Mississippi State Department of Health

Mississippi Morbidity Report

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2009 H1N1 monovalent vaccine: Safety and Immunogenicity

Introduction

In April, 2009 a new influenza A virus was identified as the cause of illness among several children in the United States and as the cause of outbreaks of illness in Mexico. By the end of May the virus was identified in Mississippi and on June 11 the world Health Organization (WHO) declared a worldwide pandemic, indicating that the virus had spread worldwide. Although the illness caused by this virus is comparable in severity to seasonal influenza, the number of people affected is likely to be greater than during the usual influenza season, as few people have any immunity to this novel virus. In addition, the 2009 H1N1 influenza A virus disproportionately affects younger persons and is particularly severe in pregnant women. Production of monovalent influenza A (H1N1) 2009 vaccines began in the summer, and were FDA approved September 15, 2009.

Vaccine Production: Four manufacturers are producing 2009 H1N1 influenza vaccine (Table). The process for producing the inactivated monovalent vaccine is the same as is used for the seasonal vaccine except it contains only one inactivated influenza virus, compared to the three inactivated influenza viruses found in seasonal vaccine. Production involves the use of embryonated hen's eggs, and therefore the vaccine contains residual egg protein, as does seasonal influenza vaccine. The production of the live attenuated influenza A (H1N1) 2009 vaccine is also comparable to the production of the seasonal trivalent version. Each is being produced by manufacturers already approved to make seasonal vaccine. FDA vaccine approval was made on the basis of "standards developed for vaccine strain changes for seasonal influenza vaccines, adherence to manufacturing processes, product quality testing, and lot release procedures developed for seasonal vaccines." **None of the approved monovalent or seasonal influenza vaccines contain adjuvants.**

TABLE. Influenza A (H1N1) 2009 monovalent vaccines approved for use in the United States, October 6, 2009

Vaccine type	Manufacturer	Presentation	Mercury content (μg Hg/0.5 mL dose)	Age group	No. of doses	Route
Inactivated*	Sanofi Pasteur	0.25 mL prefilled syringe	0	6--35 mos	2†	Intramuscular§
		0.5 mL prefilled syringe	0	≥36 mos	1 or 2†	Intramuscular
		5.0 mL multidose vial	25.0	≥6 mos	1 or 2†	Intramuscular
Inactivated*	Novartis Vaccines and Diagnostics Limited	5.0 mL multidose vial	25.0	≥4 yrs	1 or 2†	Intramuscular
		0.5 mL pre-filled syringe	<1.0	≥4 yrs	1 or 2†	Intramuscular
Inactivated*	CSL Limited	0.5 mL prefilled syringe	0	≥18 yrs	1	Intramuscular
		5.0 mL multidose vial	24.5	≥18 yrs	1	Intramuscular
LAIV¶	MedImmune LLC	0.2--mL sprayer**	0	2--49 yrs	1 or 2††	Intranasal

* A 0.5-mL dose contains 15 μg hemagglutinin of A/California/7/2009 (H1N1) pdm.

† Two doses administered approximately 4 weeks apart (≥21 days acceptable) are recommended for children aged 6 months--9 years.

§ The preferred site for infants and young children is the anterolateral aspect of the thigh.

¶ Live attenuated influenza vaccine. A 0.2-mL dose contains $10^{6.5-7.5}$ fluorescent focal units of live attenuated influenza virus reassortants of A/California/7/2009 (H1N1) pdm.

** Influenza A (H1N1) 2009 LAIV is shipped refrigerated and stored in the refrigerator at 36°F--46°F (2°C--8°C) after arrival in the immunization clinic. The dose is 0.2 mL divided equally between each nostril. LAIV should not be administered to persons with asthma. Health-care providers should consult the medical record, when available, to identify children aged 2--4 years with asthma or recurrent wheezing that might indicate asthma. In addition, to identify children who might be at greater risk for asthma and possibly at increased risk for wheezing after receiving LAIV, parents or caregivers of children aged 2--4 years should be asked: "In the past 12 months, has a health-care provider ever told you that your child had wheezing or asthma?" Children whose parents or caregivers answer "yes" to this question and children who have asthma or who had a wheezing episode noted in the medical record during the preceding 12 months should not receive LAIV.

