

2014 - 2015 Influenza & RSV Summary



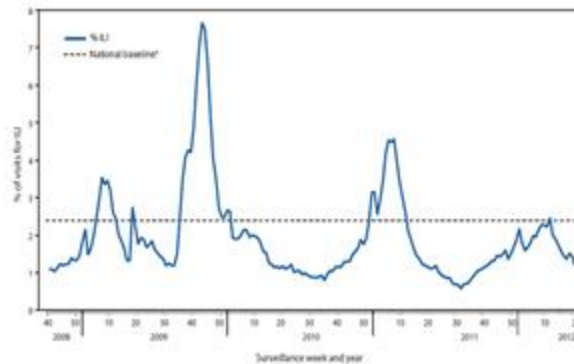
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SUMMARY

This report summarizes the influenza activity in Maricopa County for the 2014-2015 Season (September 28, 2014 [MMWR WK 40] to October 3, 2015 [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. The first locally-acquired case of influenza in Maricopa County was laboratory confirmed on October 3, 2014. ([table 1](#)). Peak influenza activity occurred in the third week of January, which was two weeks earlier compared to the previous season ([graph 1](#)). This season there were six weeks with widespread influenza activity compared to the five weeks of widespread activity during the 2013-2014 season. Influenza type A accounted for the majority of laboratory confirmed cases ([graph 2](#)). Reverse transcription polymerase chain reaction (RT-PCR) and viral culture testing suggested that the A/H3 virus was the most common viral subtype circulating during the 2014-2015 season ([graph 3](#)).

Influenza-like illness (ILI) activity in hospitals was higher during the 2014-2015 season than it was during the 2013-2014 season. In hospital emergency departments, the percentage of visits due to ILI reported this season was higher compared to the previous season ([graph 6](#)). The number of sentinel sites reporting ILI activity stayed the same in 2014-2015 compared to 2013-2014 ([graph 7](#)). Additionally, the number of schools participating in the surveillance increased in 2014-2015 ([graph 8](#)).

Pneumonia and influenza (P&I) mortality overall was lower compared to the previous season ([table 4](#)). This season there was one influenza related death in a child.

Respiratory Syncytial Virus (RSV) activity was considerably higher compared to last season and peaked in early February. ([graph 14](#)).

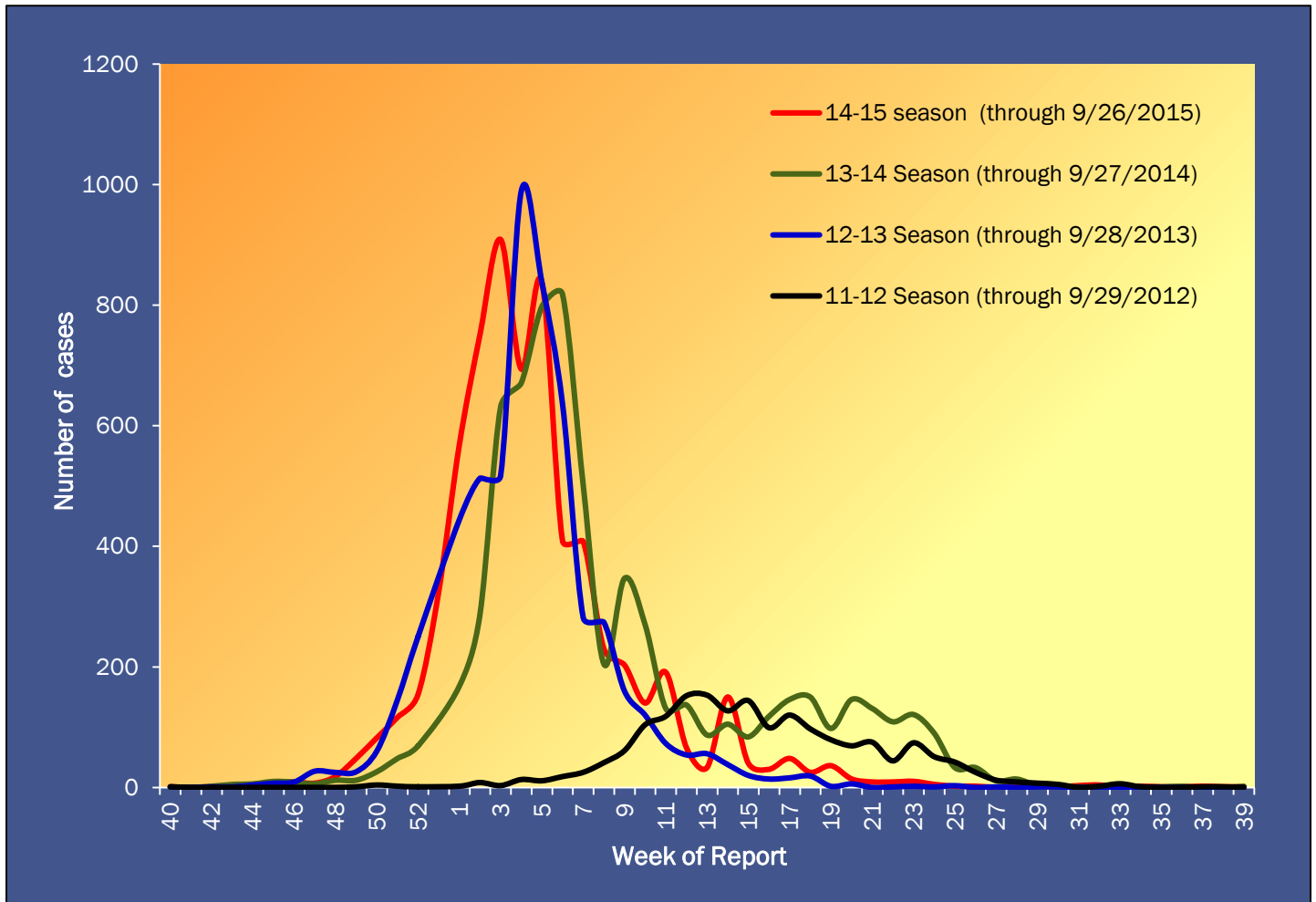
Table 1. Influenza Activity Levels, 2010-2015, Maricopa County

Table 1	2014-2015	2013-2014	2012-2013	2011-2012
First Confirmed Case w/no travel	10/3/2014	10/4/2013	10/30/2012	12/14/2011
Weeks w/Widespread Activity (AZ)	Weeks 1 - 6	Weeks 3 - 8	Weeks 1 - 7	Weeks 11 - 14
Weeks w/Hospital ILI above Regional Threshold	Weeks 50 - 11	Weeks 52 - 9	Weeks 51 - 9	Weeks 7-13, 16-18, & 20-21
Weeks w/Outpatient visits above the threshold	Weeks 48, 50 - 52, 1-10 & 12-14	Weeks 51 - 11	Weeks 2 - 4	N/A
Peek Week	Week 3	Week 6	Week 6	Week 13
Number of Pediatric Deaths	1	1	0	0
Total Cases	6,604	6,658	5,638	1808

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 2014-2015 season was recorded on October 03, 2014. This season there were 6,604 laboratory confirmed cases of influenza in Maricopa County. This represents a 0.8 % decrease in the total number of cases from the 2013-2014 influenza season, which had a total of 6,658 confirmed cases ([table 1](#)). Influenza activity was widespread from weeks 1-6 (1/4/2015-2/14/2015) and peaked on week 3 when 909 cases were reported ([graph 1](#)).

