H1N1 Influenza (Swine Flu)

Interim Report

May 6, 2009

Section 1: Current Situation

International Perspective

Worldwide, As of May 6, 2009, 1,516 lab-confirmed cases of H1N1 swine influenza have been reported from 22 countries (see Figure 1).[1] Included in this total are 29 deaths, with one death reported in the Texas in a child from Mexico and 28 deaths in Mexico.

Because of intensive screening and case-finding activities, cases are expected to be confirmed in many countries in the future.

World Health Organization Pandemic Status

In order to assist in the planning and response to spread of novel influenza viruses, the World Health Organization (WHO) developed a 6-phase scale, with phases 1 to 3 corresponding to preparedness and planning, and phases 4 to 6 corresponding to outbreaks and response (see Table 1). It is important to note that the pandemic phases are based on the geographic spread of disease, and not the severity or case fatality rate of the disease.

On April 27, the WHO raised the pandemic phase from 3 to 4. The phase was again raised on April 29, 2009 from 4 to 5, as person-to-person transmission was clearly identified in North America.[2] The phase has not yet been raised to phase 6, indicating a global pandemic, although World Health Organization officials have cautioned that declaring a phase 6 pandemic is likely to occur.

National Perspective

As of May 6, 2009, 642 lab-confirmed cases of H1N1 swine influenza, including one death, have been reported in the United States by the Centers for Disease Control and Prevention (CDC).[3] Laboratory-confirmed cases have been reported from 41 states including Nevada (see Figure 2). These reports include two deaths reported in Texas (the statistics reported in the international perspective have not yet been updated by WHO to reflect the second death reported in the United States).

Because of intensive screening and case-finding activities, cases are expected to be confirmed in all states in the future.

Influenza and Pneumonia-Related Deaths

The CDC estimates that approximately 36,000 Americans die each year from influenza-related illness.[4]

United States Categories of Severity

As part of pandemic planning, the United States Department of Health and Human Services (HHS) developed a severity index for pandemics similar to the ones used for hurricanes (see Table 2). Category 1 pandemics are the least severe (similar to seasonal influenza), and category 5 pandemics

are the most severe (e.g. the 1918 influenza pandemic). The last two pandemics experienced in the United States in 1957 and 1968 would both have been categorized as category 2.[5]

The key factor used in determining the category of a pandemic is the case fatality ratio. Although there is insufficient information to perform this calculation at this time, as there are many cases not identified or that have not been laboratory confirmed, it is likely that the case fatality rate is similar to that seen during seasonal influenza. Based on evidence now available, the current H1N1 outbreak would be category 1.

US Pandemic Influenza Response Stages

In addition to the severity index, HHS developed a number of federal government response stages, from 0 to 6 (see Table 3).[6] These stages were developed with the assumption that the outbreak would start outside North America, and would progress to a graduated response as the disease moved into North America. It was also assumed that the WHO pandemic phase would be at 6 before it reached the United States. As the outbreak was discovered in Mexico and the United States, many of the response triggers cannot be used as initially developed.

State & Local Perspective

As of May 6, 2009, five laboratory-confirmed cases have been confirmed in Nevada.[7] The first case in Nevada was confirmed on April 29, 2009 in a 2-year-old from Reno. Two relatives of this case have also been confirmed to have been infected with H1N1 swine influenza by the CDC.

The first cases in Clark County were identified on May 5, 2009 in an 11-year-old male and a hospitalized 39-year-old female. Testing on relatives of the Southern Nevada cases has not identified any other infected persons.

As of May 6, 2009, 7 additional unsubtypable specimens have been submitted to the CDC for confirmatory testing and are expected to be confirmed as H1N1 swine influenza. Five of these cases are from Clark County, one is from Washoe County, and 1 is from elsewhere in the state.

Based on the population of Clark County, approximately 230 of the 36,000 estimated annual influenza-related deaths would occur each year in Clark County.

Statistics compiled by the Nevada State Health Division Office of Health Statistics and Surveillance over the period 1998-2007 indicate a range of 318 to 452 deaths statewide each year from pneumonia and influenza (see Table 4).

