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Colorado Department
of Public Health
and Environment

Influenza Surveillance Summary
Colorado, 2012-2013

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Summary

The 2012/13 influenza season officially began September 30th, 2012 and ran through May, 25th, 2013. Influenza activity in the community during the 2012-2013 influenza season was moderately severe, with 1530 hospitalized cases reported from 47 counties. This is the highest number of cases reported since hospitalizations became a reportable condition in 2004, excluding the 2009 H1N1 pandemic (2009-2010 season), when 2041 cases were reported. Approximately 41% of hospitalized cases were age 65 years or greater. There were 5 deaths in persons less than 18 years of age during the season. Based on influenza surveillance data, the 2012-2013 influenza season peaked early, during the week ending 1/5/2013. Of those specimens subtyped by the State lab, influenza A continued to be the predominant type after the shift from influenza B in late 2012.

Components of Colorado's influenza surveillance

Surveillance activities during the 2012-2013 influenza season included: reporting of hospitalizations due to influenza, reporting of influenza-like illness (ILI) visits by selected health care sites, reporting of influenza testing activity by sentinel hospital labs, reporting of influenza outbreaks in long-term care facilities, monitoring circulating influenza viruses through molecular typing at the state public health laboratory, and reporting of influenza-associated deaths in children less than 18 years of age.

Reports of influenza-associated hospitalizations

Due to low influenza activity and the concern of false positives results from rapid antigen tests, influenza-associated hospitalizations during the early season were counted as cases only if they were positive by polymerase chain reaction (PCR), direct fluorescent antibody (DFA), or viral culture. Starting December 1, 2012 through May 25, 2013 all hospitalized influenza cases with any positive influenza test were counted as cases.

Confirmatory molecular testing by PCR at the CDPHE laboratory was done to a greater extent for the Denver metro area hospitals than for non-Denver metro area hospitals due to enhanced influenza surveillance conducted in the five county (Adams, Arapahoe, Denver, Douglas, Jefferson) Denver metro area as part of CDC-funded Emerging Infections Program grant activities. The substantially higher sensitivity of influenza PCR testing compared to rapid influenza testing likely increased influenza-associated hospitalization case ascertainment in the Denver metro area; 58% of all reported influenza-associated hospitalizations were from the five Denver metro counties which account for 46% of the Colorado population.

A total of 1530 hospitalizations from 47 counties were reported between September 30th, 2012 and May 25th, 2013 (Table 1). Influenza activity was elevated early in the season, steadily increasing until the season's peak during the week ending 1/5/2013 (Figure 1). Surveillance shows that the 2012-13 season peaked considerably earlier than other seasons, excluding the 2009 H1N1 pandemic (Figure 2). Influenza A continued to be the predominant type after the shift from influenza B during the week ending 12/29/12 (Figure 3). Among these reported cases, 995 (65%) were type A and 535 (35%) were type B. Of the type A cases, 259 (26%) were subtype A (H3), 56 (6%) were subtype 2009 H1N1, and the remaining 680 (68%) were not subtyped.

Table 1

Numbers of Reported Influenza-Associated Hospitalizations
Colorado, 2004/05 – 2012/13

Season	Hospitalizations
2004-05	980
2005-06	848
2006-07	364
2007-08	1004
2008-09	547
2009-10	2041*
2010-11	1027
2011-12	543
2012-13	1530

