

Responses to the H1N1 Pandemic

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Thesis

The continuous media coverage of the recent outbreak of H1N1 has triggered an international panic; therefore, we recommend several policy changes for handling any future incidents.

Abstract

The continuous media coverage of the recent outbreak of H1N1 has triggered an international panic. This paper clarifies many of the misconceptions about the H1N1, containing information about the virus itself, the public reaction, and current strategies for preventing further infection. Included is a timeline of events in the modern pandemic, a cross-cultural summary of public reaction, a survey of ongoing vaccination efforts, and an itemized listing of the strengths and challenges of the Centers for Disease Control and Prevention in dealing with this outbreak. The paper concludes with several suggestions to the CDC for handling the remainder of this outbreak, and for policies to more efficiently handle such incidents in the future.

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Introduction

The H1N1 pandemic has created many unforeseen problems for the people of the United States. H1N1 is erroneously referred to as “swine flu,” creating many misconceptions, leading to panic and misunderstanding of this virus. According to the World Health Organization (2009b) “an influenza pandemic may occur when a new influenza virus appears against which the human population has no immunity.” Outbreaks of influenza in animals, especially those happening simultaneously with the annual outbreak of seasonal influenza in humans, increase the chances of a pandemic, through the merging of animal and human influenza viruses (Kondrat 2009). During the last few years, the world has faced several threats with pandemic potential, such as Ebola and SARS, making the occurrence of the next pandemic inevitable. This section will clarify some of the more common misconceptions and provide an explanation of what H1N1 is and how the term “swine flu” came into being.

Professor Dmitry Lvov of D.I. Ivanovsky from the Institute of Virology in Moscow explains the etiology of H1N1 thusly:

The swine flu has appeared as a result of bird flu’s mutation in a body of the pig. Pigs easily catch both human and avian influenza. Combined, the genes of these two viruses created a new type of influenza – the swine flu [sic].” (Kondrat 2009)

While the reason for calling this virus H1N1 is unknown to many people, it is preferable to “swine flu” because H1N1 is the accurate nomenclature. The general public hears H1N1 and responds differently, since “swine flu” implies possible contraction from pigs, or from eating pork. Calling the virus “swine flu” reinforces this misconception, whereas there are none of these connotations to the title H1N1. The “H” and the “N” both refer to proteins, Hemagglutinin and Neuraminidase, which are the major factors in the lifespan of the virus. The chemical structures of the proteins are found on the outer coating of the virus particle (Rosen 2009). The numbers in this name are referring to one out of ten known forms of Hemagglutinin and one of nine forms of Neuraminidase. This virus is H1N1 as opposed to the avian flu, which was H5N1 (Rosen 2009).

Hence, “swine flu” is used inappropriately. The H1N1 virus mutated from pigs and at some point was transmitted to humans. Referring to H1N1 as “swine flu” reinforces the misconception that all pigs are infected. This virus spreads from human to human. As reported by Reuters, “[this strain of the] virus threatening people in 2009 has never been found in pigs, it just transmits from person to person” (Kondrat 2009). The term “swine flu” needs to be discontinued in order to lessen the panic surrounding this health situation.

Examples from the Herald Online web site present misconceptions health officials from Piedmont Medical Center have compiled concerning H1N1 or “Swine Flu”:

- The vaccine works instantly
- Taking Tamiflu is a good preventive measure
- Pregnant women should not get a flu vaccination

These wide spread beliefs perpetuate the “rumor mill” (Garfield 2009). Health officials have tried to dispel these myths with the following information:

- Even after you get a vaccination, you are susceptible for seven to ten days
- Taking Tamiflu while you are not sick can cause the virus to become more resistant
- Pregnant women should get immunized. They are six times more likely to be hospitalized with swine flu than non-pregnant women

Other misconceptions address the different types of flu strains. Mark Rasnake, board certified in Internal Medicine and Infectious Diseases, stated:

