IDAHO DEPARTMENT OF HEALTH & WELFARE

Disease Bulletin

VOLUME 17 NUMBER 4 • OCTOBER 2010

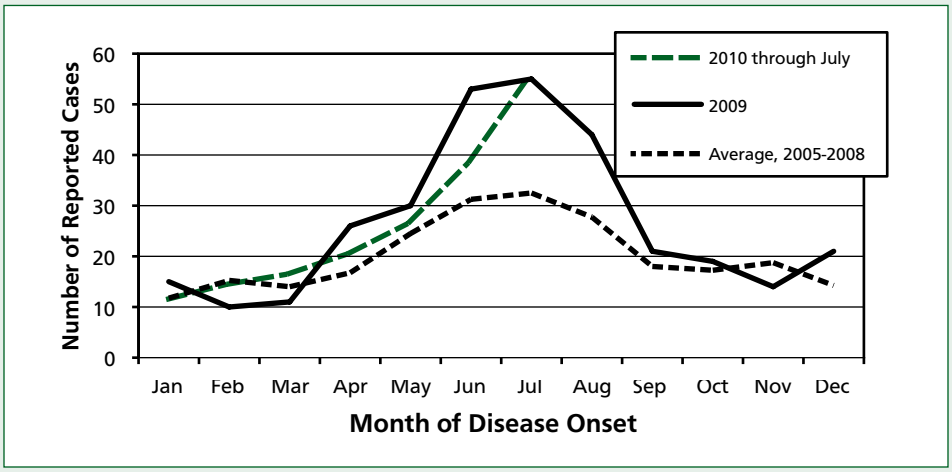
Campylobacter and Guillain-Barré Syndrome

Campylobacteriosis, caused by Gram-negative bacteria of the genus *Campylobacter*, is considered the most common foodborne illness in the developed world.[1] Most human cases are caused by *Campylobacter jejuni* and *Campylobacter coli*, although cases can be caused by other species, including *Campylobacter laridis* and *Campylobacter fetus* ssp. *fetus*. Although most infections are thought to be asymptomatic, symptomatic *Campylobacter* infections can result in diarrhea (sometimes bloody), cramping, abdominal pain, and fever, which last approximately one week. Infected persons can shed organisms in their stool for up to three weeks. Human infections with *Campylobacter* can result from eating raw or undercooked poultry, although outbreaks in Idaho have typically been associated with exposure to infected stool from dogs, cats, and calves, as well as contaminated raw milk and water sources. Campylobacteriosis is diagnosed by isolation of the bacterium from a clinical specimen; the Idaho Bureau of Laboratories (IBL) can perform subtyping to assist with outbreak detection.

During 2005–2008, an average of 242 cases of campylobacteriosis was reported annually to the Idaho Department of Health and Welfare (IDHW); the actual number of persons infected is probably higher due to underdiagnosis, underreporting, and asymptomatic cases. The median age of persons with campylobacteriosis was 27 years (range, 1–93 years); 57% were male. The majority (53%) of the 968 cases reported during this time occurred in the Central and South Central Public Health Districts. Consistent with nationwide trends, cases were reported more frequently during May–August (Figure).

During 2009, a total of 319 cases of campylobacteriosis were reported to IDHW; 187 have been reported during January–July 2010. Of these 506 cases, 55% came from the Central and Southwest Public Health Districts, in which 44% of the state's population resides. During

Figure. Number of reported cases of campylobacteriosis in Idaho by month of disease onset January 2005–July 2010.



CONTINUED ON NEXT PAGE

OFFICE OF EPIDEMIOLOGY, FOOD PROTECTION, AND IMMUNIZATION

Idaho Department of Health and Welfare

P.O. Box 83720
450 W. State Street,
4th Floor
Boise, Idaho 83720-0036
WWW.EPI.IDAHO.GOV

CONTINUED FROM FIRST PAGE

January–July 2010, approximately 7% of reported *Campylobacter* infections were associated with five reported outbreaks of campylobacteriosis. In comparison, during 2005–2009 a median of three outbreaks were reported annually, and 3% of all reported infections were associated with outbreaks. Although outbreaks in Idaho are frequently associated with infected animal stool, outbreaks associated with contaminated water have the potential to generate substantial numbers of infections. For example, an outbreak along the Idaho-Montana border identified during July 2010, has involved ≥96 cases among persons from ≥8 states, and is linked to exposure from contaminated well water at a local resort.

