

Pandemics: Health Care Emergencies

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Introduction

Pandemics have a global reach of mass destruction and historically have been more devastating than any other type of disaster. Over many centuries, only the human-made disasters of war and the intentional extermination of ethnic groups have competed with the lethality of infectious disease outbreaks. The history of the influenza pandemic – occurring about every 10–30 years – has marked global reach and concern for mass illness, chronic disability, and death. In centuries past, this concern included the plague, polio, tuberculosis, and smallpox. The Spanish Influenza pandemic of 1918–1919, during which an estimated 20–40 million people died (more people than died in World War I), is a reminder of the deadly potential of this global disaster (<http://virus.stanford.edu/uda/>). Though prevention, early detection, and treatment interventions appear to be lowering the number of people infected, there has been a steady rise in human infectious disease outbreaks over the past three decades (Smith et al., 2014). In the past decade alone, outbreaks of Severe Acute Respiratory Syndrome (SARS), H1N1 “swine” Influenza, and Ebola resulted in significant concern throughout the international community. Middle East Respiratory Syndrome (MERS) and, more recently, the Zika virus have caused significant morbidity and mortality. These outbreaks all represented significant threats to global health security and highlighted the mental health issues that are relevant to a pandemic outbreak.

Expanding world populations produce urbanization with increased population density that favors disease transmission, and climate change modifies global ecologies that influence the likelihood of transmitting infectious organisms (Morse, 1995). The large-scale migration of animals and people creates a growing public health concern of epidemic risk. The global mobility of people and various disease vectors are primary mechanisms by which new infectious

agents spread rapidly to a population with no previous exposure and no immunity, bringing disease vectors (e.g., certain species of mosquitoes) to new environments. These factors have been essential elements in the genesis of all global infectious disease outbreaks since the turn of the century. For example, at the time of the Hajj each year in the 12th month of the Islamic (lunar) calendar, more than one million people travel to Mecca – nearly half from non-Arab countries. Similarly, for the smaller ritual Umrah, more than 2.5 million traveled in 2004 to Mecca. This mass migration raises the potential for major public health and infection control problems (Ahmed et al., 2006). Other times of human migration – holidays and vacations – and the “human migratory patterns” are routes of transmission as well.

Pandemics and other infectious disease outbreaks result in psychological stressors and behavioral responses. Unlike other natural or human-made disaster events, infectious organisms cannot be perceived with the naked eye. Most people do not know they have been impacted until they are infected with potentially lethal consequences. The protracted and evolving nature of these events can result in escalating worry and distress. Like other disasters, the media plays a significant role in shaping public perception. Trust in government authorities and perceptions regarding their ability to manage an outbreak directly impact the degree to which the public participates in health risk behaviors designed to avoid infection, treat illness, and prevent spread of disease. The use of infectious outbreaks to inspire fear by political figures, community leaders, and the media to further unrelated agendas has colored the overall experience of these events by the population. The ability of governments to effectively respond is complicated by the fact that infectious diseases may first emerge during political unrest, revolution, or war.

Empirical data is more limited regarding the mental health impacts of pandemics than for other

natural or human-made disasters. While research attention has increased in recent years, most pandemics in the last century received limited study by behavioral scientists. This chapter selectively reviews the available mental health literature concerning the most impactful global infectious disease outbreaks: the ongoing HIV-1 epidemic first recognized in the early 1980s as well as outbreaks of other, less lethal infectious agents, that began in the 21st century. Salient case examples are used to illustrate mental health consequences. An overview of public health response and management of pandemic is reviewed throughout various disaster phases, and focused issues regarding mental health intervention planning for pandemics are considered.

Psychological and Behavioral Response to Infectious Disease Outbreaks

Since the highly lethal pandemic outbreak of influenza in 1918 there have been several global threats from infectious agents. The outbreaks of HIV-1 infections (associated with AIDS and numerous secondary infections), MERS, SARS, H1N1 Influenza, Ebola, and Zika infection caused global concern and brought worldwide attention to infectious disease spreading around the world. HIV-1 infections resulted in catastrophic consequences, including loss of life and disabling associated illnesses. Since AIDS/HIV-1 was recognized in the early 1980s, at least 34 million people have died of AIDS-related illness (Quinn et al., 2016). The World Health Organization (WHO) estimates that 37 million people currently live with HIV-1 infections (WHO, 2015). Overall, the impact of the HIV-1 pandemic has been compared to Spanish influenza in the early 1900s and bubonic plague in the 14th century.

Though the other outbreaks mentioned in this chapter have not resulted in catastrophic global pandemics, they provide useful data on the mental health concerns that are relevant in large-scale outbreaks of infectious disease. This experience can be treated as a series of case histories that provide examples of behavioral and psychiatric risks associated with epidemics. For heuristic purposes, oversimplified abbreviated case histories of these pandemics are considered. Hopefully, more extensive studies in the future can better document the relationships between pandemics and behavioral responses to them.

HIV-1/AIDS

The first identified manifestation of HIV-1 pandemic was Acquired Immunodeficiency Syndrome (AIDS). It was initially identified in the Western medical community in 1981, when two groups of gay men presented with unexpected diseases. One group in New York had an unusual tumor, Kaposi's sarcoma, and the other group in San Francisco presented with pneumocystis pneumonia (avian tuberculosis). All of these conditions were deadly. This introduction of AIDS to the United States generated great uncertainty and significant anxiety. Many more cases of AIDS were identified, and clinical studies indicated infection by an RNA retrovirus. This virus infected a variety of blood cells, particularly targeting the immune system. The development of a diagnostic test for the HIV-1 virus and isolation of the virus further clarified the nature of the complex disease. Initial infection by HIV-1 caused a flulike syndrome, whereas the final stages of the infection, characterized by a loss of immunity, often resulted in malignant tumors and terminal infections. It was determined that initial infections of HIV-1 generally occurred an average of 11 years before terminal illnesses developed. As a result, the health care community realized that, by the time the initial AIDS cases were recognized, the pandemic had been going on for more than a decade.