‘Swine’ influenza is a misnomer for the H1N1 virus. Swine influenza is not very common in humans, but does occasionally appear. There can be a swine-adopted strain that jumps to humans. It happens every year with swine farmers and others who closely work with the animals. We just don’t normally hear about it. It can very easily be mistaken for seasonal flu, so there have only been 50 reported cases between 1958 and 2005. (Crider 2009)

The public lacks the facts concerning the seasonal influenza virus, or “the flu.” It can be just as deadly as the swine flu, having an average mortality rate of approximately 35 thousand deaths per year. There are more influenza-related deaths each year than HIV/AIDS. Yet another misconception about H1N1 concerns its lethality (Crider 2009). H1N1 is generally less serious than the seasonal flu. According to Rasnake, simply coming down with the virus is not enough to cause death. “In most cases, the influenza-induced primary pneumonia isn’t what kills you. It activates medical problems you may already have, like chronic bronchitis, and that’s what causes death” (Crider 2009)

Methodology

Data for this report were obtained from the Centers for Disease Control and Prevention and the World Health Organization. Further information was gathered from medical journals and government publications. Due to the ongoing nature of the H1N1 situation our information is also derived from the *New York Times* and the *Washington Post*. Our sources are documented and available in the bibliography.

History of H1N1

These recent occurrences of H1N1 are of a strain that has never been seen before. However, there have been several other strains in the past that have caused public panic. Many people mistakenly think that the H1N1 virus is fairly new; the first occurrence of the virus dates back to the early 1900’s.

Influenza viruses are most notorious for their rapid mutation and unpredictable behavior. Influenza pandemics must be taken seriously precisely because of their capacity to spread rapidly to every country in the world (Chan 2009). Influenza A, of which H1N1 is a strain, is the most

common type of influenza in the world known to humans. The H1N1 virus has appeared among human populations numerous times throughout history (TestCountry 2009). The troublesome thing about this hybrid flu virus is that every time it appears, the strains vary. The initial outbreak of this virus occurred in 1918-19. This first strain came to be known as the avian influenza; however, this label was short-lived. This first strain of the virus soon came to be known as the "Spanish influenza," because Spanish newspapers and reporters were the only ones to report the initial outbreak of this deadly hybrid influenza strain. This terminology is inaccurate considering that this first outbreak of the avian flu infected one third of the world's population and killed anywhere between 50-100 million people world wide. The pandemic was extremely lethal because it attacked the lungs and lung tissue. Soon after infection, people experienced breathing troubles and died shortly after. This particular strain is the first known H1N1 outbreak (Center for Disease Control and Prevention 2009e).

There were similar outbreaks in 1957 and 1968. The outbreaks in 1957 were nowhere near as prevalent as the outbreaks in 1918-1919. This particular strain of influenza was identified quickly due to advances in technology. This was critical in eliminating the death toll which only reached about two million cases worldwide (Center for Disease Control and Prevention 2009e). This particular strain known as the "Asian Flu" was not as effective as the 1918-1919 outbreaks because this strain focused mainly on school children and military camps, which are enclosed areas. It was never widespread. Another outbreak occurred after in 1968. This outbreak first appeared in Hong Kong, which is why it is referred to as "Hong Kong flu." This flu was also not as devastating as previous ones. It developed late and didn't spread as quickly, only appearing in closed areas such as school similar to the previous outbreak in 1957. Many people in the world had already been exposed to numerous strains of this virus, developing immunity to certain strains (Castro 2009).

