State of Wyoming

Department of Health

Wyoming Influenza Summary Report
2009-2010 Season
(October 4, 2009 – May 22, 2010)

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WYOMING INFLUENZA SUMMARY REPORT, 2009 – 2010 SEASON (October 4, 2009 – May 22, 2010)

SYNOPSIS

Influenza activity during the 2009-2010 (October 4, 2009 - May 22, 2010) influenza season was severe (as determined by the number of deaths resulting from pneumonia and influenza, the number of reported cases of laboratory-confirmed influenza, and the percentage of visits to outpatient clinics or hospitals for influenza-like illness [ILI]) for the first month of the season), while the remainder of the season was mild. There was an increase of more than a 200% in the number of cases reported this season as compared with last season. The percentage of outpatient visits for ILI was also higher than last season. From the start of the traditional influenza season in early October 2009 through the middle of November 2009, widespread levels of influenza activity were reported across Wyoming. Wyoming's influenza activity, as measured by reports of ILI and reported cases, peaked during the week ending October 17, 2009 (MMWR Week 41). Activity decreased in late November and remained low for the rest of the season. Influenza seasons are unpredictable in a number of ways. Although epidemics of influenza occur every year, multiple factors may influence the timing and severity of the season. This influenza season was distinctive due to several significant issues, specifically the 2009 influenza A (H1N1) pandemic and the development of the 2009 influenza A (H1N1) vaccine.