Graph 1. Number of Laboratory Confirmed Influenza Cases Reported by Week, 2010-2015*, Maricopa County



*For graphs of multiple years, MMWR dates refers to the 2014-2015 season

INFLUENZA TYPES AND SUBTYPES

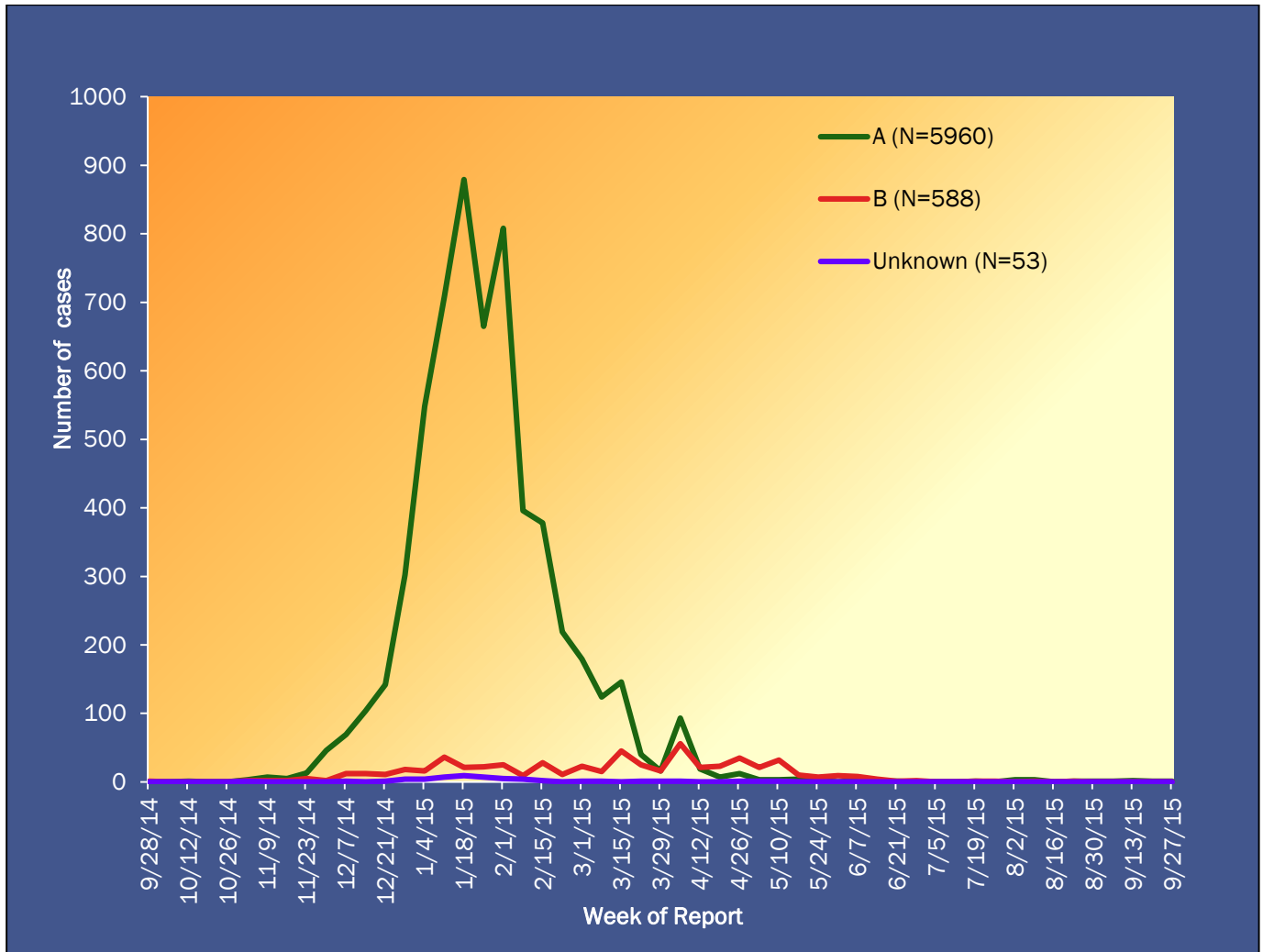
Influenza type A (90.2%) was the dominant strain circulating this season compare to influenza B (9.0%) ([table 2](#)). When influenza subtype testing was performed, A/H3 was the most common influenza subtype.

Table 2. Types/Subtypes of Influenza by Test, 2014-2015, Maricopa County

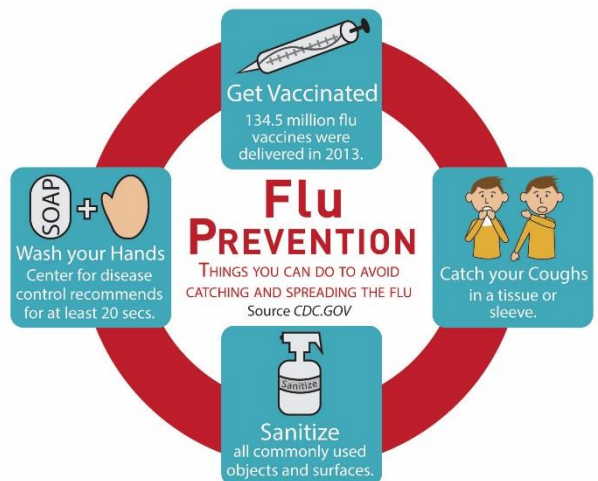
Table 2. Types/Subtypes of Influenza by Test, 2014-2015 Season, Maricopa County		
Total	6604	100.0%
Type A	5959	90.2%
<i>Subtype 2009 H1N1</i>	4	0.1%
<i>Subtype H3</i>	995	16.7%
<i>Subtyping not performed or unknown</i>	4960	83.2%
Type B	592	9.0%
Type Unknown	53	0.8%

Influenza A activity peaked during week 3 (1/18/2015 – 1/24/2015) which corresponds with the overall peak of this season ([graph 2](#)) and Influenza B activity peaked during the week 14 (4/05/2015 – 4/11/2015).

