

Preparing for Vaccination with Novel H1N1 Vaccine

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Epidemiology

In the Northern Hemisphere, novel H1N1 influenza virus is persisting, and is continuing to cause outbreaks and sporadic cases in numerous locales despite the onset of summer. Evidence to date suggests that population immunity to this virus is low, particularly among the young. Thus far, most cases of illness, hospitalization and death associated with novel H1N1 infection have occurred among persons less than 65 years of age. Groups at increased risk of influenza-related complications include pregnant women, those with asthma, COPD, diabetes, chronic cardiovascular disease, and immunocompromised persons. These are the same groups as previously recognized to increase the risk of severe illness from seasonal influenza. In addition, morbid obesity may represent an additional risk factor for severe illness. Unlike seasonal influenza where persons 65 years and older are most likely to be hospitalized or die from influenza-related complications, this age group has been substantially less affected by novel H1N1 virus than younger age groups.

Widespread susceptibility to this virus among young persons and the potential for large numbers of cases raises the possibility of more hospitalizations and deaths especially among younger age groups than would be expected for a typical routine seasonal influenza virus. The virus has also caused numerous outbreaks in schools and summer, institutions such as camps and correctional facilities, and led to disruptive interventions such as school dismissals that have substantial societal impact.

Vaccine manufacturing

Novel H1N1 vaccine is being procured by the U.S. government from five (5) vaccine manufacturers of currently U.S.-licensed seasonal influenza vaccines – inactivated subunit (4) and live, attenuated vaccines (1). Inactivated licensed novel H1N1 vaccine will be available in single-dose syringes, or in multi-dose vials. Live attenuated vaccine will be available in limited number in inhaler sprayers. Single-dose syringes will be thimerosal-free, which will address concerns about this additive, especially regarding pediatric and pregnant vaccine recipients (inhaler sprayer vaccine products will also be thimerosal-free). The availability of novel H1N1 vaccine is dependent on multiple factors including virus growth at commercial scale, regulatory review, availability of calibrated vaccine product potency assay reagents, overall production capacity, and availability to U.S. through HHS contracts.

Vaccine purchase and allocation

Novel H1N1 vaccine is being purchased by the U.S. government and will be made available for vaccinators at no cost. Syringes, needles, sharps containers and alcohol swabs will also be provided. Vaccine will be allocated across states proportional to

population. State health departments (and a few separately funded cities) will direct their allocation to local health departments and other vaccination partners.

Planning assumptions

Given uncertainty around the amount and timing of vaccine availability, state and local public health planners have been asked to plan for vaccine becoming available mid-October under the following scenarios: 40, 80, or 160 million doses becoming available from the 5 manufacturers (total) over approximately a one month period, followed by weekly amounts of 10, 20 or 30 million doses. At this point, the planning assumption is that the vaccine will require 15 µg of antigen for an immunizing dose, and that two doses spanning over 21 or more days will be needed for efficacy for most persons. Clinical trials will be conducted to determine which age groups, if any, require only one dose. The majority of vaccine will be packaged in multidose vials but enough preloaded syringes will be manufactured for young children and pregnant women.

In addition, based on best available information to date, planners have been provided scenarios to serve as a basis for making venue-based plans to vaccinate specific populations. These populations include students and staff (all ages) associated with schools (K-12th grade) and children (age ≥6 months) and staff (all ages) in child care centers; pregnant women, children 6 months – 4 years of age, new parents and household contacts of children <6 months of age, and non-elderly adults with medical conditions that increase the risk of complications of influenza, and health care workers and emergency services personnel. Formal recommendations for the use of novel H1N1 vaccine will be made by the ACIP in August 2009 based on all available epidemiologic data to date.

Vaccine delivery system

Many state health departments are partnering with private sector partners to ensure the novel H1N1 vaccine is delivered to as many recommended persons as rapidly as possible. Vaccine will thus be available in a combination of settings including public health organized vaccination clinics, and in private sector settings such as provider offices (e.g. pediatricians, family physicians, obstetricians, internists), retail settings, pharmacies, workplaces, and through community vaccinators. Private providers who wish to administer the novel H1N1 vaccine will need to enter into relationships with their public health department so that vaccine can be directed to them.

While providers will receive the vaccine at no charge, information on reimbursement for administration is needed. CDC asked AHIP (America's Health Insurance Plans) whether insurance plans would reimburse private providers for administration and received the following answer: "Every year health plans contribute to the seasonal flu vaccination campaign in several ways: a) Health plans communicate directly with plan sponsors and members on the current ACIP recommendations and encourage immunization; they also provide information on where to get vaccinations, and who to contact with any questions; b) Just as health plans have provided extensive coverage for the administration of seasonal flu vaccines in the past, public health planners can make the assumption that health plans will provide reimbursement for the administration of a novel (A) H1N1

vaccine to their members by private sector providers in both traditional settings e.g., doctor's office, ambulatory clinics, health care facilities, and in non-traditional settings, where contracts with insurers have been established.”

Providers participating in novel H1N1 vaccination will be expected to administer vaccine in accordance with national recommendations for use of the vaccine. In addition, if administering vaccine during the early weeks, they will be expected to report weekly on the number of doses administered and the ages of persons who were vaccinated. Such data are critical for assessing early uptake and for adverse event monitoring as they provide a means of calculating adverse events rates.

Monitoring coverage, safety, and effectiveness

Vaccine coverage will be monitored initially through weekly reports of doses administered, based on requirements set forth by CDC. Once the number of vaccinated persons is large enough to be detectable through population surveys, this information will be collected on an ongoing basis providing for monthly coverage estimates.

The Vaccine Adverse Event Reporting System (VAERS), a national vaccine safety surveillance program co-sponsored by the Centers for Disease Control and Prevention and the U.S. Food and Drug Administration (FDA) collects and analyzes information from reports of adverse events following immunization and will serve as the foundation for safety monitoring. VAERS accepts reports from patients, providers, public health officials and others (1-800-822-7967, <http://vaers.hhs.gov/contact.htm>). Signals that are detected through VAERS will be tested using a network of managed care organizations representing approximately 3% of the U.S. population, the Vaccine Safety Datalink (VSD). Vaccination information as well as individual outcome data are available through this network both to test signals on an ongoing basis and to monitor pre-specified adverse events. Additional strategies are being developed to actively monitor Guillain Barre Syndrome (GBS) incidence during the novel H1N1 influenza vaccination season with networks of providers set up for active case-finding.

CDC will utilize at least two primary means to assess vaccine effectiveness: the first will assess vaccine effectiveness for prevention of laboratory confirmed medically attended influenza at 4 community based sites; the second will assess vaccine effectiveness for prevention of influenza hospitalizations diagnosed by provider-ordered clinically available tests at 10 sites nationwide through the Emerging Infections Program. Additional assessments of influenza vaccine effectiveness will be conducted by the US Department of Defense which has the ability to conduct timely assessments of vaccine effectiveness in their active duty populations.

Seasonal vaccination

Seasonal vaccine will be available beginning in August or September 2009. The seasonal influenza vaccine is expected to be available earlier than the novel H1N1 vaccine, but the availability of the two vaccines is expected to overlap. The process for ordering seasonal vaccine is unchanged from previous years.