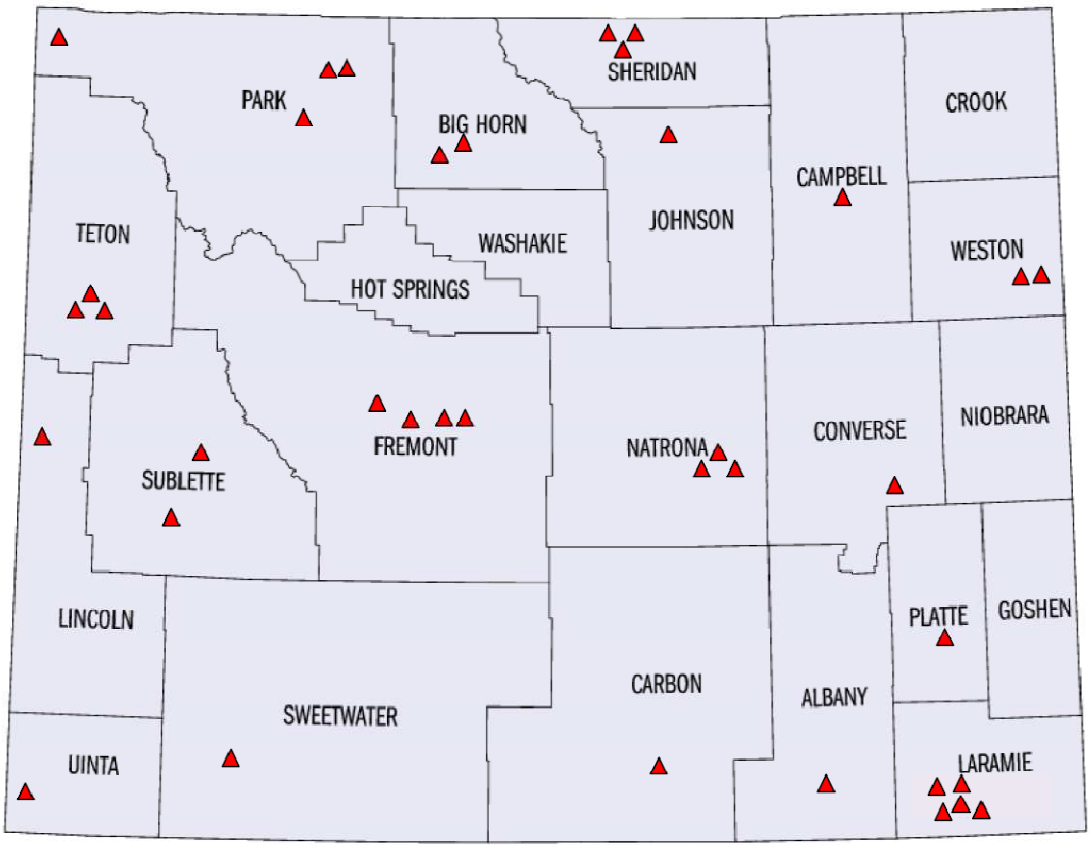
2009 INFLUENZA A (H1N1) VIRUS

During the 2008-2009 influenza season, a novel strain of influenza emerged in North America. This novel influenza virus was first detected in the United States in late April 2009. During the spring, the 2009 influenza A (H1N1) virus had become the predominating circulating influenza virus in the United States. Throughout the spring and summer of 2009, this virus continued to spread worldwide. By September 2009, influenza activity began to increase at a rate that was equivalent to previous winter peaks in the United States. The peak for the 2009-2010 influenza season occurred only two to three weeks into the traditional influenza season. Starting in November 2009, the disease began to diminish in most of the country. This trend continued for the remainder of the influenza season.

SURVEILLANCE AND THE INFLUENZA SENTINEL PROVIDER NETWORK

Influenza is a reportable disease in the State of Wyoming. The WDH receives reports of rapid diagnostic tests, direct fluorescent antibody (DFA), indirect fluorescent antibody (IFA), polymerase chain reaction (PCR) and laboratory cell cultures from various physicians, clinics, hospitals, and laboratories from across the state and the nation. The surveillance program relies on these sectors to test and report all positive results. In addition, Wyoming has a network of influenza sentinel providers located across the state. An influenza sentinel provider conducts surveillance for ILI in collaboration with the WDH and the CDC. Reports are submitted each week, even when no influenza activity is observed by the influenza sentinel providers. In addition, the influenza sentinel providers collect specimens from a small number of patients with ILI. The samples are sent to the Wyoming Public Health Laboratory (WPHL) for influenza testing. This information often provides public health officials the earliest identification of circulating virus types, subtypes, and strains during the influenza season. The map below indicates the locations of the healthcare providers enrolled in the 2009-2010 Sentinel Provider Influenza Surveillance Program.

WYOMING'S NETWORK OF INFLUENZA SENTINEL PROVIDERS
2009-2010 INFLUENZA SEASON



THE WYOMING INFLUENZA SENTINEL SURVEILLANCE NETWORK

Influenza viruses cause substantial morbidity and mortality every year. Data from influenza sentinel providers are critical for monitoring the impact of influenza and, in combination with other influenza surveillance data, can be used to guide prevention and control activities, vaccine strain selection, and patient care. Providers of any specialty (e.g., family practice, internal medicine, pediatrics, infectious diseases) in any type of practice (e.g., private practice, public health clinic, urgent care center, emergency room, university student health center) are eligible to be sentinel providers. The sentinel provider program involves two major components: weekly ILI reporting and lab specimen collection.

The first component, weekly ILI reporting, consists of recording and reporting summary data (total number of patient visits for any reason and the number of patient visits for ILI by age group) each week to the CDC via the internet. The ILI case definition used for national surveillance is (1) a fever ($\geq$100°F) and (2) a cough and/or sore throat in the absence of a known cause other than influenza. Reports were submitted weekly beginning October 4, 2009 (MMWR Week 40) and continued until October 2, 2010 (MMWR Week 39). Some of the sentinel providers discontinued reporting on May 22, 2010 (MMWR Week 20).

Historically, the twentieth week of the year marked the end of the influenza season. However, in recent years the CDC requested that influenza sentinel providers continue to report throughout the summer to develop annual epidemic thresholds. The second component, laboratory specimen collection, consists of collecting specimens from a small number of patients with ILI. The specimens are sent to the WPHL for influenza testing. This testing often provides the earliest identification of circulating virus types, subtypes, and strains in a season. During a normal influenza season, the WPHL utilizes the influenza sentinel provider program for surveillance for the WDH. However, during the emergence of Pandemic Influenza A (H1N1), the laboratory was utilized by healthcare providers across the state for diagnostic testing.