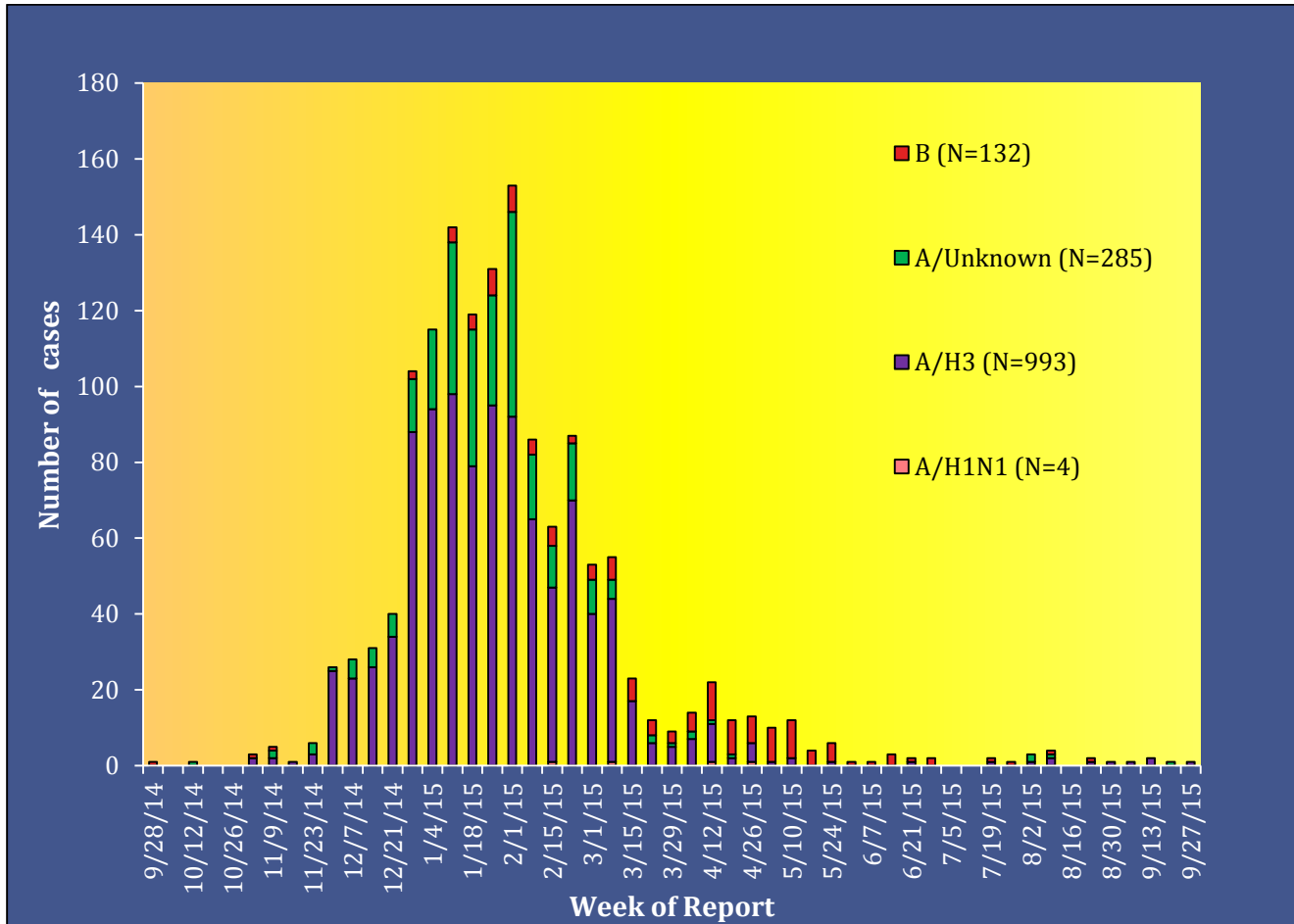
Graph 2. Influenza Activity by Type, 2014-2015, Maricopa County



Of the 6,604 lab confirmed cases reported this season, 1,414 cases tested positive by RT-PCR or viral culture ([graph 3](#)). Overall, 0.3% of specimens tested by RT-PCR or viral culture were A/H1N1, 20.2% A/Unknown, 70.2% A/H3, and 9.3% B.



Graph 3. Influenza Cases Confirmed by RT-PCR or Culture Testing, All Laboratories, 2014-2015, Maricopa County



