software ‘applications’ that can be accessed via popular internet platforms
 - Companies must **develop and maintain appropriate information and communication systems to keep employees informed and identify appropriate response actions.** Messages and information channels need to be developed early and include tangible products.

- Companies **need to consider vulnerabilities to supply chains, storage, and distribution, as well as internet and other communication technology system failures.** Many companies need to better understand the importance of supply chain vulnerabilities and how to manage them, including assisting smaller business that may be within their supply chains.
- **Governments must create new channels for engaging private sector participation.** Business and civil society representatives should be involved at the early stages of planning, policy conception, design, and allocation of roles.

Economic Impact and Vulnerability of a Global Economic System

A steady drum-beat of public health warnings and credible economic and business-analysis on the emerging crisis cemented the seriousness of the threat in the minds of global business leaders.

Throughout the past decade, outbreaks of different infectious diseases, including SARS, HPAI H5N1, and H1N1 Influenza, demonstrated to global business leaders the seriousness of a health threat in an increasingly interconnected and globalized economy. In 1997, HPAI H5N1 burst on to the scene as a highly virulent strain in Hong Kong, ringing a global alarm. In 2003, the SARS outbreak instigated a second global alarm. Despite relatively few human casualties, SARS was an economic tsunami—creating US\$30 to \$50 billion in losses over a period of just a few months. With the SARS experience still fresh in mind, HPAI H5N1 re-emerged in 2004. A steady drum-beat of public health warnings and credible economic and business-analysis on the emerging 2009 H1N1 Influenza crisis cemented the seriousness of the threat in the minds of global business leaders. It quickly became apparent that the interconnected nature of human and biological systems meant that not only such a shock should have been expected, but also meant that risks associated with the linkages and interdependencies of the global human and biological network were likely to be intensified in the future.

As a result, many large businesses prioritized pandemic preparedness, investing seriously in establishing or improving business continuity plans to avoid serious economic consequences, as well as to capitalize on possible opportunities. Global corporations soon realized, however, that planning for employee health and well-being and global business continuity under conditions of pandemic influenza was a significant challenge, requiring involvement from virtually all business functions of an organization, and combining efforts of a large number of global managers and employees. Moreover, if a company wanted to secure its global supply chains and ensure business continuity, then the needs and preparedness of employees, their dependents, vital suppliers, and key contractors also would have to be taken into consideration. In short, the scale of the planning effort required was on par with the effort and investment needed to prepare an organizations' strategic business plan, and would require the same scale of commitment and leadership from top to bottom. If private sector actors are to develop effective, flexible, well-integrated plans to ensure the continuity of their business operations and the health and well-being of their employees and dependents, then a significant level of company investment and senior management commitment is required to accomplish the task. In planning and preparing for the impacts of pandemics, businesses must concern themselves not only with the human toll of the disease, but also with the impact of fear, and the actions taken in response by governments, other institutions, and the public-at-large. The beneficial result was that these planning and preparedness efforts have strengthened overall business continuity—including preparedness for other types of disasters.

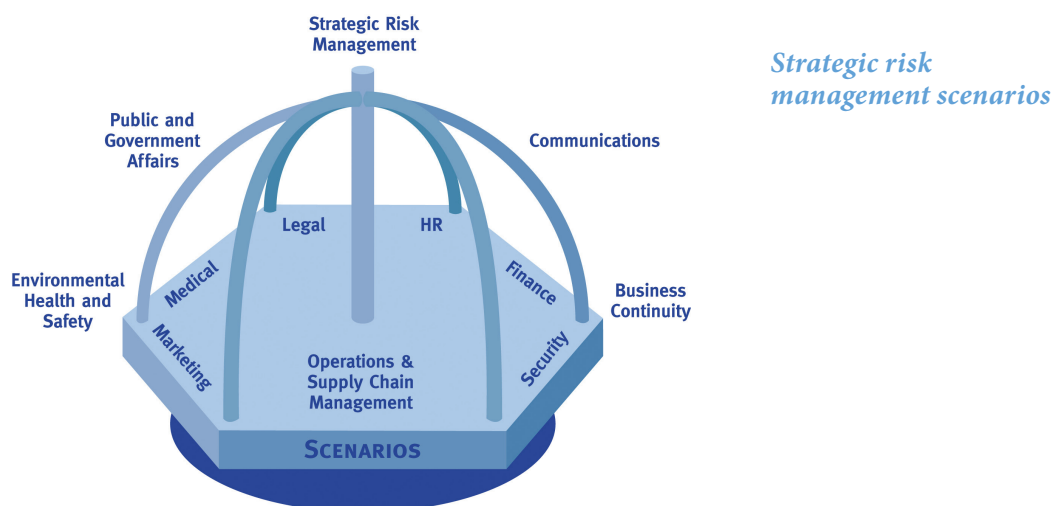
“In 2011, DuPont’s pandemic planning proved to be of significant value in an unanticipated way. The same disaster preparedness and business continuity planning, which had provided for an effective response to the 2009 H1N1 pandemic, was put to use in support of the company’s response to the crisis in Japan that was triggered by the earthquake and tsunami. The procedures originally put in place in anticipation of a serious disease threat turned out to be very valuable in helping our people and businesses respond to a crisis that none of us imagined.”

—Gil Meyer, Director, Global Issues Management, DuPont

Adapting Traditional Crisis Management and Strategic Planning Tools to Pandemic Preparedness

Pandemic planning evolved into a form of strategic risk management, which seeks to functionally integrate all assumptions and response actions within a given set of contingent possibilities or “scenarios.”

To meet the immediate needs of pandemic planning, many businesses adapted traditional crisis management and strategic planning tools. Major consulting firms and business advisories, such as IBM, Deloitte Consulting, Booz Allen Hamilton, The Conference Board, and International SOS quickly developed practices to assist major corporations with their pandemic planning and preparedness efforts, resulting in new tools for helping global corporations plan and prepare. Pandemic planning evolved into a form of strategic risk management, which seeks to functionally integrate all assumptions and response actions within a given set of contingent possibilities or “scenarios.”

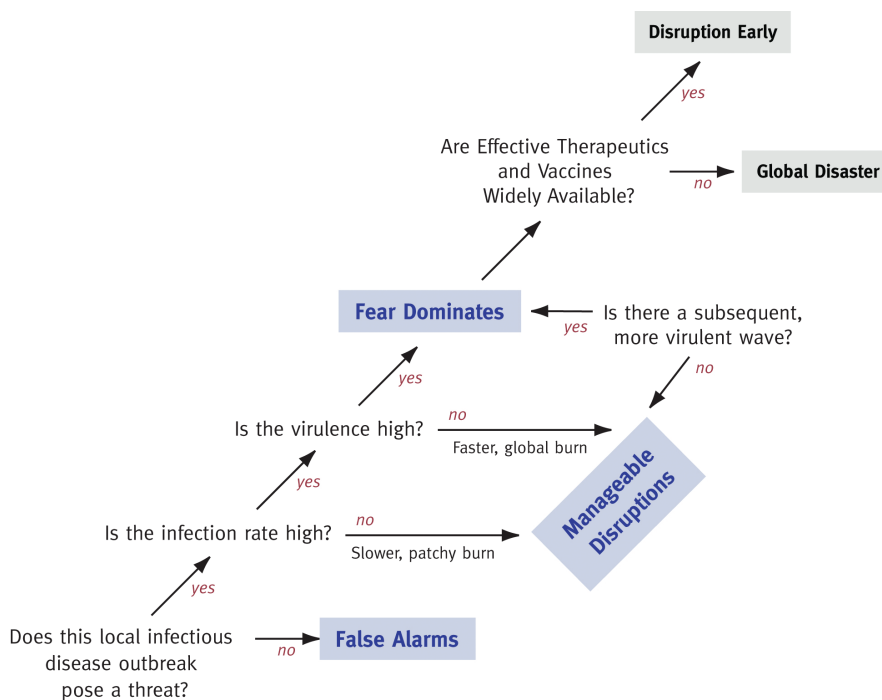


In response to pandemic influenza, companies also updated their business continuity plans. A 2010 survey of more than 900 managers found that that 79 percent of managers who activated continuity plans believed that they effectively reduced a disruption of business.¹ Driven by continuity planning for pandemics, the research also suggests a recent growth in the involvement of human resources in business continuity planning—suggesting that business continuity management is beginning to address personnel issues.

Formal Scenario Planning

One method for addressing the fundamental uncertainty surrounding a crisis before its emergence is through the use of formal scenario planning methods, as developed at Royal Dutch Shell in the 1970s. These techniques can help employees and other stakeholders grasp the most important contingencies pertaining to a complex, dynamic event. Scenario-based approaches can be structured to reflect an organization’s particular concerns and interests, including opportunity-driven business planning. When used across locations and functional areas within an enterprise, such a framework can help to ground decision-making within a commonly held logic appropriate to the business. Bio Economic Research Associates (bio-era™), a private research and advisory firm working at the intersection of emerging biological knowledge and the economy, created a generic scenario logic for infectious disease outbreaks.

The bio era Pandemic Scenarios Map: “False Alarm,” “Manageable Disruptions,” or “Fear Dominates”?



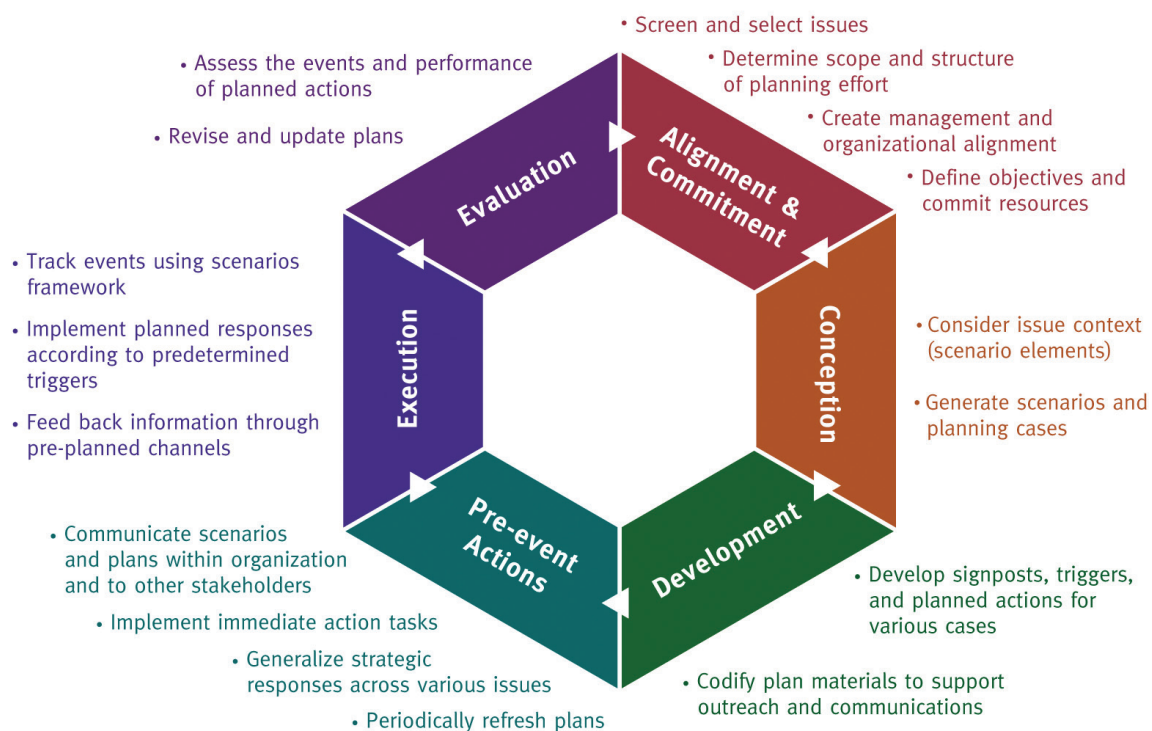
¹ Woodman, P., & P. Hutchings. *Disruption and Resilience: The 2010 Business Continuity Management Survey*. London: Chartered Management Institute.