Another outbreak of H1N1 influenza occurred in the United States at Fort Dix, New Jersey in 1976. This particular outbreak was not as serious as the first one. This outbreak was discovered when an American recruit at the Fort Dix army base started complaining about weakness and troubled breathing. It was thought the man was complaining about the seasonal flu virus that was then current; however, they were very wrong. The recruit was found dead one day later, and several other soldiers fell ill with the same symptoms as the already dead soldier (Center for Disease Control and Prevention 2009e). According to Homeland Security, President Ford and the CDC were immediately notified about the outbreak and Fort Dix was put on lock down. President Ford and the CDC passed a swine flu measure soon after. This program ensured that there would be a country-wide vaccination against the virus. This tactic was extremely successful. Three months after this program was launched, there were no further reports of any outbreaks of this particular strain (Center for Disease Control and Prevention 2009e).

The third outbreak of the H1N1 virus occurred in 1977. According to Human Health Services this outbreak started as an isolated incident in Northeastern China and soon spread world-wide. Despite the fact that this outbreak started in Northeastern China, it soon became known as the "Russian flu" or "red flu" because of the number of infected persons in the Soviet Union. This variant was also different from other outbreaks in that this outbreak primarily affected people under the age of twenty three. This is because a majority of the people over twenty three had a previous experience with a strain of the H1N1 flu virus and were therefore immune. The people

who had not experienced the disease before were the primary ones infected. The reason why this strain of H1N1 flu spread quickly was because children and young adults were attending school and transmitting it to the other children and their families. Vaccinations for this outbreak and strain of the disease were not as successful as during the outbreak at Fort Dix. The CDC was hoping to have a similar vaccination process; however, they only managed to administer around six hundred thousand vaccinations world-wide (Castro 2009).

There have been other outbreaks of the H1N1 hybrid flu virus before the current pandemic. Since there are numerous variants of H1N1, it has been difficult to develop vaccines and contain its dispersion. However, if precautions are taken and if the CDC looks into their failures and successes from past outbreaks, then we might be better prepared to address the current situation.

Modern Pandemic Timeline

The development of the H1N1 flu virus has greatly increased the amount of attention the public pays to national health. As discussed, H1N1 brought the international pandemic alert to one of its highest levels (Krisberg 2009). June 11, 2009 signified the start of the 2009 flu pandemic as declared by the WHO Director General (World Health Organization 2009a). Although H1N1 is spreading rapidly, the virus appears no more virulent than seasonal flu virus.

The H1N1 virus was first diagnosed March 18, 2009 as Mexican authorities recognized flu-like symptoms that the World Health Organization (WHO) called “influenza-like illness”. A fatal case was noted nearly a month after the first cases in Oaxaca, Mexico. Since nearly 5,000 cases with somewhat similar symptoms occur annually; this specific case was seen merely as an isolated incident. Days later, Mexican health officials contacted the Pan-American Health Organization over these cases. Another death had occurred in the same hospital in Mexico with atypical pneumonia symptoms which sparked a quarantine order. An avian flu outbreak was feared by the Mexican health officials. Samples were sent to Canada for testing in the days following (World Health Organization 2009a).

By April 23, 2009 Mexico reported the first cases of H1N1 to the WHO. Simultaneously, in the U.S., public health officials announced seven cases of the H1N1 flu in California and Texas; all patients recovered. Initial reports of the flu strain in late April, were thought to have originated in Mexico. However, officials with the Centers for Disease Control and Prevention determined the strain was identified more than a week earlier in two children in southern California (Krisberg 2009). Another incorrect finding led the public to believe that the virus killed a large number, when there had only been 15 fatalities by April 24, 2009. On the same day that Mexican authorities declared an epidemic, all schools, universities, theaters, and museums were closed in Mexico City and the city center to prevent the virus from spreading. Neighboring Latin American countries took preventative measures and declared health alerts. Isolation was ordered for people who were sick or symptomatic in Mexico. Shortly after, Mexico suspended public meetings (World Health Organization 2009a).