*2009 H1N1 Pandemic

Figure 1

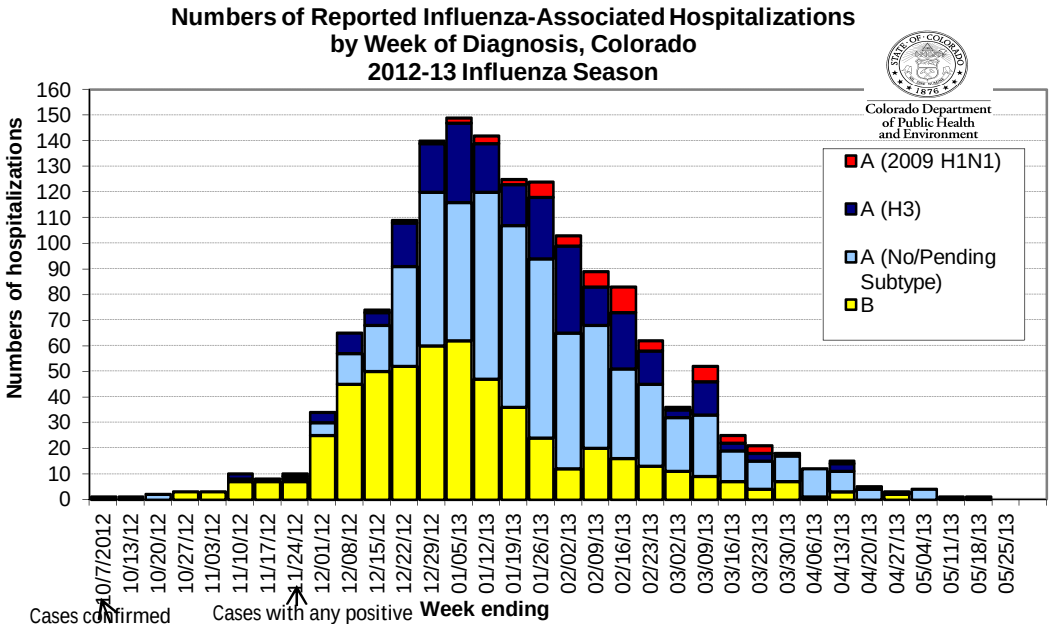


Figure 2

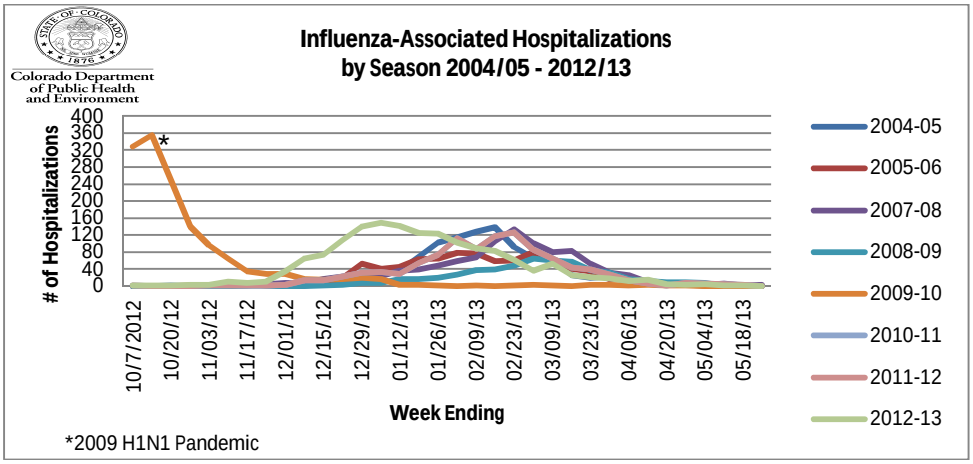
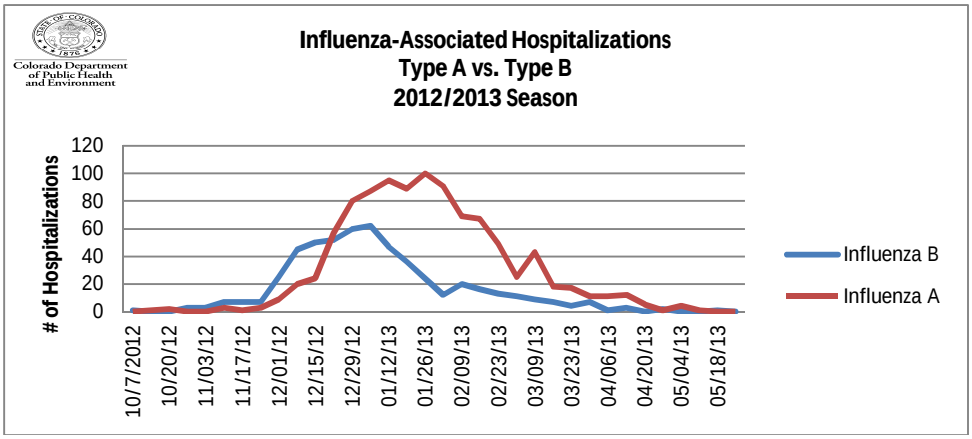