Though AIDS was identified relatively promptly after it first emerged in the developed world, it had been actively spreading throughout Africa for nearly 20 years. It spread largely through heterosexual contact and contaminated blood used for various applications. Maternal-fetal transmission and the passage of infection through intravenous drug needles would subsequently result in significant morbidity and mortality to various populations. As the clinical and epidemiological nature of the disease were clarified, it became apparent that genital sexual contact with exchange of fluids (heterosexual or homosexual) was an important way of transmitting the virus. A common behavioral response to a pandemic is to make erroneous assumptions about the nature of the disease based on very incomplete initial information. During this earlier period characterized by uncertainty and misinformation, the fact that the initial patients were homosexual led to the erroneous assumption that AIDS was a "homosexual" disease. For instance, Kaposi sarcoma associated with AIDS was labeled "gay cancer" (Washer, 2010). At the time,

homosexuality was considered deviant behavior by the majority, which resulted in a range of sociocultural and political responses. Laws were passed in some locations that isolated and punished individuals identified as male homosexuals. In some instances, transmitting the disease was criminalized. It was also reported that 20% of those with AIDS were physically assaulted (Grmek, 1990; Herek, 1999).

The tendency to scapegoat patients is not uncommon in pandemics. As a result of this misperception, early disease sufferers were highly stigmatized regardless of their sexuality or the actual origins of the infection. Teenager Ryan White was a hemophiliac who was infected with HIV-1 through a transfusion used to treat his medical condition. He developed AIDS and initially was not allowed to return to school after partially recovering his health following treatment, but was eventually admitted to the school after an eight-month legal battle. He eventually became a hero to many. This demonstrates one of the behavioral reactions that may have a mixture of effects; an individual is initially stigmatized, but is later seen as a hero for gracefully managing an infectious illness contracted through a mechanism outside his control. Various pandemics may lead to scapegoating of specific groups, such as homosexuals or various ethnic groups, who are blamed for causing or spreading the illness. Misinformation, fear messaging, and inadequate leadership increase the likelihood of scapegoating and other fear-based behaviors that can result in misdirected resources and injury to social cohesion.

In addition to cancers and opportunistic infections, additional research revealed AIDS was associated with significant neuropsychiatric disease, including dementia, depression, psychosis, and other symptoms. The antivirals used to treat the infection also demonstrated significant drug interactions, particularly with medications used to treat neuropsychiatric symptoms. These medical findings further articulated the degree to which HIV-1/AIDS represented a major global public health concern. However, a variety of social, cultural, and political beliefs and agendas slowed efforts to control the spread of the infection. Some African leaders felt that the presence of AIDS would result in stigma and abuse by Western authorities for the purpose of achieving economic and political advantages. Thabo Mbeki, President of South Africa from 1999 to 2008, questioned the correlation between HIV-1 and AIDS. He voiced skepticism about the efficacy of anti-retroviral therapies, subsequently banning their use.

As a result, it is estimated that nearly 365,000 people with HIV-1 died due to lack of access to treatment, including pregnant women whose infants were subsequently infected as well (Chigwedere et al., 2008).

Though sexual transmission was well documented, the use of condoms was seen as sinful and discouraged by some religious groups and leaders. In this way religious beliefs and messaging by leaders had a profound adverse impact on disease prevention. Other public health interventions, such as providing clean needles to drug users, may have also limited the spread, but were seen as controversial and never fully implemented. Another behavioral response to AIDS was the development of folk and traditional treatments that did not control the disease progression or transmission. For instance, one simple but important method of preventing disease transmission is male circumcision. Various folk and traditional beliefs about circumcision decreased utilization of this prevention in some cultures. Public health officials attempting to control spread of the disease early in the epidemic assumed that everyone in the population would favor the use of all means necessary to limit the spread of infection. These and other behavioral responses, which had a significant adverse impact on transmission of the disease, demonstrated this assumption was not accurate.

The challenges and responses to this epidemic include both successes and failures, therefore it may provide a useful model for examining behavioral and psychiatric consequences of epidemic infectious disease. The global management of HIV-1/AIDS began more than four decades ago. The initial pandemic illness was never effectively isolated or eradicated, and the disease has become an established and enduring aspect of the world's health burden. The excitement about the threat it constitutes has received diminished media attention and has become less visible to the public. HIV-1/AIDS illustrates that, for a society, acceptance and avoidance may represent a society's cognitive, behavioral, and cultural responses to failed efforts at controlling pandemic illness. HIV-1/AIDS illustrates the adverse impact that erroneous assumptions and marginalizing of various groups can have on disease management. Stigma around HIV-1 infection continues, to varying degrees, throughout the world. Socioeconomic, political, and religious factors heavily influenced the early global progression of HIV-1 infection. An awareness and consideration of these factors and behavioral responses may enhance

decision-making and communication by leaders and public health officials to allow for earlier prevention, detection, and treatment of future pandemic outbreaks.