Participating influenza sentinel providers are offered summaries of state and national influenza data, free subscriptions to CDC's Morbidity and Mortality Weekly Report and Emerging Infectious Diseases Journal, and a number of viral isolation test kits for free influenza testing. The most important consideration is that the data provided are critical for protecting the public's health. For more information on the Influenza Sentinel Surveillance Network, or if you are interested in becoming a sentinel provider, please contact the Infectious Disease Epidemiology Program at (877) 996-9000.

REPORTED CASES

This season 3,109 cases of laboratory-confirmed influenza (rapid diagnostic testing, DFA, IFA, PCR and laboratory cultures) were reported from all of Wyoming's 23 counties. The first positive cases for the 2009-2010 influenza season were reported the week ending October 10, 2009 (MMWR Week 40). Reporting of influenza peaked the week ending October 17, 2008 (MMWR Week 41), when 1,015 cases were reported. In comparison, the 2008-2009 influenza season peaked the week ending March 21, 2009 (MMWR Week 11) when 135 cases were reported. Table 1 displays the number of cases reported by week. Although all positive laboratory tests for influenza are required by law to be reported to the WDH, not all providers report these results. Additionally, many ill persons do not seek medical care or are not tested for the disease. Therefore, comparing reported cases of influenza from year-to-year or week-to-week may not be valid as many factors influence testing and reporting.

REPORTED CASES OF INFLUENZA (RAPID AND CULTURE TEST POSITIVE)
WYOMING, (2005-2006 to 2009-2010)