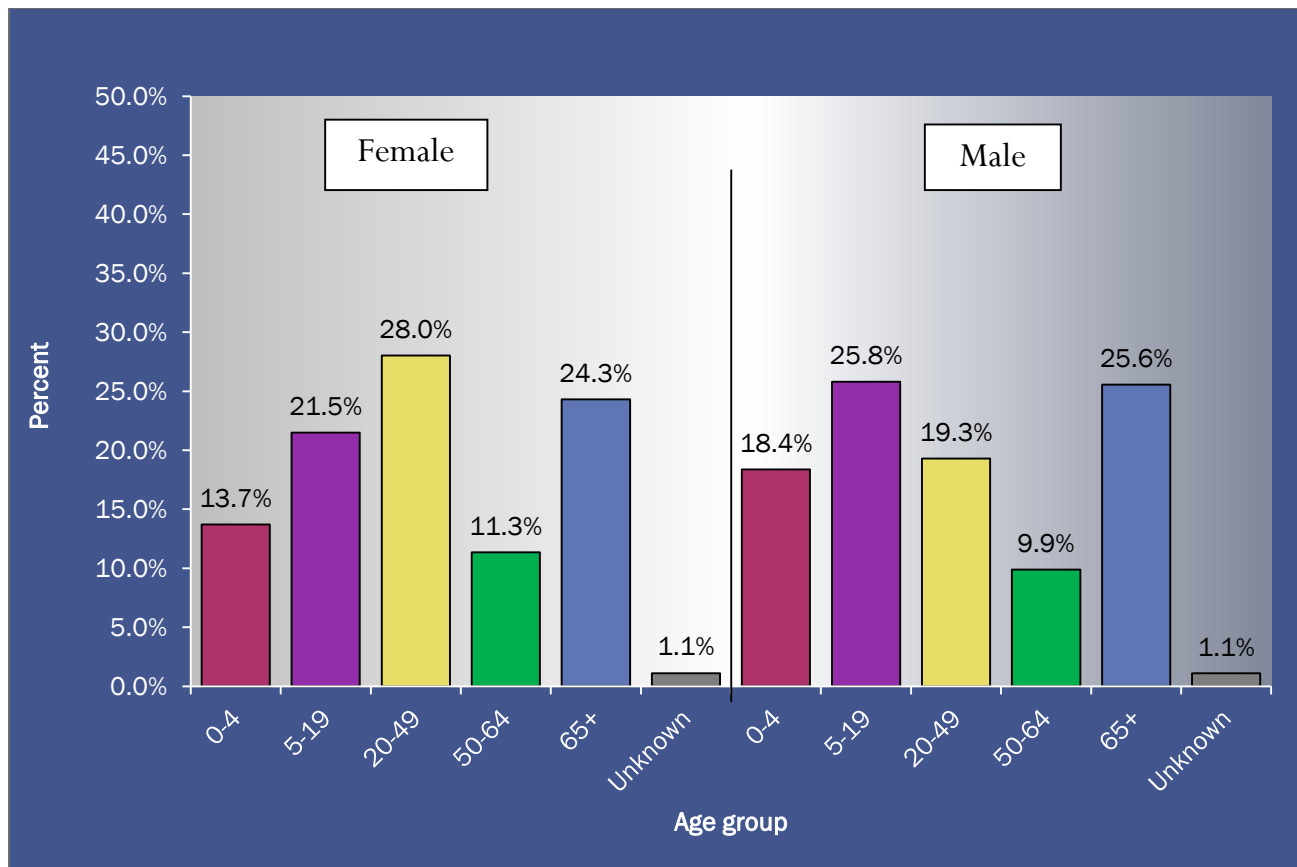
INFLUENZA ACTIVITY BY AGE AND GENDER

The demographic breakdown of laboratory confirmed cases in Maricopa County is provided below ([table 3](#)). Slightly over half of reported cases were female ([graph 4](#)). 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 ages 65+ ([graph 5](#)).

Table 3. Confirmed Cases by Gender and Age, 2014-2015, Maricopa County

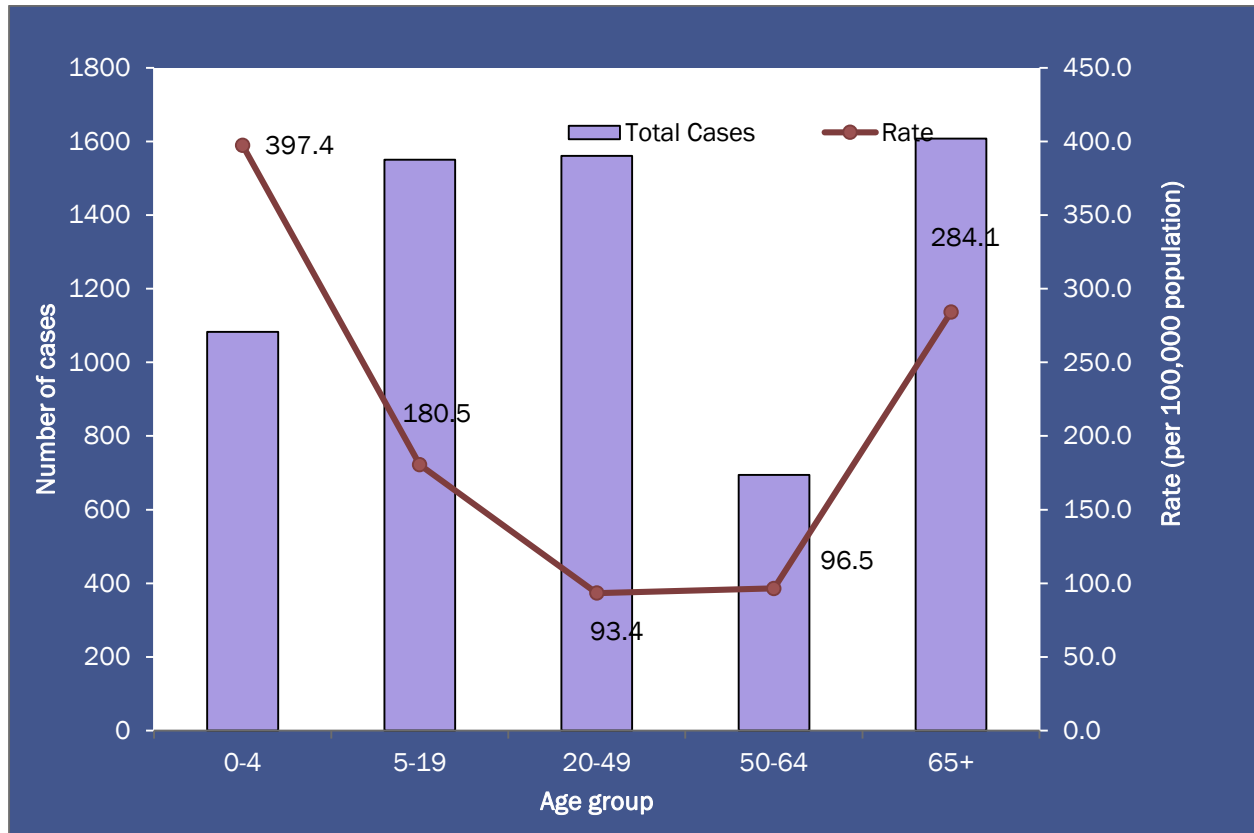
	TOTAL	%
GENDER		
Female	3,428	51.91%
Male	2,930	44.37%
Unknown	246	3.73%
Total	6,604	100%
AGE GROUP		
0-4	1,083	16.40%
5-19	1,550	23.47%
20-49	1,561	23.64%
50-64	694	10.51%
65+	1,608	24.35%
Unknown	108	1.64%
Total	6,604	100%

Graph 4. Confirmed Cases by Gender and Age, 2014-2015, Maricopa County (n=6,358)



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

Graph 5. Rates of Confirmed Influenza Cases by Age Group per 100,000 Residents*, 2014-2015, Maricopa County