Severe Acute Respiratory Syndrome (SARS)

The SARS outbreak was the first new global epidemic of the 21st century, which spread from China throughout Asia and beyond between 2002 and 2004. The first presumed case was reported in Guangdong, China, in November 2002. The illness spread to Hong Kong, Singapore, and Taiwan and more broadly throughout Asia. In response to growing awareness and concern, WHO issued a heightened global health alert on March 12, 2003 regarding a mysterious pneumonia. The illness spread from Asia to Canada, Europe, and the United States, eventually affecting 29 countries. By July 2003, 8,098 cases were reported with a 9.6% fatality rate. SARS is caused by a coronavirus and is spread through airborne transmission. It impacts elderly and those with weakened immune systems at a disproportionate rate and with much higher lethality than most infectious agents that result in a similar constellation of symptoms. WHO officially declared China free of SARS in May 2004.

Nearly 40% of the community population experienced increased stress in family and work settings during the outbreak; 16% showed signs of traumatic stress; and high percentages of the population felt helpless, apprehensive, and horrified by the outbreak (McAlonan et al., 2005). About 30% of the community thought they would contract SARS, and only a quarter believed they would survive if they contracted the disease, despite an actual survival rate of 80% or more. Such a high rate of perceived risk might have preceded widespread distress and disruption had the outbreak been either more widespread or more lethal (Lau et al., 2005). In addition to adverse mental health symptoms, elements of resilience in different subpopulations of adults were observed. One study found that, during the SARS outbreak, only elderly adults living in the most highly infected areas reported lower levels of subjective well-being, while those living in less infected areas, as well as younger adults, remained within a previously established normal range (Lau et al., 2008).

Community residents were diligent in adopting person-to-person transmission precautions. However, precautions were adopted differentially based on anxiety levels and perceived risk of contracting the disease,

indicating the importance of stress and anxiety, as well as baseline mental health, on the public's willingness and ability to take necessary precautions (Lau et al., 2005). The experience of an infectious disease outbreak, even among those that did not contract the illness, can have long-lasting impacts on a community. Following resolution of SARS illness, 9.2% of residents in more highly impacted communities reported feeling more pessimistic overall about life, with older adults, high school seniors, and those worried about recurrence being most affected (Peng et al., 2010). In addition, well after some communities were declared free from further transmission by WHO, people continued to avoid leaving their home, wearing surgical masks when leaving their home, and sterilized cleaning of their homes (Cheng, 2003).

Health care workers were particularly vulnerable to developing mental health symptoms as a result of treating outbreak victims. Nurses who treated SARS patients reported high levels of stress and about 11% had traumatic stress reactions, including depression, anxiety, hostility, and somatization symptoms (Chen et al., 2005). As with many infectious disease outbreaks, health care workers disproportionately developed SARS. Those not infected often experienced heightened anxiety and distress about the possibility of infection, accompanied by the requirement to care for increasing numbers of ill patients and colleagues while living with a constant sense of uncertainty (Maunder et al., 2003). Inadequate worker capacity caused significant concern in the nursing community and led to health care personnel citing a right to refuse to work (Tzeng, 2004).

The SARS outbreak highlighted the significance of public education in the adoption of protective health behaviors. In addition, there were disparities observed in adverse psychological effects based on age and socioeconomic status. Accurate, timely, and ongoing public health education campaigns that bridge the gap of health disparities by accessing the broadest range of citizens can aid prevention and treatment efforts during infectious disease outbreaks. Though all disasters have the potential to disproportionately impact health care workers, infectious outbreaks have unique and severe consequences. Ensuring that health care personnel receive education to understand the infectious disease, are supplied with and trained to use personal protective equipment, and have access to medical and mental health resources can reduce adverse psychological effects on this population. In addition, health

care worker stress can be reduced by ensuring adequate health care worker capacity during response to crisis situations, such as infectious disease outbreaks (Ruderman et al., 2006).

H1N1 Influenza Virus

Between 1918 and 1920, the H1N1 influenza virus infected 500 million people around the world, ultimately killing between 50 million and 100 million. In spite of advances in prevention, detection, and treatment, eradication of H1N1 influenza virus has remained elusive. In 2009, cases of H1N1 began in Veracruz, Mexico, months before it was officially recognized as part of an early epidemic. The virus appeared as a new strain of H1N1 resulting from the triple reassortment of bird, swine, and human flu viruses, which further combined with a Eurasian pig flu virus leading to the label “swine flu.” Efforts in Mexico to close public facilities in an attempt to contain the spread of illness were unsuccessful, with the virus spreading around the globe over the next several months. In late April 2009, WHO declared its first ever “public health emergency of international concern.” In June 2009, WHO and U.S. Centers for Disease Control and Prevention (CDC) declared the outbreak a pandemic. Like the pandemic of 1918, the resurgence of H1N1 raised particular concern because it commonly infected previously healthy individuals. Unlike most strains of influenza, H1N1 demonstrated no predilection for the elderly. Symptoms typically lasted four to six days, with a minority of patients appearing to resolve and then abruptly developing onset of fever and shortness of breath. This Acute Respiratory Distress Syndrome caused significant concern in the health care community. Before the pandemic was declared over in late 2010, the total number of fatalities attributed to the H1N1 was approximately 200,000 but may be higher, with nearly 65% of all deaths occurring in those under age 65 (Shrestha et al., 2011; Simonsen et al., 2013).