The Crisis Planning Lifecycle

Global corporations also use another crisis management approach, which follows the generalized life cycle of crisis planning, beginning with alignment and commitment and ending with post-event evaluation. Most large companies have on-going, formal screening efforts in place to do this. Once an emerging issue or threat is identified, the scope of the planning effort required must be defined, management support garnered, and resources secured. The next task is to learn more about the nature of the issue or threat, and the risks it poses. Then strategic planning techniques to develop formal scenarios guide deeper learning about the issue and generate useful frameworks for future decision-making.

Simulations also are a fundamental component of business continuity management, allowing plans to be revised, refined and updated before weaknesses are exposed by a real disruption. In the same 2010 survey, approximately half of managers reported that business continuity exercises are undertaken annually (if not more), and 70 percent of those who rehearsed their business continuity plans reported that the exercise exposed shortcomings—which emphasized the importance of conducting and learning from rehearsals. The majority of those surveyed indicated that the identified shortcomings were addressed, thus strengthening the continuity plans.

Crisis Planning Lifecycle



Benefits to Pandemic Planning

Scenario-based approaches to crisis management and business continuity can be integrated with normal business planning needs.

Scenario-based approaches may also be used to identify business opportunities. While most companies perceive business continuity and crisis management as strictly cost-based activities that do not generate revenues or profits, scenario planning for crisis management and business continuity can be integrated with normal business planning needs to generate explicit business opportunities. For example, Cargill leveraged a scenario planning exercise aimed at preparing for HPAI H5N1 to explore positive business growth opportunities that could arise as the virus spread from Asia and affected poultry operations in other countries. Likewise, DuPont identified opportunities for their personal protective equipment businesses, and Ecolab for their sanitation products. Planning and preparing for a potential crisis does not mean that normal businesses imperatives need be ignored. Indeed, that is why private sector practitioners are interested in pandemic planning—to ensure the continuous (if not expanding) functioning of their core business activities.

“We have found opportunities for a number of our businesses and products in planning around the possibility of pandemic influenza – especially in our bio-security businesses... Verkon S® is a disinfectant for livestock facilities, such as poultry operations..., and for Tyvek®, which is used in housing insulation and for bio-security garments... We also have created two types of kits that offer protection for individuals using our own disinfectant products and personal protective equipment, such as surgical masks... and we are finding great interest in these products.”

—Gil Meyer, Director, Global Issues Management, DuPont

Case Study: GlaxoSmithKline (GSK)

GlaxoSmithKline (GSK) is a global, multi-national pharmaceutical corporation with more than 100,000 employees in 137 countries. The company has a substantial business in manufacturing and distributing influenza vaccines and anti-viral medicines that are critically important countermeasures in response to an influenza pandemic. Since 2003, the company has invested well over US\$2 billion towards expanding manufacturing capacity and research in these two areas. In addition, in 2004, GSK initiated a major internal effort to enhance GSK's plans and global preparedness to meet the challenges posed to business continuity and employee protection in response a pandemic threat. GSK developed a flexible response strategy around a broad range of possible scenarios. Plans and guidance were modified throughout the pandemic as new public health knowledge emerged.

Although the company's initial response was triggered by WHO, the company found it needed to develop new tools to provide guidance appropriate to local conditions. A GSK issues management team created a decision guide for local leadership to use for risk assessment. GSK country leaders worked with their local GSK medical expertise to rate their local impact, corresponding to recommended actions. GSK tracked and charted local scores on a color-coded global map so that GSK leadership could follow and understand the changing status of local conditions globally at a glance. This method enabled GSK to gauge the medical, community, and business operational impact of influenza to trigger appropriate actions, rather than relying on global pandemic alert phases that might not match the local experience. This system also enabled more efficient, two-way communications from the corporate crisis management team to all GSK leadership—enabling local needs to be reported and supported in areas of severe outbreak.

“Developing the appropriate triggering mechanisms for action as a pandemic progressed proved to be challenging. We, like many others, tied actions in our plans to the global phases of a pandemic as defined by the WHO. This worked in principle but not in practice. We found that the better tool for triggering action was the local severity; what was the actual experience in your country and community to drive appropriate actions. This is why the decision guide became invaluable.”

—**Jack Holt**, Director of Global Crisis & Continuity Management, GSK

GSK's business continuity plans ensured the company continued to operate effectively throughout the pandemic. The company was rapid and hard-hitting in providing all GSK employees and their family members with trusted, basic information on the nature of the pandemic threat and what to do about it. The company also developed systems for enhanced cleaning, social distancing, absence management, travel health, and immunization, which have been retained and used for the company's seasonal influenza control efforts. The pandemic also led GSK to fund and implement a global employee assistance program to provide counseling and emotional support to managers and employees during crises.

GSK also created a crisis and continuity management center to provide ongoing expertise, tools, training, and global "readiness" monitoring to ensure preparedness and rapid response to future pandemics, crisis incidents, or other business disruptions. GSK has noted where their pandemic preparedness work has enabled improved response to other crises, including:

- **Global travel disruptions:** In preparing for a pandemic, GSK improved its ability to support its business travelers. The company was able to provide support to the approximately 1,500 employees affected by extended air travel closures due to the 2009 volcanic eruptions in Iceland.
- **Civil unrest:** The corporate network of integrated crisis management and business continuity plans helped establish a communication framework for use across the company's various country and site operations during unrest in Thailand (2010) and the Middle East (2011).
- **Natural disasters:** The global network for supporting country crisis response efforts for a pandemic was utilized to provide resources and support to local teams after the earthquakes in Chile and New Zealand.
- **Seasonal influenza:** All materials for employee education and communications continue to be used for seasonal influenza to manage severe local outbreaks that may cause a disruption.

Improving Linkages with Governments and Other Players

Fundamental to an effective response to global threats is enhanced collaboration and cooperation between governments, businesses, and civil society. In this regard, public health agencies and private sector players both have important leadership roles to play—and should be actively seeking partnerships to develop such tools, and to promote solutions to the challenges posed by all-hazards business continuity and crisis management planning. There are various means of accomplishing this, including the introduction of statutory or/legislative incentives and requirements for private sector enterprises to take on this work. For example, legislation passed by the U.S. Congress in 2002 to protect the U.S. food supply against bio-terrorist threats provided funding as encouragement for private businesses to invest in preparedness work. In the U.K., parliamentary passage of the 2004 Civil Contingencies Act requiring frontline responders to establish and maintain business continuity management plans is credited with greatly enhancing the uptake of these plans. Australia's government, particularly through the Department of Innovation and Industry, has done considerable work on preparing pandemic preparedness toolkits and guideline materials for the private sector. However, a study of business continuity planning in Europe identified huge gaps and differing level of advice given to businesses to prepare for a pandemic between European countries.¹ Another 2010 survey found that of the different types of organizations using business continuity plans, the public sector was the highest.² The same survey found that 26 percent of surveyed U.K. firms used government advice to help develop their continuity plans.

Ultimately, it is important for governments to create new channels for engaging private sector participation. The role of business is not just preparing its own assets and operations for anticipated global threats, but also providing know-how, solutions, and resources to the overall disaster preparedness challenge, ranging from risk assessment, to designing disaster risk management and financing vehicles, and designing and deploying new technologies. Better engagement of business is needed in the policy-shaping process. Business and civil society representatives should be involved at the early stages of planning, policy conception, design, and allocation of roles, at central levels and in dispersed locations.

Public authorities also need to engage with the private sector to ensure they are able to protect the functions carried out by companies which are vital to society; and to harness useful business know-how and capacities to look after companies' own needs and protect other actors. Business can help in different ways at the stage of risk analysis and policy design, in concrete emergency planning, in tackling ad hoc events and hazards, and in the process of post-crisis return to normality and reconstruction. Business people can make inputs to the quality of risk assessment. They can input to

1 Conseil, A., S. Mounier-Jack, & R. Coker. (2008). *Business Continuity Planning and Pandemic Influenza in Europe: An Analysis of Independent Sector and National Governments' Guidance*. London: London School of Hygiene and Tropical Medicine.

2 Woodman, P., & P. Hutchings. *Disruption and Resilience: The 2010 Business Continuity Management Survey*. London: Chartered Management Institute.

vulnerability mapping, because of their insights into the complex interdependencies of productive sectors, service providers, infrastructure systems, and utilities with other parts of the economic and social system. The data management models created by business for multi-variable analysis, graphic display and scenario building are among the most advanced available.

Partnering with Public Health Organizations

The private sector has acknowledged the importance of communication from public health agencies around infectious disease threats. Companies have relied on the information and guidance from these agencies to communicate with their employees and other stakeholders. Public health agencies such as WHO and the U.S. Centers for Disease Control and Prevention are seen as highly credible, trusted sources on public health threats and what to do about them. In addition, these agencies do an outstanding job in this role. Unfortunately, the tangible value provided by doing so is not always recognized by the private sector or other sectors of society. Likewise, when private companies have potential solutions to emerging disease threats, their motives often are called into question. Both sectors would benefit from honest dialogue to identify ways in which they might improve their working relationships, and best help each other better address the threat of emerging infectious disease. Companies could benefit greatly from better packaging and delivery of public health expertise and information—and could be valued partners in promoting and helping public health to accomplish common goals. Public health agencies could benefit through partnerships with private sector participants that recognize and support the value of the information and services they provide.

While many private sector pandemic plans had action triggers linked to WHO pandemic alert phases, a number of private sector players voiced dissatisfaction with their dependence on this system during the H1N1 2009 Influenza pandemic. As a result, some companies decided to de-couple their future decisions from the WHO alert system, and have pursued defining their own alert stages and the evaluation criteria they will use independently. An alternative is for WHO to solicit participation from the private sector to design a WHO system explicitly for private sector decision-makers to exist side-by-side, but independent of the existing WHO pandemic alert system—or any modified system aimed at the general public or public health agencies or constituencies.

“We established good links with regional WHO Collaborating Center for Reference and Research on Influenza and also the State Department of Health to get accurate, unemotional information.”

—David Jenkins, Vice President, Safety and Security, BHP Bilton

Internet-Based Information and Tools

The internet plays an increasingly important role in enabling companies to organize and empower employees to work together and to collaborate directly with partners, vendors, and suppliers. It proved to be a critical tool for companies in planning and preparing for pandemic influenza.

In addition, international organizations and government agencies, such as WHO and the U.S. Centers for Disease Control and Prevention, used the internet to disseminate guidance on the steps companies needed to take in order to better prepare their organizations. Such checklists to help businesses prepare for pandemic influenza were often adapted and extended by other actors familiar with the planning environment inside large global companies. On the basis of the checklists, consulting firms created more detailed planning templates that could be directly embedded within internet-based collaboration tools and platforms. Such systems enabled large organizations to address the immensely complex nature of pandemic planning in an easily customizable, flexible, but structured and coordinated way. Moreover, the experience gained from such efforts can be easily and repeatedly leveraged by turning what works best into re-useable templates that can be stored and if needed, rolled out, and re-used later. The fields in such templates can be pre-populated with resources—such as software applications, documents, website links, and even employees—that are appropriate and relevant to accomplishing any particular task. Finally, while internet-based tools and platforms have been recognized as an excellent achievement in pandemic preparedness, the importance of these elements also points to a critical vulnerability. Potential failures in the internet and other communication systems remain significant threats that have not yet been sufficiently mitigated.

Addressing Employee Needs

Appropriate information and communication systems demonstrates commitment to protecting employee health and well-being.

For the corporate sector, pandemic preparedness includes understanding the needs of employees and ensuring that efficient mechanisms are in place for addressing those needs. Companies must develop and maintain appropriate information and communication systems to keep employees informed and identify appropriate response actions. These actions help to demonstrate to employees that companies are committed to protecting employee health and well-being. To be successful, messages and information distribution channels (such as company websites, publications, and internal correspondence) need to be developed early and include tangible products (such as masks, hand-sanitizer, and medications) to protect their physical and psychological well-being. This combination of “trusted information source” and “active protector” is reported to benefit employee satisfaction, reduce absenteeism, and increase productivity.