Section 2: The H1N1 Virus

Epidemiology

The most comprehensive epidemiology of the H1N1 swine influenza virus is the result of an outbreak investigation conducted at a school located in New York City. The investigation identified a symptom profile and disease severity similar to that seen during seasonal influenza (see Table 5).[8] None of the 44 cases interviewed reported travel to Texas, California, or Mexico (the three areas with known transmission at the time of interview). The distribution of case onset (see Figure 3) is similar to that which would be expected during an outbreak of seasonal influenza (assuming a point source), with a maximum of a four- to five-day incubation period. Seasonal influenza typically has a 2 day incubation period (range 1-4 days).[9]

In addition to published reports, CDC officials continue to provide information about the disease during frequent press conferences. Secondary attack rates within families appear to be similar to that seen with seasonal influenza.[10]

Given the evidence currently available, it appears that the virus is similar to those found during seasonal influenza. The widespread reports of disease from throughout the county[11] also indicate that transmission has been occurring for some time at low levels without apparent large increases in ILI numbers[12] and no local reports of outbreaks. In most cases, no epidemiologic links to other cases have been established, suggesting that asymptomatic or very mild disease may be occurring.

Characterization of the Virus

The virus appears to be a reassortment of genes from a human influenza virus, avian influenza virus, a swine influenza virus that has circulated in United States pigs since 1999, and a swine influenza virus of Eurasian origins.[13,14] Genetic analysis of the virus has not identified the markers for virulence identified in the 1918 influenza strains.[15]

Testing by CDC indicates that the virus is resistant to amantadine and rimantidine but sensitive to zanamivir and oseltamivir.[16]

Section 3: Mitigation and Response

Surveillance

National guidelines have resulted in intensive enhanced surveillance throughout the United States. At this time, results show that the new H1N1 influenza virus has spread throughout the United States and to many countries throughout the world. This intensified surveillance has also resulted in identifying the presence of routine circulating influenza A and B viruses that otherwise would have been unrecognized.

Through May 4, 2009 the Southern Nevada Public Health laboratory has received 71 samples for viral typing. Of these, 28 were negative for influenza by PCR. Of the remaining 43 samples positive for influenza A by PCR, 7 (10%) were unsubtypable and were sent to CDC for H1N1 swine influenza confirmation; 2 specimens have been confirmed, and 5 are pending at CDC. Twenty-seven (38%) were typed as either A/H1, A/H3, or B (i.e. types that are normally identified during seasonal influenza). Initial typing on 9 (21%) samples at SNPHL is pending.

Nationally, the CDC has recently refocused its goals on monitoring the severity of illness among those who acquire infection with the new virus. They have asked that states submit no more than 10 isolates per week, preferably from patients with severe disease or those hospitalized with an influenza-like illness, so they can monitor the virus for any mutations.

In Nevada, we are now recommending that physicians do not need to routinely test for influenza virus among patients who present with symptoms of influenza.

Antiviral medications

Seeing a doctor is NOT needed for mild illness. Like regular flu, most people with this new flu have had mild illness and do not need to see a doctor. Ill persons whose symptoms become worse (trouble breathing, very high fever, severe cough) are advised to contact their personal healthcare provider.

CDC now recommends that testing and antiviral treatment be focused on those with severe respiratory illness and those at highest risk of complications from influenza.[17,18]

Antivirals should be prescribed to:

- Hospitalized patients with probable, or confirmed H1N1 swine influenza infection, or positive influenza A rapid testing
- Patients with mild or uncomplicated febrile respiratory illness who are at higher risk for severe illness or complications of influenza because of underlying health conditions
- Health-care workers involved in direct patient care of suspected, probable, or confirmed cases of H1N1 swine influenza and who have not used appropriate personal protective equipment

Antivirals should **not** be prescribed to:

- Patients with mild or uncomplicated febrile respiratory illness with no underlying conditions that place them at risk for more severe illness or complications of influenza
- Asymptomatic close contacts of suspected, probable, or confirmed cases with no underlying conditions that place them at risk for more severe illness or complications of influenza
- Health-care workers involved in direct patient care who used appropriate personal protective equipment
- Patients or health-care workers who wish to take the antiviral medications prophylactically in the absence of exposure to disease
- Patients who wish to stockpile the antivirals for future use

School Closures and Event Cancellation

The CDC guidance document dated May 1, 2009 provides for considerable flexibility in making decisions about school closures, recognizing that the local authorities are responsible for making the decisions about school closures, and that those decisions should be based on the extent and severity of the illness in the community.[19]

The guidance document emphasizes that "decisions regarding school dismissal within these communities are being left to the appropriate authorities but must involve consultation with local and State public health officials, taking into account the extent and severity of H1N1 disease in the community".