†† Two doses administered approximately 4 weeks apart are recommended for children aged 2--9 years.

Clinical trials: As with inactivated seasonal influenza vaccine, clinical trials involving healthy adults by NIH, National Institute of Allergy and Infectious Diseases (NIAID) and by the vaccine manufacturers have taken place. Preliminary data show immunogenicity and safety similar to that for seasonal influenza vaccine, with appropriately elevated antibody titers measured 21 days after vaccination with one 15µg dose. The NIAID has reported preliminary results among children that indicate those 10 to 18 years of age developed antibody titers after only one dose of vaccine. Children 6 months through 9 years had lower antibody responses after one dose, in general, with the lowest being among the youngest. Therefore two doses, at least 4 weeks apart are being recommended for this age group. Trials of the live attenuated virus vaccine also indicate results comparable to seasonal influenza vaccine. Pediatric trials and those including pregnant women and HIV infected persons are ongoing.

Safety: In addition to testing the vaccines for efficacy, safety of the vaccine is also assessed in the clinical trials. So far, the safety profile is very like that expected with seasonal influenza vaccine. The most common side effect is local discomfort at the site of the injection (46%), along with headache, malaise or myalgia among 45%. Side effect assessment for seasonal influenza indicates that the proportion with systemic side effects such as these is not significantly different from those found after placebo injections.

Safety concerns: As this 2009 H1N1 influenza virus has been called "swine" flu virus, concern regarding an association between this vaccine and Guillain-Barré Syndrome (GBS), as occurred in 1976 with the "swine flu" vaccination program, is understandable. GBS occurs at an estimated rate of 1 to 2 cases per 100,000 per year, and about 2/3 of these occur within days or weeks after a diarrheal illness (often *Campylobacter jejuni*) or viral upper respiratory infection. In 1976, an outbreak of a swine influenza occurred at Ft. Dix, New Jersey. Due to concern over the possibility of a pandemic (although continued transmission did not occur), vaccine was produced and the US moved forward with nationwide vaccination. It was determined that there was an increase in incidence of GBS of approximately 1 per 100,000 people vaccinated, and the vaccination program was ended. Multiple studies since 1976 have shown no increase in GBS following influenza vaccination, and one study from that combined data from the 1992-1993 and 1993-1994 seasons, showed an increase of one case per million vaccinated. A report from the Institute of Medicine in 2003 assessed the relationship between flu vaccine and neurologic complications including GBS and multiple sclerosis (MS). The committee accepted the causal relationship between the 1976 influenza vaccine and GBS, and concluded, "…the evidence was inadequate to accept or reject a causal relationship between GBS in adults and influenza vaccines administered after 1976." The committee rejected a causal relationship between influenza vaccine and MS.

Safety surveillance: The system for vaccine post marketing surveillance of adverse events includes the Vaccine Adverse Event Report System (VAERS) which is managed by CDC and FDA. All health care providers are encouraged to report any possible adverse event of concern after vaccination even if the relationship is not certain.

Please report adverse events possibly related to vaccination by going to the VAERS website (http://vaers.hhs.gov/). The Vaccine Safety Datalink (VSD) Project is a population based data collection system resulting from a collaboration between CDC and 8 large managed care organizations.

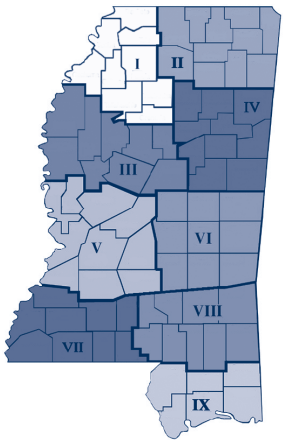
Information is collected on approximately 9 million persons, and analyzed weekly to search for any health outcomes following administration of any vaccine.

