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## SUMMARY

This report summarizes the influenza activity in Maricopa County for the 2012-2013 Season (September 30, 2012 [MMWR WK 40] to September 28, 2013 [MMWR WK 39]). Maricopa County Department of Public Health (MCDPH) influenza surveillance is a collaborative effort between MCDPH, Arizona Department of Health Services (ADHS), Centers for Disease Control and Prevention (CDC), and local community partners such as health care providers, emergency departments, community health clinics, Office of Vital Statistics, Office of the Medical Examiner, and local schools. Information on influenza activity is based on several influenza indicators such as: laboratory-confirmed cases, influenza like illness (ILI) activity, absenteeism information from schools, pneumonia and influenza (P&I) mortality, influenza –associated pediatric mortality, and summer surveillance activity. Typically, influenza peaks in January or February; however, widespread influenza activity can occur as early as October or as late as May during a flu season. Influenza cases reported to MCDPH represent a small proportion of the true number of cases of influenza. Many people do not visit the doctor when ill and not every patient exhibiting ILI symptoms is tested.

Based on influenza indicators in Maricopa County, this season was moderately severe, especially compared to the previous season. The first locally-acquired case of influenza in Maricopa County was laboratory confirmed on October 30, 2012. ([table 1](#)). Peak influenza activity occurred in mid January, which was earlier compared to the previous season (mid March in 2011-2012). There were seven weeks with widespread influenza activity this season. In contrast, there were only four weeks of widespread activity during the 2011-2012 season. Influenza type A accounted for the majority of laboratory confirmed cases ([graph 3](#)). RT-PCR and viral culture testing suggested that the A/H3 virus was the most common viral subtype circulating during the 2012-2013 season ([graph 4](#)).

Influenza-like illness (ILI) activity was generally higher during the 2012-2013 season than it was during the 2011-2012 season. In hospital emergency departments, the percentage of visits due to ILI reported this season was higher compared to the previous season ([graph 7](#)). Data reported to CDC from sentinel sites show that the percent of outpatient visits due to ILI was higher on average than in 2011-2012 ([graph 8](#)). Although sentinel site ILI never exceeded the CDC regional baseline, for several weeks during this season levels peaked above the ADHS epidemic threshold. Additionally, school absenteeism due to ILI was higher than in the previous season ([graph 10](#)).

Pneumonia and influenza (P&I) mortality overall was somewhat higher compared to the previous season ([table 4](#)), although the number of pediatric deaths remained the same. This is the second season where there has not been an influenza death in a child reported since the condition became reportable in the state of Arizona in 2004 ([graph 11](#)).

Respiratory Syncytial Virus (RSV) activity was also more severe this season compared to the previous season and also peaked earlier, in mid-February ([graph 16](#)).

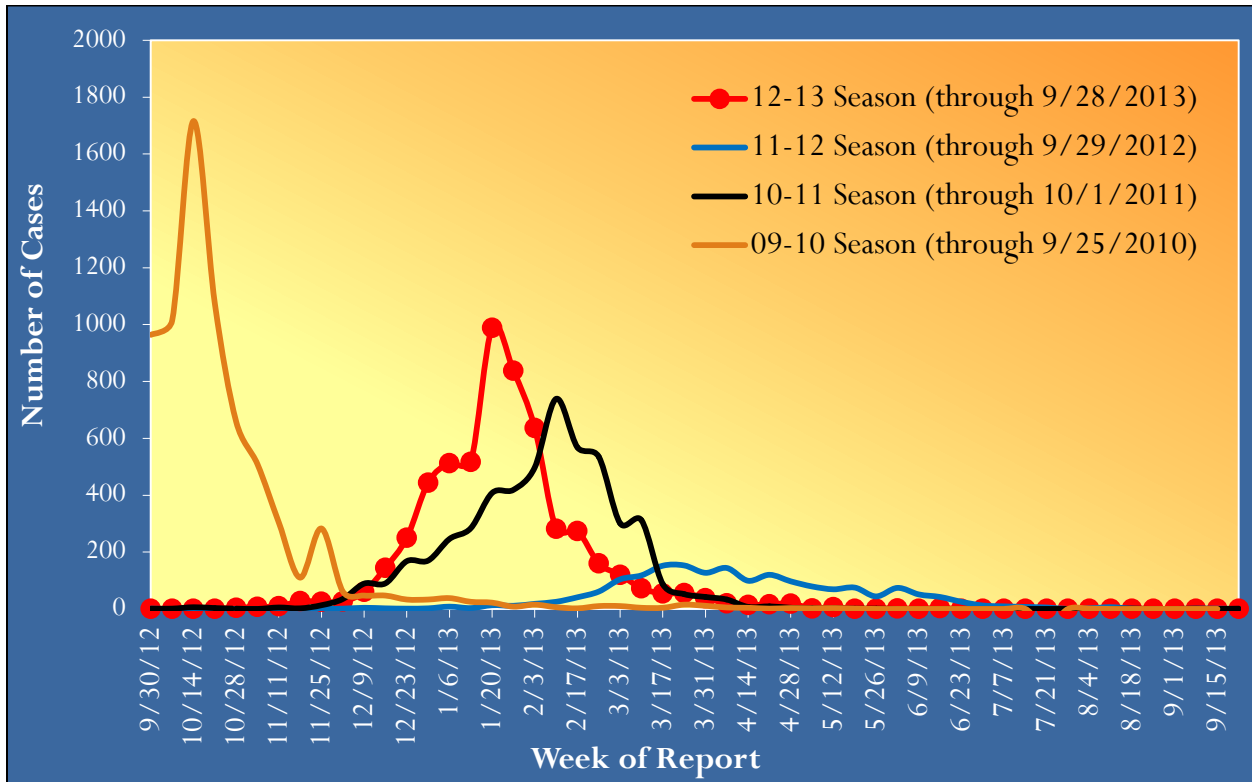
**Table 1. Influenza Activity Levels**

	<b>2012-2013</b>	<b>2011-2012</b>	<b>2010-2011</b>	<b>2009-2010</b>
<b>Date First Case Confirmed, no travel</b>	Oct. 30, 2012	Dec. 14, 2011	Sept. 28, 2010	Confirmed during summer
<b>Weeks with Widespread Activity (AZ)</b>	<b>Weeks 1-7</b> (12/30/2012- 2/16/2013)	<b>Weeks 11 – 14</b> (3/11/2012-4/7/2012)	<b>Weeks 52 – 10</b> (12/26/2010-3/12/2011)	<b>Weeks 40 – 48</b> (10/4/2009-12/5/2009)
<b>Weeks with Hospital ILI above Regional Threshold</b>	<b>Weeks 51-9</b> (12/16/2012-3/2/2013)	<b>Weeks 7 – 13</b> (2/12/2012-3/31/2012) <b>Weeks 16 –18</b> (4/15/2012-5/5/2012) <b>Weeks 20-21</b> (5/13/2012-5/26/2012)	<b>Weeks 50-13</b> (12/12/2010- 4/2/2011)	<b>Weeks 40-44</b> (10/4/2009-11/7/2009)
<b>Peak Week</b>	<b>Week 4</b> (1/20/2013-1/26/2013)	<b>Week 13</b> (3/25/2012-3/31/2012)	<b>Week 7</b> (2/13/2011-2/19/2011)	<b>Week 42</b> (10/18/2009-10/24/2009)