In the H1N1 pandemic, 45% of people worried they or a family member would become infected; 10.7% felt panic, depression, or emotionally disturbed as a result of H1N1; and 14.9% were fearful about the pandemic announcement (Gu et al., 2015). Another study found that 76.5% of respondents avoided going out or visiting crowded places or hospitals, with females and older respondents being more likely to adopt avoidance behaviors (Lau et al., 2010).

A systematic review of perceptions and behavioral responses found that, in most countries, perception of vulnerability increased over time, while self-efficacy decreased (Bults et al., 2015). Increased psychological distress, feelings of vulnerability, and social isolation worsen mental health for individuals and have adverse social and economic consequences for communities.

Mass psychogenic illness can occur when large groups of individuals collectively develop a fear that they have developed an illness even in the absence of disease. Clusters of mass psychogenic illness were observed following vaccinations in school-aged children. Approximately 3% of children vaccinated experienced mass psychogenic illness consisting predominantly of symptoms including dizziness, nausea, weakness, and headache. The average age was 13 and 67% were female (Huang et al., 2010). Evaluation of these incidents resulted in recommendations aimed at reducing the frequency of occurrence of mass psychogenic illness, including vaccinating first those students who report less fear of injection, providing support volunteers or teachers to help relieve anxiety, and having students sitting down during the 30-minute observation period following vaccination (Huang et al., 2010).

A critical aspect of pandemic preparedness and response is the use of health risk behaviors by the general public to prevent infection, treat illness, and reduce transmission. As a result of the H1N1 pandemic, myriad research evaluated the relationship between mental health symptoms and health risk behaviors, such as use of preventive measures including vaccinations, hand washing, and social distancing. Anxiety about risk of infection was more likely to cause individuals to adopt preventive behaviors than was a factual perception of risk alone. This suggests that emotional factors, more than cognitive ones, lead to behavior change during a pandemic. Research in younger and older adults found that anxiety, worry, and perceived severity of H1N1 relative to SARS predicted adoption of protective health behaviors (Liao et al., 2014). Among university students, increased worry led to increased adoption of vaccination and other prevention behaviors such as washing hands and avoiding crowded places (Serino et al., 2011). A critical factor in the management of infectious disease outbreaks is the fact that perceived reliability of information provided by the government affects community behavior. A series of surveys in the Netherlands demonstrated decreased perceived

reliability of government information about H1N1 that correlated with increased perceived vulnerability. Trust in government regulators was also shown to be an important determinant in the willingness of people to take newer antiviral medications (Quinn et al., 2015). Additional studies found that those who had the most doubt regarding adequacy of governmental preparedness were most likely to experience emotional distress (Lau et al., 2010).

The H1N1 pandemic reaffirmed the psychological and behavioral impact of these events. It also highlighted the importance of risk perception in planning and response efforts to optimize health risk behaviors and collaboration between the general public, community leaders, and government officials. Following the H1N1 pandemic, U.S. government and private-sector disaster mental health experts conducted a comprehensive review and provided recommendations for public health officials to mitigate the impact of an influenza pandemic. The recommendations focused on vulnerable populations and emphasized interventions, education and training, and communication and messaging, noting the importance of including behavioral health and science expertise in a comprehensive public health response (Pfefferbaum et al., 2012).

Ebola

The Ebola outbreak that began in early 2014 was the largest and deadliest in recorded history, killing more than 11,000 people, including citizens as well as aid workers (CDC Case counts page), before being brought under control in 2015. Ebola's highly infectious and virulent nature, rapid progression, and high fatality rate created an unparalleled level of fear throughout the international community that would later be declared a global threat to international security by the United Nations Security Council (United Nations, 2014). A global public health response was initiated, bringing health care and aid workers from around the world, costing Africa an estimated \$15 billion (Reuters, 2015).

Significant worldwide concern emerged in light of media coverage indicating that several infected individuals departing West Africa arrived at other countries without their illness being detected at the airport. Fear behaviors were central to the ongoing spread and worsening impact of Ebola outbreak in West Africa with symptomatic patients escaping from treatment

units, families concealing sick relatives at home, preferential use of traditional healers, and physical contact with infectious corpses (Chan, 2014). Exacerbating concern among health care workers was the growing rate of infection and death by exposure to patients, with 649 infected and 365 dead by late December 2014 (WHO, 2014).

Health care workers are often at increased risk for adverse psychological symptoms following disaster events. Workers caring for infected Ebola patients have been especially vulnerable due to inadequate protective equipment, fear and stigmatization by their family and friends, and the persistent threat of contracting a disease that is frequently lethal (Hewlett & Hewlett, 2005). Health care workers infected with Ebola have experienced anger, anxiety, and insomnia (Mohammed et al., 2015). Further, the stress of providing care while wearing extensive protective gear cannot be ignored. Being continuously gowned, gloved, and masked in a hot environment while trying to provide medical care is often physically and mentally exhausting. The breakdown of care in this situation is a real risk, which can result in care providers' feeling guilty, withdrawing emotionally, and the collapsing morale of the care team. The likelihood of care delivery failure is increased when resources are poor and there is inadequate social and emotional support for caregivers who are themselves at risk for contracting these infectious diseases.

A particular challenge in managing mental health during the Ebola outbreak was a profound shortage of mental health providers. Sierra Leone and Liberia were two of the countries most impacted by the outbreak. At the time, they had a combined population of more than 10 million, but only a single psychiatrist for each country, several dozen mental health nurses, and approximately 100 trained paraprofessionals who assess and manage common mental disorders (Levin, 2014). Trained, knowledgeable mental health personnel are essential to address the psychological needs of a community experiencing distress.