Vaccine Administration: The Influenza A (H1N1) 2009 monovalent vaccine is being provided to the state free. Physicians who would like to provide the vaccine to their patients may find information at the MSDH website (www.HealthyMS.com/swineflu). Providers may charge an administrative fee. Vaccine is beginning to be available for ordering – and information about this process will be sent to you when you sign up to be a vaccine provider.

A telephone survey performed by the Southern Research Company in Mississippi over the last month revealed that 62% of respondents were likely or very likely to get the vaccine when it is available. When asked what would have a positive influence on their decision, the most common response (44%) was for the vaccine to be recommended by a health care provider.

In summary, the influenza A (H1N1) monovalent vaccine is being produced and evaluated in the same way as the seasonal influenza vaccines. The vaccine is the best way to prevent 2009 H1N1 influenza in you and your patients. It should be recommended, especially for those in the ACIP priority groups for vaccination including pregnant women, persons six months through 24 years of age, persons who care for or live with children less than six months of age, health care providers and EMS personnel, and persons with chronic conditions that make them high risk for complications from the flu.

References available upon request.



Mississippi
Provisional Reportable Disease Statistics
September 2009

		Public Health District									State Totals*			
		I	II	III	IV	V	VI	VII	VIII	IX	Sept 2009	Sept 2008	YTD 2009	YTD 2008
Sexually Transmitted Diseases	**Primary & Secondary Syphilis**	3	0	4	0	4	1	1	3	1	17	17	166	120
	Total Early Syphilis	4	0	6	0	17	1	1	12	4	45	36	399	274
	Gonorrhea	77	42	80	39	199	53	47	65	89	691	531	5,672	5,413
	Chlamydia	249	150	285	157	565	178	164	173	221	2,142	1,570	18,110	14,961
	HIV Disease	6	3	7	1	11	3	1	6	2	40	47	452	417
Myco-bacterial Diseases	**Pulmonary Tuberculosis (TB)**	1	1	1	0	2	0	0	1	1	7	6	71	58
	Extrapulmonary TB	0	2	0	0	2	0	0	0	0	4	0	17	12
	Mycobacteria Other Than TB	3	2	1	2	4	4	3	1	1	21	28	226	223
Vaccine Preventable Diseases	**Diphtheria**	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pertussis	0	0	1	2	0	0	0	0	0	3	5	54	83
	Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0
	Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Measles	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mumps	0	0	0	0	0	0	0	0	0	0	0	1	0
	Hepatitis B (acute)	1	0	0	1	1	0	0	0	0	3	3	31	35
	Invasive *H. influenzae* b disease	0	0	0	0	0	0	0	0	0	0	0	0	2
	Invasive Meningococcal disease	0	0	0	0	0	0	0	0	0	0	0	4	9
Enteric Diseases	**Hepatitis A (acute)**	0	0	0	0	0	1	0	0	0	1	0	11	4
	Salmonellosis	12	21	5	13	42	10	5	6	7	121	198	715	908
	Shigellosis	2	3	0	0	0	1	0	0	0	6	12	39	278
	Campylobacteriosis	0	0	0	0	2	1	2	1	0	6	8	95	97
	***E. coli* O157:H7/HUS**	0	0	0	0	0	0	0	0	0	0	0	6	4
Zoonotic Diseases	**Animal Rabies (bats)**	0	0	0	0	0	0	0	0	0	0	3	4	5
	Lyme disease	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rocky Mountain spotted fever	0	0	0	0	0	0	0	0	0	0	1	7	10
	West Nile virus	1	1	0	0	2	0	0	3	1	8	12	47	63

*Totals include reports from Department of Corrections and those not reported from a specific District.