Although the majority of *Campylobacter* infections resolve without treatment, campylobacteriosis can result in serious and life-threatening disease. One severe complication associated with *Campylobacter* infection is Guillain-Barré syndrome (GBS), a serious neurologic disorder involving acute inflammatory demyelination of the peripheral nerves.[2] GBS most often manifests as progressive, symmetrical weakness, beginning in the legs and progressing to the arms and bulbar muscles. Weakness is associated with decreased or absent deep tendon reflexes. Paresthesias, involvement of cranial nerves, and paralysis of respiratory muscles can also occur. Approximately 4%–15% of patients with GBS die, and 20% have disabilities lasting more than one year after onset.[3]

Although GBS has been linked to influenza vaccinations in some years,[3] it is less well known that approximately two-thirds of GBS cases are preceded by bacterial or viral infections, including influenza. Approximately 40% of all GBS cases are thought to be associated with *Campylobacter* infection. The mechanism by which campylobacteriosis triggers GBS is unknown, but is thought to involve molecular mimicry, whereby *Campylobacter* antigens generate antibodies that cross-react with peripheral nerve proteins. Approximately 1/1,000 reported *Campylobacter* infections results in GBS, but the risk for GBS after infection with specific *C. jejuni* serotypes is estimated to be as high as 1/158.[4]

GBS, which has an annual incidence of 1–2 per 100,000 population nationally,[3] is not a reportable disease in Idaho unless it is thought to occur as a complication of immunization; therefore, the burden of GBS in Idaho is unknown. Because of the increasing prevalence of *Campylobacter* infections during the past two years (Figure), clinicians should be aware that Idaho might experience a concomitant increase in GBS cases. *Campylobacter* is reportable in Idaho; cases are investigated by public health staff to identify the source and to prevent further exposures. *Campylobacter* isolates should be forwarded to IBL for subtyping to assist with outbreak detection and to improve our understanding of the epidemiology of *Campylobacter* in Idaho.

[1] Ailes EL, Demma, Hurd S, et al. Continued decline in the incidence of Campylobacter infections, FoodNet 1996–2006. *Foodborne Pathog Dis* 2008;5:329–37.
[2] Hughes RAC, Cornblath DR. Guillain-Barré syndrome. *Lancet* 2005;366:653–66.
[3] Iskander J, Broder K. Monitoring the safety of annual and pandemic influenza vaccines: lessons from the US experience. *Expert Rev Vaccines* 2008;7:75–82.
[4] Allos BM. Association between Campylobacter infection and Guillain-Barré syndrome. *J Infect Dis* 1997;176(Suppl 2):S125-8.

New Seasonal Influenza Vaccine Recommendations: Special Considerations

In July 2010, the Centers for Disease Control and Prevention's (CDC's) Advisory Committee on Immunization Practices (ACIP) updated recommendations regarding the use of influenza vaccine. Influenza vaccine is now recommended for all persons aged ≥6 months for the 2010–11 influenza season. The 2010–11 seasonal influenza trivalent vaccine will contain strain A/California/7/2009 (H1N1), which was available as a monovalent vaccine and widely used during 2009–2010, leading to questions about proper use of trivalent vaccine in the upcoming flu season. This is particularly confusing for providers and parents of the 240 (preliminary data) children reported with H1N1 infection and the more than 65,000 children aged 6 months–8 years who were reported in the Idaho Immunization Reminder Information System to have received at least one dose of Influenza A (H1N1) 2009 monovalent vaccine during April 2009–July 2010.

Seasonal influenza vaccination following 2009 H1N1 influenza monovalent vaccine

For the 2010–11 influenza season, children aged 6 months–8 years who did not receive at least one dose of an influenza A (H1N1) 2009 monovalent vaccine should receive two doses of a 2010–11 seasonal influenza vaccine, regardless of previous influenza vaccination history. Children aged 6 months–8 years for whom the previous 2009–10 seasonal or influenza A (H1N1) 2009 monovalent vaccine history cannot be determined should receive two doses of a 2010–11 seasonal influenza vaccine. A second dose is not necessary for children being vaccinated for the first time who were aged 8 years at the time of the first dose but who are seen again after they have reached age 9 years. (See Figure for further information on number of recommended doses.)