## LABORATORY CONFIRMED INFLUENZA

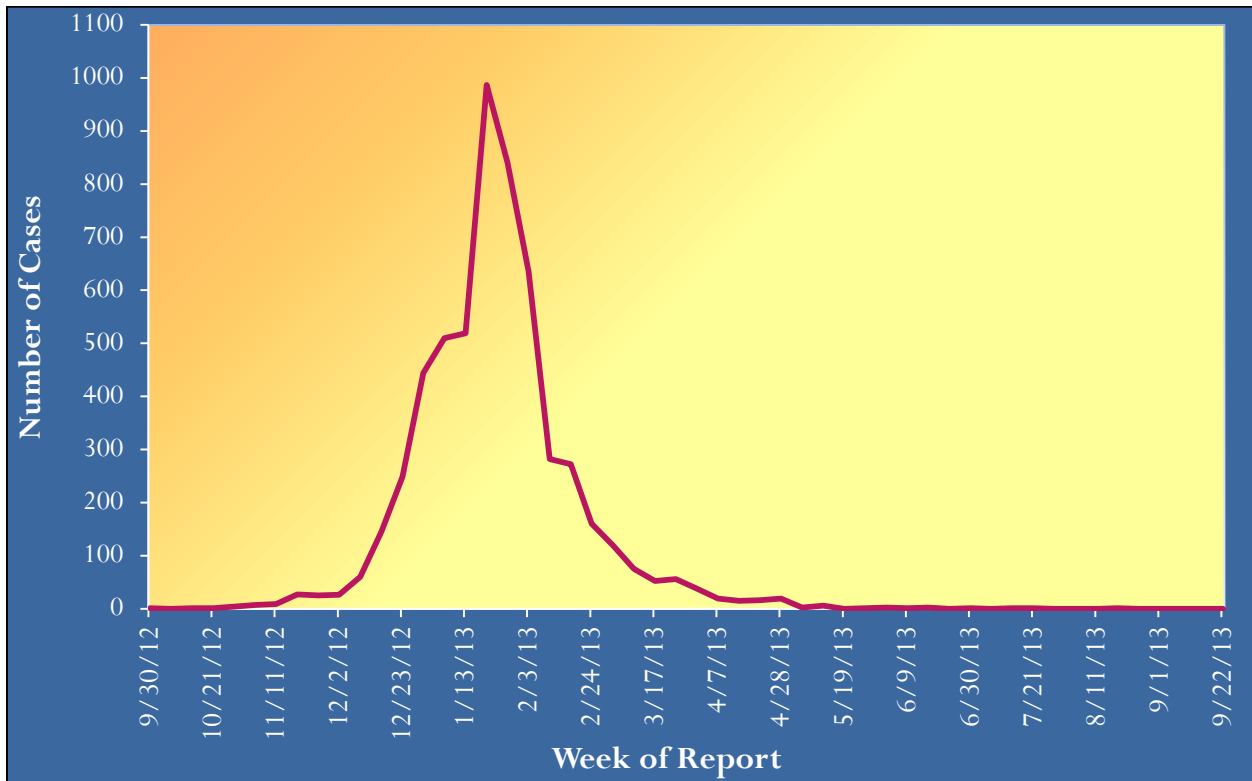
Influenza is a laboratory reportable disease under Arizona Administrative Code R9-204. Influenza seasons run from week 40 to week 39. The first case without travel history in the 2012-2013 season was recorded on October 30, 2012. This season there were 5,638 laboratory confirmed cases of influenza in Maricopa County ([table 2](#)). This represents a 212 % increase in the total number of cases from the 2011-2012 influenza season, which had a total of 1,808 confirmed cases. Influenza activity was widespread from weeks 1-7 (12/30/2012-2/16/2013) and peaked on week 4 when 989 cases were reported ([graph 2](#)). Influenza activity began to dramatically decrease in April.

**Graph 1. Number of Laboratory Confirmed Influenza Cases Reported by Week, 2009-2013\*, Maricopa County**



\*For graphs of multiple years, date of report refers the weeks in the 2012-2013 season

**Graph 2. Number of Laboratory Confirmed Influenza Cases Reported by Week, 2012-2013, Maricopa County**



## INFLUENZA TYPES AND SUBTYPES

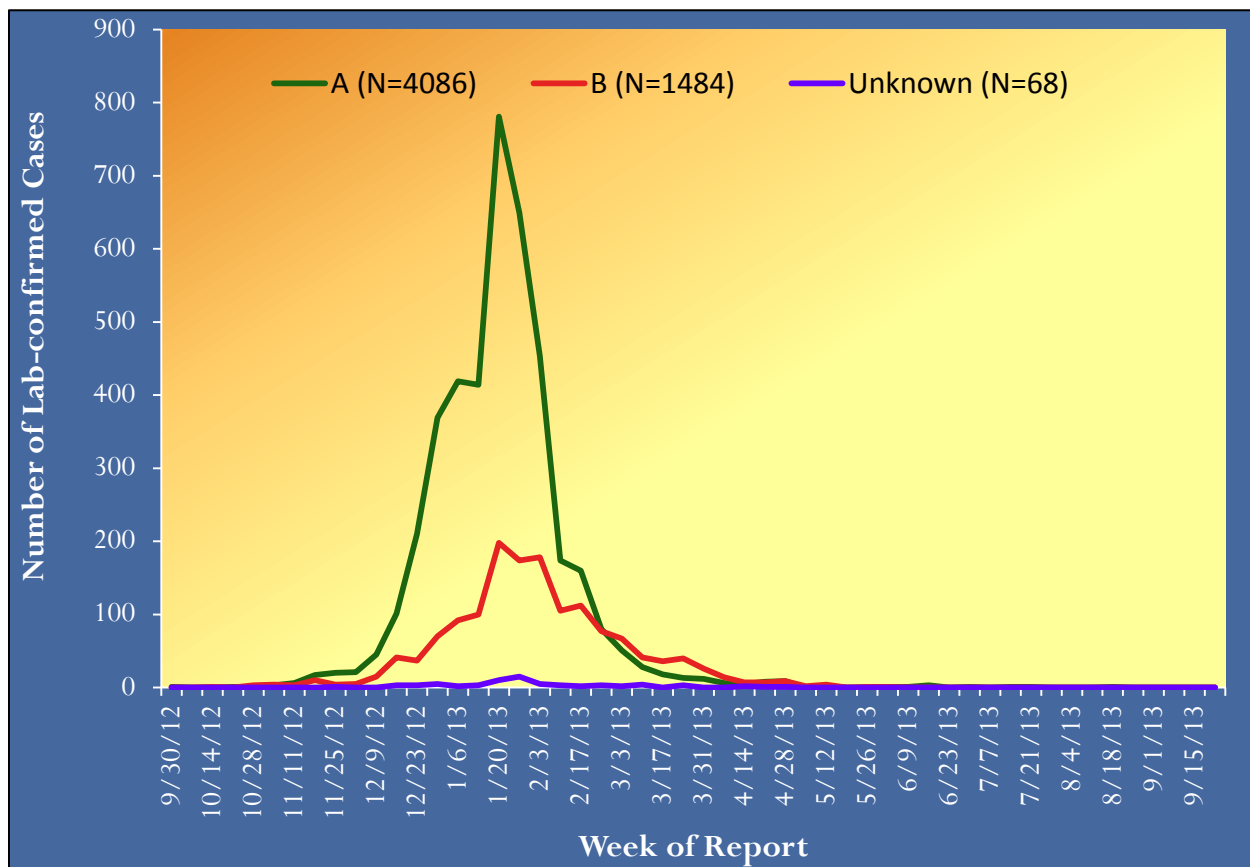
Influenza types A (72.5%) and B (26.3%) were the dominant influenza strains circulating this season ([table 2](#)). When influenza subtype testing was performed, influenza A/H3 was the most common influenza A subtype.