* Based on 2014 Census population estimates for Maricopa County

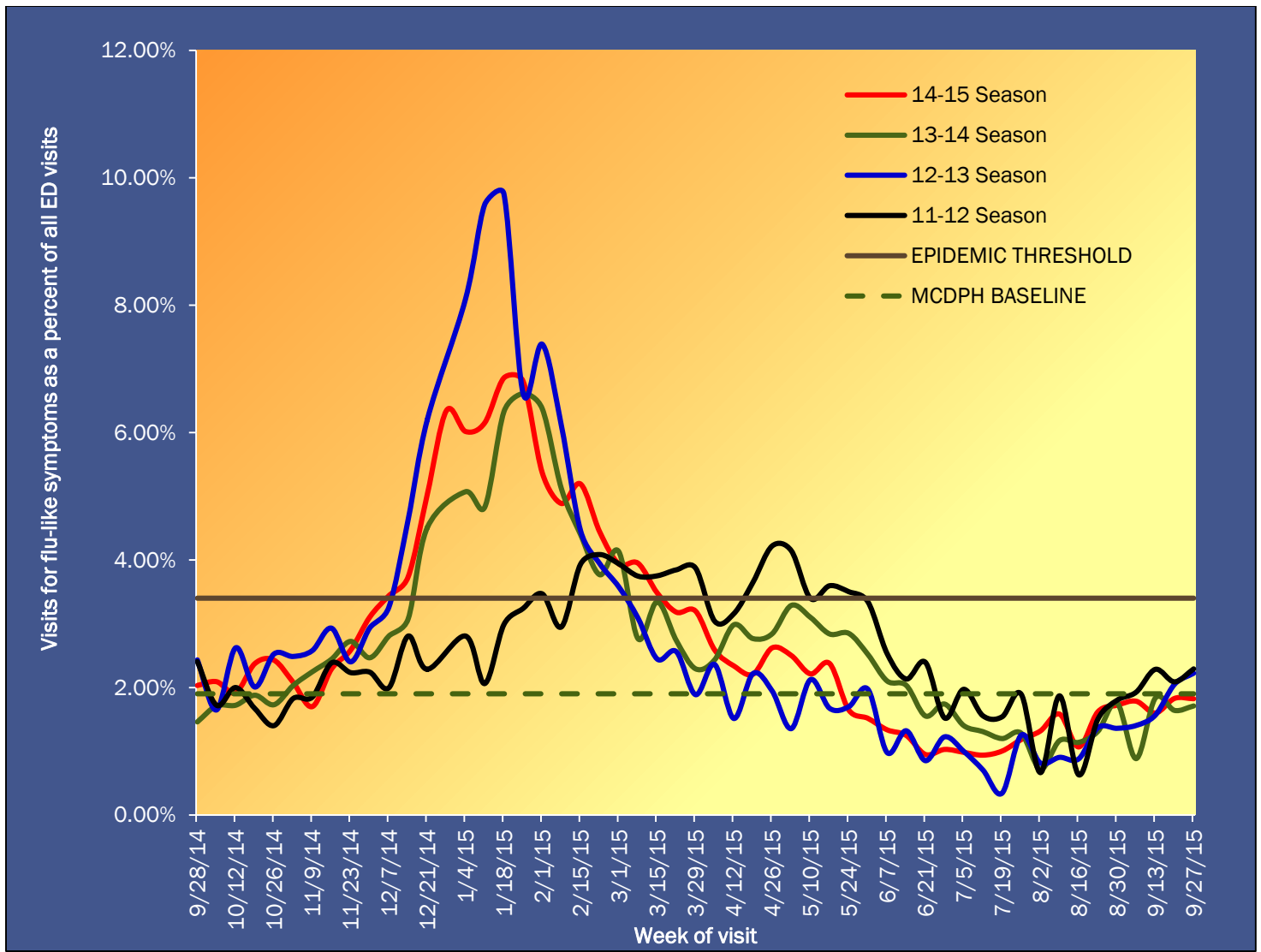
ILI INDICATORS

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.

Emergency Department Visits

Every week local emergency departments report visits due to ILI and total number of emergency department visits. The percent of visits due to ILI is compared to the baseline and epidemic threshold for emergency departments each week to show the level of influenza activity (see [appendix](#) and [graph 6](#)). The MCDPH baseline is 1.9% and MCDPH epidemic threshold is 3.4%. ILI activity was slightly higher this season compared to the 2013-2014 season. Peak ILI activity occurred during week 3 (1/18/15-1/24/15), when 6.86% of all emergency department visits were due to ILI. This peak occurred the same week as it did in the 2013-2014 season, when 6.6% of all emergency department visits were due to ILI.

Graph 6. Visits by Individuals with Influenza-Like Symptoms as a Percent of All Hospital Emergency Department* visits, 2011-2015, Maricopa County