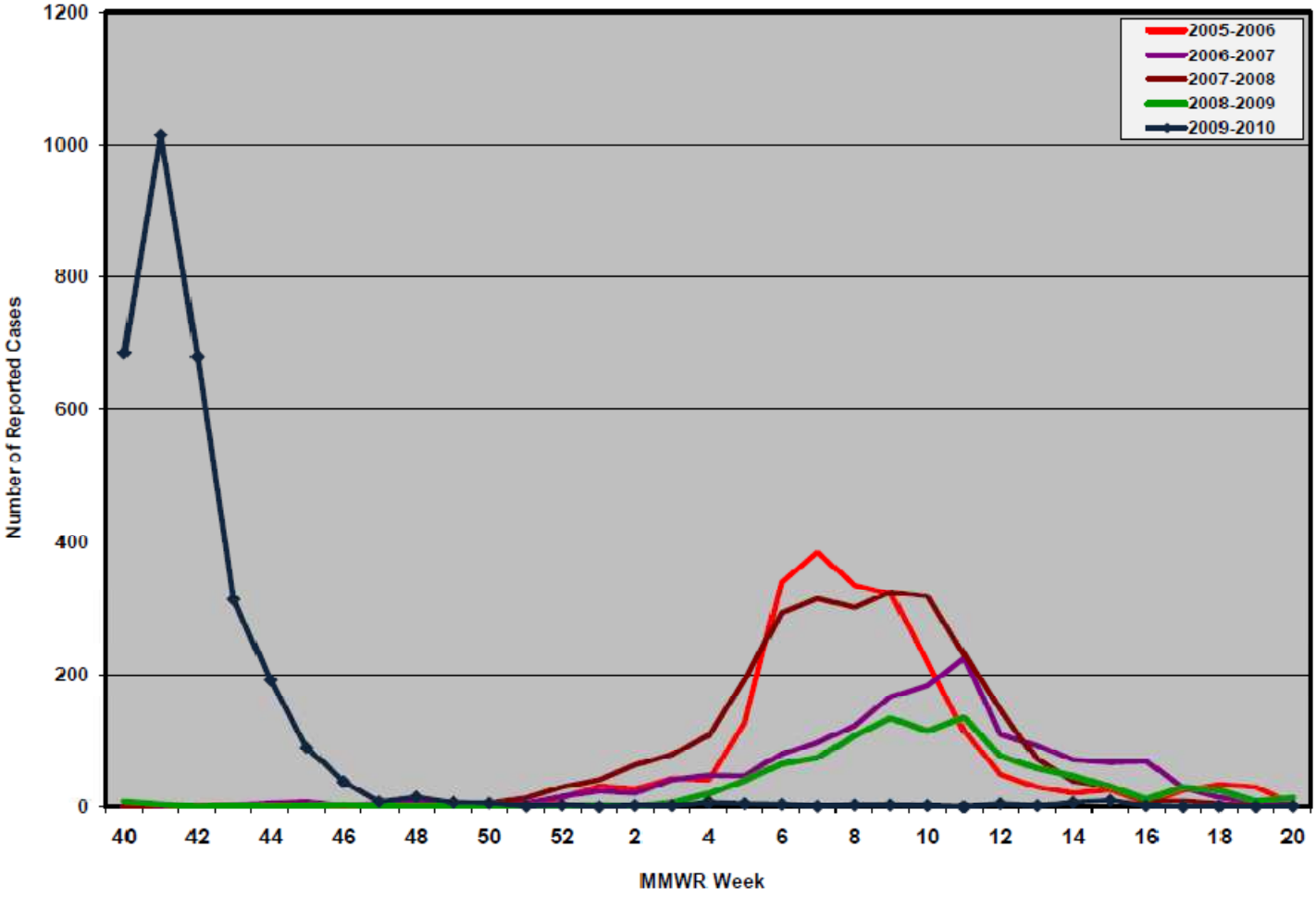


TABLE 1. REPORTED CASES OF INFLUENZA; WYOMING, 2009-2010 SEASON

Week Ending	Number
10-Oct	685
17-Oct	1015
24-Oct	679
31-Oct	313
7-Nov	192
14-Nov	90
21-Nov	38
28-Nov	8
5-Dec	15
12-Dec	7
19-Dec	6
26-Dec	1
2-Jan	3
9-Jan	0
16-Jan	2
23-Jan	2
30-Jan	7
6-Feb	5
13-Feb	4
20-Feb	1
27-Feb	3
6-Mar	3
13-Mar	2
20-Mar	0
27-Mar	5
3-Apr	2
10-Apr	7
17-Apr	10
24-Apr	2
1-May	0
8-May	1
15-May	0
22-May	1
Total	3109

County	Number
Albany	96
Big Horn	43
Campbell	314
Carbon	52
Converse	63
Crook	34
Fremont	239
Goshen	6
Hot Springs	25
Johnson	6
Laramie	851
Lincoln	58
Natrona	531
Niobrara	5
Park	34
Platte	26
Sheridan	113
Sublette	56
Sweetwater	302
Teton	60
Uinta	133
Washakie	45
Weston	17
Unknown	
Total	3109

Age	Number
0-4	671
5-10	812
11-19	693
20-39	603
40-59	273
60+	57
Unknown	
Total	3109