**Table 2. Types/Subtypes of Influenza by Test, 2012-2013, Maricopa County**

	<b>Total</b>	<b>5,638</b>	<b>100.0%</b>
Type A		4,086	72.5%
<i>Subtype 2009 H1N1</i>		32	0.8%
<i>Subtype H3</i>		922	22.6%
<i>Subtyping not performed or unknown</i>		3,132	76.6%
Type B		1,484	26.3%
Type Unknown		68	1.2%

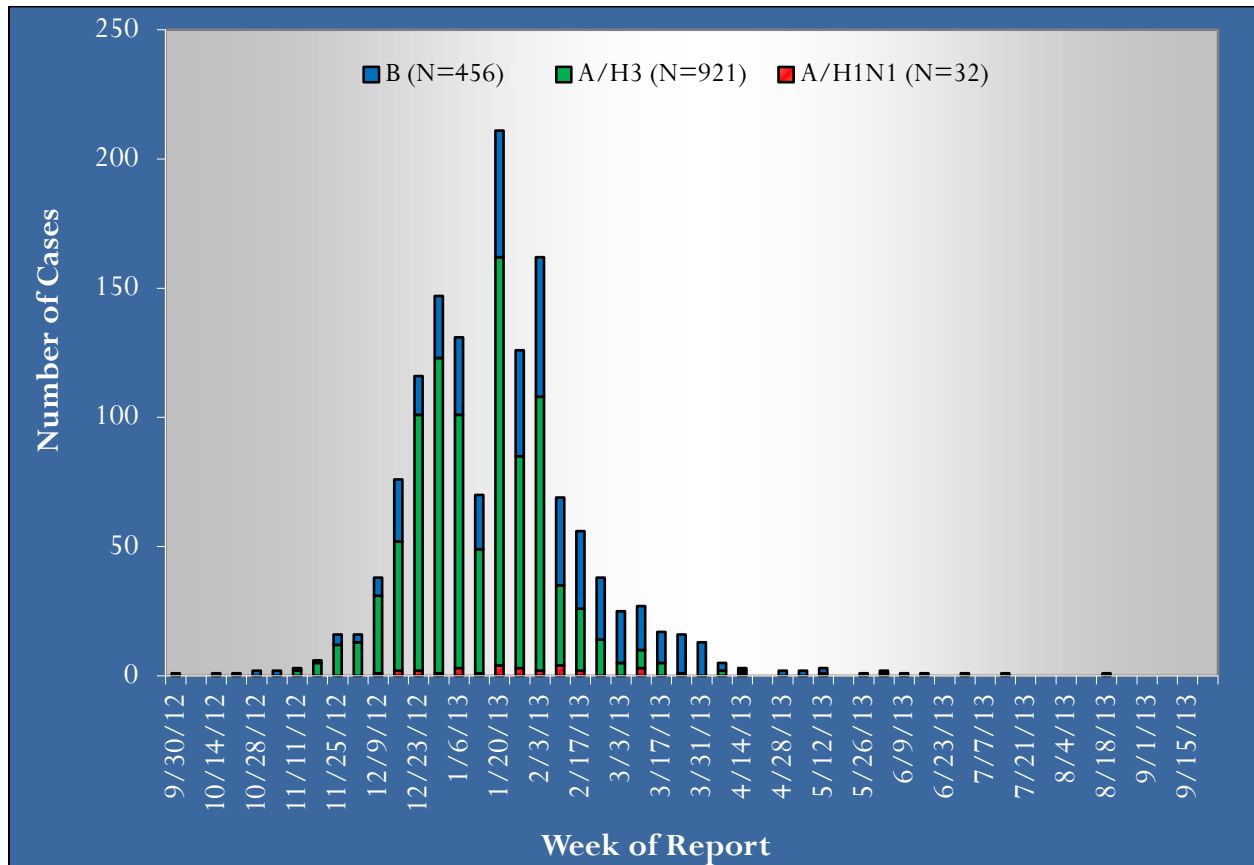
Influenza A activity peaked during the week of 1/20/2013 (week 4) which corresponds with the overall peak of this season ([graph 3](#)). Similarly Influenza B activity also peaked in week 4.

**Graph 3. Influenza Activity by Type, 2012-2013, Maricopa County**



Of the 5,638 lab confirmed cases reported this season, 1,409 cases tested positive by RT-PCR or viral culture ([graph 4](#)). Overall, 65.4% of specimens tested by RT-PCR or viral culture were A/H3, 2.2% A/H1N1, and 32.4% B. This is the lowest level of A/H1N1 activity reported since the pandemic seasons.

**Graph 4. Influenza Cases Confirmed by RT-PCR or Culture Testing, All Laboratories, 2012-2013, Maricopa County**



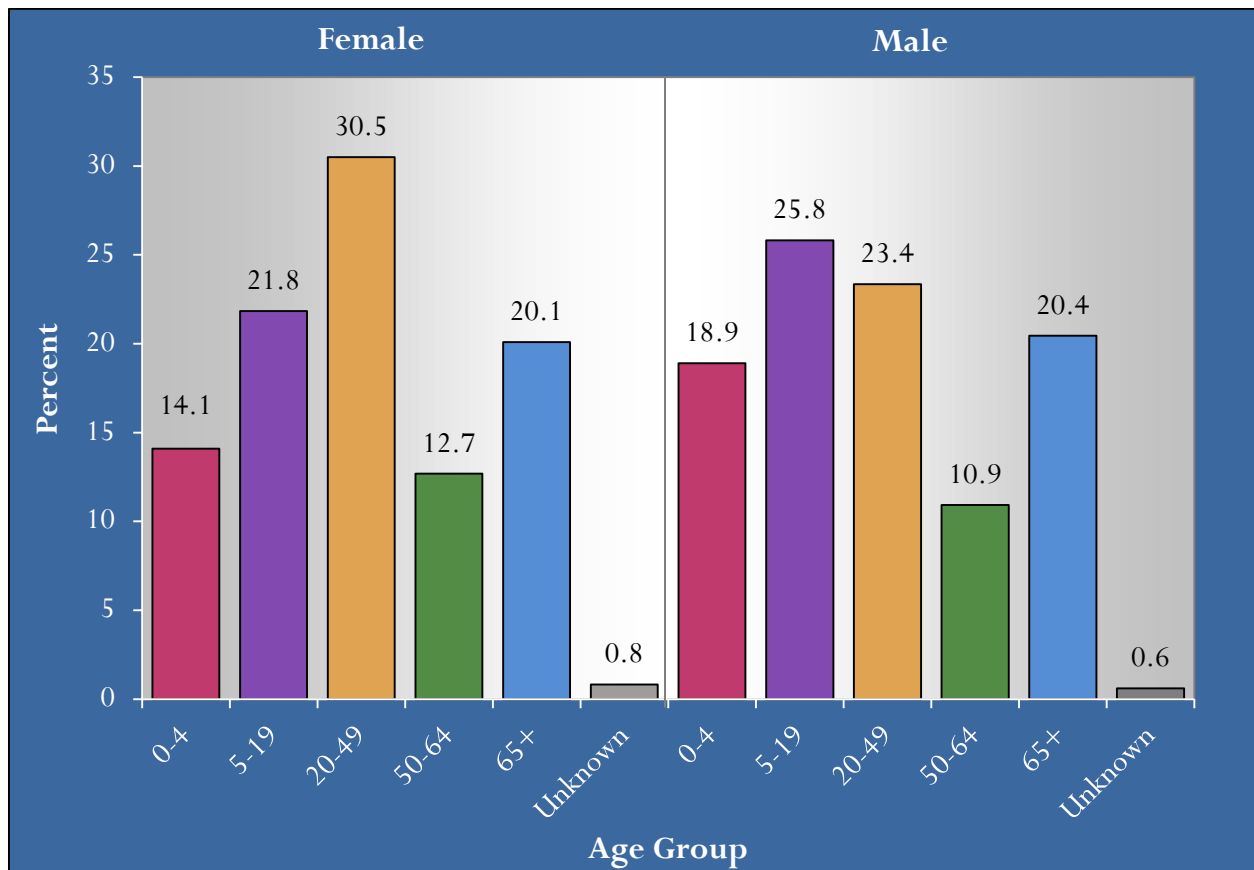
### INFLUENZA ACTIVITY BY AGE AND GENDER

The demographic breakdown of laboratory confirmed cases in Maricopa County is provided below ([table 3](#)). Slightly over half of reported cases were female. The majority of all cases were reported in those ages 5-19 and 20-49. However the rate of reported cases was highest among children 0-4 years of age, followed by adults 65+ ([graph 6](#)).