On May 4, 2009 The State of Nevada has adopted a policy regarding school closures (attached).

On May 5, 2009, CDC issued new guidance on school closures consistent with the policy previously adopted by the State of Nevada.[20] These guidelines no longer recommend school closures for a suspected or confirmed case of H1N1 swine influenza.

There are no recommendations to cancel public events. People who are ill should avoid traveling and avoid public locations and crowded venues. The identification of cases at this time does not merit any additional travel recommendations or the closing of public events and venues.

Travel Notices

Limiting travel and imposing travel restrictions would have very little effect on stopping the virus from spreading, but would be highly disruptive to the global community. The current CDC travel recommendation is that people avoid non-essential travel to Mexico.[21] WHO is not recommending travel restrictions related to the outbreak of the H1N1 flu virus.[22]

Patient Education

Patients should be instructed to handle their illness as they would seasonal influenza. Non-hospitalized patients with febrile respiratory illness are being advised to stay home for seven days after symptom onset or 24-48 hours after symptom resolution, whichever is longer. Current recommendations to the public encourage good health habits to minimize the spread of influenza:

- Cover your nose and mouth with a tissue when you cough or sneeze. Throw the tissue in the trash after you use it.

- Wash your hands often with soap and water, especially after you cough or sneeze. Alcohol-based hand cleaners are also effective.
- Avoid touching your eyes, nose or mouth. Germs spread this way.
- Try to avoid close contact with sick people.
- If you get sick with influenza, stay home from work or school and limit contact with others to keep from infecting them.
- Plan ahead. Have enough food and supplies on hand to ensure you can rest comfortably at home if you do become ill but don't require professional medical care.

Section 4: Figures and Tables

Figure 1. Worldwide Distribution of Laboratory-Confirmed H1N1 Swine Influenza Infections
Shading indicates countries where laboratory-confirmed cases of disease have been reported
Source: World Health Organization Update 17[23]

Figure 2. United States Distribution of Laboratory-Confirmed H1N1 Swine Influenza Infections
Shading indicates states where laboratory-confirmed cases of disease have been reported
Source: Centers for Disease Control and Prevention Daily Update, May 6, 2009