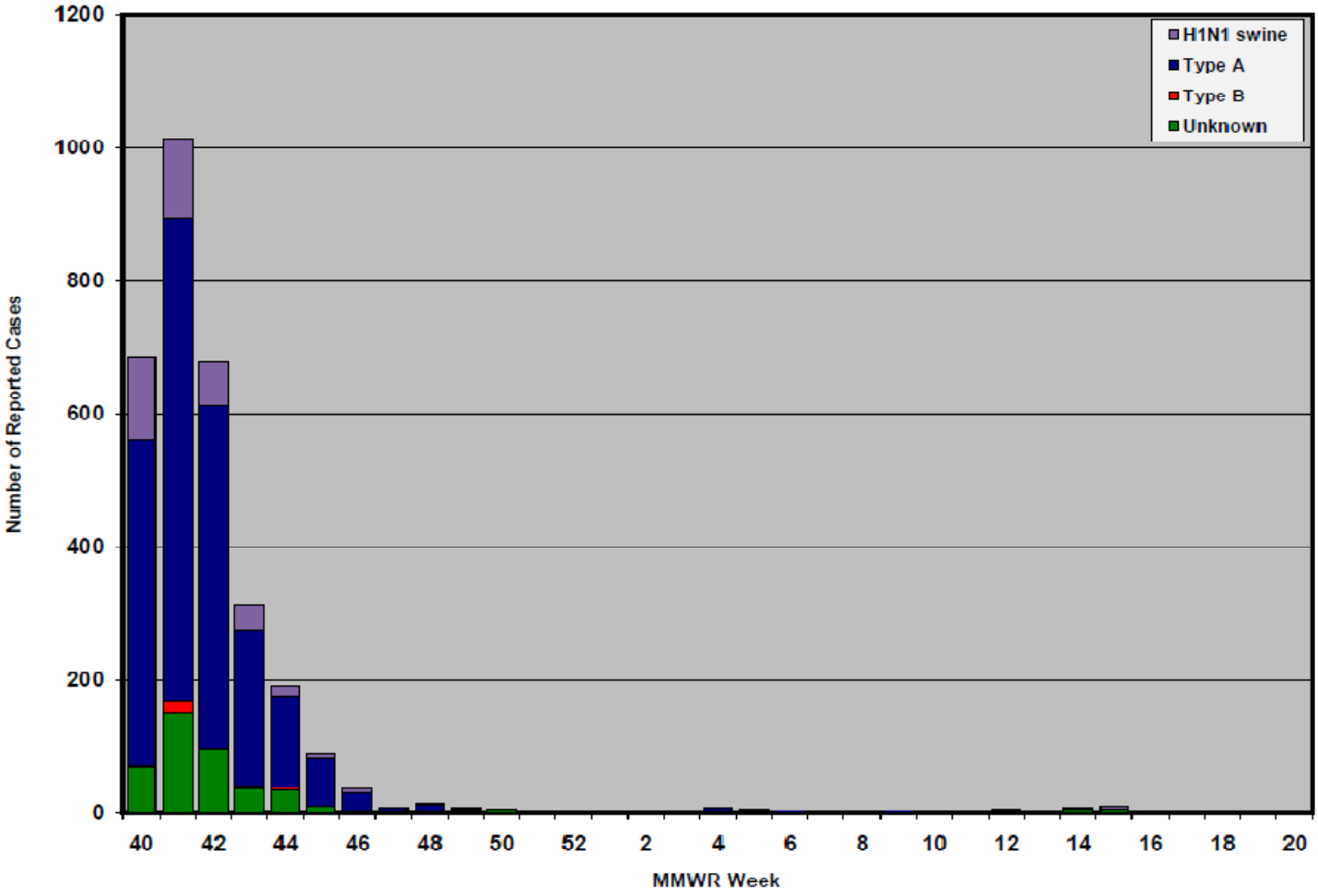
Gender	Number
Male	1549
Female	1560
Unknown	
Total	3109

Type	Number
A (Unknown Subtype)	2254
B	39
Pandemic A	397
Unknown	419
Total	3109

LABORATORY DATA

Of the 3,109 reported cases, 2,651 (85.3%) were type A, 39 (1.2%) were type B, and 419 (13.5%) were not typed. Three hundred seventy-nine of these cases were confirmed by PCR and cell culture at the WPHL and an additional 22 cases were confirmed by PCR and cell culture at outside laboratories. One case was confirmed by DFA; and the remaining 2,706 were confirmed by rapid test only. During the 2009-2010 influenza season, the WPHL tested a total of 842 specimens for influenza virus and 379 (45.0%) were positive. The first PCR and cell culture positive isolate was confirmed by WPHL during the week ending October 10, 2009 (MMWR Week 40), and the last positive isolate was confirmed during the week ending April 24, 2010 (MMWR Week 16). Among the 401 influenza isolates, 397 (99.0%) were 2009 Influenza A (H1N1) viruses and 4 (1.0%) were an unknown subtype of Influenza A viruses.