In the United States, the emergence of four cases of Ebola during one month created extraordinary levels of fear well in excess of any actual risk, accusations regarding breached protocols and poor training, and inadequate equipment (Black, 2015). Fear-related internet activity, such as searches to learn about and assess the presence of Ebola symptoms, were directly proportional to the frequency of media coverage, demonstrating the important role of media in

the experience of public fear (Towers et al., 2015). Inadequate data currently exists to determine the mental health impact of the Ebola outbreak on citizens of the United States and other countries outside West Africa. However, research has demonstrated that indirect exposure to mass trauma through the media, largely dominated by distressing and repetitive imagery, results in increased rates of acute stress following a large-scale traumatic event (Holman et al., 2014). Consequently, it is reasonable to assume that many people exposed to Ebola only through ongoing and widespread media coverage may experience adverse mental health symptoms. Regardless, many communities throughout the United States developed heightened anxiety even with no actual risk through exposure, movement restriction, or quarantine activity. The development of this “contagion of fear” is a critical reminder that the scope of behavioral health effects resulting from infectious outbreaks are neither directly related to actual risk nor limited by proximity.

An important psychological aspect of treatment for Ebola was the need to quarantine, which frequently increased distress for both the patient and his or her family. Conversely, the inappropriate use of quarantine and travel restriction were also utilized by government leaders. In the United States, health care providers returning from providing care to Ebola patients were detained and forcibly quarantined contrary to established standards of care. In addition, military personnel involved in constructing health care facilities in West Africa were quarantined upon return to the United States in spite of having had no contact with ill patients. In both cases, fear drove the development of policies and procedures that were in direct conflict with contemporary medical evidence and recommendations by the country’s highest medical authorities. While fear-based decisions, such as quarantine against expert medical advice, may enhance the perception of safety for some in the community, this may ultimately result in increased anxiety and confusion, while eroding trust as the public observes various sectors of the government working in opposition to one another.

The Ebola outbreak and subsequent fear response within the regional and international community highlight the importance of effective communication, education, personnel resources, and cultural sensitivity and awareness when managing international disease outbreaks (Morganstein & Ursano, 2014). Effective support for health care providers through

Table 18.1 Important features and lessons learned from prior pandemic outbreaks

Risk perception (vs. actual risk) governs individual & community behaviors
Timely & accurate information enhances public trust
Population-based prevention & treatment measures are enhanced by education
Cultural & religious beliefs & practices impact adherence to recommendations
Fear-based decision-making increases population distress & erodes trust
First responders have unique psychological vulnerabilities
Adequate resourcing of health care personnel is critical to sustaining response efforts
Media plays a critical role in public perception of risk & safety
Behavioral health interventions are essential in preparation & response

education and training as well as the provision of adequate resources and support can optimize critical treatment interventions. An understanding and management of fear-based decision-making, particularly among leaders, enhances trust and reduces distress for a population.

Infectious outbreaks during the 21st century provide valuable lessons that assist the public, first responders, health care providers, community leaders, and policy-makers in optimizing management of future pandemic events (see Table 18.1).

Public Health Management of Pandemic Illness

Adequate preparation, response, and recovery are essential to optimize community well-being and reduce distress in response to disasters. Widespread outbreaks of infectious disease, such as a pandemic, create unique issues that should be addressed by those leading disaster management efforts, including community leaders and media personalities. Fears of contagion, isolation, and stigma associated with infection have an effect on management of pandemics generally observed following other events, such as natural disasters and mass violence. The awareness and management of tipping points, which dramatically alter levels of fear and health risk behavior within a population, are critical in the process of managing widespread or global outbreaks. Risk and crisis communication take on a heightened significance, as population behavior will be largely governed by beliefs and level

Table 18.2 Similarities and differences in CBRN, natural disaster, and pandemic

Dimension	CBRN ^a	Natural disaster ^b	Pandemic ^c
Altered sense of safety	++++	+++	++++
Intentional	+++		
Unpredictable	+++	++	++
Localized geographically		+++	
Local fear	+++	+++	+++
National fear	+++		+++
National bereavement	+++	+	+++
Consequences spread over time	+++	++	+++
Loss of confidence in institutions	+++	+	+++
Community disruption	+++	+++	+++
Target basic societal infrastructure	+++		
Overwhelm health care systems	++++	+++	+++
Hoaxes/copycats	+++		

^a CBRN – chemical, biological, radiologic, nuclear

^b Natural disaster, e.g., hurricanes, tornados, earthquakes

^c Pandemic – infectious epidemic that is not localized and can span the globe

of concern. Those preparing for and responding to pandemics should remain vigilant about and plan for these unique and inevitable factors.

Infectious disease epidemic may appear to develop quickly, but the consequences of such events are likely to be long-lasting. Unrecognized spread of an infectious agent may produce a chronic problem like HIV-1. Incubation is a poorly understood concept in lay circles. In the case of the HIV-1 epidemic, the virus spread rapidly and the deadly consequences were only recognized after some delay. Care for the infected includes care for new cases as well as those who may carry the virus over decades. Development of effective early detection systems are critical to future planning, but may be expensive when cost over time is considered. Resistance to committing public expenditures required to ensure early detection is common, as one common behavioral response to pandemics is to assume that delayed recognition is sufficient.