Employees frequently cited the importance of simple, culturally appropriate messaging on the nature of the threat and how individuals should respond as essential in corporate communications efforts aimed at pandemic preparedness.

“I learned that to educate people in disease prevention, I needed to put these recommendations in the context of the diseases that were in the area, the key features of their environment, the tendencies and habits of people in that area and culture, etc. In general, I learned to accept others, and they will accept you.”

—**Etsuko Okuda**, Licensed Nurse, International SOS

Companies also reported unexpected challenges with information and communication systems. In today’s business world, many global corporations grow through mergers and acquisitions, and as a result, management responsibilities can be diffused to local or regional subsidiaries—resulting in weak, centralized human resource and supply-chain management functions. As a result, some global corporations could not produce consolidated lists of current employees or suppliers. This information is important for understanding which employees are essential for business continuity and for building additional capacity within the organization in times of staff absences due to illness or death. Centralized access to such information is also useful for communicating rapidly during crises. Building the necessary information access and flow across such organizations can be a serious long-term challenge.

Another challenge that companies faced in pandemic preparedness was addressing the needs of employees when individuals become concerned en masse and simultaneously seek help. Many companies reported difficulties in handling sudden surges in demand for services or information by employees in response to rising concerns at the approach of infectious disease. Internal staffing and systems should be reviewed in light of possible surges in demand, and surge capacity installed. For companies, this may be primarily an information management and communications challenge, and fortunately, scalable case management systems are now accessible over the internet, and can be easily and cheaply incorporated into any organization.

Identifying Other Vulnerabilities

Business continuity planning offers companies a chance to consider and plan for vulnerabilities related to other business operations, including supply chains, storage and distribution, and internet and technological system failures. Many businesses need to better understand the importance of supply-chain vulnerabilities and how to manage them. Driving business continuity management through the supply chain is important for any organization wishing to improve its resilience. Smaller businesses may be more vulnerable given their limited resources and planning dedicated to pandemic preparedness. Larger businesses may play a more significant role in assisting small firms while securing their own supply chains. For example, the multi-national corporation Walmart leveraged its pandemic preparedness by calling together 500 of their largest suppliers to discuss preparedness planning and supply-chain management efforts. After developing its business continuity plans, General Electric used its plans to drive alignment from suppliers—requiring critical suppliers to meet a standard of support to ensure the security of their supply chains.

Large, global corporations frequently mention the difficulty and expense in acquiring, storing, and distributing pharmaceutical countermeasures, such as antiviral drugs, as a serious challenge. The private and public sectors could benefit from partnering to jointly develop more standardized and rational approaches to decision-making in this arena, and perhaps simplify decision-making through jointly developed tools and approaches. Questions to be addressed include how to best evaluate the quantity, types, and best uses of pharmaceutical countermeasures, and once acquired, how to best store, distribute, and dispose of stockpiles. Collaboration towards modernizing and standardizing country regulations regarding the private use of pharmaceutical countermeasures is also warranted.

We established good links with regional WHO Collaborating Center for Reference and Research on Influenza and also the State Dept. of Health to get accurate, unemotional information”.

—**David Jenkins**, Vice President, Safety and Security, BHP Bilton


Conclusions

All of the experiences, achievements, and lessons learned through private sector pandemic planning and preparedness efforts are important, and all sectors of society can benefit by learning from them and putting them to good use.

A compelling tide of public health warnings and credible, economic analysis demonstrating significant economic burden cemented the seriousness of the pandemic threat in the minds of global business leaders and catalyzed commitments to take real action in response. Subsequent private sector efforts and investment in response to the threat posed by pandemic influenza totaled many billions of dollars. The fact that the private sector invested as much human and financial capital as it did in preparing for pandemic influenza between 2004 and 2009 is extraordinary. Better understanding this dynamic would be helpful for mobilizing private sector resources in advance of future emerging and potential systemic threats.

There is significant scope for strengthening collaboration between governments and businesses. Governments should create new channels for engaging private sector participation. Business and civil society representatives should be involved at the early stages of planning, policy conception, process, design, and role allocation, at central levels and in dispersed locations. Strong partnering opportunities exist for private companies and public health agencies to further the development of tools to help all parts of society better prepare in response to emerging threats. WHO could partner with private sector participants to package public health knowledge and expertise into software applications that can be accessed via popular internet platforms.

The time, place, and severity of the next pandemic cannot be predicted. It is not helpful to prepare exclusively for the single threat of pandemic. Planning and preparedness for emerging disease should be incorporated into integrated all-hazard business continuity and crisis management plans. The process of planning is as valuable as the plan itself—and produces savvy teams that can pivot and respond appropriately to surprises.



Comprehensive risk communication plans encompass both preparedness and response strategies. This chapter looks at pandemic communication issues faced by governments, public health authorities, and NGOs at central and field levels. It describes the significant progress that has been achieved in planning communication with the public—and in using research and new methodologies. It highlights the importance of coordination through communication taskforces, the value of risk communication training for government and the media, and the growing impact of new technologies.

Risk Communication

Key Lessons in Pandemic Communication

- **Partnerships at the global and national levels are important to achieve a comprehensive, multi-sector communication response.** Although potentially difficult, strong partner coordination allows public health authorities to utilize the communications capacity and credibility of other organizations to disseminate public health advice, to better understand the situation, and ultimately, limit an outbreak's spread.
- **Continue to test and revise existing national communication strategies.** Social mobilization and behavior change components should be strengthened, particularly at the community level. Repeat media training for government spokespersons and media to minimize loss of capacity due to staff turnover and complacency.
- The development of effective guidelines and recommendations for behavior change communication requires multi-disciplinary, multi-sector analysis, and dialogue. **Each region and country must analyze local social, cultural, and economic data to develop locally feasible and meaningful behavior change strategies.** And future behavioral research must include the non-health, multi-sector components of preparedness.

Risk Communication as a Strategic Tool in Pandemic Preparedness

Risk communication is defined by WHO as the range of communication capacities required through the preparedness, response, and recovery phases of a serious public health event to encourage informed decision-making, positive behavior change, and the maintenance of trust.¹ Risk communication is an essential part of any comprehensive response to protect public health in the event of a pandemic. The role of risk communication is to instruct, inform, and motivate persons to adopt appropriate self-protective behavior, update risk information, and dispel rumors. Ideally, pandemic communication maximizes the public's capacity to act as an effective partner by encouraging prevention, promoting containment, and fostering resilience and recovery. However, the public's response to communication is affected by existing psychological, social, cultural, health, and socioeconomic factors—and each of these factors affect how individuals will interpret messages, as well as their willingness and ability to act in a timely manner.²

Moreover, communication processes can prepare the public to adapt to changing circumstances or uncertainty during an emerging pandemic, educate public health planners about existing vulnerabilities and resources that affect pandemic risk for specific populations, create dialogue between potentially affected populations and risk managers, and foster an environment of mutual trust. Preparedness strategies must consider what may be asked and expected of individuals at all stages of a pandemic to guide communication planning. A pandemic may require minimally disruptive recommendations (such as hand washing), but other actions may be more difficult, evoke strong emotions, or fuel controversy (as may quarantines or school and public facility closures). In addition, disturbing information may need to be conveyed without harming public cooperation, and reducing negative consequences relies heavily on gaining cooperation from diverse entities.

To guide communication planning, preparedness strategies must define what may be expected of individuals at all stages of a pandemic.

Importance of Partnerships in Risk Communications

Strong partner coordination offers the chance for public health authorities to utilize the communications capacity and credibility of other organizations to better understand the situation, to disseminate public health advice, and ultimately to limit an outbreak's spread.

1 WHO. (2011). IHR core capacity monitoring framework: Checklist and indicators for monitoring progress in the development of IHR core capacities in states parties. 2011. Retrieved from www.who.int/ihr/IHR_Monitoring_Framework_Checklist_and_Indicators.pdf

2 Vaughan, E., & T. Tinker. (2009). Effective health risk communication about pandemic influenza for vulnerable populations. *American Journal of Public Health*. 99;S324-S332.

Effective pandemic preparedness requires coordinated planning and partnerships at all levels. Partnerships at the global and national levels are important to achieving a comprehensive, multi-sector communications response. And national governments and partners must push to keep coordinating bodies and partnerships active. However, the fact that organizations have distinct structures, leadership, and perspectives means that coordination can be challenging. This is especially so during outbreaks when partnerships broaden into non-health sectors, and the human health risk is elevated. Although potentially difficult, strong partner coordination offers the chance for public health authorities to utilize the communications capacity and credibility of other organizations to disseminate public health advice, to better understand the situation, and ultimately, to limit an outbreak's spread. The ability to reach audiences is largely dependent on the quality and scope of collaboration with partners at many levels. On the other hand, failure to coordinate increases the possibility that communication resources will be wasted, fails to take advantage of each partner's distinct dissemination channels, and increases the likelihood of confusing or contradictory public information.

Productive partnering involves sharing authority and learning new ways of responding to crisis. This level of collaboration can be a major paradigm shift for government ministries as well as for global and local organizations. It takes time to build a sufficient level of trust for partnerships to function satisfactorily. Transparency in working processes, sharing of information, admitting what is outside the capacity of the organization, and letting go of the corporate brand so that all are speaking with one voice, are some aspects of partnership that can be difficult to operationalize.

Planning and Coordination

Several factors have contributed to increased acknowledgement of the importance of communication planning in emergency and pandemic preparedness: the allocation of significant resources by international and national organizations, including the private sector, to improve communication; rapidly growing scientific literature; and analysis and consolidation of cumulative experiences. The last decade offers a range of lessons learned and best practices in crisis and risk communications from events such as the SARS outbreaks in 2003, the Asian tsunami in 2004, Hurricane Katrina in 2005, terrorist bombings in London (2005) and Madrid (2004), and the 2009 H1N1 Influenza outbreak.³ Most of these experiences point to the importance of advance planning and coordination.

Advance planning is critical but must be flexible enough to accommodate changes in the evolving situation.

³ Tinker, T.L., & Vaughn E. (2010). *Risk and Crisis Communications: Best Practices for Government Agencies and Non-Profit Organizations*. Washington, DC: Booz Allen Hamilton. Retrieved from <http://www.boozallen.com/media/file/Risk-and-Crisis-Communications-Guide.pdf>

Working with Partnerships for Risk Communication

- Develop partnerships in advance of a problem, and develop flexible and adaptable coordination plans.
- Explain organizational systems and processes to partners who may not have had exposure to past public health emergencies.
- Build trust by demonstrating transparency, especially about how public health decisions are made.
- Include partners according to the specific nature of the problem or the course of the disease. Involve partners from within affected communities: they represent points of view that are vital to understanding the perceptions of various groups affected.
- Be prepared to interact with organizations that are not necessarily supportive of government authorities.
- Not all partners need to communicate exactly the same message. The key is to ensure public health messages are not contradictory or confusing.

Source: WHO *Outbreak Communication Planning Guide*

A number of international agencies have led or coordinated risk communication at the global and regional levels. WHO developed outbreak communication principles and an outbreak communications planning guide, consistent with its International Health Regulations requirements to strengthen risk communication capacity in member states. Since that time, risk communication experts from WHO member states and partner nations have used the evidence-based, field-tested communication guidelines to establish a comprehensive framework for effective communication during infectious disease outbreaks. In 2008, a WHO working group updated the guidelines. As the 2009 H1N1 Influenza pandemic was the first global event that tested the WHO's recommendations, WHO commissioned an independent review committee to identify lessons learned for the planning and future implementation of several critical areas, including risk communication.

The UN System Influenza Coordination and the Humanitarian Pandemic Preparedness Initiative (managed by the IFRC) coordination groups included agencies focusing on communication for the 2009 H1N1 Influenza pandemic response. Global coordination of communication was handled through conference and bilateral telephone calls, emails, and meetings among partners. The Initiative also formed a multi-agency communication taskforce and combined weekly conference calls for information sharing and coordination. UNICEF's Asia Pacific Regional Shared Service Center was also in regular contact with communication officers in the region to coordinate the agency's communication work.