**Table 3. Confirmed Cases by Gender and Age, 2012-2013, Maricopa County**

	TOTAL	%
<b>GENDER</b>		
Female	2,903	51.5
Male	2,471	43.8
Unknown	264	4.7
<b>Total</b>	<b>5,638</b>	<b>100</b>
<b>AGE GROUP</b>		
0-4	965	17.1
5-19	1,324	23.5
20-49	1,529	27.0
50-64	658	11.7
65+	1,114	19.8
Unknown	48	0.9
<b>Total</b>	<b>5,638</b>	<b>100</b>

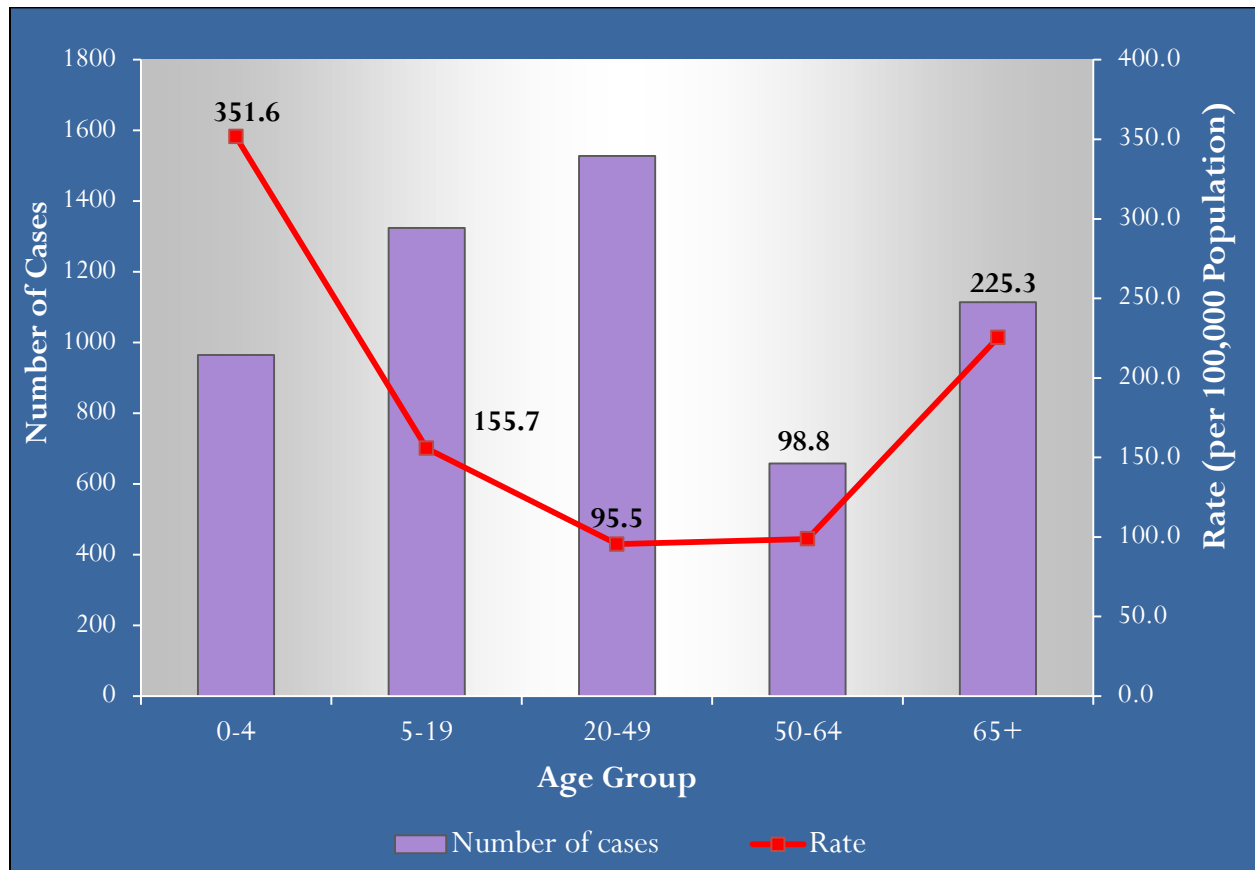
**Graph 5. Confirmed Cases by Gender and Age, 2012-2013, Maricopa County (n=5,374)**



\*264 cases were excluded from this graph because their gender was unknown



**Graph 6. Rates of Confirmed Influenza Cases by Age Group per 100,000 Residents\*, 2012-2013, Maricopa County**



\* Based on 2012 Census population estimates for Maricopa County

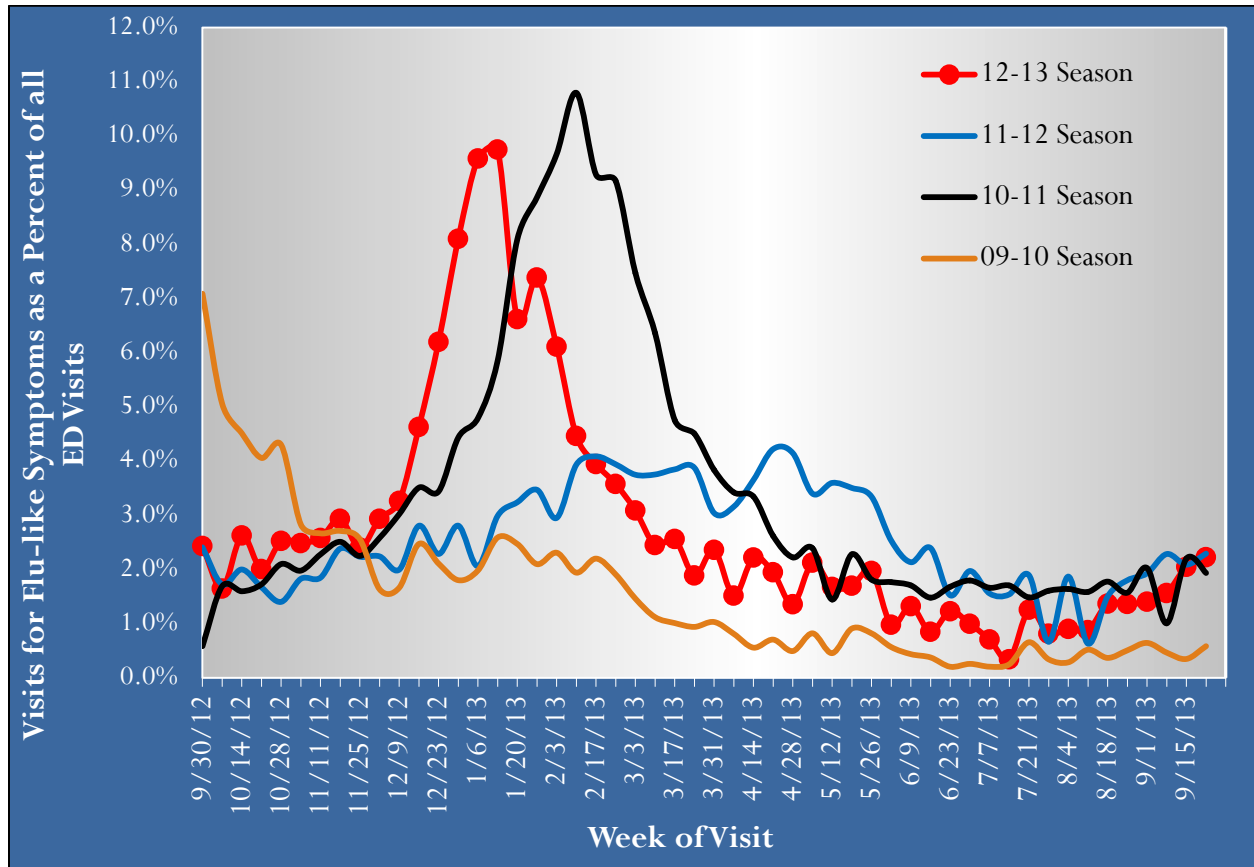
## ILI INDICATORS

In order to estimate the severity of an influenza season, MCDPH collects data on influenza-like illness because not all suspect cases of influenza can be tested. ILI is defined as a fever greater than or equal to 100°F **AND** cough or sore throat in the absence of a known cause other than influenza. MCDPH uses the following sources to estimate the incidence of ILI: emergency department visits, sentinel site (outpatient clinic) visits, and student absenteeism due to influenza-like symptoms.