Seasonal influenza vaccination following laboratory-confirmed 2009 H1N1 influenza

There is no known harm in providing one or two doses of 2010–11 seasonal influenza vaccine to a child who has been infected previously with the 2009 influenza A (H1N1) virus. At immunization provider discretion, children who had **laboratory-confirmed** 2009 H1N1 influenza (RT-PCR or virus culture specific for 2009 H1N1 influenza, NOT a rapid flu test) can receive the appropriate number of 2010–11 seasonal vaccine doses (one

or two) without regard to previous receipt of the influenza A (H1N1) 2009 monovalent vaccine; however, providers should also determine whether two doses are indicated on the basis of seasonal vaccine history (Figure, see footnote).

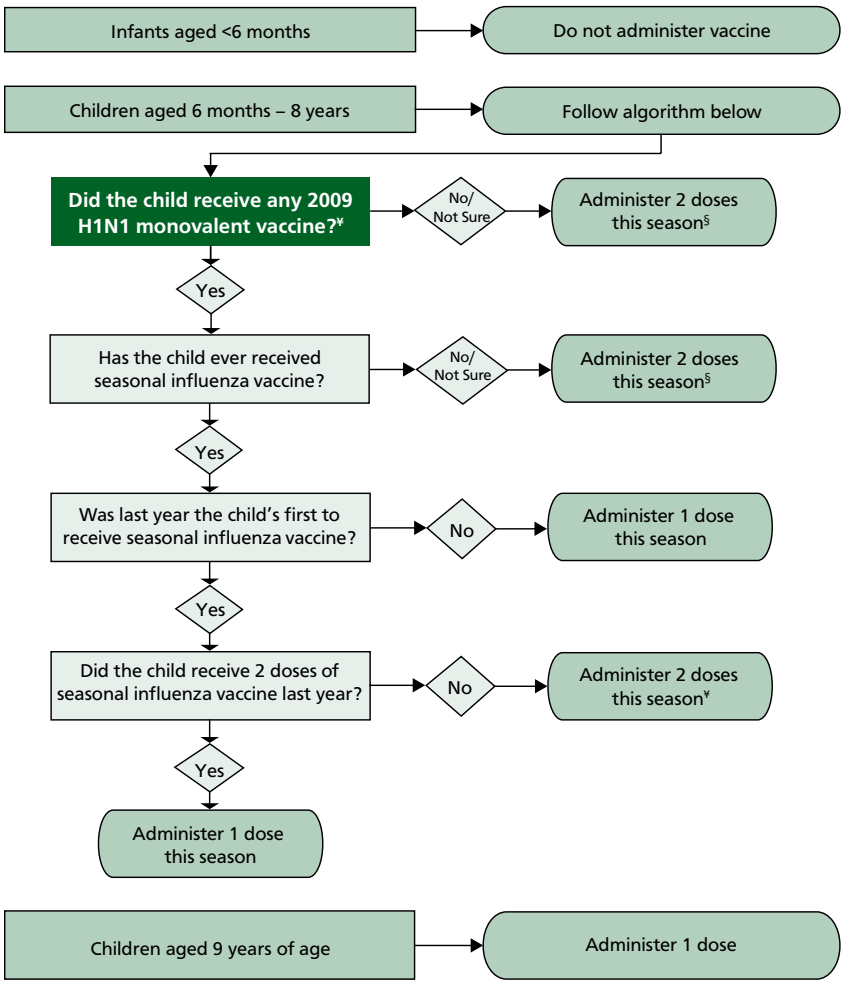
New ACIP recommendation regarding use of CSL seasonal influenza vaccine (Afluria®)

Alfuria® is a trivalent inactivated influenza virus vaccine for persons ages 6 months and older. On August 5, 2010, ACIP voted to update recommendations on the use of Alfuria® because of data suggesting: 1) an increased risk of febrile seizures in children aged 6 months–4 years following 2010 Fluvax® or Fluvax Jr® (vaccine manufactured with the same process and antigenically equivalent to 2010 Afluria®), 2) a higher frequency of reported fever in children aged 5 years–8 years following Fluvax® compared to previous seasons, and 3) a higher frequency of fever in children aged 5 years–8 years following Afluria® in one clinical trial in 2009. For the 2010–11 influenza season in the United States, ACIP recommends:

- Afluria® should not be used in children aged 6 months–8 years (see exception below for children aged 5–8 years).
- Other age-appropriate, licensed seasonal influenza vaccine formulations should be used for prevention of influenza in children aged 6 months–8 years.
- If no other age-appropriate, licensed seasonal influenza vaccine is available for a child aged 5–8 years who has a medical condition that increases their risk for influenza complications, Afluria® can be used; however, providers should discuss with the parents or caregivers the benefits and risks of influenza vaccination with Afluria® before administering this vaccine.
- Afluria® may be used in persons aged ≥9 years.