Figure 3



The highest age group specific rates of reported hospitalizations were in infants <6 months of age (Table 2, Figure 4), followed by adults 65 years of age and older. Rates among this older age group were notably higher than in the 3 previous seasons (Table 3).

Table 2

Influenza-Associated Hospitalization Rates by Age Group, Colorado 2012-13

Age	No.*	%	CO pop dist	Rate per 100,000
<6 mo	49	3.1	33257	141.3
6-23mo	106	6.9	99744	106.3
2-4	103	6.7	208449	49.4
5-18	133	8.7	968572	13.7
19-24	42	2.7	418412	10.0
25-49	203	13.3	1810130	11.2
50-64	271	17.7	1002508	27.0
65+	625	40.8	577445	108.2
Total	**1530**	100.0	**5118517**	**29.9**

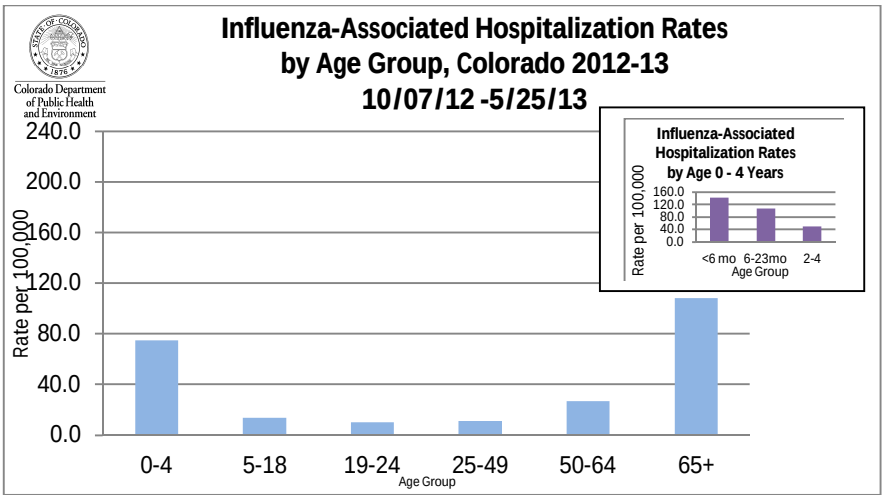
2011-based final population estimates from Demography Section, Colorado Dept. Local Affairs

Table 3

Influenza-Associated Hospitalization Numbers and Rates for Adults 65+ by Season Colorado, 2009/10 – 2012/13

Season	Hospitalizations	Rate per 100,000
2012/13	625	108.2
2011/12	233	42.4
2010/11	305	59.1
2009/10	220	45.0

Figure 4



Reports of influenza-like illness (ILI) by sentinel providers

Sentinel providers report the total number of patient visits each week and the number of patient visits for ILI by age group. Kaiser Permanente (KP) for the Denver-Boulder metropolitan area and Primary Care Partners, P.C. of Mesa County reported influenza-like illness based on ICD-9 diagnostic codes 487.1 (influenza with other respiratory manifestations) and/or 079.99 (unspecified viral infection) from their electronic medical records database. Peak levels of outpatient ILI were 4% during 2012-2013 season, compared to pre-pandemic seasons when the peak percentage of visits for ILI ranged from 1.5% to 4.7% (Figure 7). There was a distinct peak in KP ILI percentage during the week ending January 19th (Figure 5).