Two regional initiatives supported countries and agencies doing risk communication: the Pan-American Health Organization organized training workshops for reporters and designated government spokespersons in member Latin American and Caribbean states, and UN System Influenza Coordination formed a multi-agency group, called the Asia Regional Communication Initiative, that hosts regular round table meetings on risk communication issues. These and similar collaborations paid off in the quality of press coverage and relationship with authorities during the 2009 H1N1 Influenza pandemic.

Over the past five years, national governments have found that working through a designated coordination body with a broad range of partners and stakeholders improves the planning and delivery of an effective pandemic response, including communication. The best examples of coordination come from countries that experienced avian influenza and the 2009 H1N1 Influenza. These countries formed a ministerial-level coordinating body with leadership shared between animal and human health. Some governments also authorized a related taskforce for coordination that included partnering organizations. The crucial element is that one entity be the primary venue for planning, mutual agreement, and buy-in, with decisions backed by the government.

Partnerships—a key element to pandemic preparedness and response—are not permanent. They wax and wane over time often in response to changing priorities and funding levels. Reports from the field suggest that good working relationships between agencies established during the recent pandemic often boiled down to the personality or working style of individuals within organizations. With high staff turnover common and key individuals moving on, partnerships need constant attention to maintain linkages between crises. Several strategies are being applied:

- Use the same coordination bodies to address other health problems (dengue fever, cholera);
- Integrate practices and messages into long-term initiatives (such as disaster preparedness, school curricula, child survival outreach);
- Continue building capacity (with the media, communication skills for field workers across sectors);
- Conduct simulations (within and among organizations).

Bangladesh's National Preparedness Response Plan

In 2005, the Bangladeshi government developed its first national avian and pandemic influenza preparedness plan with support from WHO and the FAO. The plan defined the roles and responsibilities of agencies involved in its implementation and provided the framework for establishing coordination, including an advisory committee at the ministerial level and a taskforce of representatives from relevant ministries, directorates, NGOs, civil society, and the private sector. The taskforce chair rotated between the Ministry of Health and the Ministry of Fisheries and Livestock. The plan also established a number of key coordination committees and identified the need for a risk communication strategy. A communication committee of the national taskforce developed the 2007-2008 National Communication Strategy and Action Plan for Avian Influenza and Human Pandemic Influenza. It mandated coordination across communication partners to harmonize messaging, ensure media training for key spokespersons, and develop a national communication strategy. All communication material would be approved after endorsement from the national taskforce.

While this structure worked well in response to HPAI H5N1, 2009 H1N1 Influenza required a coordination framework focused more on human health. As a result, a new, multi-institutional communication working group was established, led by the Institute of Epidemiology, Disease Control and Research within the Ministry of Health with representatives from WHO, UNICEF, and the U.S. Centers for Disease Control and Prevention. At the height of the pandemic, this communication working group met almost daily to develop messages and coordinate communication materials. Given the urgency, communication materials were hand delivered to the Ministry of Health for immediate approval. This coordination structure provided quick turnaround and swift information dissemination to maintain a high level of trust between the government and the public.

The communication working group also developed a comprehensive strategy for coordinating with the media, providing journalists with consistent, up-to-date information, and striving for openness and transparency. The Ministry of Health held press briefings in collaboration with WHO and UNICEF, first as weekly updates, then almost daily during the height of the pandemic. Spokesperson media training was conducted in a coordinated manner—creating a core group of national spokespersons with experience in dealing with the press.

The risk communication strategy also incorporated outreach campaigns to address specific risk scenarios. For example, several important religious holidays coincided with the height of the 2009 H1N1 Influenza pandemic in September 2009. It was expected that 4 to 5 million people would travel back to their villages during this time. To prevent wide-scale transmission of the virus during this travel period, the working group implemented a large-scale outreach campaign targeting such travel points as bus depots, train shelters, and river launch stations. Print materials were developed and distributed to encourage prevention measures, free face masks were distributed, public announcements were broadcast at terminals, text messages were sent to more than 7 million mobile phone users, and television spots were aired. As a result of the targeted campaign, there was no major increase in the number of 2009 H1N1 Influenza cases reported in the provinces during and after the festivals.

There are several lessons learned from the Bangladeshi experience in pandemic preparedness. First, the national strategy with high-level political endorsement provided a solid foundation for response efforts, including communication. Senior-level leadership ensured that multi-sector coordination drew in all stakeholders, resulting in little duplication of efforts and strong harmonization. The communication capacity built during the HPAI H5N1 pandemic helped to solidify and strengthen coordination efforts during 2009 H1N1 Influenza—and presumably, will help Bangladesh deal effectively and efficiently with future emerging infectious diseases.

Another lesson is the importance of communication strategies being supported by necessary policy, capacity building, and infrastructure changes. In the case of HPAI H5N1, rates of reporting of sick birds did not improve initially despite messages disseminated through community health workers, broadcast media, and flyers. Since then, authorities have improved and publicized the compensation rate for dead birds, established an active surveillance system using trained community animal health workers, and are experimenting with easier reporting through a text message gateway system. As a result, reporting rates have improved.

Comprehensive Communication Strategies

Comprehensive risk communication plans encompass both preparedness and response strategies. For preparedness, strategies include working with communities to develop preparedness plans and strengthening the capacity of outreach workers to communicate effectively. For response, they include identifying and addressing the communication needs of different target audiences, including vulnerable and high-risk groups; utilizing multiple communication channels, including print and broadcast media, social media, and social mobilization; and incorporating available behavioral and formative research.

A communication strategy consisting mostly of disseminating timely and scientifically sound information to an entire population is not enough to achieve wide-scale behavior change. For this to occur, strategies must include specific behavior change objectives (in addition to changing awareness, increasing knowledge, and building trust). Although the final objective is the same—to gain widespread cooperation in reducing transmission and mitigating the health, social, and economic impact of a pandemic—different methods must be used with different groups. Communication must also use social mobilization and behavior change communication principles.

Social mobilization and behavior change communication use participatory methods including media, interpersonal communication, and dialogue with community groups. Social mobilization is an at-scale interpersonal communication effort that entails dialogue between community members and credible people they know and trust—in contrast to an often heavy reliance on broadcast media to disseminate information to the general population. Typically, social mobilization engages existing networks found in civil society organizations, NGOs, religious and community leaders, private health providers, pharmacists, major employers and so on, to carry messages to their constituents and assist these communities in carrying out recommendations. Participatory methods allow communities to be directly involved in dialogue about the disease, its risks, and what their community and family can do to remain safe. If these methods are used during planning and preparedness to promote relevant policy, infrastructure, and social changes, it is more likely that behavioral recommendations will be acted upon in the emergency. The IFRC is a good example: more than 90 of their national societies trained and equipped volunteers to make house-to-house visits during the 2009 H1N1 Influenza pandemic. The U.S. Agency for International Development's Avian Influenza Behavior Change and Communication project gave technical assistance, training, and support to local groups to do social mobilization programs in more than 40 countries in response to avian influenza.

Behavioral Research

Behavioral research is the cornerstone of communication planning. Using a variety of qualitative and quantitative research methods, social/behavioral research is used to identify the special characteristics and concerns of different segments of a population—marginalized groups as well as at risk populations—to make communication understandable and action-able. Research should guide decisions about strategy, message,

and materials development. Data can also serve as a baseline to compare changes measured after interventions are completed.

In the context of avian influenza, many countries conducted research to identify the social, psychological, cultural, and economic factors affecting poultry-rearing practices, especially of small-scale farmers. Some areas researched included the feasibility of recommended farming and protective practices, impact of economic loss, ceremonial and social role of chickens, chickens as the main source of protein for the rural poor, and generations of experience of raising chickens successfully. Further research was done with key actors throughout the poultry industry chain (“from farm to fork”).

There are multiple examples from pandemic responses that highlight the need to better utilize and integrate behavioral research in pandemic preparedness. For example, although several knowledge, attitude, and practices studies were available in 2007 related to avian influenza, little adaptation of the key messages regarding farming practices and personal protection has taken place. Only recently has there been more diversification of messages. The anticipated impact (changed behavior supported by accurate messaging and effective social mobilization) could have been improved had this research been taken into consideration.

For the future, research should focus more on non-health, cross-sector components of preparedness and response such as the social and economic consequences of compliance, feasibility of recommended behaviors, relevant policy changes, methods and effect of community participation. Currently, communication planners are the major user of behavioral research data, but other programmatic areas, such as health, agriculture, water, sanitation, social welfare, and education, should take advantage of this wealth of information.

Message development

Behavior change communication is the strategic use of communication to promote positive health outcomes, based on proven theories and models of behavior change.

Strong multi-agency coordination and agreement on one set of messages were important elements in successful handling of communication during the 2009 Influenza pandemic. Many country-level communication teams used WHO/UNICEF’s behavioral guidance for 2009 H1N1 Influenza and the Food and Agriculture Organization (FAO)’s guidance for HPAI H5N1. When messages came from one credible source, it was easier to harmonize messages used by all local agencies involved in pandemic response. However, few local agencies adapted messages to the local context, beyond translation into local languages and changing illustrations to local clothing and context.

Few countries altered the general behavioral recommendations. While many countries reported that cough/sneeze etiquette and hand washing had improved, anecdotal evidence suggests that practices such as social distancing, greeting rituals, and staying

home from work remained largely unchanged. The public did not readily embrace these practices or found them unfeasible. For example, many in Ethiopia did not consider influenza to be a serious threat, and the only isolation they practiced was to isolate someone ill at home.¹

In other areas, certain farming practices remained largely unchanged despite communication materials and messages for avian influenza being translated and visually adapted to the local rural context. In particular, farmers disregarded recommendations to separate chickens from other birds or humans, and to keep children away from the family flock. These recommendations were difficult for small-scale farmers to implement given their living and economic conditions. An evaluation report concluded that: “Because lack of knowledge does not appear to be a factor (in compliance to behavior recommendations), intervention programs must include feasible options for resource-poor settings that have limited materials for personal protection (water, soap, rubber gloves, masks) and must offer farmers alternative methods to work safely with poultry on a daily basis.”²

An important activity then during preparedness would be to use standard methodology of behavior communication research and analysis by behavioral scientists and to problem-solve together with affected populations to arrive at a do-able list of behaviors. These discussions need to be an essential part of preparedness, before translating messages and designing materials. Message development also needs to be accompanied by minimizing policy, infrastructure, and social barriers identified in behavioral research.

Reaching Vulnerable and Marginalized Populations

Social mobilization uses planned actions and processes to reach, influence, and involve all relevant segments of society, across all sectors, to create an enabling environment and effect positive social change.

The quality of response during a pandemic depends partly on the ability to meet the specific communication needs of all populations, including those most vulnerable and most likely to experience communication gaps. Vulnerability refers to individuals, groups, communities, or places where health disparities, differences in treatment access, living conditions, health literacy, language, immigration status, risk perceptions, and lack of confidence in the government’s ability to respond could exacerbate risks for particular populations. Evidence for a differential impact from pandemic influenza includes both higher rates of underlying health conditions in minority populations,

1 Addis Continental Institute of Public Health and AI.COMM. (2008). Assessment of preparedness to pandemic influenza in Ethiopia: Final report. Washington, DC: AED. Retrieved from <http://avianflu.aed.org/docs/research/EthiopiaPandemicReport.pdf>

2 Wilsmore, A., Ancia, A., Dieleman, E., & Faiz, N. (2010). Outcome and impact assessment of the global response to the avian influenza crisis, 2005-2010. Luxembourg: European Commission. Retrieved from www.eeas.europa.eu/health/docs/health_grai_en.pdf

increasing their risk of influenza-related complications, and larger socioeconomic, cultural, educational, and linguistic barriers to adoption of pandemic interventions.

Print and Broadcast Media

Risk communication relies heavily on print and broadcast media to disseminate accurate and timely information. Therefore, developing a good working relationship with the media is a critical component to pandemic preparedness. Being transparent with information and with the government's ability to respond to a constantly changing situation represents a major paradigm shift in media relations for many governments, especially those with authoritarian regimes. Indeed, building the capacity of local media to cover technical information, transmit policy statements from authorities, and report on events in a balanced fashion has been a major activity over the past five years.