## Emergency Department Visits

Every week local emergency departments report visits due to ILI and total number of emergency department visits. ILI activity was higher this season compared to the 2011-2012 season. Peak ILI activity occurred on the week of 1/13/13, when 9.8% of all emergency department visits were due to influenza-like illness. This peak occurred earlier than it did in the 2011-2012 season when activity was highest on 4/22/12 with 4.2% ILI visits.

**Graph 7. Visits by Individuals with Influenza-Like Symptoms as a Percent of All Hospital Emergency Department\* Visits, 2009-2013, Maricopa County**

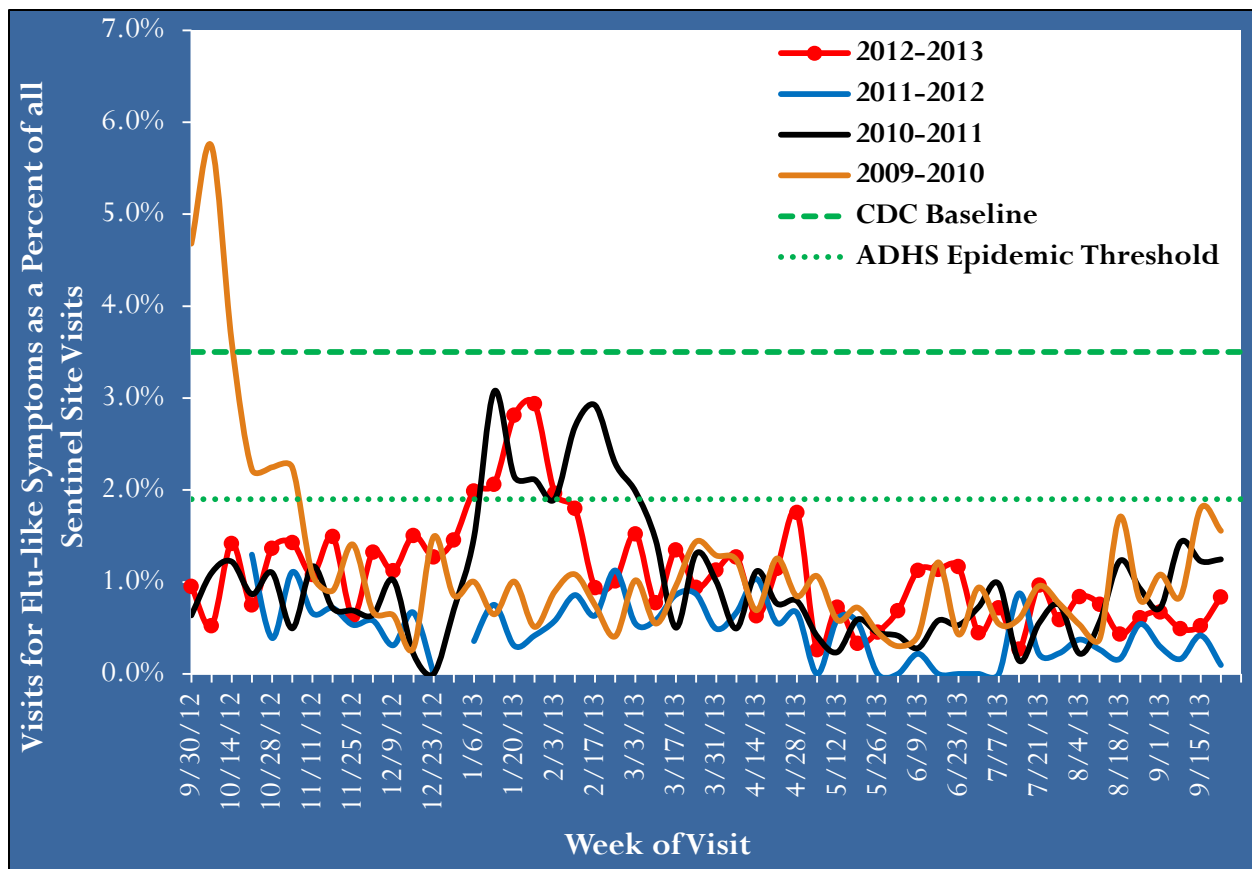


\*Twelve emergency departments participating in ILI reporting

## Sentinel Site Surveillance

Maricopa County sentinel sites (outpatient clinics) report visits due to influenza-like symptoms and the total number of visits seen each week to CDC. This percentage is then compared to the CDC baseline and ADHS epidemic threshold each week to determine the level of influenza activity. Although ILI activity in sentinel sites never exceeded the CDC baseline, it exceeded the ADHS epidemic threshold during the weeks of 1/6/2013 to 2/3/2013. Additionally, ILI activity reported from sentinel sites this season was higher compared to the previous season.

**Graph 8. Visits by Individuals with Influenza-like Symptoms as a Percent of All Sentinel Site (Outpatient Clinic) Visits, 2009-2013, Maricopa County\***



\*Two sentinel sites participating in ILI reporting

For more information on CDC and ADHS baselines and thresholds visit:

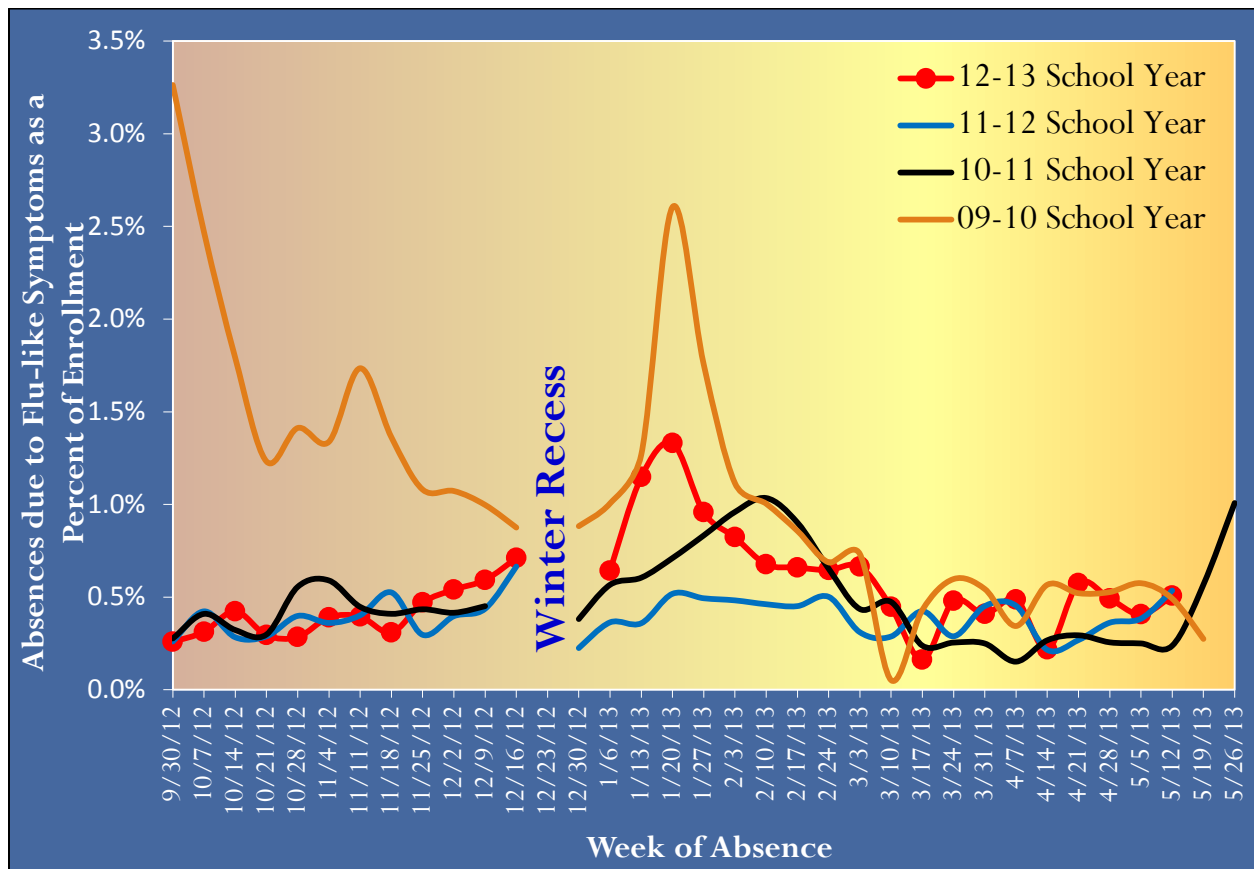
<http://www.cdc.gov/flu/pdf/weekly/overview.pdf>