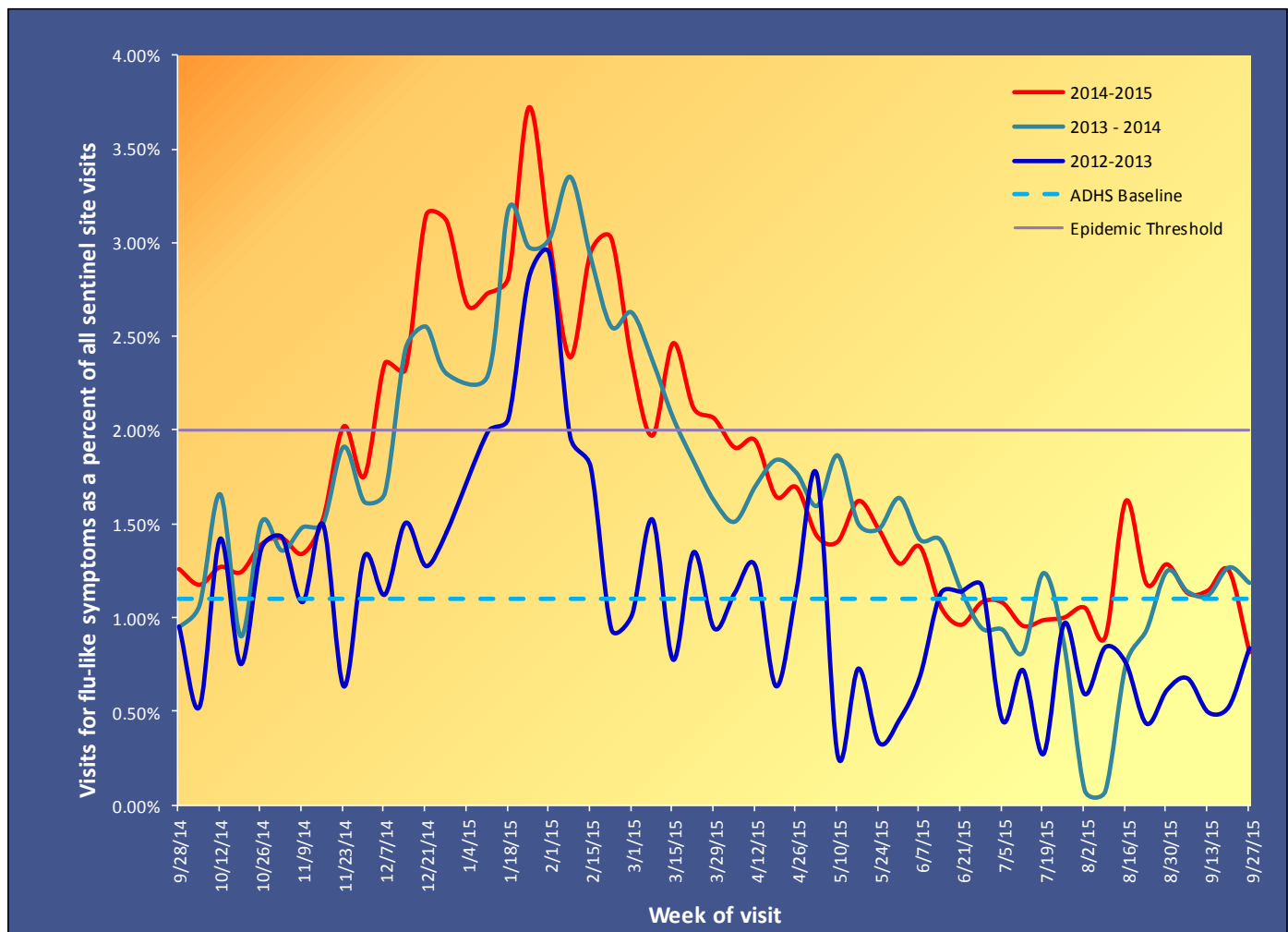


*Ten emergency departments participating in ILI

Sentinel Site Surveillance

Maricopa County sentinel sites (outpatient clinics) report each week total number of visits as well as influenza-like illness visits to CDC. The percentage of ILI visits is compared to the ADHS baseline and epidemic threshold each week to show the level of influenza activity ([graph 7](#)). The number of participating sentinel sites in influenza surveillance stayed the same in 2014-2015 as compared to 2013-2014 which include Wesley Health Center, CIGNA clinics, Adelante clinics and ASU Student Healthcare Center.

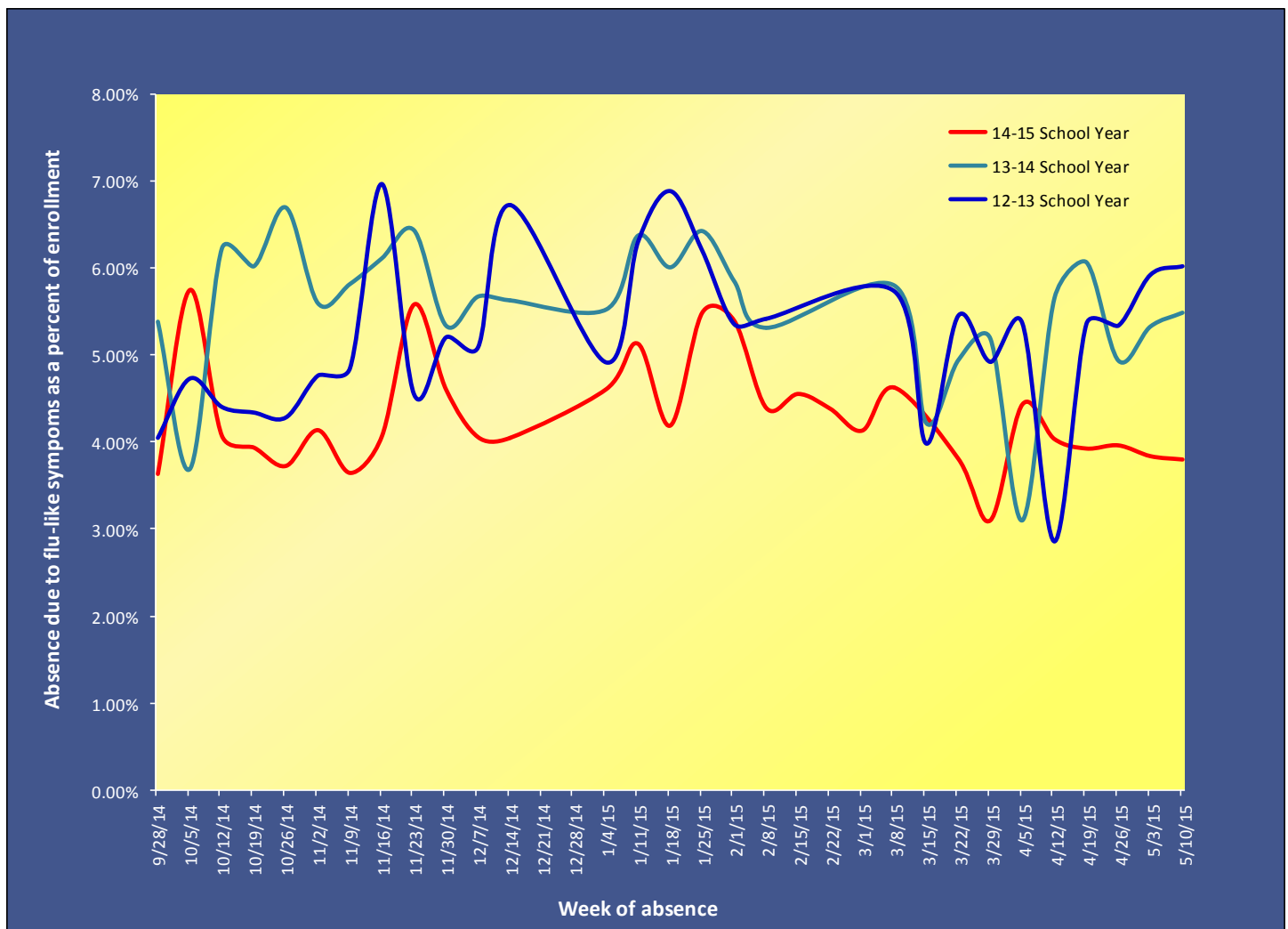
Graph 7. Visits by Individuals with Influenza-like Symptoms as a Percent of All Sentinel Site (Outpatient Clinic) Visits, 2011-2015, Maricopa County



School Surveillance

Maricopa County uses a web-based school surveillance system to collect student absenteeism data. Participation of schools in the surveillance increased slightly from 82 schools in 2013-2014 to 84 schools in 2014-2015 representing 5 school districts. During the 2014-2015, week 48 (11/23/2014-11/29/14) had the highest percent of absenteeism due to ILI ([graph 8](#)).

Graph 8. Student absenteeism as a percent of total enrollment, 2012-2015, 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, it is suspected that 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 is slightly lower in this season compared to last season, also those directly attributed to influenza decreased compared to last season including one pediatric flu death.