The first meeting of the Emergency Committee was held under International Health Regulations on April 25, 2009 in Geneva to advise the Director-General of the WHO that there was a public health emergency. The WHO also warned of a potential pandemic that could arise from the

human-to-human transmission of the virus. The U.S. declared a health emergency the following day, after 20 cases in the country were confirmed. Europe recorded its first cases-these were people who had traveled to Mexico. On April 27, 2009 the alert level of the pandemic was raised from three to four, meaning an increased in risk of pandemic (World Health Organization 2009a). The WHO warned that no region in the world was safe from the virus. California declared a state of emergency as the virus progressed. Pork imports were suspended in some countries in hopes of containing the virus. This attempt, however, only led to a rise in panic level. The first fatal case confirmed in the United States was that of a 23-month old Mexican child. On the same day, April 29, 2009, more cases were noted in Europe, one in a person who had not traveled to Mexico. The alert level was once again raised, this time to five, as imminent pandemic. The “swine flu” was now officially given the name H1N1 by the WHO (World Health Organization 2009a).

On April 30, 2009 the French government decided not to suspend flights to Mexico; however, they did advise people not to travel there. Traveling to Britain, France, Canada, Italy, and the Netherlands was deemed safe. The WHO, the Food and Agricultural Organization, and the World Organization for Animal Health issued a statement that pork and pork products would not be a caused of infection if handled properly (World Health Organization 2009a). Despite this public statement, people still thought that the virus was transmitted by swine. The media and certain official health sites led the public to this conclusion as well. Misleading information was one of the key elements that led to media and public panic. The virus is spread from human-to-human contact. Eating pork will not spread the virus.

On May 1, 2009 the first Asian case of H1N1 occurred in a man returning from Mexico. The hotel staff and guests where the man stayed were quarantined for a week. Similar precautions were seen in Mexico itself as it shut down plans for May Day weekend. The next day, Canada reported that a herd of swine in Alberta showed symptoms of having H1N1. Over the next three days the number of cases rose, as did the number of countries reporting outbreaks. Despite Mexico saying the virus was in a “stabilization phase,” bringing the number of fatalities to 19 with 454 confirmed infections (World Health Organization 2009a). May 4, 2009 brought the count to 21 countries reporting 1,085 cases of H1N1 with 26 deaths. The United Nations General Assembly was addressed by the WHO Director-General who presented uncertainty regarding the pandemic. Solidarity in this time was stressed, past pandemics were looked upon for helpful information, and a limited number of available vaccines were noted by public health officials. On May 5, 2009, 2.4 million courses of antivirals were released to countries most in need, including Mexico (World Health Organization 2009a). Since the start of the pandemic, the number of countries with documented cases and the total number of infected people with the virus has increased drastically.

Various recommendations have been made to protect the American population. Most are preventive measures to limit the spread of the virus and prevent infection. Other countries and regions have handled prevention differently than the U.S. The debate over who should get the vaccine has affected the intensity of these precautions. The vaccine was mandatory for healthcare workers. Since many workers view this as a violation of their rights, changes were needed. Comprehensive flu infection control programs that would provide personal protective equipment for those in contact with the virus would be implemented to replace a mandatory vaccine.

Another strategy to restrict the spread of disease, especially in the workforce, would entail abolishing sick-leave policies that require the worker to come to work rather than stay home. This would help to limit the number of people exposed to the virus. However, many workers do not have paid sick time, so staying home isn't an option, and when absences stack up discipline is possible (Hennessy-Fiske 2009). As time passes, major health systems have begun to disregard the mandate to require flu shots for all health care workers. This is in response to the ethics and legalities of the matter as well as vaccine shortages. The CDC shows that only 48 percent of people in the health care industry received the vaccine, as opposed to the 86 percent who received it under voluntary program policies (Young 2009).

An ABC News Health report determined that the recent map of the H1N1 outbreak released by the CDC does not reflect what the hospitals actually are seeing. The reports from the hospitals, though not scientific samples, suggested that not only did the extent and severity of the illness vary from region to region, but in some cases it varied even among hospitals in the same state. Many were misled about the severity of the outbreak; more than half of the hospitalized cases of H1N1 had underlying conditions (Hutchison 2009). Having underlying health conditions is associated with a higher risk of medical complications from influenza.