<http://azdhs.gov/phs/oids/epi/flu/pdf/2012-2013/influenza-rsv-2012-13-week-39.pdf>

## School Surveillance

Maricopa County uses a web-based school surveillance system to collect student absenteeism data due to ILI and other illnesses. This season, 13 schools participated in this program. Overall, absenteeism due to influenza-like symptoms was higher than in the previous season, most noticeably during the months of January and February. Peak ILI activity occurred on the week of 1/20/2013, when 1.33% of students were absent due to flu-like symptoms ([graph 9](#)).

**Graph 9. Student absenteeism due to influenza like symptoms as a percent of total enrollment, 2009-2013, Maricopa County**



## INFLUENZA MORTALITY

Influenza-associated deaths in adults are not reportable in Arizona. Many influenza-related fatalities are attributed to complications of influenza infection, including pneumonia. Individuals who died of influenza-associated pneumonia may or may not have influenza listed as a cause of death. As a result, influenza deaths are often underreported. In order to estimate the burden of influenza mortality, pneumonia and influenza (P&I) deaths are grouped together and used as an indicator of the severity of a flu season.

The table below shows the number of P&I deaths recorded during the current and previous influenza seasons ([table 4](#)). The number of all P&I deaths increased season compared to last season including those directly attributed to influenza.

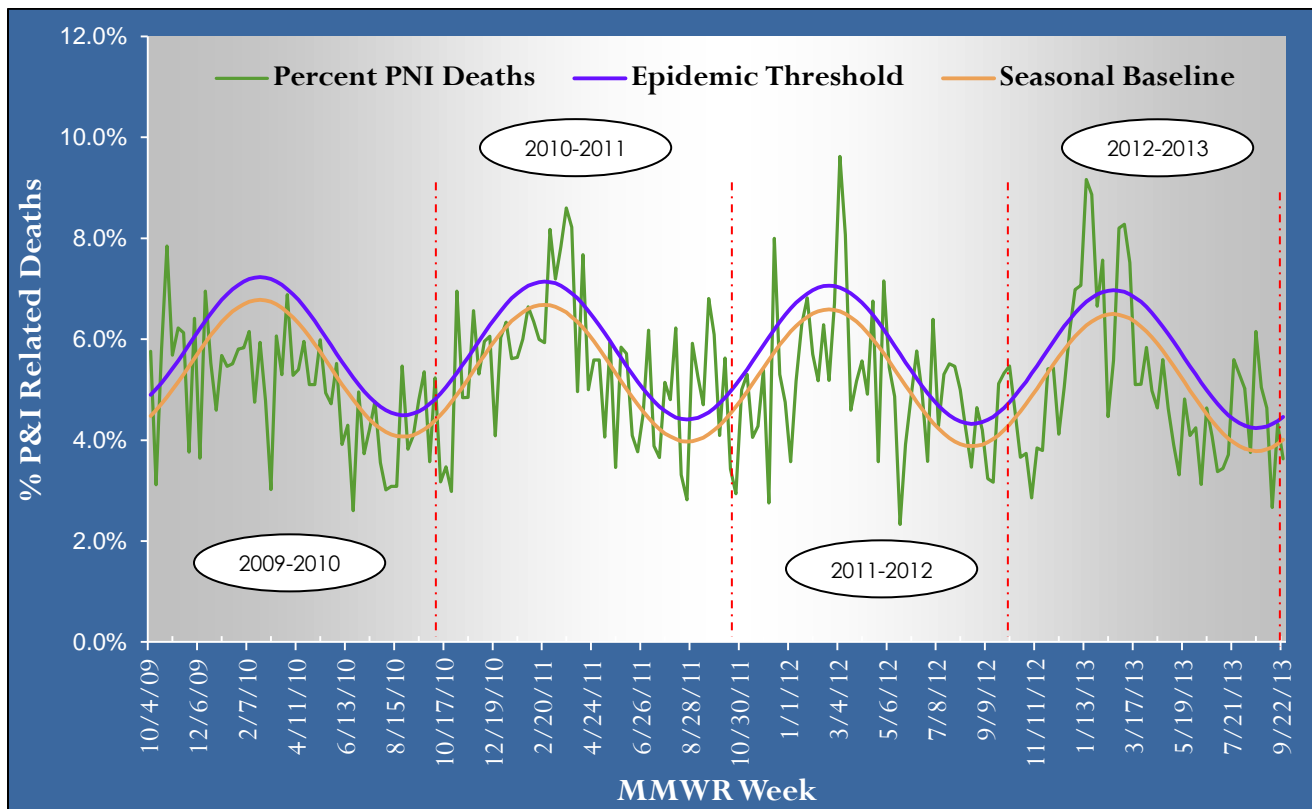
**Table 4. P&I Deaths, 2011-2012 & 2012-2013 Seasons, Maricopa County**

	Current Season (2012-2013) As of [9/28/2013]		Last Season (2011-2012) As of [9/29/2012]	
	Pneumonia and Influenza	Influenza	Pneumonia and Influenza	Influenza
<b>Pediatric (Under age 18)</b>	12	0	12	0
<b>Adult (18 and Over)</b>	1338	26	1286	5

Source: MCDPH Office of Vital Statistics

Maricopa County participates in CDC’s 122 US Cities P&I reporting system. Every week deaths due to P&I that occurred in Phoenix are reported to CDC. The percent of all deaths due to P&I is plotted against the baseline and threshold value calculated for each week. Baselines and thresholds are calculations using historical P&I data to estimate what levels are expected for that time of the year. When levels exceed the epidemic threshold, this indicates elevated influenza activity.