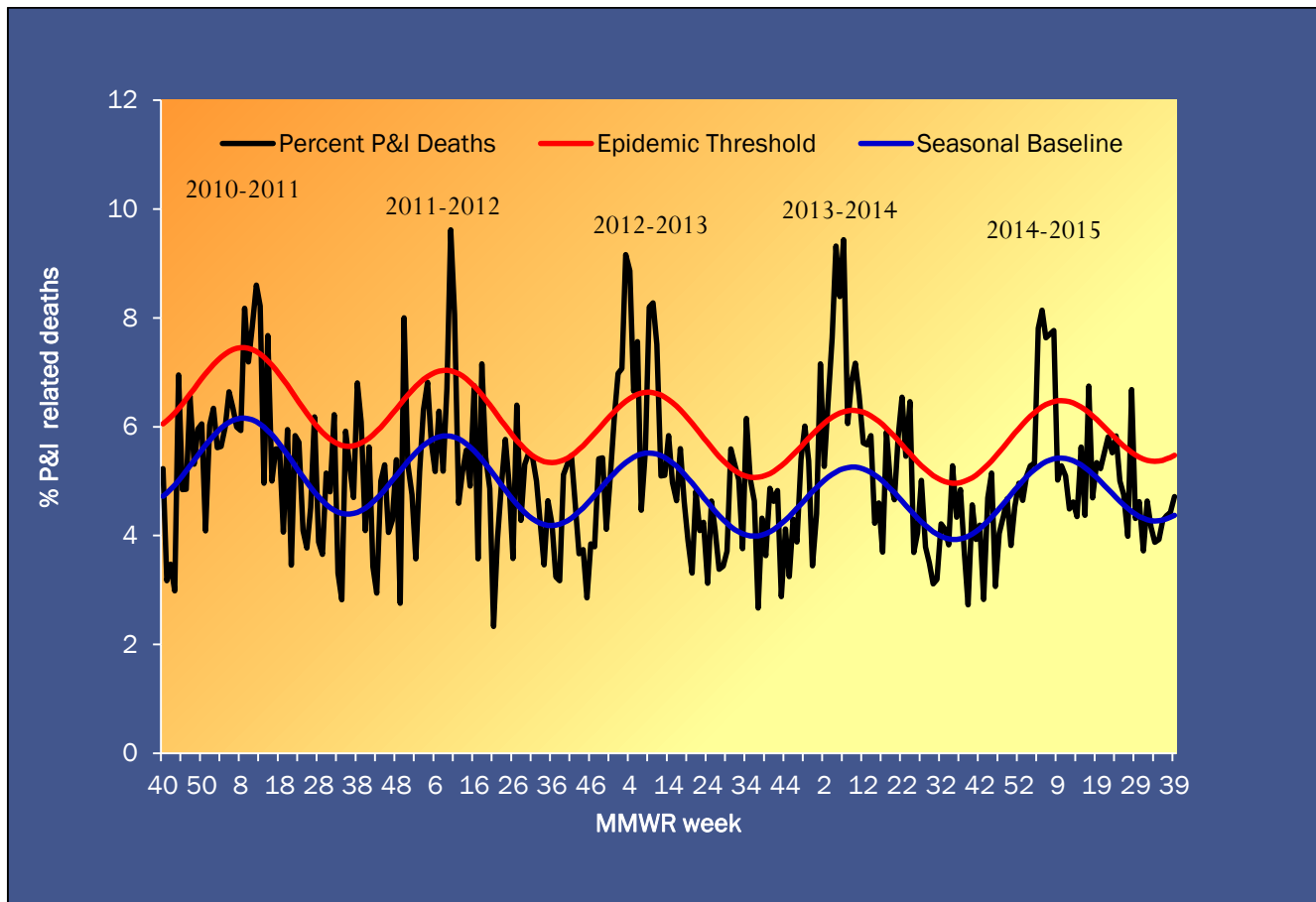
Table 4. P&I Deaths, 2013-2014 & 2014- 2015 Seasons, Maricopa County

	Current Season (2014-2015) As of [10/03/2015]		Last Season (2013-2014) As of [09/27/2014]	
	Pneumonia and Influenza	Influenza	Pneumonia and Influenza	Influenza
Pediatric (Under Age 18)	13	1	6	1
Adult (18 and Over)	1281	12	1307	38

Source: MCDPH Office of Vital Statistics

Maricopa County participates in Centers for Disease Control and Prevention (CDC) 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. During the 2014-2015 season, the percent of deaths due to P&I exceeded the epidemic threshold 7 times ([graph 9](#)).

Graph 9. P&I Related Deaths as a Percent of Total Deaths, 2010-2015, Maricopa County