Various preparations were put together in response to the H1N1 pandemic. Colleges and universities reviewed and revised policies in order to make the virus less transmissible. For example, teachers considered and altered their attendance policies, requesting that ill students remain at home until the infectious period ended (HIN 2009). In contrast, schools in France responded with different precautions. The French health officials announced that a school could close if three students showed symptoms in less than a week (Lyman 2009). The United States and Britain, however, kept schools opened. The British did prepare to broadcast informative lessons on television and radio. The country also sent mailings to parents of school children so that symptoms could be recognized, according to the European Health Commission in Brussels (Lyman 2009). The head of the infectious disease unit at Italy's Higher Institute of Health, Giovanni Rezza, states: "[T]he idea is that by blocking the spread of the disease among the vulnerable you can effectively stop it from spreading among the population as a whole." (Lyman 2009:7A).

The flu virus has also had an impact religiously, affecting religious ceremonies in different cultures. In an effort to slow the spread of H1N1, Arab health ministers announced in July 2009 that children, the elderly and those with chronic medical conditions would be banned from this year's annual pilgrimage to Saudi Arabia. However, they stopped short of calling for the cancellation this year of the *hajj* — a duty for all Muslims in their lifetime — which attracts about 3 million people every year to the holy cities of Mecca and Medina. (Kaiser 2009b). The ritual pilgrimage among the Islam of various countries was also affected in early November. According to Murphy (2009), an estimated 2.5 million people from up to 160 countries — including perhaps 15 thousand from North America — will walk, pray and eat in proximity to each other for several days. They will touch the same religious objects and sleep in crowded tent cities. It was recommended that the groups most vulnerable to infection not go on the pilgrimage. It was also suggested that vaccines be provided to potential pilgrims to help contain the virus, though most countries are not in a position to do this. In mid-September 2009 only 26 cases of

influenza occurred when a wave of almost two million visited Mecca during the holy month of Ramadan. There were no flu-related deaths (Murphy 2009).

Positive health precautions were strengthened in many places as a result of the outbreak. Schools, universities and workplaces have updated preparedness plans. Hand washing is one of the most effective ways to prevent the spread of the virus. Universities have placed bulletins across their campuses to make students aware of the infection. The need for a robust and well-funded public health infrastructure once again was recognized by the public and the government (Krisberg 2009).

Researchers led by Rino Rappuoli of Novartis Vaccines and Diagnostics SRL reported, “Although the H1N1 pandemic has the potential to cause a social and economic emergency, it also provides an opportunity to rethink our approach to the influenza virus disease and to develop more effective vaccines and economically sustainable solutions for developing and developed countries.” The need to improve influenza surveillance and bring flu vaccines into childhood immunization in developing countries was also indicated by the report. (Kaiser 2009a).

The timeline from the initial H1N1 outbreak was swift. Many decisions were made regarding the pandemic and how to control it. The media, with false data, helped to spread the panic among the public.

Vaccination Efforts by Government Agencies

This section of our paper shall discuss the vaccination efforts put in place by various government agencies during the H1N1 pandemic. In looking at the ongoing vaccination programs, it is necessary to examine the perception of delay, shortages in the supply, and the public reaction to the vaccine.

Data in this section were obtained from official releases by the Centers for Disease Control and Prevention and the World Health Organization. Due to the current nature of these events, however, it was necessary in many instances to turn to popular news sources such as The New York Times and its news-oriented weblogs.

The primary concern of many in the world seems to be the apparent delays in vaccine accessibility. For instance, Governor David Patterson of New York has declared a state of emergency. He has issued a proclamation adding “physician assistants, dentists, dental hygienists with anesthesia certificates, pharmacists, midwives and podiatrists” to the list of medical professionals able to administer the vaccine. Officials consider the delivery of the vaccine too slow, claiming it has been “hampered by manufacturing delays” (Hartocollis 2009a).