The management of behavioral health aspects of a pandemic outbreak is divided into three phases: preparedness, early outbreak response, and later response and recovery. Preparation begins with realistic assessment and communication of risk before it occurs and commitment to do the best one can with the resources available. Then one must develop access to necessary, additional outside resources that are not available at the disaster site. The first step in fostering health, and enhancing psychological, emotional, and behavioral

responses at the crisis site is an effective public health program of risk assessment and communication, public health prevention measures, and consequence management that can be known by the community at risk and practiced by all. These require effective political and community leadership, appropriate prevent organization, and staffing and funding. The interrelationship between psychological, emotional, and behavioral responses and the other elements of the response plan is important to consider. While planning can be based on the assumption that public health efforts will be successful, planning for failure (e.g., failure mode analysis) is critical to enable behavioral and consequence management for all outcomes. Community and behavioral crisis can result from lack of support and services, absence of a vaccine, and ineffective therapies. The community needs a practiced plan that provides reasonable safety.

The existing data on infectious disease outbreaks, chemical, biological, radiological, and nuclear (CBRN) events, natural disasters, and established public mental health principles can be brought to bear on the planning for a response (see Table 18.2). Public mental health measures must address numerous areas of potential distress, health risk behaviors, and psychiatric disease. In anticipation of significant disruption and loss, promoting health protective behaviors and health response behaviors is imperative. Special attention is needed for: (1) risk communication; (2) safety

communication through public/private collaboration; (3) psychological, emotional, and behavioral responses to public education, public health surveillance, and early detection efforts; (4) psychological responses to community containment strategies (quarantine, movement restrictions, school/work/other community closures); (5) health care service surge and continuity; and (6) responses to mass prophylaxis strategies using vaccines and antiviral medication.

Preparedness for Pandemic

Preparedness for a pandemic includes educating the public, preparation of leadership, and sustaining preparedness and training leadership. Public education must begin before a pandemic occurs, and be embedded in existing disaster public education campaigns, resources, and initiatives (e.g., Department of Homeland Security's website, <http://www.ready.gov>; Red Cross' website, <http://www.redcross.org/prepare/disaster/flu>; CDC's website, <http://www.cdc.gov/flu/pandemic-resources>; and Health and Human Services websites, <http://www.flu.gov> and <http://www.flu.gov/planning-preparedness/federal/pandemic-influenza.pdf>). Education focuses on facts, including what is known, what is not known, and how individuals, communities, and organizations can prepare for a potential outbreak. Public education can alter threat awareness (e.g., "Is there a risk to me?"), threat assessment (e.g., "How great is the risk to me?"), and preparedness behaviors in every phase of an event. Public education in advance of an outbreak addresses various threats, those of low risk and those of high risk.

Mental health planning for a pandemic must address basic principles (see Table 18.3). Efforts to increase health protective behaviors are a priority in planning interventions. Individuals under stress, such as first responders and caregivers in families, need reminders to take care of their own health and limit potentially harmful behaviors. This includes taking medication, giving medications to the elderly and children, and when to go for vaccinations. Many people may elect to avoid seeking psychological aid while they perceive their family to be under threat of infection. In addition, the natural progression and associated morbidity of many mental health disorders becomes more pronounced over time. As a result, requests for mental health care and support services may actually surge as disease threat decreases. Planning for delayed surge in medical care utilization is helpful to avoid

Table 18.3 Intervention planning for pandemic

- Increase health protective & response behaviors
- Plan for risk communication
- Plan for safety communication
- Public education for threat management & recovery
- Facilitate community-directed efforts
- Psychological First Aid
- Care for first responders to maintain their function & workplace presence
- Adequate medical personnel to sustain effective care interventions
- Mental health surveillance

overstressing health care resources. Risk communication principles should be followed when transmitting information broadly to increase health-promoting and prosocial behaviors. Interactions with the media will be both critical and challenging. Effective safety communication involves promoting clear, simple, and easy-to-do measures that are effective in helping individuals protect themselves and their families.

Preparing response teams for management of and deployment to pandemics is essential. Personnel responding to pandemics will be required to manage their own fear and anxiety about exposure for themselves and their loved ones. They may also have family members directly affected by the infectious agent, making them both responder and victim. The potential for these dual roles requires additional education and preparation. First responders and deployment teams should have advanced training to enhance trust and develop esprit de corps, increase comfort and familiarity with practices and procedures, and ensure effective working knowledge and utilization of personal protective equipment. In addition, responders should be educated in advance about potential reactions they may experience, as well as how to access resources to help manage symptoms that persist or become problematic for social or occupational functioning. These interventions ultimately decrease novelty and fear of the unknown, provide anticipatory guidance, and enhance feelings of self-efficacy.

Leadership preparation includes an understanding of which members of the population will be most vulnerable and who will need the highest level of health services, including mental health services. This will include those at greatest risk for problems related to contagion, such as those with psychiatric illness,

children, elderly, homeless, and those with losses, who must be considered when planning.

Planning leadership functions requires identifying community leaders, spokespersons, and natural emergent leaders who can affect community and individual behaviors and who can endorse and model protective health behaviors. Identifying community partners allows for a range of organizations and stakeholders to coordinate on planning efforts that enhance the effectiveness and efficiency of subsequent response efforts (DHS, 2011). It is often forgotten that the workplace is a community with inherent resources as well as a population at risk. Corporations have public education resources to reach large populations. The media and celebrity groups are also important leaders in most modern societies and have a critical role in providing communication. For instance, a team comprised of a musician, health care provider, religious official, and political leader might establish a broad-reaching credibility capable of motivating health-promoting and prosocial behaviors in a diverse array of individuals and communities.

