

2009 H1N1 Influenza Issue Brief

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Cases, Hospitalizations, and Mortality

By Rambhia K, Watson M, Sell TK, Nuzzo J, Toner E

This overview of the current status of the 2009 H1N1 influenza pandemic in the U.S. describes the epidemiology, clinical manifestations, and treatment of individuals infected with 2009 H1N1 influenza. Information is current as of October 21, 2009.

Extent of Illness in the United States

For the week ending October 10th 2009, surveillance systems of the Centers for Disease Control and Prevention indicated widespread influenza activity in 41 states and regional activity in 8 states. To date, 2009 H1N1 has been observed in all 50 states and all U.S. territories, and all regions have levels of influenza-like illness (ILI) well above normal seasonal levels for this time of year. The southeastern states—Alabama, Florida, Georgia, Kentucky, Mississippi, South Carolina, North Carolina, and Tennessee—were especially hard hit with ILI in September.

Not All Influenza-like Illness is Influenza

The CDC reports that less than 30% of specimens tested by collaborating laboratories of the U.S., World Health Organization (WHO), and National Respiratory and Enteric Virus Surveillance System (NREVSS) were positive for influenza, results that are similar to those of last year's seasonal influenza data. Of those specimens tested and found positive for influenza in recent months, nearly all were influenza A, and nearly all that were sub-typed were 2009 H1N1.

Hospitalization Rates Highest Among Younger Patients

In the week ending on October 10, 2009, slightly more than 1,000 individuals were hospitalized in the U.S. with laboratory-confirmed influenza. Because not all patients hospitalized with ILI are tested, and some influenza tests produce false negative results, the total number of hospitalizations due to 2009 H1N1 influenza is likely greater than the number reported.

Hospitalization rates are highest among infants and toddlers, ages 0-4, while children between the ages of 5 and 17 years have higher rates of hospitalization than those older than 18 years of age.

Hospitalization rates are greater for younger adults than for older adults—a pattern that is the opposite to that of seasonal influenza. Of 272 patients hospitalized in the U.S. for 2009 H1N1 between April and June, only 14 (5%) were over the age of 65 years. Recent studies suggest that the current decreased impact on the elderly may be the result of immunity acquired through prior exposure to similar H1N1 viruses circulating prior to 1957 and/or to vaccination with H1N1 swine flu vaccine in 1976.

Of those 272 hospitalized cases, 67 [25%] required intensive care.⁵ Other recent studies indicate that approximately two-thirds of patients admitted to the ICU with 2009 H1N1 influenza may require mechanical ventilation, and more than expected may require intensive care for several weeks and the most advanced rescue therapies.^{4,5}

Bacterial Co-infection

As expected, based on seasonal influenza and prior pandemics, data from the CDC indicate that a substantial minority of patients with 2009 H1N1 influenza infection will acquire a secondary bacterial infection.⁶ Of those fatal 2009 H1N1 cases between April and June from which pathological specimens were referred to the CDC, approximately 29% had evidence of a bacterial co-infection.⁶ In comparison, ICU patients from Australia and New Zealand had a 20% rate of bacterial co-infection.⁷ At the current time, CDC data are insufficient to determine the true prevalence of bacterial co-infection among 2009 H1N1 patients.

Mortality Rates

In the week ending on October 10, 2009, approximately 60 individuals died with laboratory confirmed H1N1 infection.⁸ Typically, influenza deaths are estimated based on national rates of pneumonia and influenza deaths, which was 6.7% during the same week, a rate that is above the threshold for an influenza epidemic. Between April and October, there were 86 laboratory-confirmed pediatric deaths (children aged 0-17 years).⁹ This number is greater than the average number of pediatric influenza deaths that have occurred in each of the last 4 flu seasons.⁹

Early Antiviral Use Encouraged

The CDC strongly recommends that patients hospitalized with suspected influenza should be treated with oseltamivir (Tamiflu[®]) or zanamivir (Relenza[®]) as quickly as possible; this is especially important for those at risk of serious complications. Treatment with Tamiflu[®] and Relenza[®] has been associated with improved survival, especially when initiated early.¹⁰ CDC is emphasizing that laboratory confirmation of influenza is not necessary to initiate treatment.

CDC points out that most healthy persons who develop uncomplicated influenza (e.g, do not have pneumonia) do not need routine treatment with antiviral medications.⁸

Antiviral Resistance

All 2009 influenza A H1N1 viruses tested since the emergence of the pandemic in April have been resistant to amantadine and rimantadine, and, worldwide, 28 samples have shown resistance to oseltamivir as of September 24, 2009.¹¹ In the U.S., oseltamivir resistant cases have been reported, 30% of which have been isolated since September 1, 2009.¹² To date, there has been little evidence of community transmission of oseltamivir-resistant 2009 H1N1 influenza virus; however, reports of limited transmission of oseltamivir-resistant 2009 H1N1 influenza underscore the need for the judicious use of antivirals.¹⁰

Conclusions and Commentary

The timing and magnitude of the 2009 H1N1 influenza pandemic is earlier and greater than typically observed with seasonal influenza. This pattern is similar to that observed during the 1957 pandemic;¹¹ however, this year's pandemic has largely spared the elderly.¹² This difference limits our ability to extrapolate from 1957 data to estimate the numbers of infections and deaths that will ultimately be caused by the 2009 H1N1 influenza.¹¹ With currently available data, it is also difficult to determine the proportion of 2009 H1N1 cases that will likely require hospitalization or develop serious complications. This makes it difficult to estimate the ultimate burden on hospitals as well.

Although a precise description of the epidemiology of this pandemic (e.g., attack rate, hospitalization rate, and case fatality rate) is not yet possible, at this point, it is clear that this pandemic is relatively mild, which is similar to the last 2 pandemics in 1968 and 1957.¹¹ However, the predilection for infection of children and young adults and the small fraction of patients who require extraordinary amounts of intensive care have created unexpected challenges. To date, the largest burden has fallen on emergency departments and ICUs, with a small percentage of ICU patients requiring an extraordinary amount of medical resources. Patients requiring extensive resources, intensive care, and, in some cases, rescue measures, place a burden on hospitals greater than their numbers alone suggest.

Changes in our healthcare system over the last several decades have reduced our nation's capacity to accommodate sudden surges in the number of sick people. The result is the stress currently being experienced by many emergency departments and ICUs. It is fortunate that the pandemic is not any worse than it is.

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Press Contact

Molly D'Esopo

443-573-3307

molly_desopo@upmc-biosecurity.org