**Graph 10. P&I Related Deaths as a Percent of Total Deaths, 2009-2013, Maricopa County**

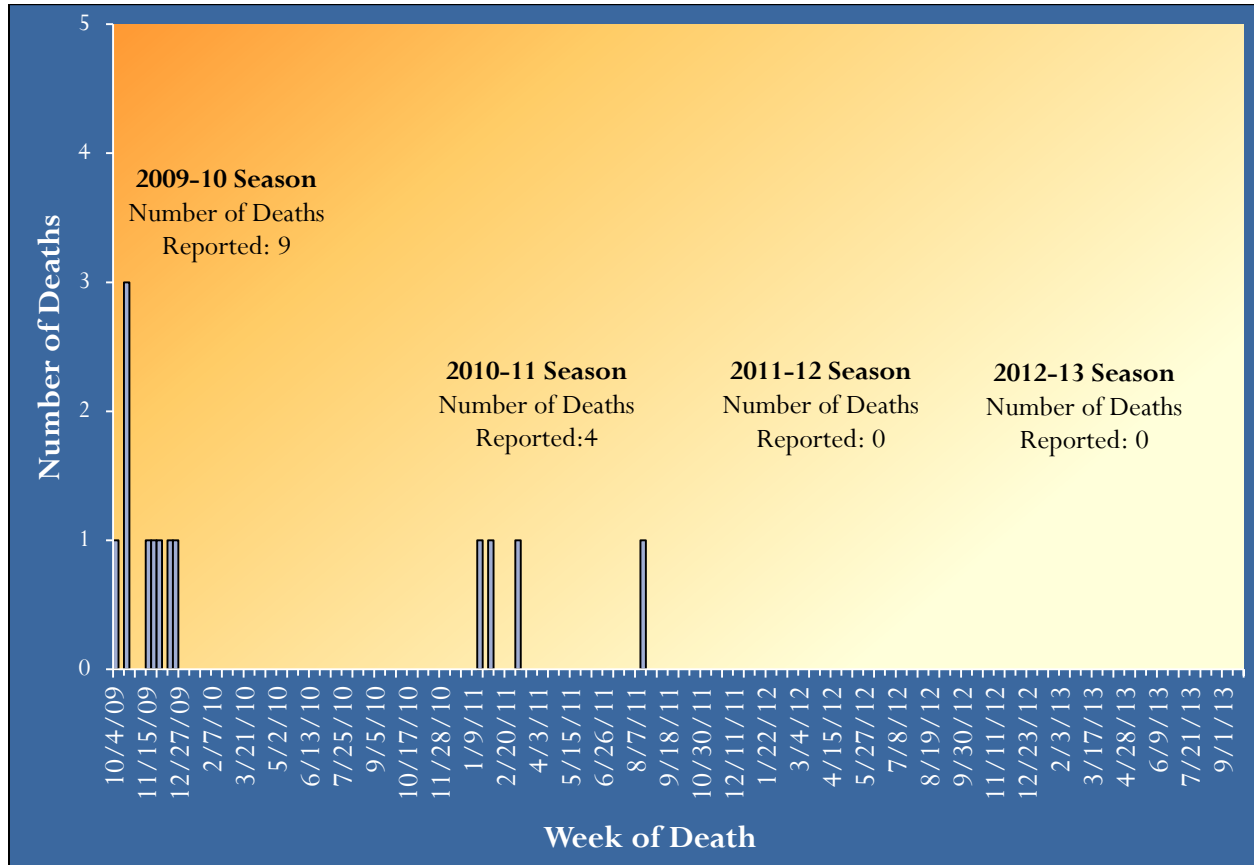


Source: MCDPH Office of Vital Statistics

\*The dashed lines represent the ending of a season and the beginning of the next season

Influenza-associated mortality in children is reportable in Arizona. [Graph 11](#) shows the number of pediatric deaths that were attributed to influenza from 2009-2013. No pediatric influenza deaths were recorded during the 2012-2013 season. This is the second season, since this condition became reportable in 2004, that Maricopa County has not had an influenza-associated pediatric death.

**Graph 11. Number of Pediatric Deaths Associated with Laboratory Confirmed Influenza by Week of Death, 2009-2013, Maricopa County**

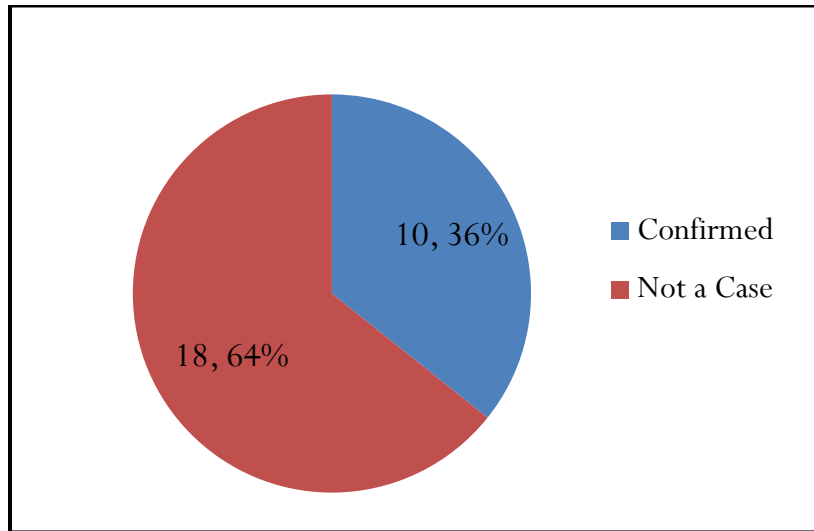


## SUMMER INFLUENZA SURVEILLANCE

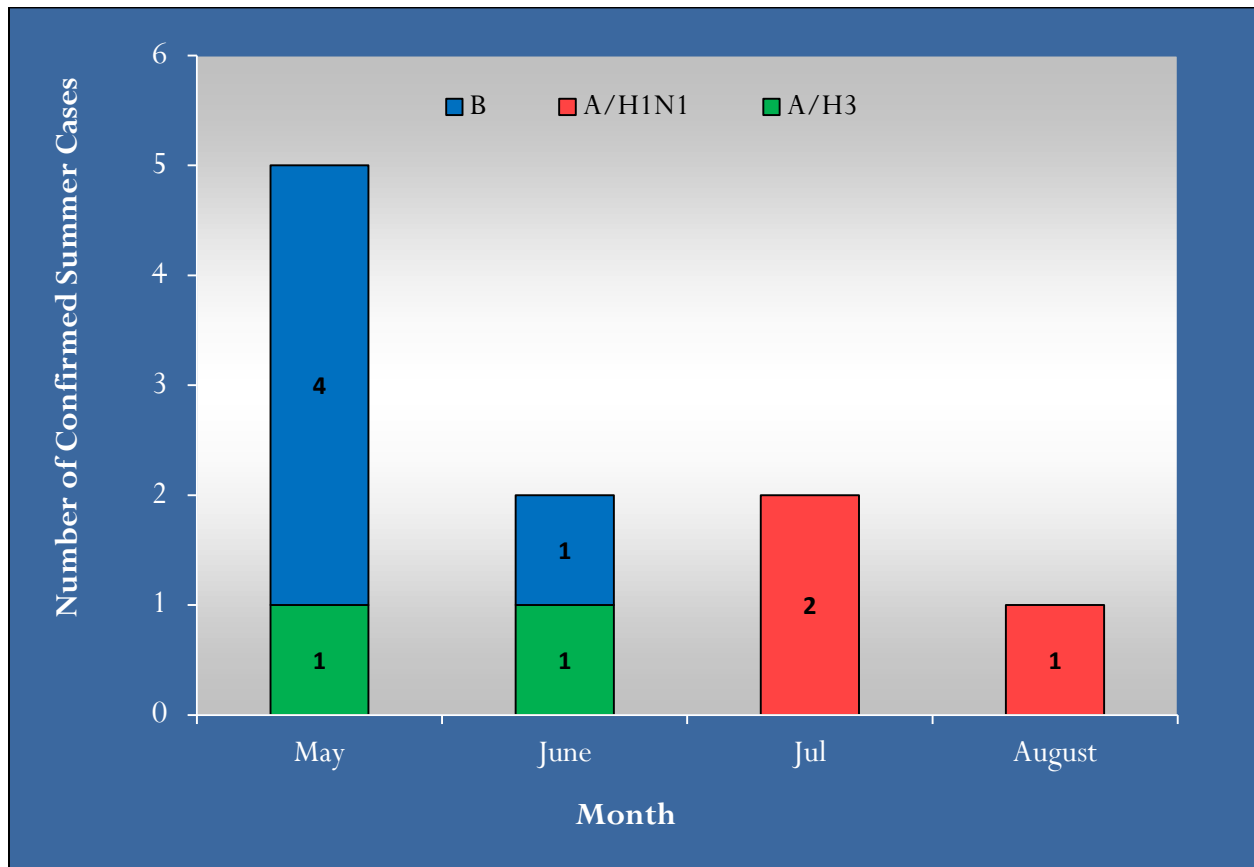
The summer surveillance period this season began on April 29th, 2013. A total of 37 cases were reported during this period from which 28 required investigation. Due to the high likelihood of false positive results from rapid tests during the summer, ADHS stops counting rapid tests as confirmed 14 days after the collection date of the last RT-PCR or viral culture confirmed case ([see ADHS report for more information on summer surveillance, p. 12](#)). These cases are then followed up by MCDPH through investigation to acquire hospitalization status and travel history, in addition to ensuring that the specimen is submitted to the Arizona State Laboratory for RT-PCR or viral culture testing.