While data are limited, no increase in febrile seizures has been reported to date with administration of other trivalent inactivated influenza vaccine products during the 2010 influenza season in the Southern Hemisphere. See **www.cdc.gov/mmwr/preview/mmwrhtml/mm5931a4.htm** for more information.

Figure. Number of 2010–2011 seasonal influenza vaccine doses recommended for children.



* Figure developed by CDC with the American Academy of Pediatrics, Committee on Infectious Diseases.
¥ Children who had a laboratory-confirmed 2009 pandemic H1N1 virus infection (*e.g.*, reverse transcription-polymerase chain reaction or virus culture specific for 2009 pandemic influenza A(H1N1) virus) are likely to be immune to this virus. At provider discretion, these children can have a "Yes" entered at this box, and proceed down the path to the next box to determine whether two doses are indicated monovalent vaccine was administered, enter "No" here.
§ Interval between 2 dose is >4 weeks.

Reference: CDC. MMWR Recommendations and Reports. August 6, 2010; 59(rr08):1–62

Investigation of Deaths by Using Postmortem Nasopharyngeal Swabs for Influenza Testing—Idaho, 2009

During autumn 2009, Idaho experienced several unattended or unexplained deaths suspected to be related to 2009 influenza A (H1N1). To facilitate cause of death determination for deaths investigated by coroners or pathologists, the Idaho Department of Health and Welfare implemented distribution of nasopharyngeal (NP) swabs through public health districts for sampling by coroners and pathologists. Swabs were tested for influenza virus at the Idaho Bureau of Laboratories and the Washington State Public Health Laboratory; CDC and commercial pathology laboratories examined tissues.

During September 1–December 1, 2009, coroners or pathologists investigated 13 suspected influenza-related deaths: 6 by swab, 3 by autopsy, and 4 by both swab and autopsy. Median time between death and receipt of results from swabs was 4 days (range: 2–41 days) and from tissues, 41 days (range: 23–72 days). Four of the 13 coroner- or pathologist-investigated deaths had samples positive for 2009 H1N1 influenza virus: two had positive postmortem swabs, one initially had an equivocal antemortem swab that retested positive, and one deceased had both posi-

CONTINUED ON NEXT PAGE

Idaho Disease Bulletin

IDAHO DEPARTMENT OF HEALTH & WELFARE

Division of Public Health
P.O. Box 83720
Boise, ID 83720-0036

ROUTINE 24-Hour Disease Reporting Line
1.800.632.5927

EMERGENCY 24-Hour Reporting Line
1.800.632.8000

An electronic version of the Rules and Regulations Governing Idaho Reportable Diseases may be found at http://adm.idaho.gov/adminrules/rules/idapa16/0210.pdf.

Current and past issues are archived online at www.epi.idaho.gov.

CONTINUED FROM PAGE 3

tive postmortem swab and tissue samples.

Four of Idaho's twenty-three 2009 H1N1 influenza-related deaths during autumn 2009 were investigated by coroners or pathologists. NP swabs provided rapid results and detected four 2009 H1N1 influenza-related deaths that might otherwise have been missed; the swabs contributed to coroner decisions that 2009 H1N1 influenza was not a contributing factor in nine deaths. NP swabs should be considered in postmortem investigations where influenza is suspected, although the length of time that influenza virus can be recovered by NP swabs following death is unknown. Because the sensitivity of rapid flu tests for detecting 2009 influenza A (H1N1) ranges from 10–70% in comparison to RT-PR, postmortem NP swabs should be sent to public health or commercial laboratories for influenza virus detection and characterization.

West Nile Virus Data Snapshot

West Nile virus (WNV) activity has been well-documented in Idaho since 2004, most often in southwestern counties. Certain mosquito species and avian hosts function as long-term reservoirs while mammalian species are typically dead-end hosts. Surveillance is conducted on WNV in mosquitoes, sentinel avian species, horses, and humans. Idaho reported the highest number of human cases nationwide in 2006 with 996 cases and 23 deaths. Since that year, annual reported case counts and deaths have dropped precipitously. From 2007 through 2009, the average annual reported case count was 66 (Figure) and the average number of deaths was one per year. As of September 30, 2010, one human case with onset in 2010 has been reported. Annual prevention activities throughout Idaho include seasonal promotion of the print, television, and radio "Fight the Bite" campaign and updating the state WNV website **www.westnile.idaho.gov**.

Figure: Reported human cases of West Nile virus by report week and year—Idaho, 2007–2009