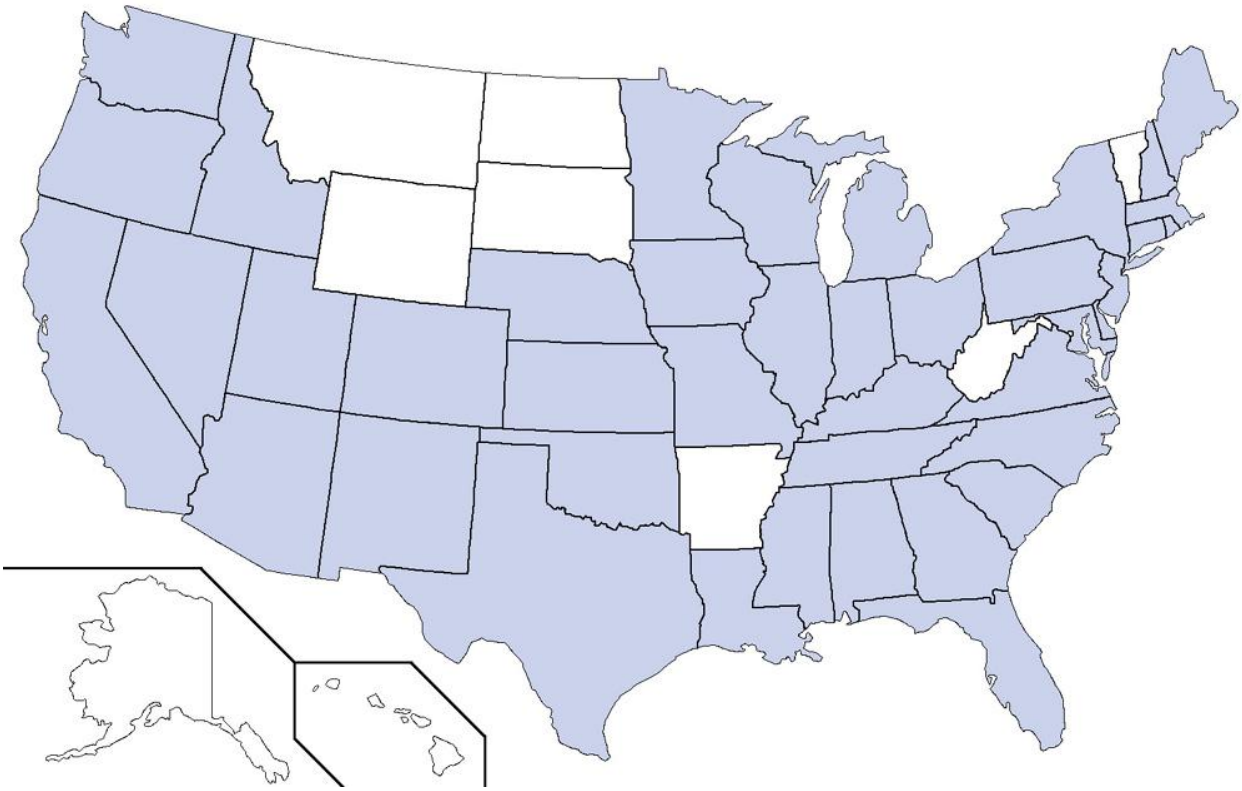

Figure 3. Outbreak Curve for New York City School Outbreak
Source: MMWR[24]

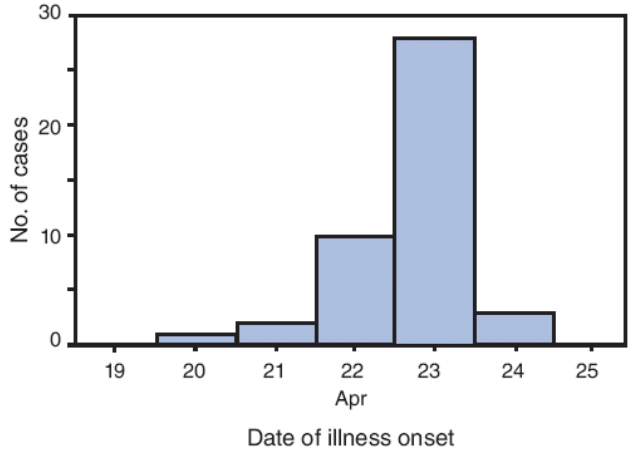

Table 1. World Health Organization Pandemic Phases
Source: World Health Organization[25]

WHO Phase	Definition
1	No viruses circulating among animals have been reported to cause infections in humans
2	An animal influenza virus circulating among domesticated or wild animals is known to have caused infection in humans, and is therefore considered a potential pandemic threat
3	An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people, but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks
4	Verified human-to-human transmission of an animal or human-animal influenza reassortant virus able to cause community-level outbreaks
5	Human-to-human spread of the virus into at least two countries in one WHO region
6	Community level outbreaks in at least one other country in a different WHO region in addition to the criteria defined in Phase 5

Table 2. United States Pandemic Severity Index
Source: US Department of Health and Human Services[26]

Category	Case Fatality Ratio	Expected United States Deaths	20th Century US Experience
1	<0.1	<90,000	Seasonal influenza
2	0.1-<0.5	90,000 - <450,000	1957 and 1968 pandemics
3	0.5-<1.0	450,000 - <900,000	None
4	1.0<2.0	900,000 - <1.8 million	None
5	≥2.0	≥1.8 million	1918 pandemic

Table 3. United States Federal Government Response Levels
Source: US Department of Health and Human Services[27]

WHO Phase	US Response Stage	Description
1	0	New domestic animal outbreak in at-risk country
2		
3	0	New domestic animal outbreak in at-risk country
	1	Suspected human outbreak overseas
4	2	Confirmed human outbreak overseas
5		
6	3	Widespread human outbreaks in multiple locations overseas
	4	First human case in North America
	5	Spread throughout United States
	6	Recovery and preparation for subsequent waves

Table 4. Pneumonia and Influenza Deaths in Nevada, 1998-2007
Source: Office of Health Statistics and Surveillance, Nevada State Health Division

Year	Deaths
1998	402
1999	318
2000	323
2001	353
2002	365
2003	406
2004	398
2005	452
2006	425
2007 (Preliminary)	402

Table 5. Symptoms Reported in New York City Outbreak
Source: MMWR[28]