From the investigations that were conducted this summer, 10 cases were confirmed ([graph 12](#)). The majority of these cases reported were influenza type B and occurred in May ([graph 13](#)). Furthermore, the majority of the cases were locally-acquired ([graph 14](#)) and required hospitalization ([graph 15](#)).

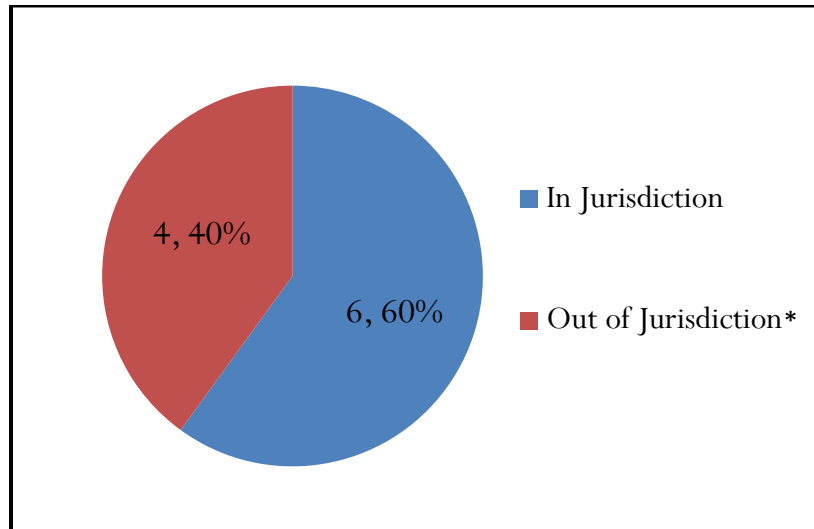
**Graph 12. Summer Investigations by Case Classification, 2012-2013, Maricopa County**



**Graph 13. Confirmed Summer Influenza Cases by Month Reported and Influenza Sub-Type, 2012-2013, Maricopa County**

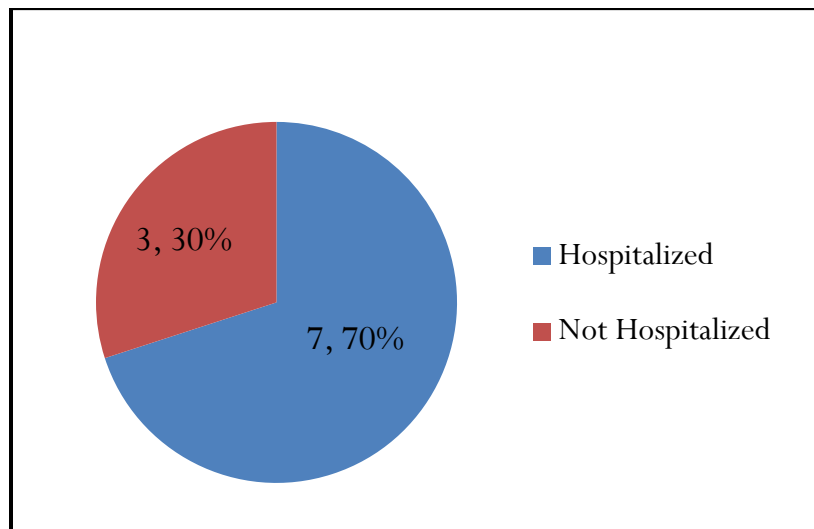


**Graph 14. Summer Influenza Cases by Place of Infection, 2012-2013, Maricopa County**



\* The 4 out of jurisdiction cases travelled to California and Canada, Alaska, New York, and Nevada.

**Graph 15. Summer Influenza Cases by Hospitalization Status, 2012-2013, Maricopa County**



## RSV SURVEILLANCE

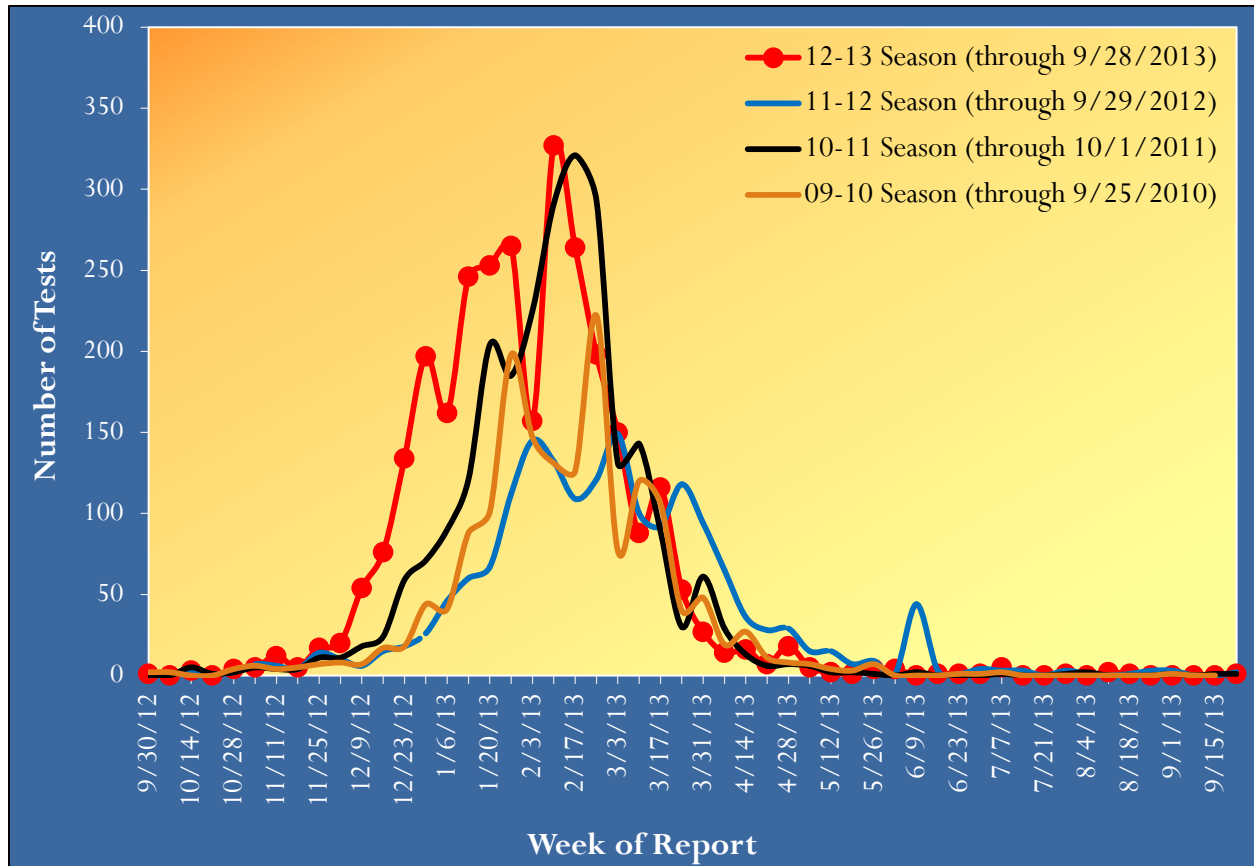
Respiratory syncytial virus (RSV) is a laboratory reportable disease in the state of Arizona. Activity is usually highest during the winter and early spring. RSV infections are most common in children. To learn more about RSV, visit the following link: <http://www.cdc.gov/rsv/>

The number of individuals with confirmed RSV tests by week from 2009-2013 are shown in [graph 16](#). In total, there were 2,918 individuals confirmed with an RSV test this season. RSV activity was highest from late December to mid-March. Peak activity occurred during week 7 (2/10/13), with 327 laboratory confirmed RSV



cases ([graph 17](#)). The onset, offset, and peak of widespread RSV activity occurred earlier than in previous seasons. In general, the 2012-2013 RSV season was more severe than the previous three seasons.

**Graph 16. Number of Laboratory Confirmed RSV Cases Reported by Week, 2009-2013, Maricopa County**



**Graph 17. Number of Laboratory Confirmed RSV Cases Reported by Week, 2012-2013, Maricopa County**