However, some consideration must be given to the overall timeline of this pandemic. The first reported cases occurred in Mexico, in March 2009. The first death officially credited to H1N1 – also in Mexico – did not occur until April 12, 2009. The outbreak was not recognized as an international concern for nearly two weeks more, when the World Health Organization declared on April 24, 2009 that there were “nearly a dozen cases in the United States” in addition to the

“several hundred cases” already in Mexico (World Health Organization 2009a:3). The first doses of the vaccine were made available on October 5, 2009 (Hartocollis 2009b), making the turnaround from recognition of pandemic to availability of vaccine slightly more than five months. Indeed, the injectable version of the vaccine shipped two weeks ahead of schedule (McNeil 2009a). It is therefore our conclusion that the perception of delays is a symptom of the ongoing public panic, rather than a valid chronological concern.

A more pressing issue in the minds of many is the shortage of vaccine doses. In the United States, the CDC is recommending the dosage to specific subsets of the population:

[P]regnant women, people who live with or care for children younger than 6 months of age, healthcare and emergency medical services personnel, persons between the ages of 6 months and 24 years old, and people ages of 25 through 64 years of age who are at higher risk for 2009 H1N1 because of chronic health disorders or compromised immune systems. (Center for Disease Control and Prevention 2009a)

Despite the relatively limited nature of the target populations, there seems to be a perception in the minds of the populace – as well as its leaders – that there cannot possibly be enough vaccine to go around.

One possible source of this fear is the availability of the vaccine to anyone who wishes to receive it. As recently as 2005, eligibility for flu vaccinations was restricted by the government to high risk populations, leading in some cases to an overabundance of supply (MacKenzie 2005). Though the CDC has made it clear who *should* receive the vaccination first, there is no requirement for the population at large to honor this request. In some cases, medical professionals and civic leaders are taking it upon themselves to act as de facto police, seeking out people at flu clinics who are clearly not at high risk to politely recommend they yield their dose to those who need it more (Steinhauer 2009).

The situation is further complicated by issuing vaccine doses to private companies. Citigroup, for instance, had received 1,200 of the 2,400 doses it requested as of November 5, 2009. “By contrast, Memorial Sloan-Kettering Cancer Center received 200 of the 27,400 doses that it requested for its patients, workers and volunteers” (Anderson 2009:A28). There is no reason to believe that these companies will distribute to anyone who is outside the high risk group, but in light of present distrust of large financial institutions, much of the population finds itself concerned by these developments. CDC director Michael Osterholm quite rightly describes outrage over this distribution “a distraction” (Anderson 2009:A28). This is a distraction that could easily have been avoided.

Standing in sharp contrast to these concerns is the apparent disinterest towards the vaccine in some large urban areas. A study conducted by the Public Health department at the University of Pittsburgh published in September 2009 revealed widespread distrust of potential H1N1 vaccines, concluding that large percentages of the population would not accept the drug if it was provided (Quinn et al 2009). To date, this projection is borne out by numbers from New York

City, where fewer than 50 percent of parents with elementary-aged children have granted permission for the schools to vaccinate their children (Medina 2009).

The ongoing debate in the state of New York regarding the vaccination of health care workers serves to further highlight this phenomenon. In August, Dr. Richard Daines, state health commissioner, mandated that all individuals employed by health care organizations must be vaccinated by November 30, 2009. Disciplinary action up to and including termination was threatened for those who chose not to comply. In October, an injunction was issued to prevent this policy from being implemented, pending review by the legislative branch of the state government (Hartocollis and Chan 2009).

In light of these developments, it is currently impossible to determine if a shortage of the vaccine truly exists within the United States. It is entirely possible that current demand could be met with existing supplies, assuming surplus stock from each area is consistently redistributed to sites still in need. Therefore, it is our conclusion that the shortage – at least within the United States – exists primarily in the public perception of the situation, rather than in the number of doses available.