Figure 5

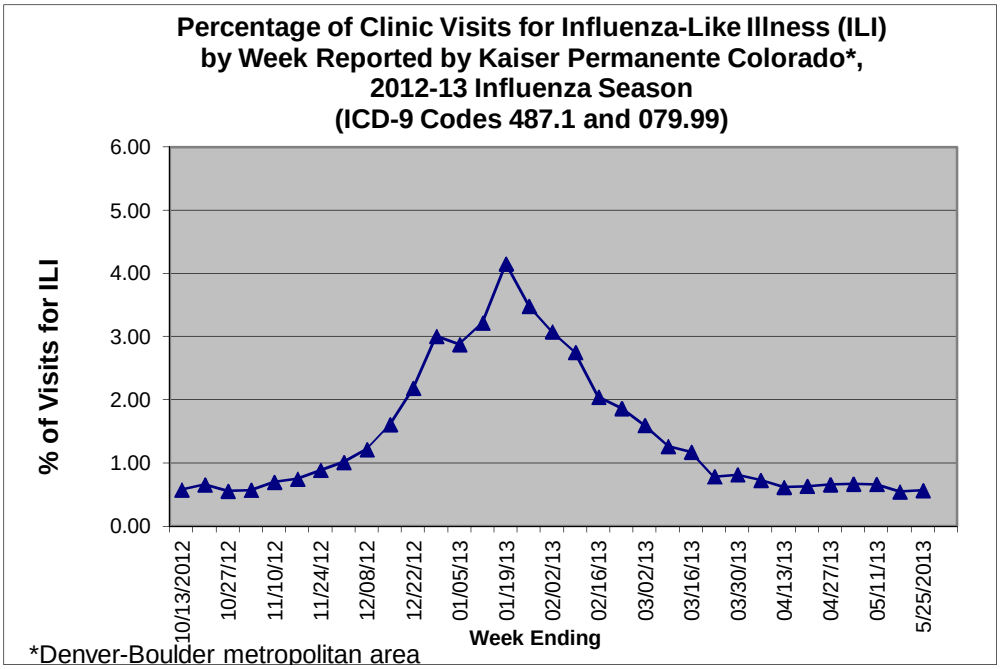


Figure 6

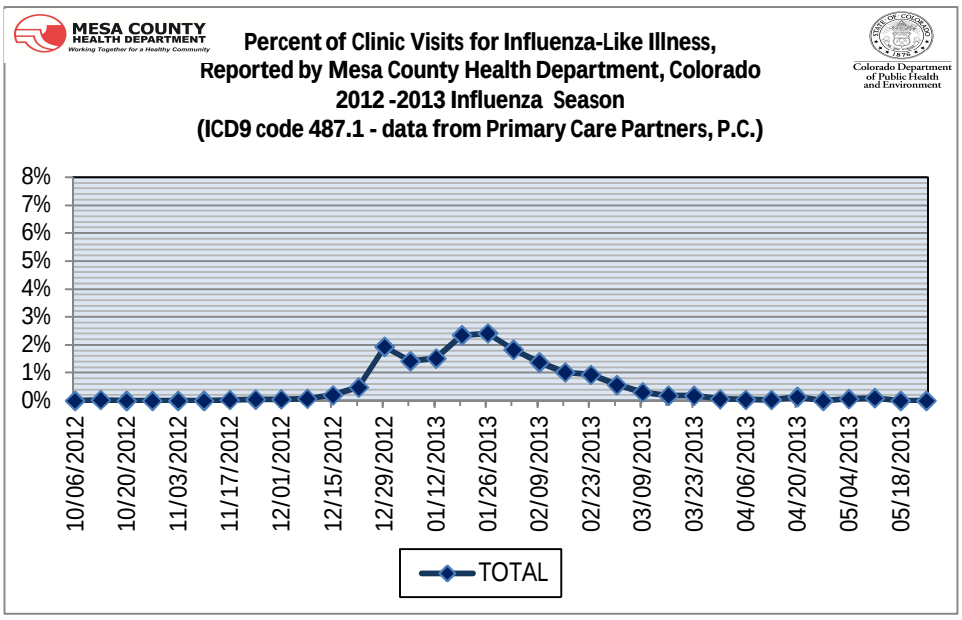
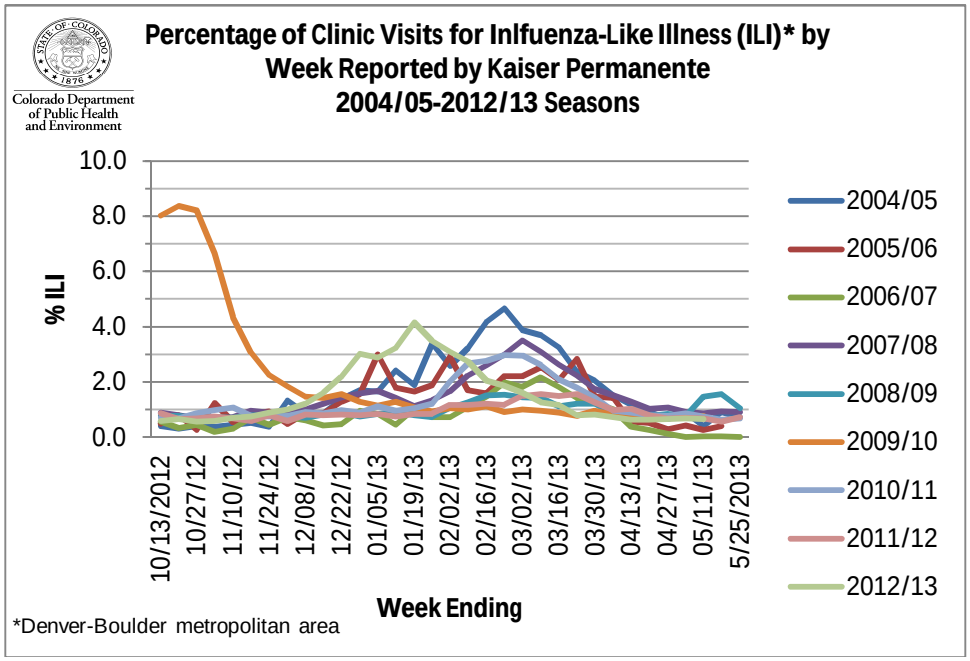


Figure 7



Circulating influenza virus surveillance

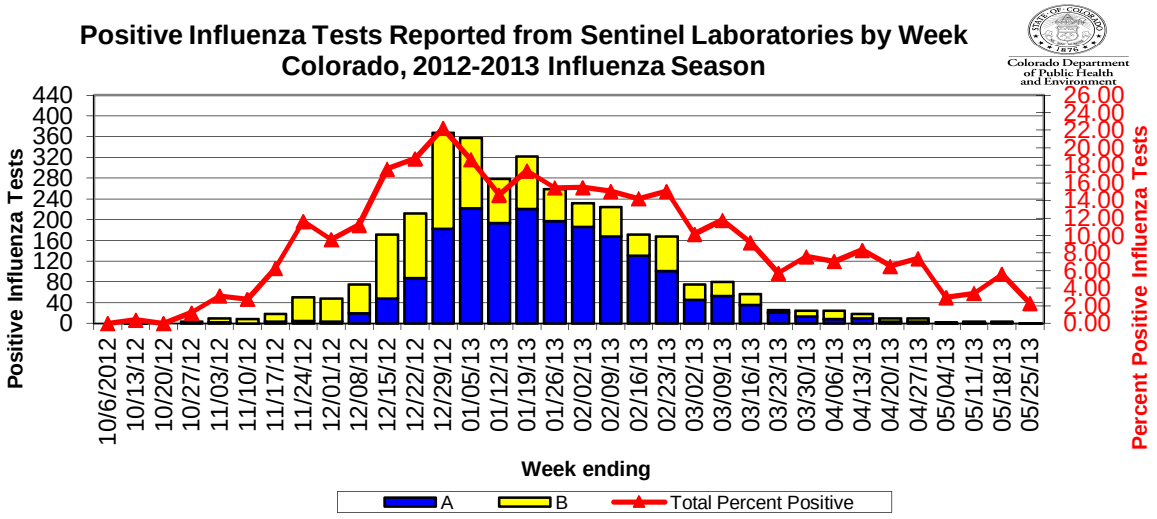
An important component of influenza surveillance consists of the typing and subtyping of influenza virus isolates throughout the season to determine the circulating strain(s) of influenza virus. Sentinel providers and hospital laboratories submit clinical specimens to the state laboratory where virus isolation, typing and subtyping are performed. Some of these are then sent to CDC for further antigenic characterization (assessment of match to the vaccine strains).