Despite substantial investment in improving risk communication capacity and implementation, evidence from several countries showed that risk communication via various channels—in particular mass media—increased panic and led those at risk from avian influenza to hide, sell, give away, or eat infected or potentially infected birds, as a means of protecting or gaining something from their assets. This panic had the effect of increasing disease risk, rather than minimizing it. In some situations, poultry owners distrusted official government communication, viewed the messages as detrimental to their livelihoods, and disbelieved the disease threat. Their trust also may have been eroded by the inconsistency between the government's statements and its policies (namely, the request to “report sick birds to your local veterinarian,” while local authorities were unprepared to process reporting and no compensation program was in place).

Improving Interpersonal Communication Skills

Training in interpersonal communication skills is also an important part of preparedness. Training of field workers should reflect a multi-agency, cross-sector approach by including government outreach workers, NGO field staff, volunteers, religious group members. The IFRC's training sessions in many countries included government field workers and other NGOs. Many countries collaborated on developing training modules for communication skills to be used across a wide spectrum of community members. Common training helps to harmonize messages and to operationalize the partnerships forged at national levels.

Training in communication skills does not need to be a stand-alone activity. Indeed, interpersonal communication skills should be an integrated component in otherwise technical trainings for service delivery personnel crucial to pandemic situations (including facility-based health providers, police, school teachers, veterinarians, and others). Although these service providers will be over-burdened during an emergency, they will need basic interpersonal communication skills to relay important information correctly and effectively to the public they serve. Training of news reporters (broadcast and print) and of government spokespersons should also be on-going. Relations between

Case Study: Social Mobilization of Small-scale Farmers and Poultry Producers in Nigeria

An FAO project in Nigeria used participatory communication methods at the community level. The project worked with free-range poultry producers, small-scale (backyard) farmers, poultry and animal transporters, live bird/animal market vendors, and processors. It also involved key local, state, and federal governmental and non-governmental stakeholders, including community-based organizations.

FAO assessed the biosecurity of the poultry value chain to identify priority areas and biosecurity needs; documented existing biosecurity practices and identified gaps; conducted studies of the socio-economic impact of avian influenza in Nigeria; reviewed avian influenza communication activities and their impact upon behavior change at the community level; utilized participatory communication methodologies (including focus group discussions and community capacity enhancement); trained local government area veterinary and communication officers on the practice and promotion of biosecurity; and provided training in participatory disease searches to enable local authorities to detect disease events. In addition, some community members were selected by their communities to act as community animal health liaison officers. They served as the interface between local animal health authorities and communities, and participated directly in disease reporting. Messages and communication materials for poultry keepers, backyard farmers, and animal transporters were developed, pre-tested, and disseminated at live bird and animal markets.

The results of FAO's project were:

- Improved capacity for disease control of poultry and other animal disease among various levels of government and for the implementation of biosecurity measures in rural communities;
- Better linkages between communities and veterinary authorities to improve the coordination of disease response and control;
- Increased disease searches and reported events in conducted by communities;

- Increased capacity of government authorities to conduct disease search and participatory epidemiology;
- Established animal health networks and coordinated multiple stakeholder activities in local pilot areas;
- Mobilized and empowered communities to demand veterinary services;
- Community willingness to work with authorities to provide veterinary services to their communities, demonstrating a feasible basis for public-private partnerships for service delivery in rural areas.

Through this project, FAO developed and tested a replicable methodology for the promotion of biosecurity within resource-poor communities.

government authorities and the press are often fragile, so capacity building and fostering positive and constructive interactions should be ongoing, and should not wait for the next crisis to emerge.

Looking forward, agencies and NGOs should avoid developing new materials for interpersonal communication skills for field workers, and instead test and revise the vast amount of resources developed during the last five years and revise and harmonize training modules according to lessons learned.

Social Media

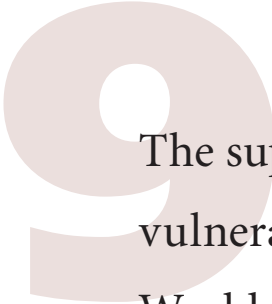
More recently, both the media and the public are using new technologies to share information. One of the biggest changes is the ever-growing access to mobile communication devices, which has given average citizens the ability to document and disseminate—in real time—the ongoing effects of natural disasters, terrorist attacks, or industrial accidents. In addition, the use of social networking sites (such as Twitter, Facebook, YouTube), blogs, and unofficial websites are enhancing the use of mobile devices. Not only do these new communication channels provide opportunities to reshape and expand how official communications occur (information-sharing through community response grid approaches), but they also highlight difficulties in controlling message content, rumors, inaccurate information, and trust in government communicators. As a result, some government agencies involved in risk management have already added social media to their communication plans.

Conclusions

Several factors have contributed to increased awareness of the importance of communications planning in emergency and pandemic preparedness, including the allocation of significant resources by international and national organizations. The primary lessons learned are related to the importance of creating multi-sector partnerships and advanced planning and coordination. On the face of it, these guidelines are simple and straightforward. However, as the experience of SARS and the 2009 H1N1 Influenza outbreak has shown, outbreak control and outbreak communication is rarely a simple process of winning public trust and transmitting information objectively and openly. More often than not, it is a messy business requiring political decisions with winners and losers.

As noted in a UN and World Bank report, “Communication remains an area which requires significant support across animal, human, and environmental health stakeholders...Outbreak communications for H5N1 in poultry and humans and H1N1 and humans, and behavior and social change improvements have led to increased knowledge and promotion of the adoption of protective practices...In most countries, evidence-based communication interventions and accurate messaging have contributed to the adoption of protective behaviors that helped reduce transmission of H1N1...Several evaluations have shown that communication strategies have been effective in reaching out, raising awareness, and improving knowledge of avian influenza, despite competing health and national emergency priorities. Continuing an evidence-based approach of working with communities by understanding the socio-cultural drivers of change will continue to be vital.”¹

¹ UN System Influenza Coordination and the World Bank. (2010). Animal and pandemic influenza: a framework for sustaining momentum—Inter-ministerial Conference on Animal and Pandemic Influenza, 20-21 April 2010, Hanoi, Vietnam. Retrieved from <http://un-influenza.org/files/Synopsis.pdf>



The supply chain and logistics sector remains critically vulnerable to the impacts of a severe global pandemic. The World Food Programme, the U.S. Agency for International Development, and in-country partners have worked to strengthen the capacity of humanitarian logistics systems in developing countries to enable transport, supply and delivery of critical goods and people during pandemic conditions. This chapter describes the work to assess the resilience and capacity of critical regional logistics corridors, highlighting the need for better supply chain assessment, planning, and modeling.

Supply Chain and Logistics Preparedness

Key Lessons in Pandemic Communication

- Most **national preparedness plans do not address the supply chain challenges** that will occur during a severe pandemic. More work is needed to better institutionalize processes and ensure that they are contained in appropriate national, organizational, supply chain sector, and corporate pandemic and disaster plans. The identification of **a lead organization for supply chain preparedness is critical**.
- The unavailability of funds and contracting time constraints meant that many organizations could not procure needed commodities. **Pandemic preparedness and response plans should identify funding sources** for response operations, and contingency funds must be available to ensure that the supply chain can respond to events in a proactive manner.
- Preparedness and response **plans should include provisions for establishing emergency contracting and procurement processes** that facilitate rapid acquisition of equipment and supplies. Supply-chain managers should obtain advance approvals for acquisition of key commodities needed during the early stages of pandemic or disaster response.
- Determining the correct **types and quantities of public health products requires an analysis of many variables**, including product consumption patterns, beneficiary demand requirements, replenishment lead times, and costs. Efforts should be undertaken to **develop consumption models and review existing data** to determine the most effective way to manage stocks to maximize shelf-life and minimize loss and damage.
- More work is required to **improve pandemic vaccine distribution**, including guidelines for vaccine allocation, modeling to facilitate timely decision-making, and assessing cold chain storage capacity.
- **Communication planning must be an integral part of vaccine management programs**, including the development of country-level technical guidance as well as public information campaigns during distribution.

Complexity and Strategic Importance of Supply Chains

The supply chain and logistics sector is one of the most significant and complex aspects of disaster response and one that remains critically vulnerable to the impacts of a severe global pandemic.

The supply chain and logistics sector is recognized as one of the most significant and complex aspects of disaster response, and one that remains critically vulnerable to the impacts of a severe global pandemic. Global, national, and local supply chains are responsible for maintaining livelihoods, human health, governance and security, social and humanitarian needs, and economic systems. The impact of an influenza pandemic on these supply chains could range from disruption in local markets and the retail sector to catastrophic global failures affecting equitable access to food, fuel, water, and sanitation—as well as disruptions in banking services and a virtual collapse of global markets. These disruptions and competition for scarce resources may result in civil unrest, heightened tensions between neighboring states, and escalation of local, national, or regional conflicts. As is the case with most areas of disaster preparedness, the identification of a lead organization is critical for the planning and preparedness of the supply chain. Each organization involved must have a clear mandate of their roles and responsibilities and how the supply chain will be managed to support response activities. In a supply chain, every link in the chain is dependent upon the performance of others.

Key Support for Strengthening Supply Chain Systems

Both the 2009 H1N1 Influenza pandemic and other program work accomplished by WHO, the World Food Programme, the U.S. Agency for International Development, and other partners has shown a number of areas where supply chain plans, policies, procedures, and systems can be improved. In many cases, national, organizational, and supply-chain corporation pandemic preparedness and response plans are either inadequate or do not exist, constituting a significant shortfall in pandemic preparedness. In addition, lessons learned suggest that current procurement and distribution processes are insufficient to deal with the challenges that will confront supply-chain managers during a severe global pandemic, or even a major disaster. Experience shows that these procedures must be streamlined to provide timely delivery of disaster relief supplies and equipment.

There have been several important initiatives to strengthen supply chain and logistics for pandemic preparedness. Recognizing the significance of supply chain systems for vulnerable populations, both the World Food Programme and U.S. Agency for International Development have established programs that focus on various components of preparedness and response, including collaboration with national and international partners to reinforce pandemic preparedness.

The U.S. Agency for International Development supported the establishment of an emergency supply of infection-control equipment and partnerships to reinforce preparedness efforts focusing on non-pharmaceutical interventions and supply chain activities. The U.S.'s Pandemic Preparedness Program included several components to focus pandemic stakeholders on the challenges posed by a severe global pandemic. Supply-chain management and overall logistics preparedness was a central tenet of these exercises. The U.S. Agency for International Development's country and regional offices collaborated with the World Food Programme to work with stakeholders to develop plans, policies, and procedures to enhance supply-chain management within pandemic preparedness. The U.S. support of response efforts during natural disasters also contributed to a better understanding of challenges. These disaster response operations enabled the U.S. Agency for International Development and other partners to assess the national and regional level of disaster preparedness, and identify gaps in the supply chain sector.

The World Food Programme's support of national disaster response efforts contributed to the understanding of disaster response supply-chain challenges, including those that occur during a severe global pandemic. These "real world" disaster response operations enabled it to work with other partners in assessing the national and regional level of disaster preparedness and thus identify existing supply-chain sector shortfalls.

The World Food Programme is the lead for the logistics cluster, a mechanism for inter-agency coordination of humanitarian assistance. As lead, the World Food Programme fostered partnerships and collaborative relationships to promote issues associated with maintaining supply-chain continuity during a severe global pandemic. Its Pandemic Response Unit developed and coordinated many pandemic preparedness activities, including logistics corridor assessments, simulation exercises, and stress-testing of operational plans. The unit also coordinated the World Food Programme's internal effort to strengthen its business continuity plans to minimize the impact of a pandemic event on critical functions. These business continuity planning efforts also enhanced internal preparedness and response capacity to support governments and other pandemic partners in delivering essential services to vulnerable populations under extreme circumstances. In addition, the World Food Programme continued its efforts to identify and implement risk reduction strategies in support of public health and to reduce the impact of all disasters on life-saving humanitarian operations.