Preparedness represents a critical step in ensuring an effective pandemic response. Ultimately, if responses are undersupported and fail, the community anger and lowered morale may complicate the ability of community members to respond to an outbreak, as well as recover once an outbreak has ended. Sustaining preparedness requires maintaining motivation, capital assets, equipment, and funding in order to continue preparedness efforts over the long term, not just to focus on immediate needs.

Early Pandemic Response

Communication and dissemination of timely and accurate information are important first responses to an actual or believed pandemic outbreak of infectious disease. It is important to share what is known as well as what is not known and avoid false reassurances. Messages should be complete, clear, and succinct, providing specific information on what people should do as well as behaviors to avoid. Information should be repeated and provided in a range of modalities, such as television, radio, social media, and others, to reach a broad population. These early risk and crisis communication interventions establish credibility and trust with the public and may enhance the willingness of health care and other critical personnel to participate in the response (Balicer et al., 2010). Wide dissemination of uncomplicated, empathically informed

information on normal stress reactions can serve to normalize reactions and emphasize hope, resilience, and natural recovery.

Educating the public not only informs and prepares them; it also enlists them as partners in the process and plan. Education and communication must address fear of contagion, danger to family and pets, and mistrust of authority and government. The tendency to expect or act as if these are not present can delay community-wide health protective behaviors. Facilitating community-directed efforts involves organizing communal needs and directing action toward tangible goals. This action-oriented, hopeful group behavior can foster the inherent community resiliency and recovery. Using evidence-informed principles of Psychological First Aid – fostering safety, hope, connectedness, self-efficacy, and calming – are important components of the response to a pandemic (see Table 18.4).

Recommendations to prevent exposure, infection, or halt disease transmission may be met with skepticism, hope, and fear. These responses vary based on the individuals' and the local community's past experiences with government agencies and previous infectious outbreaks (Chan et al., 2015). In addition, compliance with recommendations for vaccination or medication treatment or prophylaxis will vary greatly and will not be complete. The media can either amplify skepticism or promote a collaborative approach. Interactions with the media will be both challenging and critical. The public must clearly and repeatedly be informed about the rationale and mechanism for distribution of limited supplies, such as antiviral medication. Leadership will find it difficult but extremely important to adhere to policies regarding such distribution. Abuses of policy will undercut public safety

Table 18.4 Principles of Psychological First Aid

- Establish safety; identify safe areas & behaviors
- Maximize individuals' ability to care for self & family & provide measures that allow individuals & families to be successful in their efforts
- Teach calming skills & maintenance of natural body rhythms (e.g., nutrition, sleep, rest, exercise)
- Maximize & facilitate connectedness to family & other social supports to the extent possible (this may require electronic rather than physical presence)
- Foster hope & optimism while not denying risk

and public adherence to other government risk reduction recommendations.

Particular attention should be given to the psychological aspects of isolation and infection control (Substance Abuse and Mental Health Services Administration, SAMHSA, 2014). The requirement for medical personnel to deliver health care while using protective equipment can also be distressing for patients as well as the care providers. Isolated patients may experience a range of psychological responses such as depression, acute stress disorder, PTSD, sleep disturbances, and anxiety symptoms. Those with underlying psychiatric illness may experience an exacerbation of symptoms. These may be further complicated by the need for quarantine, which can increase distress for both the patient and their loved ones. It can be helpful to address institutional barriers with the goal of reducing feelings of isolation, such as enhanced visiting hours or creative IT solutions that allow patients to connect virtually with family and friends when direct contact is medically unsafe. Family and friends may fear the patient's death but also contracting the illness themselves. Educating health care providers about these unique effects on the patient and family can enhance patient-provider working relationships and experience of care. Working with members of the health care team to understand their particular fears and concerns can enhance their resilience and sustain them throughout the experience.

Mass fatality and management of bodies, as well as community responses to mass deaths, are difficult and challenging for planners and leave those closely involved susceptible to adverse psychological symptoms (Ursano & McCarroll, 1990). The human aspects of mourning, ritual, religion, and family are important resources to incorporate into the logistical plan. Containment measures related to bodies may be in conflict with religious rituals of burial and the usual process of grieving. Local officials need to be aware of the potential negative impact of disrupting normal funeral rituals and processes of grieving in order to adhere to safety precautions. Public health announcements should include (if known) how long the virus or "infection" remains in the corpse and what should be done with bodies. In a pandemic, funeral resources will be overwhelmed and mortuaries may not be willing to handle contaminated bodies. To facilitate long-term grief recovery as well as practical needs, careful identification of bodies must be ensured and appropriate and accurate records maintained.

The transport of patients to their home countries for treatment may generate fear of infection in the general population of that country. Public health messages should provide information about how infected persons will be managed. Media can play an important role in fostering a sense of calming and safety for the population through clear, repeated messages that accurately convey risk and inform people how to protect themselves. Patients may require additional psychosocial support to address feelings of isolation or marginalization. Those providing these interventions should be educated on the unique aspects of the infectious agent as well as how to manage social isolation and stigma.

Tipping points, events that dramatically increase or decrease fear and helpful or health risk behaviors, will occur. Deaths of important or particularly vulnerable individuals (e.g., children), new unexpected and unknown risk factors, and shortages of treatments are typical tipping points. The behavioral importance of community rituals (e.g., speeches, memorial services, funerals, collection campaigns, television specials) can help manage community-wide distress and loss.