REPORTED CASES OF INFLUENZA BY VIRUS TYPE
WYOMING, 2009 - 2010 SEASON



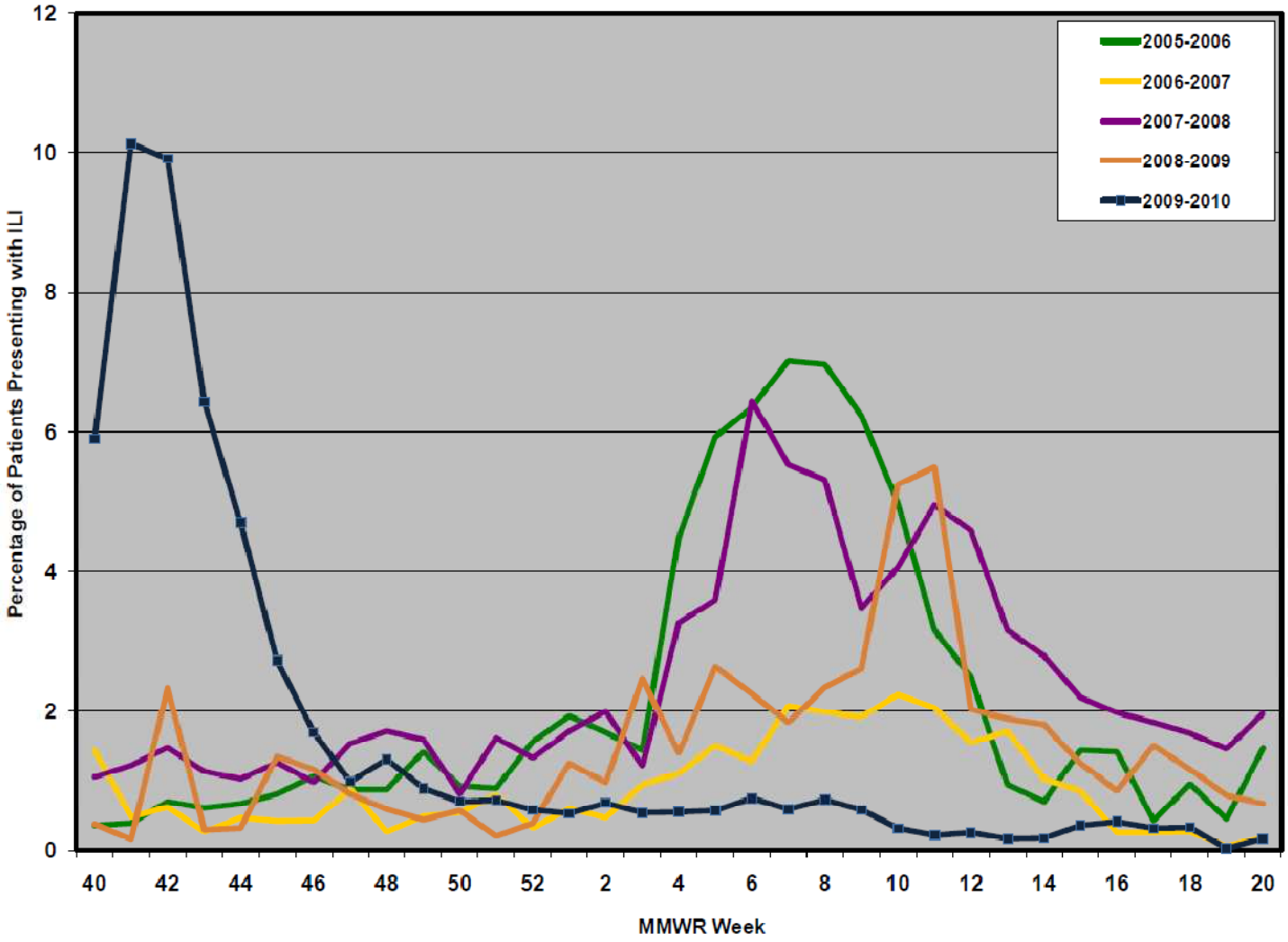
On a national level, WHO and National Respiratory and Enteric Virus Surveillance System collaborating laboratories tested a total of 456,302 specimens for influenza viruses and 90,235 (19.77%) were positive. Among the 90,235 influenza viruses, 89,878 (99.6%) were influenza A viruses and 357 (0.4%) were influenza B viruses. Sixty-six thousand nine hundred seventy-eight (74.2%) of the 90,235 influenza A viruses were subtyped: 66,978 (99.84%) were 2009 influenza A (H1N1) viruses, 34 (0.05%) were seasonal influenza A (H1N1) viruses and 71 (0.11%) were influenza A (H3N2) viruses. During the 2009-2010 influenza season, 2009 influenza A (H1N1), seasonal influenza A (H1N1), seasonal influenza A (H3N2), and influenza B viruses co-circulated in the United States. Overall, 2009 influenza A (H1N1) viruses were the most commonly reported influenza virus type and subtype throughout the entire influenza season. From MMWR Week 40 through MMWR Week 20, 2009 influenza A (H1N1) viruses were more frequently reported. The 2009 influenza A (H1N1) viruses predominated during the season; over 99% of all influenza viruses that were subtyped throughout the 2009-2010 season were 2009 influenza A (H1N1). As of May 22, 2010, the CDC antigenically characterized 1,895 influenza viruses [1,847 2009 influenza A (H1N1), 2 seasonal influenza A (H1N1), 14 seasonal influenza A (H3N2) viruses, and 32 influenza B viruses] collected by United States laboratories since September 1, 2009.