Identifying and Understanding Transport Corridors

Transport corridors function as vital economic and humanitarian routes from point of entry to point of distribution.

In the developing world, transport corridors function as vital economic and humanitarian routes. Despite their vital importance in pandemic preparedness, there are

relatively few examples of comprehensive analysis of transport corridors, which would involve:

1. Identification of the most conceivable primary and secondary transport modes from point of entry to points of distribution;
2. Assessment of the respective governments' and NGOs' capacity to respond to emergencies, including customs, port, air, rail and road operations; food milling, storage, suppliers of food and non-food commodities; communications, and electricity generation and supply; and fuel refining supply and distribution;
3. Understanding each systemic link in the supply chain, including their strengths and shortfalls, with potential solutions or alternatives;
4. Identifying functional linkages between governments, UN agencies, NGOs, and private sector entities;
5. Understanding the extent of business continuity efforts.

The World Food Programme's Logistics Corridor Assessment Project analyzed the systemic risk and potential impact of a pandemic on the movement of humanitarian goods along key humanitarian and economic corridors in both Africa and Asia, providing users with country-level assessments that contained critical information to support the development of pandemic operational continuity response plans. World Food Programme country and regional offices worked with national and regional stakeholders to develop plans, policies, and procedures to enhance all aspects of supply-chain sector preparedness to support humanitarian aid operations. These offices are well embedded in the local, regional, and national infrastructures and therefore have significant knowledge and understanding of the national and regional supply chain sector and relationships with key sector stakeholders.

The 2009 H1N1 Influenza pandemic did not significantly affect the transportation sub-sector of the supply chain sector. Due to the mildness of the virus, absenteeism and other effects that would normally be expected in a severe pandemic did not arise. However, modeling and other analysis show that a severe pandemic could present significant challenges to the transport sub-sector, potentially affecting all sectors of society. These effects include potential to close or at least greatly decrease the flow of major ports and transportation hubs and significantly decrease available cargo transport (road, rail, air, sea). These effects may necessitate use of other assets to maintain supply chain transportation capabilities, including prioritization of loads to ensure critical commodities are moved before less critical items, use of military equipment and personnel, and possible bilateral or regional cooperation. Although some work has been done to address the potential transportation challenges presented by a severe pandemic or other major disaster, little of this work has been institutionalized through incorporation in appropriate pandemic and disaster plans. This shortfall should be addressed by supply-chain managers and planners.

Case Study: Supply Corridors in the Great Lakes Region

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Prior to the Logistics Corridor Assessment Project, very little work had been done to conduct similar analysis of logistics corridors, including identification of the components necessary for their operation and the preparedness of these components to perform their individual roles during a major disaster. This lack of information inhibited the ability of the World Food Programme and other humanitarian organizations to conduct effective response activities during such an event.

The Northern Corridor is the primary transport network that links Kenya's Port of Mombasa to the other Great Lakes countries (Uganda, Rwanda, Burundi, and the Democratic Republic of Congo), with additional links to Ethiopia, Somalia, northern Tanzania, and Southern Sudan. This corridor is quite literally the umbilical cord for the entire Great Lakes Region, and is one of the most strategic commercial and humanitarian routes in Africa. This corridor is more than 1,400 kilometers long and includes a collective population that exceeds 130 million people. Traffic figures indicate that more than 4,000 light vehicles, 1,250 trucks, and 400 buses use the road each day, accounting for more than 10 million tons of annual cargo.

The greatest pandemic preparedness impact of the project was probably achieved in Africa, where the data collection and fact-finding exercise incorporated a series of regional workshops. These workshops included an introduction and awareness of pandemic influenza, activities to identify the risks and challenges related to the local situation, and table-top pandemic scenario exercises. Key organizations, such as the Kenya Ports Authority and Kenya Airports Authority, embraced this initiative, established their own working groups, and conducted follow-up workshops to strengthen pandemic awareness and continuity planning among the local logistics community.

A key benefit of the project was enhancement of emergency preparedness. Some stakeholders, such as the Tanzania Airports Authority, had existing emergency response mechanisms, but lacked an understanding of pandemic issues and challenges. These organizations were able to use their existing systems to embrace pandemic preparedness with little difficulty. Some organizations with less capability required additional support to develop and institutionalize emergency preparedness plans, policies, and procedures.

Most national pandemic plans do not address the supply chain challenges that will be present during a severe pandemic. These include movement of humanitarian aid and critical supplies from ports and local manufacturers across national borders to final destinations, all occurring at a time when pandemic-related effects on society may be widespread and quite severe. While these supply chains may exist prior to the pandemic, supply chain managers and planners should not assume that these will function normally during a severe pandemic. A severe pandemic could significantly affect port or border clearance and efficient processing of containerized and bulk cargo due to staffing shortages, increased insecurity, and other potential societal impacts. While some work has been accomplished to establish procedures for expediting critical cargo during disaster response, more work is needed to better institutionalize these processes and ensure they are contained in appropriate national, organizational, supply chain sector, and corporate pandemic and disaster plans.

Contingency Funds for Commodities

Contingency funds must be established to ensure that the supply chain can respond to events immediately upon occurrence of an emergency.

Contingency funds must be established to ensure that the supply chain can respond to events in a pro-active manner immediately upon occurrence of a pandemic emergency or other disaster. The protocols for use of identified funds must be sufficiently flexible to allow supply chain managers to commit funds to suppliers based on the current situation and on the anticipated progression of the pandemic or disaster. In past pandemics, funding sources were not amenable to providing significant funding until the pandemic had progressed more fully, thus delaying effective response and actions to prepare for the inevitable local outbreaks. This funding delay made it difficult to procure required commodities—such as N-95 respirators and other protective equipment—because once funding was secured, items were no longer available. In the case of the 2009 H1N1 Influenza response, the requirements for commodities rose exponentially during the first few weeks of May 2009, as organizations and institutions began to utilize available funding. The unavailability and time constraints linked to funding resulted in many organizations not being able to obtain required supplies—and ultimately losing funding. Ideally, equipment and supplies should be sourced prior to their actual need, thus permitting sufficient lead time for transport to best support response operations.

Assessing Demand for Public Health Commodities, Equipment, and Supplies

Determining which supplies and health products to buy and how much requires an analysis of many variables, including the protocols for the distribution of products, locations, population needs, consumption patterns, replenishment lead times, and costs.

Pandemic preparedness and response activities undertaken over the last five years offer a wealth of data regarding the consumption patterns and demand requirements of many different products for a variety of activities, including surveillance, training, outbreak investigation, specimen collection, preservation, and transport, as well as laboratory diagnosis and infection control efforts in hospitals and clinics. Determining the correct types and quantities of public health products to procure requires an analysis of these variables, including the protocols for the distribution of products (based on organizational policies), beneficiary population, location, established requirements, consumption patterns, replenishment lead times, and costs. This information is vital to supply chain preparedness. Although some of this knowledge and information is now beginning to be utilized in decision-making, more can and should be done to ensure that organizations and institutions better forecast expected demands and consumptive patterns for public health commodities. The supply chain will function more efficiently when demand requirements are clearly identified and are used to make supply chain decisions. Experience during the 2009 H1N1 Influenza pandemic clearly showed that real-time inventory status was critical during the initial stages of the pandemic to ensure equitable access to existing supplies. Efforts should be undertaken to develop consumption models and review existing data to determine the most effective way to manage stocks to maximize shelf-life, minimize loss and damage, and ensure well-established procedures for the use and tracking of materials.

Procurement Strategies

Disasters most often require immediate procurement, transport, and deployment of commodities to alleviate human suffering and save lives. While these requirements may be addressed in general terms within disaster preparedness and response plans, they are rarely addressed in required detail. The 2009 H1N1 Influenza found many organizations and institutions unprepared, with plans that failed to adequately identify sources of funding and supply to support logistics requirements. In the past, the only way to overcome the uncertainty of the market was to procure and stockpile supplies prior to an event. However, this approach requires significant up-front capital investment and often has high storage costs. An alternative approach is to enter into agreement with suppliers, detailing the quantities and types of commodities expected, and the quantities and timing of the supplies. This risk-sharing approach, when put into a contractual agreement, allows organizations to minimize costs associated with storage and maximize product

availability through pre-arranged agreements. Supply-chain managers for all response organizations should pursue methods for establishing virtual stockpiles or contractual agreements with manufacturers and vendors, to limit the quantities of product that require storage, to balance shelf-life concerns, and to ensure that a supplier relationship exists that allows access to critical supplies in the event that global demand outstrips supply.

Procurement policies also often inhibit the supply chain's ability to quickly procure commodities needed to enable emergency response. Governments, organizations, and institutions often have laborious contracting processes, requiring multiple bids and justification for "sole source" procurements. Several reviews of the 2009 H1N1 Influenza response reported that these processes created significant delays in procurement of supplies required to support response operations. Preparedness and response plans should include provisions for establishing emergency contracting and procurement processes that facilitate the rapid acquisition of equipment and supplies. These streamlined procedures are a well-established tenet of disaster supply chain management, but unfortunately many countries, organizations, and institutions have not yet adopted them within their disaster management plans, policies, and procedures. Supply-chain managers should obtain advance approval for acquisition of key commodities to be used in the early stages of a pandemic or disaster.

Inventory Management

Effective management of inventory is a critical component of supply chain management and is essential to successful distribution of equipment and supplies. The vast majority of public health commodities required to support a natural disaster or humanitarian crisis are available and in stock. However, pandemics often create a surge in demand that distorts markets. Effective management of stockpiled commodities informs supply-chain managers and other decision-makers of the types, quantities, and condition of available commodities. When properly executed, inventory management permits managers to order commodity items at the optimal point in time, thus minimizing warehousing costs while simultaneously ensuring provision of adequate equipment and supplies. Many governmental agencies and private organizations reported problems with inventory management during the 2009 H1N1 Influenza due to inadequate systems, policies, and procedures to adequately manage inventory items. This deficiency was identified as one of the primary reason for inequitable distribution of public health commodities, and in some cases resulted in ordering of additional supplies for which adequate inventory was already on hand—thus putting unnecessary strain on the supply chain.

The distribution of commodities to beneficiaries is sometimes erroneously considered the end of the supply chain. In fact, a one-time distribution is rarely sufficient. In most cases, continual supply of commodities is required, which requires reordering and restocking. Even in preparedness plans that provide detailed discussion of supply-chain

policies and procedures, the issue of replenishment is often unaddressed. Managers must identify minimal stock levels, order lead times, and consumption rates, and input these variables into the supply-chain systems to ensure adequate stock levels are maintained throughout a pandemic event. The 2009 H1N1 Influenza provided some information on the inadequacy of existing plans for replenishment and restocking of key commodities, particularly in the area of public health supplies.

Vaccine Management

Failure to adequately plan for H1N1 Influenza vaccine management, coupled with uncertainty regarding vaccine quantities and unrealistic expectations about supply chain flexibility, led to challenges in supporting the deployment and distribution of vaccine commodities.

Global vaccination programs require careful planning and implementation to achieve public acceptance and to realize coverage targets. To facilitate an effective global response, the planning process must assess the comparative strengths of the organizations participating in the response. The strengths and limitations of donors, implementing partners, governmental authorities, and existing systems must be identified and considered in planning to avoid delays, redundancy, and gaps in program coverage. Experience shows that national vaccine programs require a balanced package of technical, operational, and financial inputs with support from a variety of partners. The specific contracting and procurement requirements must be understood and considered prior to implementation of any program. During the 2009 H1N1 Influenza pandemic, failure to address these requirements early, coupled with uncertainty regarding vaccine quantities and unrealistic expectations about supply chain flexibility, led to challenges in supporting the deployment and distribution of vaccine commodities.

More work must be done on distribution strategies for vaccines during future pandemics. While the exact nature of future events may be unknown, it is still possible to establish guidelines for vaccine allocation and to use modeling to facilitate more timely decisions concerning vaccine distribution in future pandemic events. These efforts will advance planning by supply-chain managers, reduce supply chain costs, and facilitate more timely distribution of vaccine commodities. Communication planning must receive greater attention as an integral part of vaccine management programs, including the need for country-level technical guidance, as well as suggested public information strategies during vaccine distribution operations. Program managers must coordinate with country-level public health officials to ensure deployment strategies are feasible and capture the unique needs of host nations. The human resource and time requirements for the preparation of H1N1 vaccine information and training materials, as well as the identification of country specific regulatory, importation, and storage requirements led to delays in the deployment of H1N1 vaccine during the pandemic.