Based on typing and subtyping at the state laboratory, influenza A (H3) viruses predominated. Among 631positive specimens (out of 864) tested at the state laboratory, 428 (68%) were type A and 203 (32%) were type B. Of the type A specimens, 368 (86%) subtyped as H3 and 60 (14%) as 2009 H1N1.

Sentinel laboratory reporting of influenza testing

The percentage of respiratory specimens that tested positive for influenza at 18 sentinel hospital labs peaked during the week ending December 29th (red line in graph below). Type B viruses comprised of 50% of the positive influenza tests reported by sentinel laboratories during that week.

Figure 8



Reports of pediatric deaths due to influenza

Pediatric influenza-associated deaths have been a reportable condition in Colorado since the 2004-05 influenza season. During the 2003-2004 season 12 pediatric deaths were reported, since then an average of 2.75 deaths have been reported each season, excluding the pandemic. During the 2012/13 season there were 5 pediatric deaths (in persons less than 18 years of age); none of these children were documented to have received all recommended doses of influenza vaccine at least 2 weeks before the onset of influenza symptoms.

Table 4

Influenza-Associated Pediatric Deaths
2003/04-2012/13 Influenza Season

Season	Deaths
2003-04	12
2004-05	2
2005-06	2
2006-07	1
2007-08	2
2008-09	7*
2009-10	12**
2010-11	3
2011-12	0
2012-13	5

*Includes death reported in 08-09 season but after defined season dates which may have been acquired on domestic and/or international travel.
** 2009 H1N1 Pandemic

Reports of influenza outbreaks in long-term care facilities

Long-term care facilities (LTCF) are requested to report outbreaks of influenza or ILI. The number of outbreaks reported during the 2012-13 influenza season (n=48) was higher than the number reported during most other seasons (Table 5). The number of LTCF outbreaks reported during the 2012-13 influenza season peaked during week ending January 12th.

Figure 9

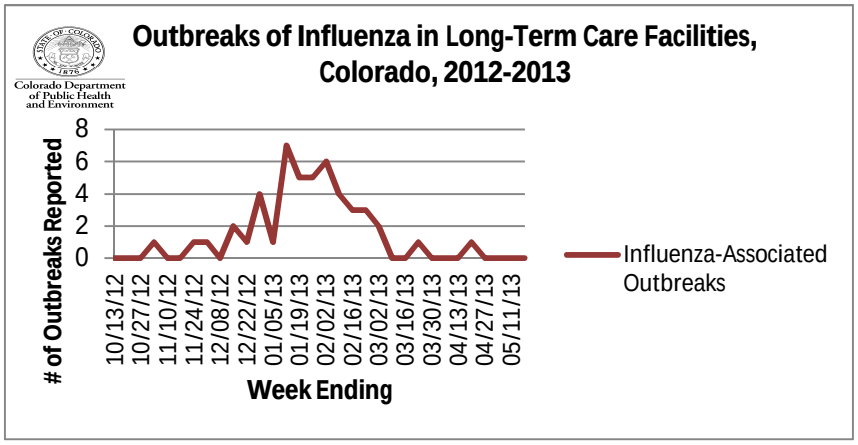


Table 5

Outbreaks of Influenza in Long-Term Care Facilities
Colorado, 2004/05 – 2012/13

Season	Outbreaks
2004-05	51
2005-06	34
2006-07	15
2007-08	55
2008-09	11
2009-10	3*
2010-11	37
2011-12	22
2012-13	48

*2009 H1N1 Pandemic