One thousand eight-hundred forty-one (99.7%) of 1,847 2009 influenza A (H1N1) viruses tested are related to the A/California/07/2009 (H1N1) reference virus selected by WHO as the 2009 H1N1 vaccine virus, and as a component in the 2010-2011 Northern Hemisphere vaccine. Six viruses (0.3%) tested showed reduced titers with antiserum produced against A/California/07/2009. Both seasonal influenza A (H1N1) viruses tested were related to the influenza A (H1N1) component of the 2009-2010 Northern Hemisphere influenza vaccine (A/Brisbane/59/2007). The 14 influenza A (H3N2) viruses tested showed reduced titers with antisera produced against A/Brisbane/10/2007, the 2009-2010 Northern Hemisphere influenza A (H3N2) vaccine component, and were antigenically related to A/Perth/16/2009, the WHO recommended influenza A (H3N2) component of the 2010 Southern Hemisphere and 2010-2011 Northern Hemisphere vaccine formulations. Influenza B viruses currently circulating globally can be divided into two distinct lineages represented by the B/Yamagata/16/88 and B/Victoria/02/87 viruses. The influenza B component of the 2009-2010 and 2010-2011 Northern Hemisphere vaccines belongs to the B/Victoria lineage, which currently predominates in most countries where circulation of influenza B has been reported. Twenty-seven (84.4%) of the 32 influenza B viruses from the U.S. tested belong to the B/Victoria lineage and are related to the influenza vaccine component for the 2009-2010 and 2010-2011 Northern Hemisphere influenza B vaccine strain (B/Brisbane/60/2008). Five (15.6%) virus tested belongs to the B/Yamagata lineage.

INFLUENZA-LIKE ILLNESS REPORTS FROM WYOMING SENTINEL SITES

Each week sentinel providers reported the total number of patients seen and the number of those patients with ILI by age group. Influenza-like illness morbidity as reported by Wyoming sentinel providers started the influenza season (week ending October 10, 2009 [MMWR Week 40]) above the baseline level (0 - 4.07%)* and remained above the baseline until the week ending November 14, 2009 (MMWR Week 45). The peak occurred during the week ending October 17, 2009 (MMWR Week 41). In comparison, the 2008-2009 influenza season peak was 5.25% during the week ending March 14, 2009 (MMWR Week 10).

WEEKLY INFLUENZA-LIKE ILLNESS (ILI) REPORTING BY WYOMING SENTINEL PROVIDER, (2005-2006 to 2009-2010)



REPORTED INFLUENZA-ASSOCIATED DEATHS

Influenza-associated deaths are reportable in the state of Wyoming. This influenza season, eight influenza-associated deaths were reported. Four of the deaths occurred in individuals over the age of 65, and four deaths occurred in individuals under the age of 65. There were two additional deaths that occurred during the summer months (the 2008-2009 influenza season). Both deaths occurred in individuals under the age of 65. There were a total of ten influenza-associated deaths since the emergence of the 2009 Influenza A (H1N1) virus in April 2009. This is an increase over previous influenza seasons.