Separating young children from supportive parents or the elderly from caregivers may increase adverse mental health symptoms and should be avoided whenever possible (Somasundaram & van de Put, 2006). Managing relationships with supportive pets may be difficult. These matters will involve thoughtful management on site. Obtaining voluntary cooperation in management of disease control may be more effective in controlling exposure than applying rules that can only be achieved by using extreme force. Attending to matters like hearing aids and glasses for the elderly can be important. Clocks and calendars with large lettering should be present in the treatment area.

The public health system must be prepared for surges in demands for health care, especially in the early stages of a pandemic. Victims and their families should be provided guidance to support their psychological well-being (see Table 18.5). Those who believe they have been exposed (but actually have not) may and often do outnumber those exposed. The care demand can quickly overwhelm a community's medical response capacity. Planning for the psychological and behavioral responses that accompany the health demand surge, the community responses to shortages, and the early behavioral interventions after identification of the pandemic and prior to availability of vaccines are important to public health preparedness.

Table 18.5 Psychological principles to support victims of pandemics and their families

Use empathic & supportive communication
Provide informed, ongoing information about treatment
Address institutional barriers to reduce feelings of isolation for patients
Include family in treatment planning, including relevant updates
Anticipate psychosocial issues (fear, depression, etc.) in patients & family members
Provide developmentally appropriate information & support to children
Address health care personnel fears about working with infected patients

Mental health surveillance is important for directing services and funding and ideally should occur during and after a pandemic event. This requires ongoing population-level estimates of mental health problems and determinations of who is at greatest risk. Surveillance for PTSD, depression, altered substance use, psychosocial needs (e.g., housing, transportation, schools, employment), and loss of critical infrastructure necessary to sustain family and community function is needed.

Later Pandemic Response and Recovery

Later response and recovery includes sustaining and rebuilding community function. Community social supports – formal and informal – are very important (see Table 18.6). Providing tasks for community action can supplement needed work resources, decrease helplessness, and instill optimism. In-person social supports may be hampered by the need to limit movement or contact due to concerns of contagion. Virtual contact – via web, telephone, television, and radio – will be particularly important at these times. At other times local gathering places – religious institutions, schools, post offices, and shops – can be points of access for education, training, and distribution. As much as reasonable, instilling a sense of normalcy and helping to reestablish routines can be effective in fostering resiliency. This includes planning for return to work, and for children to school, when conditions allow. In addition, observing rituals and engaging in regular activities can decrease community and organizational distress and untoward behaviors. Keeping families and members of a community together is important (especially in any required relocations). If fear and anxiety persist, over time, the management of

Table 18.6 Psychological principles for communities exposed to pandemics

Stay informed using credible sources of information
Discuss children's concerns using developmentally appropriate language
Limit exposure to graphic media, especially for children
Use prevention measures (i.e., hand-washing) to reduce risk
Avoid socially isolating due to fear
Take medications for prevention or treatment as prescribed
Tell a health care provider if stress or worry causes problems at home or work
Avoid using alcohol, tobacco, or other drugs to manage difficult emotions
Talk with friends, family, & neighbors to foster support for one another

racial and social conflicts may take on added significance. An ongoing public fear of contagion may lead to stigma and discrimination, which can marginalize and isolate certain groups, thereby impeding their return to optimism, hope, and access to resources.

Historically, recovery efforts have focused on restoration of communities to pre-disaster functioning. More contemporary disaster planning emphasizes rebuilding stronger, smarter, and safer communities. This focus is sometimes called “building back better” in the process of creating a new normal following disasters (Epping-Jordan et al., 2015; WHO, 2013). In the context of pandemic, opportunities may exist to strengthen social capital and build new preparedness relationships; enhance coordination of public health, medical, mental health, and social services; increase the health literacy of the population through education and messaging; and empower neighbors to help neighbors through the provision of evidence-informed early intervention efforts, such as Psychological First Aid.

Conclusion

Infectious diseases have caused extraordinary morbidity and mortality throughout history. Advances in technology and health care have allowed more prompt identification, evaluation, and treatment, although global threats continue. The HIV-1/AIDS pandemic and the outbreaks of SARS, H1N1, and Ebola provide important information to better understand psychological and behavioral response to widespread infectious disease. Resistance to drug treatment, such as with tuberculosis and other infectious organisms,

presents increasing concern as well. New infectious agents, such as Zika virus, and reemergence or evolution of existing diseases, as with dengue and various hemorrhagic fevers, represent threats of emerging global concern.

Pandemics represent a unique form of disaster and result in both adverse psychological symptoms and behavioral responses. Though literature on pandemics has been limited, recent outbreaks have continued to shed light on the role of mental health in these events. An understanding of the phases through which pandemics progress is essential for planning and response efforts. Building trust and credibility in government officials is important to optimize health risk behavior by the general public. An understanding that the behavior of the general public will be governed largely by perception of risk, rather than actual risk, can aid in public health response efforts. An appreciation of unique social and cultural variables that impact how individuals and groups experience and respond to infectious disease outbreaks is critical to effective communication during these events. The avoidance of fear-based decision-making by public officials and health care leaders can enhance prosocial behavior and may reduce stigma and scapegoating. Future research should further elucidate intervention strategies to increase desirable health risk behaviors that reduce the potential for future pandemics, such as decreasing incidence of infections, prompt and adequate treatment for the ill, and measures to effectively prevent spread of disease. Mental health providers have an important role to play by assisting disaster planners in anticipating public health response, ensuring the efficacy of communication efforts, and treating the adverse psychological and behavioral effects of pandemic outbreaks.

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