Internationally, however, there can be no denying that there is an issue of supply, due largely to the burden of paying for the vaccine. Many non-industrialized countries are having extreme difficulty acquiring sufficient – if any – quantities of the vaccine. To alleviate this concern, the WHO announced recently that it would distribute 200 million doses of the vaccine to 100 developing countries (Associated Press 2009). This plan is intended to supplement pledges by nine large industrialized nations to donate ten percent of their supply (Reuters 2009) – a pledge that has not yet been honored by the United States. The U.S. has announced it will not donate until all citizens who are at high risk have been inoculated (Agence France-Presse 2009).

This decision certainly seems to be in keeping with an internal perception of shortage in the U.S., and will likely heighten that same perception in the long run. An argument could be made that a decision to distribute pledged doses now would only heighten the panic. This must be counterbalanced against the realization that by maintaining possession of those doses, the U.S. is preventing them from being administered to at-risk populations in countries where sufficient medical treatment could be considered far from abundant.

Interestingly, some of this international shortage could be alleviated in part by the decision of all industrialized nations to use vaccination doses heightened by adjuvants, which increase the effectiveness of medications to which they are added (Mosby's 1994). The WHO has called for the use of adjuvants in vaccinations, and several countries – including Canada and many members of the European Union – have chosen to purchase doses of the vaccine reinforced by these additives. The United States, on the other hand, has opted for vaccinations that do not include adjuvants, due in part to fear of the public reaction (Pollack 2009). This may have been a good choice, as adjuvants are not yet approved by the Food and Drug Administration. This concern was cited in the study by the University of Pittsburgh as a major factor in the public's unwillingness to be vaccinated (Quinn et al 2009).

This contradiction appears to be the crux of the public concerns over the H1N1 vaccine. In essence, government agencies here in the US and internationally have tried to walk the fine line between perception of safety and perception of shortage. Unfortunately, the public here seems fully in the grip of both hysterias, convinced en masse that the vaccine is unsafe while simultaneously panicked that there isn't enough to go around. It seems clear that action must be taken in future pandemics to prevent such conclusions from being drawn. Our recommendations for the future are presented later.

CDC Responses

The CDC refers to itself as “your credible source for online information” on its website and states several goals (Centers for Disease Control and Prevention 2009c). These goals are described as “healthy people at every stage of life, healthy people in healthy places, people prepared for emerging health threats, and healthy people in a healthy world” (Centers for Disease Control and Prevention 2009c). This implies that the CDC works to keep people informed with the most accurate and current information, and facilitates preparedness and promotes healthy environments. This section will examine how thoroughly the CDC met these goals. The CDC has done much to inform people about the spread of the flu and the importance of preparedness, but may have failed to facilitate this preparedness and contributed more to a panicked state than a prepared state.

One area the CDC struggled with during the initial outbreaks was communication. Until the infection reached the United States, a press briefing regarding H1N1 was not released. Before this briefing, in December 2008, a YouTube video was released by the CDC dramatizing the personal stories of those who had lost children to the seasonal influenza virus. While this was designed to encourage vaccination for all flu viruses, it was also a scare tactic that served to frighten people about emerging threats. The CDC did begin work on a vaccine for H1N1 once the April 2009 cases occurred.

In November 2005 Tom Davis' congressional testimony about preparedness for influenza outbreaks referred to H1N1 as a “pandemic that never materialized” (Davis 2005). This was in reference to past episodes of H1N1 showing that it had been recognized and dismissed as a threat (Davis 2005). This raised many issues about whether a vaccine could have been developed earlier. Another issue raised was the need for up-to-date information on the illnesses present in livestock or humans throughout the world. While steps such as creating briefings and YouTube videos are measures to inform and reach a wider audience, they do not efficiently facilitate preparedness or inform people in a way that is useful rather than frightening.