Case Study: H1N1 Influenza Vaccine Management

The U.S. Agency for International Development (USAID) supported the WHO-led global immunization initiative during the 2009 H1N1 Influenza. This support included financial grants to WHO, commodity grants to countries, and technical assistance at global, regional, and country levels, including assistance in communications, vaccination program management, and supply chain management. Several lessons learned have been identified.

USAID focused on providing funding for ancillary products and products themselves (syringes and safety boxes) to individual countries, while WHO focused on providing vaccines. Due to delays in clarification of which vaccine would be supplied to which country, the supply chain was unable to execute advanced planning. This situation led to the air transportation of ancillary products when surface transport would have been more appropriate and more economical. In addition, the delay in decisions concerning vaccine distribution increased the difficulty of communicating technical vaccine management guidelines to public health authorities within each country, inhibiting the ability to conduct adequate public information campaigns prior to vaccine distribution. In many cases, vaccines were distributed without management guidelines, without garnering adequate government support for vaccine programs, and without adequate public information campaigns. While data is not available to determine the impact of the shortfalls in communication, anecdotal observations suggest that the efficacy of vaccine distribution was negatively affected.

Assessing and Understanding Cold Chain Capacity

The ability of cold chains to accommodate unanticipated quantities of commodities is limited.

Globally, H1N1 Influenza vaccine distribution relied on established, in-country Expanded Program for Immunization (EPI) cold chain. In general, this system worked, but specific factors affected cold storage capacity in each country. EPI supply chains were built to accommodate routine vaccine distribution to support national immunization campaigns, and thus are not designed to expand to accommodate large increases in capacity. Therefore, the ability of these cold chains to accommodate unanticipated quantities is limited, and pandemic vaccines may require careful metering during distribution operations.

Although the target for H1N1 vaccine coverage was limited to approximately 10 percent of the population, and the vaccines were packaged in multi-dose vials (which compresses the amount of cold chain required), the 2009 H1N1 vaccine initiative did not take into account the scheduling of other national vaccination campaigns. Therefore, program managers overestimated the ability of existing cold chain storage to accommodate the H1N1 vaccine, resulting in emergency procurement of commercially available cold storage. During the 2009 H1N1 Influenza pandemic, most countries could not readily provide information regarding the status of their in-country cold chains, including the volumes available and locations of alternative commercial sources for cold chain storage.

Program managers should not rely on EPI systems for all required storage during pandemic vaccine distribution. While useful for storage during vaccine distribution, these systems are not designed to accommodate large surges in vaccine capacity, and therefore other arrangements must be made if large quantities of vaccine are allocated to a country. An assessment of cold chain storage capacity for each country should be conducted in cooperation with local supply-chain managers during pre-pandemic planning. This information should be captured and retained for use during pandemic response operations.

Conclusions

Many governments, NGOs, and supply-chain corporations continue to lack pandemic preparedness and response plans, as well as business continuity plans. And experience shows that where these plans do exist, they are often inadequate, particularly in addressing supply-chain plans, policies, and procedures. Significant additional work is required to better prepare governments, organizations, and corporations for pandemic response operations, including supply-chain activities. Additional work is urgently needed to close this gap as quickly as possible.

Governmental agencies, organizations and institutions must develop effective inventory management plans, policies, procedures, and systems capable of managing commodity items in the dynamic environment presented by a major disaster, including an influenza pandemic. These plans, policies, procedures, and systems must address product security and integrity, environmental storage conditions, expiration dates, access, and stock rotation, as well as dispatch protocols and tracking, usage guidelines, and a variety of other aspects that affect the management of commodity items.

Pre-pandemic planning must include an assessment of anticipated pandemic vaccine management program partners to determine their optimal roles and responsibilities, obtain agreement among the various partners, and include this determination in existing plans. These planned roles and responsibilities can then be quickly reaffirmed early in the implementation of the pandemic response plan. Data regarding product consumption, utilization rates, beneficiary demand requirements, and other variables regarding the use of public health commodities should be better utilized to strengthen the supply chain for future events. This information would enhance logistics preparedness efforts and inform decision-makers of budgetary requirements to support future programmatic interventions. Supply-chain managers for all response organizations should pursue methods for establishing virtual stockpiles or contractual agreements with manufacturers and vendors to limit the quantities of product for storage, to balance shelf-life concerns, and to ensure contractual relationships with suppliers.

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Travel and tourism is a growing economic sector that many countries depend on as a priority for development. During recent pandemics, travel and tourism became a factor of unprecedented global importance—not only because of the increase in international travelers and the overall socio-economic importance of the sector—but also because the expanding links and speedier connections of international travel enabled faster spread of disease. This chapter emphasizes the importance of preparedness planning and timely and honest communication with the travel and tourism sectors, particularly regarding the wording of travel warnings.

Travel and Tourism Sectors

Key Lessons in Travel and Tourism Preparedness

- Large-scale actors within the travel and tourism sector, such as the airline industry, have many years of **experience in crisis preparation and management**. This sector took pandemic preparedness planning seriously.
- **Simulation exercises** allowed continuous and further development of assumptions among private and public sector players within the industry.
- **Timely and honest communication about travel plays a crucial role during pandemics**. Communication messages must be accurate, appropriate, and consistent.
- **The wording of travel warnings is particularly important**. International and national agencies should take great care in the wording of travel warnings for both domestic and international travel. Future efforts need to be well coordinated to properly name pandemics, to avoid public confusion.
- Complacency was an issue before and after the 2009 H1N1 Influenza pandemic. While the tourism sector had a strong interest to maintain vigilance and preparedness, health authorities in countries that had not yet experienced 2009 H1N1 were hard pressed to justify their pandemic preparedness efforts. **Authorities and stakeholders must continue to advocate for strong preparedness efforts**.

A Critical Element of Global Economic Development

While the travel and tourism sector tends to be resilient, it is reliant on an “intact” environment and can be affected by negative events.

Travel and tourism is a growing economic activity, and many countries depend on travel and tourism for economic development. National and local environmental policies, regional planning, education, transport, and culture contribute to a favorable infrastructure for a successful tourism industry. At the same time, travel and tourism is heavily dependent on a safe environment, whether it is natural, cultural, social, human, or animal health environment. These factors have a direct influence on the competitiveness and market success of tourism. Although travel and tourism is generally resilient, major disasters or emergencies will undoubtedly affect it.

Within the last decade, many major events have affected global tourism: the terrorist attacks of 9/11 (2001); SARS (2003); the Asian tsunami (2004); bombings in Bali (2002, 2005), Madrid (2004), and London (2003, 2005); Hurricane Katrina (2005). In 2010 alone, the world witnessed events such as the earthquake and tsunami in Chile, an earthquake in Haiti, volcano eruptions in Iceland and in Indonesia, and an oil spill along the Gulf coast of the United States and Mexico. The economic and societal consequences of such events can be enormous. In 2003, SARS affected 26 countries with more than 8,000 cases, 774 deaths, and economic losses of US\$60 billion. The 2009 H1N1 Influenza caused limited impact in terms of human deaths, but the consequences for the travel and tourism sector were in many countries and subsectors quite significant. This pandemic caused economic losses in the travel and tourism sector of nearly €3 billion—with more than half of these losses attributed to Mexico’s economy.¹

During these recent pandemics, travel and tourism became a factor of unprecedented global importance—not only because of the growth in the number of international arrivals from 25 million in 1955 to 935 million in 2010 and the overall socio-economic importance of the sector—but because the expanding links and speedier connections of global travel enable faster spread of communicable disease. This factor allowed the 2009 H1N1 Influenza to spread around the globe in just six weeks, compared with six months for other pandemics.

¹ Economic Commission for Latin America and the Caribbean and Pan American Health Organization (2010), *Evaluación preliminar del impacto en México de la influenza AH1N1*. Economic Commission for Latin America and the Caribbean, Mexico City.

Unique Challenges for Travel and Tourism

National tourism authorities have an incentive to avoid giving information on health risks.

With as many as 8 million international travelers en route on any given day of the year, travel and tourism presents unique and complex logistical challenges for pandemic preparedness. International travelers are often unfamiliar with the emergency structures and procedures of a host country. Often, they do not speak local languages, nor are they prepared for extended stays. The increasing number of travelers that make their own travel arrangements—rather than using tour operators—also complicates logistics. In addition, many countries also have large numbers of domestic travelers, which adds to the overall volume of travelers.

Like other service industries, tourism is a trust and belief product that expects the supplier to reduce uncertainty and risk. During times of crisis, trust and belief products are much more challenging to handle. Health risks in particular present national tourism authorities with a dilemma. If they alert the public about risks in a timely manner, they may help reduce or even eliminate the danger to public health, possibly on a global scale. But at the same time, they are certain to have a negative impact on the flow of tourists to their country, and thus also on tourism earnings. And the more the country's economy is dependent on tourism, the greater the economic damage can be. National tourism authorities thus have an incentive to avoid giving information on potential health risks, especially epidemic or pandemic risks that can jeopardize a country's entire economic foundation.

Pandemic Preparedness in Travel and Tourism

Countries that experienced high losses in bookings and reservations during the SARS and HPAI H5N1 pandemics subsequently integrated travel and tourism into their emergency plans.

Not surprisingly, there is a strong relation between a country's level of development and the existence of a national preparedness plan. It is also not surprising that the countries that have integrated travel and tourism in their national preparedness plans are those countries that experienced high losses in bookings and reservations during the SARS and HPAI threats. In 2008, the World Tourism Organization (UNWTO) surveyed the integration of travel and tourism into national emergency structures among its member states. Of the countries surveyed, about 72 percent had national emergency plans—the majority of those plans had been created in the last 10 years. The countries that had most consistently integrated travel and tourism were those that had experienced past incidents.

The tourism sector has taken pandemic planning very seriously. All major airports, tour operators, cruise liners, attraction parks, and large service providers developed pandemic management plans. Although these efforts were usually triggered by overall efforts related to pandemic preparedness, they were streamlined within each company's own general crisis management plans—following a path which started some 15 years ago. As a result, the travel and tourism sector has gradually developed holistic crisis management. However, smaller tour operators and service providers are not addressing pandemic planning with the same determination, resulting in a gap among these providers.

UNWTO's efforts in the field of risk assessment and crisis management have to be recognized and appreciated. It set up a working group on risk assessment and crisis management, chaired by France and co-chaired by Thailand and Canada, that was active in assisting in Asia during the early pandemics and other natural disasters. In 2008, it launched a crisis management platform to provide an online source for up-to-date pandemic information for the travel industry. As part of its preparedness efforts, the UNWTO conducted a number of international simulation exercises. These were always aimed at wide private and public sector participation, particularly from as many different public sector areas as possible—whether from the travel and tourism sector, health, transport, foreign affairs, interior, civil protection or communications—and with a strong participation of international organizations, especially from the UN System Influenza Coordination. The simulation exercises allowed continuous and further development of assumptions, which were the basis of all pandemic planning and preparedness activities.

Case Study: Tourism in Thailand and Other ASEAN Countries

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In Thailand, tourism follows agriculture, exports of goods, provision of services, and foreign investment in terms of importance for the country's economy. The country's tourism strategy calls for facilitation of travel, liberalization of tourism services, joint marketing and promotion, sustainable tourism development to alleviate poverty, and community-based tourism to raise the standard of living for local people. Thailand recorded 11.5 million international tourist arrivals in 2005—a 1 percent drop following the 2004 tsunami. However, in 2006, arrivals rose to 13.8 million, and were estimated to reach 14.6 million in 2007. The HPAI H5N1 pandemic and political uprisings also affected Thailand's tourism. Thailand is an active member of ASEAN, and the regional organization has aided Thailand in boosting tourism and helping with multi-sector pandemic preparedness.