2009 INFLUENZA A (H1N1) VACCINE DEVELOPMENT

The viruses used in making influenza vaccine are chosen each year based on information gathered over the previous year about the strains of the viruses that are infecting humans and how they are changing. Circulating influenza strains and information on disease trends are gathered by 122 national influenza centers in 94 countries. The combined data is analyzed by the four World Health Organization (WHO) Collaborating Centers for Reference and Research on Influenza. Based on this information, experts forecast which viruses are likely to circulate the following season, and the WHO recommends specific virus strains to be used to make the vaccine.
The recommendation for vaccines produced for the Northern Hemisphere is made by the WHO in February each year. This provides the vaccine manufactures ample time to complete production of the vaccine supply for the following influenza season. Each country can use the recommendations made by the WHO to assist with national decisions about what viruses to use in influenza vaccines for their country. In the United States, an advisory committee convened by the Food and Drug Administration (FDA) makes the final decision about vaccine strains in February. Manufacturers grow vaccine strains based on these recommendations. Vaccine efficacy each year depends on how closely related (or matched) the viruses in the vaccine are to the circulating influenza viruses.

The 2009 influenza A (H1N1) virus was first detected in April 2009, consequently it was an arduous process to develop, test and manufacture sufficient quantities of the vaccine as quickly as possible. The same manufacturers that produce seasonal influenza vaccines also produced the vaccine against the pandemic 2009 influenza (H1N1) virus. This monovalent vaccine was produced in the same way that the seasonal vaccines are made. By mid-September, vaccine manufacturers received approval from the FDA for the use of influenza A (H1N1) 2009 monovalent influenza vaccine in the prevention of influenza caused by 2009 influenza A (H1N1) viruses. Preliminary data indicated that the immunogenicity and safety of the 2009 influenza A (H1N1) vaccines were similar to those of seasonal influenza vaccines. Both forms of the vaccine, nasal spray and injected,

became available to the public in early October. The Centers for Disease Control and Prevention (CDC) organized a nationwide 2009 influenza A (H1N1) vaccination campaign. The CDC distributed vaccine to 62 project areas across the globe, including the 50 states, U.S. territories, and several major metropolitan areas. By the start of 2010, there was a surplus of the 2009 influenza A (H1N1) vaccine.

PANDEMIC INFLUENZA PLANNING

The presence of a virulent strain of avian influenza H5N1 in parts of Asia and the emergence of 2009 influenza A H1N1 has resulted in a sense of urgency among health officials world-wide to remain constantly prepared for the possibility of a novel strain of influenza and another influenza pandemic. The WDH has a state public health pandemic influenza plan that can be used to provide guidance on the control of such an outbreak. The plan contains information on measures that may be helpful, such as, surveillance methods to detect an outbreak early, controlling the early spread of the disease through isolation of those ill, and using antiviral medications and vaccine in the most effective ways. A copy of the Wyoming Pandemic Influenza Response Plan can be found at: http://www.health.wyo.gov/phsd/epiid/pandemic.html. In addition, the federal government maintains a comprehensive website about avian and pandemic influenza. This website is located at: http://www.pandemicflu.gov.

COMPOSITION OF THE 2010-2011 VACCINE

The WHO has recommended vaccine strains for the 2010-2011 Northern Hemisphere trivalent influenza vaccine, and the Food and Drug Administration (FDA) has made the same recommendations for the U.S. influenza vaccine. Both agencies recommend that the vaccine contain A/California/7/2009-like (2009 H1N1), A/Perth/16/2009-like (H3N2), and B/Brisbane/60/2008-like (B/Victoria lineage) viruses. A seasonal influenza A (H1N1) component is not included in the 2010-2011 formulation, and the A (H3N2) component has been changed from the 2009-2010 Northern Hemisphere vaccine formulation. This recommendation was based on surveillance data related to epidemiology and antigenic characteristics, serological responses to 2009-2010 trivalent seasonal and 2009 H1N1 monovalent vaccines, and the availability of candidate strains and reagents.

REPORTING REMINDER

All of the following are reportable to the WDH: laboratory-confirmed cases of influenza, influenza-associated deaths, an unusual incidence of influenza-like illness, and outbreaks or unusual clusters of influenza or influenza-like illness in schools, nursing homes, and other institutions. A

report is required by state statute from both the attending healthcare provider/hospital and any laboratory performing diagnostic testing. Reports can be faxed to our secure fax machine at (307) 777-5573 or can be made by phone to (307) 777-7953.