The first press briefing by the CDC on April 23, 2009 discusses H1N1 as “swine flu,” and associates it with pigs, downplaying the possibility of human-to-human transmission. The CDC also stated that the cases reported in April 2009 were the first of this genetic makeup found in the United States; however, it is known that several outbreaks occurred in the past, specifically at Fort Dix (Centers for Disease Control and Prevention 2009d). This briefing failed to achieve the goals of the CDC because it did not properly inform people of the history and nature of the virus, or prepare them for the possibility of widespread person-to-person transmission. Since then, however, the CDC has been releasing updates at least weekly. Their website, www.flu.gov,

provides information about prevention and prevalence. The CDC has also been successful in the timely creation of the vaccine, as well as creating recommendations for vaccination and containing infection. The CDC has released information on its website, at CDC.gov, Flu.gov, and YouTube, and has also created podcasts to urge people to wash their hands, cover their mouths when coughing, and avoid sick people. These are all effective means of attempting to prevent the spread of any influenza virus. The vaccine is the only way to prevent infection from the virus. Beyond this, the CDC recommends that if you become sick, you should stay at home and avoid contaminating others. This does achieve the CDC's goals of providing accurate information, as well as promoting healthy environments.

As addressed earlier, the CDC has made recommendations about the vaccination. According to the CDC website as well as Flu.gov, pregnant women, young children and those in contact with them, and those at high risk for complications, especially elderly, should receive priority in vaccination. These recommendations help to satisfy the goal of "healthy people at all stages of life," (Centers for Disease Control and Prevention 2009c) ensuring that those who are most vulnerable to H1N1 are protected.

One recommendation by the CDC seems to have resulted in confusion. In a letter to educators in June 2009, the CDC states that by Fall 2009 the H1N1 virus may become more serious and life-threatening. They recommend that schools enforce "strict exclusion policies for students and staff with flu-like symptoms" (U.S. Department of Education 2009). Recommendations such as this may result in people associating all flu-like symptoms with the H1N1 virus rather than a seasonal illness. This can cause problems in determining prevalence of the disease. Stigma due to the suggestion of seclusion may also cause people to not seek treatment for infections from both H1N1 as well as other illnesses. It can cause parents to panic, and unnecessarily keep their healthy children home from schools in order to protect them. Later decisions, as referenced by President Obama's administration, would scale back the instances in which schools close. Unfortunately, closing schools is only effective before a pandemic has reached its peak; once it has done so, it can only work to slow the spread moderately. While this was an attempt by the CDC to slow the spread of the H1N1 virus, it seemed to create panic instead.

Overall, the CDC has taken many steps to help inform people about prevention and the spread of H1N1, but may not have provided the most accurate, up-to-date information. By referring to H1N1 as "swine flu," the CDC perpetuates misconceptions people may have about eating pork, or the nature of the virus itself. Beyond that, some recommendations may also cause people to overreact, believing that H1N1 is a much more deadly influenza strain than it actually is. While the goals put forward by the CDC are very commendable, as are many of its efforts, changes in the way it has responded to H1N1 could have resulted in a calmer, more thoroughly informed public.

Recommendations

In the event of future outbreaks of influenza, in order to keep people informed and prepared, please consider these recommendations:

- Continuously monitor influenza strains in livestock herds throughout the world
- Work to inform the population of the U.S. about outbreaks in other countries before they emerge as domestic health threats
- In the event of any given outbreak, immediately work to establish proper nomenclature to avoid undue panic
- Proactively educate public regarding health risks of current outbreaks as they occur
- Initial press releases should include historical information on relevant previous outbreaks
- Make sure all public outreach attempts include accurate information from the start (including YouTube videos and podcasts)
- Avoid stigma associated with seclusion by educating populations on proper safety techniques during contagious period
- Provide information regarding vaccine safety and effectiveness early, ideally before vaccination is available

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