Following the 2004 tsunami, the UNWTO drafted the Phuket Action Plan, raising awareness of risk and crisis management in tourism. Because of tourism's importance to the economy and the vulnerability of the industry, Thailand placed emphasis on risk and crisis management. As negative publicity from the tsunami had a severe impact on tourism for affected countries and the region as a whole, ASEAN campaigned strongly in favor of accurate information on the impact of the disaster. Learning from the tsunami experience, ASEAN assures tourists of the destination's safety and works in collaboration with the tourism industry, to support not only Thailand, but neighboring destinations as well.

The UN and ASEAN continued their efforts when an earthquake hit Java, Indonesia, in 2005. Airlines and travel agencies were urged not to cancel trips to Indonesia, a message much appreciated by the Indonesian government. Collaboration between international organizations, the private sector, and the media proved very useful. This would of course not have had the same impact if reliable information and timely action had not been taken.

ASEAN, within the region, is also focusing on crisis communication in tourism. The "Roadmap for ASEAN Integration" translated ASEAN's commitment to develop a regional crisis communication framework and action plan. ASEAN's second pandemic simulation exercise has integrated tourism into its multi-sector approach. ASEAN's crisis communication manual provides a common framework for national tourism organizations in managing communications in crisis. ASEAN member countries are translating this manual into their local languages, and workshops and training will be conducted in the future.

The Tourism Emergency Response Network

In 2005, UNWTO and the World Economic Forum conducted a comprehensive study of emergency networks, which unveiled many insufficiencies in emergency systems related to travel and tourism. The study identified several key characteristics for developing a global response system: 1) the system should be based on existing structures so that it would stay active and relevant even during times when there is no crisis; 2) it should allow for fast reaction and communication, capturing information at the global level, while emphasizing the relevant elements from local and various sectors; and 3) all partners should be equal. Based on these findings, the UNWTO launched the Tourism Emergency Response Network in 2006. During 2009 H1N1 Influenza, the network met as often as twice a week by conference call and all key players participated, including WHO and International Civil Aviation Organization. WHO's participation included various departments, including representatives of the International Health Regulations in all meetings. As part of pandemic preparation, member states nominated tourism administrators as influenza focal points. These focal points received continuous information, findings, and guidance, as they were being developed and disseminated by the network secretariat, WHO, and other agencies, and liaised back with the network secretariat, to ensure timely, two-way communication.

The 2009 H1N1 Influenza Experience

Early one morning in late April 2009, the UNWTO's crisis management department received an alert from the UN's Department of Public Information that an unusual form of H1N1 Influenza had been observed in Mexico and the United States, and required international attention. It was agreed that WHO would be the lead agency to ensure consistency and a single, unified approach.

WHO and UN Department of Public Information were informed that the UNWTO's secretary general was set to travel to Mexico to open a tourism fair, alongside Mexico's president. Talking points were developed to ensure the best support for the travel and tourism sector. Within two hours, the Tourism Emergency Response Network was alerted, and these talking points were distributed.

Within days, following the protocol of the International Health Regulations, WHO declared the situation an international public health emergency. From that moment and for the following weeks, UNWTO was directly engaged into a new process of emergency coordination and communication through the Tourism Emergency Response Network. Informing and consulting the influenza focal points network allowed for two-way communication, which in turn improved the relevance of the messages and actions by all the network actors, including UNWTO, WHO, and the International Civil Aviation Organization. This direct, two-way communication proved extremely helpful during the beginning of the pandemic, when sector stakeholders and member states needed to be kept informed. Undifferentiated communication efforts using media channels or press releases would not have achieved the same openness and efficiency.

Members of the Tourism Emergency Response Network

Airport Council International
African Travel and Tourism Association
American Hotel and Lodging Association
American Society of Travel Agents
Arab Tourism Organization
Asociación Latinoamericana de Transporte Aéreo
Association of Asia and Pacific Airlines
Association of European Airlines
British Travel Association
Canadian Tourism Commission
Caribbean Tourism Organization
Caribbean Hotel and Tourism Association
Cruise Lines International Association
European Travel Agents' and Tour Operators' Associations
European Travel Commission
Federation Internationale de l'Automobile
German Travel Association
International Air Transport Association
International Association of Amusement Parks and Attractions
International Association of Travel and Tourism Professionals
International Hotel and Restaurant Association
International Shipping Federation
Meeting Profesional International
National Tour Association
Pacific Asia Travel Association
Tour Operators' Initiative for Sustainable Tourism Development
United Federation of Travel Agents' Associations
US Travel
World Travel Agents Associations Alliance
World Travel and Tourism Council
World Tourism Organization
World Youth Student and Educational Travel Confederation
World Youth Student and Educational Travel Confederation

The 2009 H1N1 Influenza pandemic generated many lessons learned. Although the resulting financial and economic crisis affected many countries, a large portion of the economic burden of this pandemic was shouldered by the travel and tourism sectors. Interestingly, there is a tendency to publish information during an emergency, but not afterwards—therefore it is difficult to assess the full impact of 2009 H1N1 Influenza. In the case of 2009 H1N1 Influenza, the pandemic plans that had been developed based on various scenarios and assumptions were different than the actual actions which were carried out—suggesting that pandemic plans need further review and updating for broader types of pandemics.

The Need for Consistent Global Messaging

Timely and honest communication plays a crucial role during pandemics. Since information and reporting is critical for containment of the disease, communication messages must be accurate, appropriate, and consistent. Travel and tourism is easily disrupted by wrongly handled communications and inconsistent measures. Therefore, it is critical that national tourism organizations, as well as public health agencies, work together to create clear, consistent messages.

As with other communication, the wording of travel warnings is particularly important. During 2009 H1N1 Influenza, WHO included a travel warning in its global statement that recommended the delay of international travel during illness. UNWTO recommended an alternative phrase, “If ill, it is prudent and responsible to stay at home and avoid traveling until fully recovered”—emphasizing that during a pandemic, a sick person should remain at home and not travel at all, whether travel is to work or to domestic or international destinations. While WHO agreed in principle to this recommendation, the International Health Regulations’ legal framework deals only with international recommendations, and WHO was not in a position to make recommendation about domestic policies. This situation highlighted an example where unnecessary inconsistencies could be incorrectly interpreted by the general public—and clearly should be resolved in the future. Ultimately, while WHO had issued global recommendations regarding travel, many countries implemented their own policies, such as limiting or banning flights from affected countries, warning citizens against travel to certain countries, and screening travelers at airports. Following the experience of the 2009 H1N1 Influenza pandemic, UNWTO advocated among international public health agencies to ensure precise and appropriate wording for travel warnings.

Another issue related to messaging for travel communications was the confusion around the name of the virus. Even prior to the 2009 H1N1 Influenza pandemic, WHO avoided naming any pandemic after a specific geographic area. However, the initial naming of 2009 H1N1 Influenza as the “swine flu” caused irrational slaughtering of pigs, affecting the meat production and export sectors. As a result, the World Organization for Animal Health issued a press release and proposed naming it the “North-American influenza.”

While WHO ensured that the naming process had been thought through beforehand, in fact, different names for the pandemic were used around the world: swine influenza, Mexican flu, the novel H1N1 flu, influenza A (H1N1), and pandemic (H1N1) 2009. Future efforts need to be well coordinated to ensure precise and appropriate naming for pandemics to avoid international and public confusion and misunderstandings about the source or regions affected.

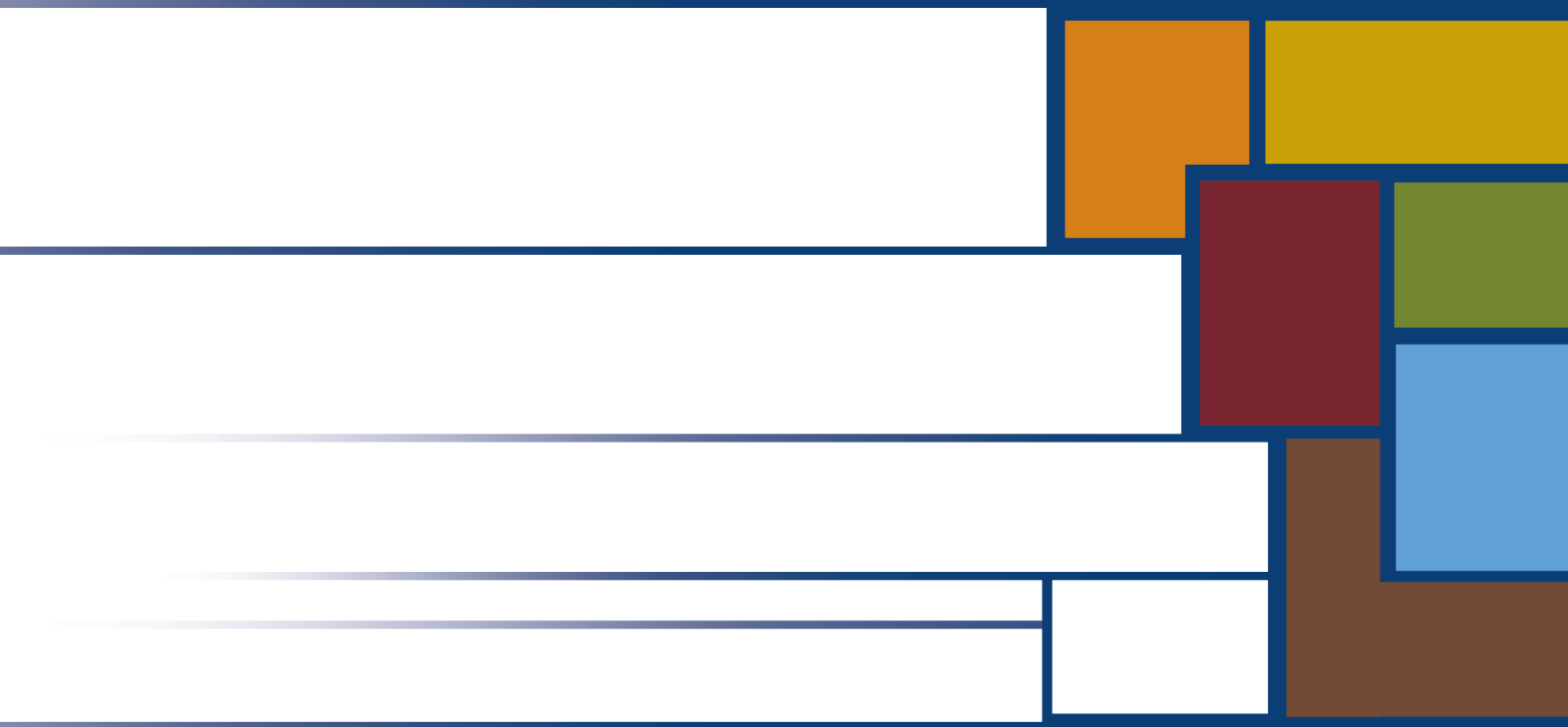
Staying Vigilant

Complacency in the tourism and travel sectors was an issue before and after the 2009 H1N1 Influenza pandemic. Many players had difficulties assessing the relevance of their own actions as they related to overall response efforts. After the first wave of the pandemic had peaked in the southern hemisphere and affected the northern hemisphere, UNWTO initiated a series of review and exercises, aimed to identify good practices and deficiencies. Interestingly, while stakeholders in the tourism sector had a strong interest in maintaining vigilance and preparedness, health authorities in several countries that had not experienced the pandemic had problems justifying their pandemic preparedness efforts. Authorities and stakeholders must continue to advocate for the importance of pandemic preparedness.

Conclusions

The global travel and tourism is a growing economic sector that many countries depend on as a priority for development. Large-scale actors within the industry have long recognized the need for crisis planning. Following the early pandemics, and with support from the UNWTO, many international tourism and travel organizations have begun preparedness planning. However, international agencies and national governments must remain vigilant to ensure continued preparedness and readiness between emergencies.





Editors: Michael Mosselmans, Ronald Waldman, Cindi Cisek, Eileen Hanlon, Cindy Arciaga
Designer: Greg Berger Design