Symptom	n	% (of 44)
Cough	43	98
Subjective fever*	42	96
Fatigue	39	89
Headache	36	92
Sore throat	36	92
Runny nose	36	92
Chills	35	90
Muscle ache	35	90
Nausea	24	55
Stomach ache	22	50
Diarrhea	21	48
Shortness of breath	21	48
Joint pain	20	46

*Among 35 patients who reported a maximum temperature, the mean was 102.2°F (range: 99.0-104.0°F)

Section 5: References

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Nevada Guidance on School and Childcare Facility Closure In Response to Human Infections with 2009 Influenza A (H1N1) Virus

Last updated May 3, 2009 8:00 AM PST

Update on Status of the H1N1 Virus Outbreak

As of May 3, 2009 Nevada has one confirmed case and 8 probable cases of the new H1N1 strain. The U.S. case number is 226 with one death. The H1N1 disease observed in the U.S. so far has not been the severe, fatal flu that might come from a new strain. In fact, illness with the new strain is very similar to the seasonal flu. Although the situation will continue to be monitored very closely, state and local health officers of the governmental public health agencies in Nevada have agreed that there is no reason at this time to respond differently to the outbreak of the new strain than for seasonal flu. The Nevada State Health Division has in collaboration with health and education authorities developed a process to make decisions on school and childcare facility closings on a case by case basis. Upon notification of a new confirmed or probable case in a school or childcare facility a meeting will be called of the Joint Health and Education Authorities Influenza Oversight Committee to make the decision on school closure or other remediation efforts.

The following recommendations are based on current information and are subject to change based on ongoing surveillance and continuous risk assessment.

Background

The one confirmed case of H1N1 influenza in Nevada was detected in a childcare facility. Inevitably, additional cases of H1N1 influenza will likely be confirmed in a Nevada school or another childcare facility. When this happens, a decision must be made about facility closure, both at the school/childcare facility of the infected child and possibly other schools/childcare facilities in the area. A confirmed or probable case in a student will not automatically merit a recommendation to close schools. Closing a school or childcare facility is a step not to be taken lightly and all implications of this action must be considered before a decision is made. This is especially true because potential benefits from the strategy of school closure to control an influenza outbreak are unproven. Furthermore, based on evidence in recent reports, it appears the H1N1 virus is similar to seasonal influenza viruses for which school closures are not routinely recommended.

This document provides guidance for Nevada on school and childcare facility closure. The most recent Centers for Disease Control and Prevention (CDC) guidance document provides for considerable flexibility in making decisions about school closures, recognizing that the local authorities are responsible for making these decisions and that those decisions should be based on the extent and severity of the illness in the community.

Recommendations when H1N1 is Confirmed or Probable

Upon notification of a confirmed or probable case the Joint Health and Education Authorities Influenza Oversight Committee will make the decision on school closure or other remediation efforts. The Committee will consist of the State Health Officer, the State Superintendent of Public Instruction, the local health officer and the local school superintendent or private school/childcare facility operator.

Evaluation Criteria

The Committee will consider the following criteria, including but not limited to:

- Severity of illness based on national surveillance and CDC recommendations
- Timing of the illness onset and when the student was in school
- Infectivity of the H1N1 virus based on national surveillance
- Extent of transmission including number, timing and location of cases
- Transportation issues related to exposure of children on school buses
- Social or economic issues
- Risks of recongregation if schools were closed
- Availability and feasibility of other community mitigation measures

Non-School Closure Mitigation Measures

In place of school closure, local school districts will identify and implement other appropriate mitigation measures in consultation with state and local health authorities, including but not limited to:

- Increased disease surveillance by the school nurse or other responsible person, ensuring that ill children do not attend school
- Increased hand washing, providing hand sanitizers (if possible), and other interventions normally used during seasonal influenza
- Increased communication with children, parents and school staff about disease prevention, including reminders to have children and school staff stay home if they are ill
- Siblings, other family members and close contacts who present to school or report signs or symptoms compatible with influenza-like illness will not be allowed to attend school until they recover from their illness or they return with a signed release from a health care provider

Length of School Closure

Current CDC guidelines that suggest that schools be closed for a period of up to 14 days are under review and likely to be changed. If a school is closed, the Committee will establish the length of the school closure based on the latest CDC guidelines and the specific circumstances of each case.

References

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State Health Division Bi-Lingual H1N1 Flu Hotline: 866.767.5038

www.cdc.gov/swineflu

www.health.nv.gov