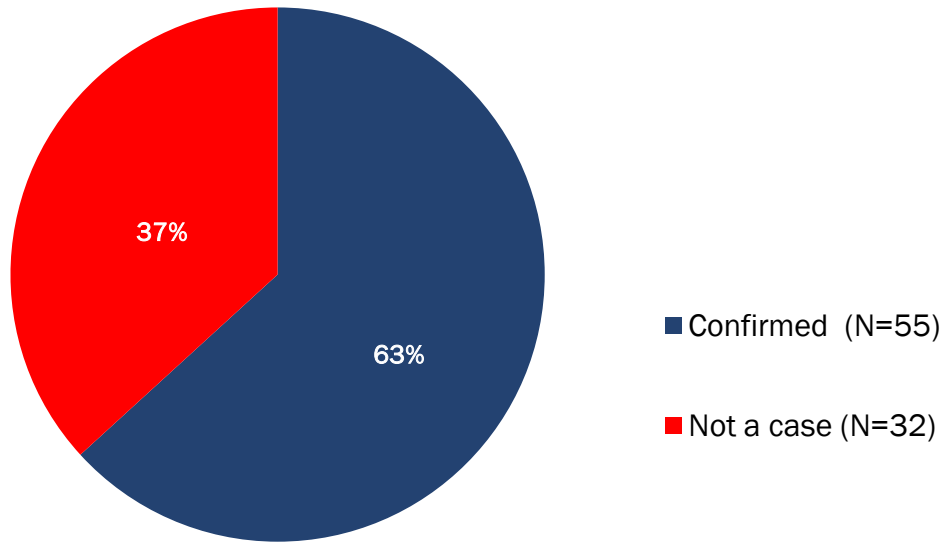


Source: MCDPH Office of Vital Statistics

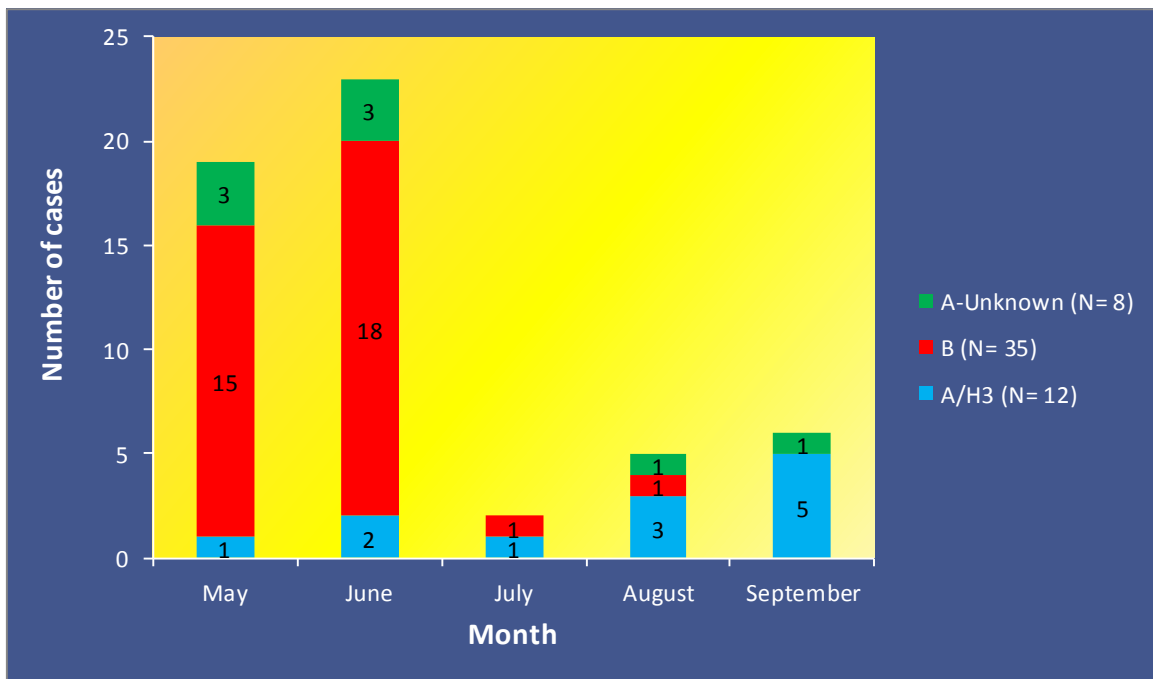
SUMMER INFLUENZA SURVEILLANCE

Each year Maricopa County stops counting rapid tests if they are collected 14 days after the collection date of the last RT-PCR or viral culture confirmed case at the Arizona State Laboratory ([see ADHS report for more information on summer surveillance, p. 12](#)). This is because there is a high likelihood of false positive results from rapid tests during the summer. After May 24, 2015, individuals that only had positive rapid tests were not considered cases. During the summer surveillance period, a case is only considered confirmed if they have a positive RT-PCR or viral culture test. Confirmed cases are further investigated by MCDPH in order to acquire hospitalization status and travel history. A total of 87 cases were reported during this period, of which 55 were confirmed and then investigated. ([graph 10](#)). The majority of these cases tested positive for influenza B ([graph 11](#)). Furthermore, the majority of the cases acquired influenza outside of Maricopa County ([graph 12](#)). There was a higher number of hospitalized than non-hospitalized cases ([graph 13](#)).

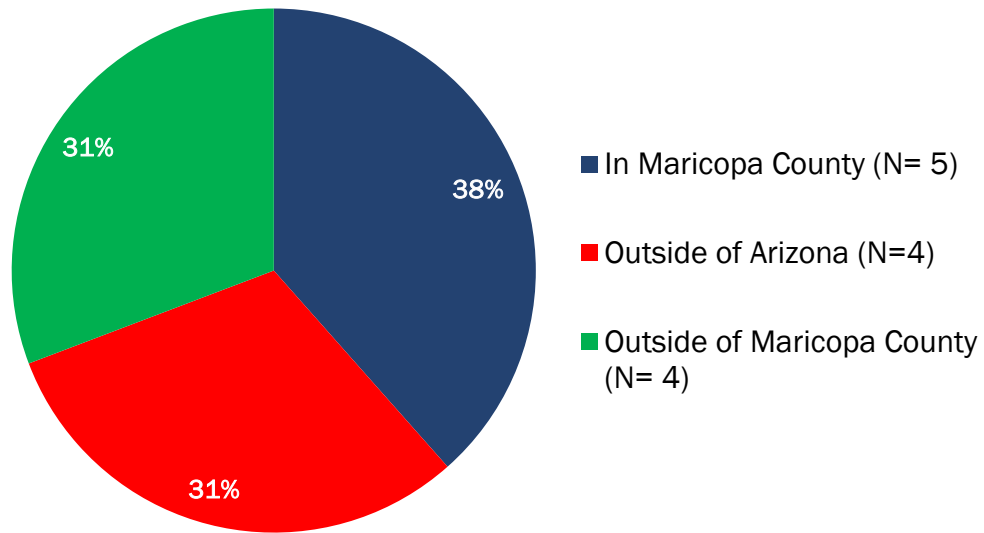
Graph 10. Summer Investigations by Case Classification, 2014- 2015, Maricopa County



Graph 11. Confirmed Summer Influenza Cases by Month Reported and Influenza Sub-Type, 2014-2015, Maricopa County

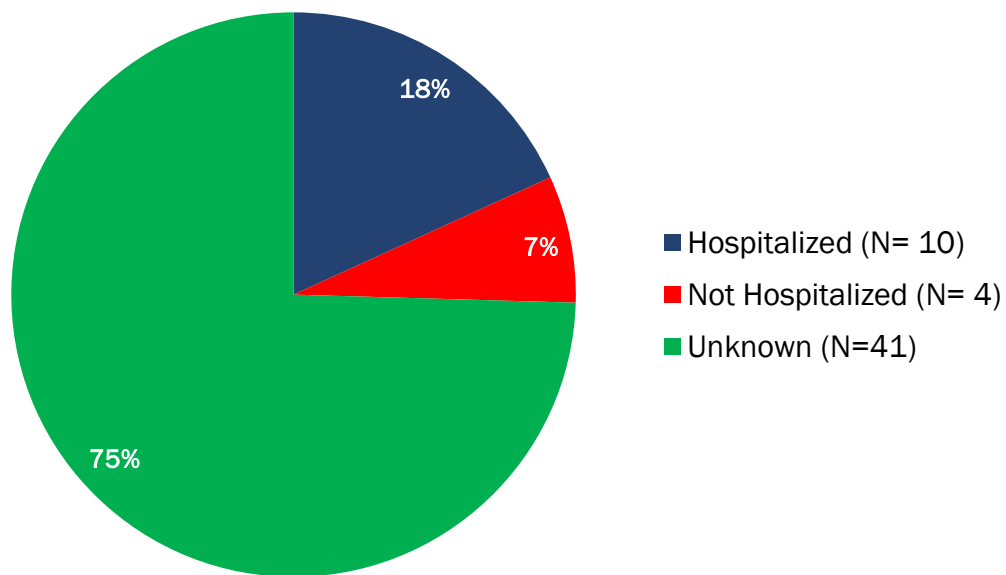


Graph 12. Summer Influenza Cases by Place of Infection, 2014- 2015, Maricopa County



* Forty-two cases had unknown travel history

Graph 13. Summer Influenza Cases by Hospitalization Status, 2014- 2015, Maricopa County

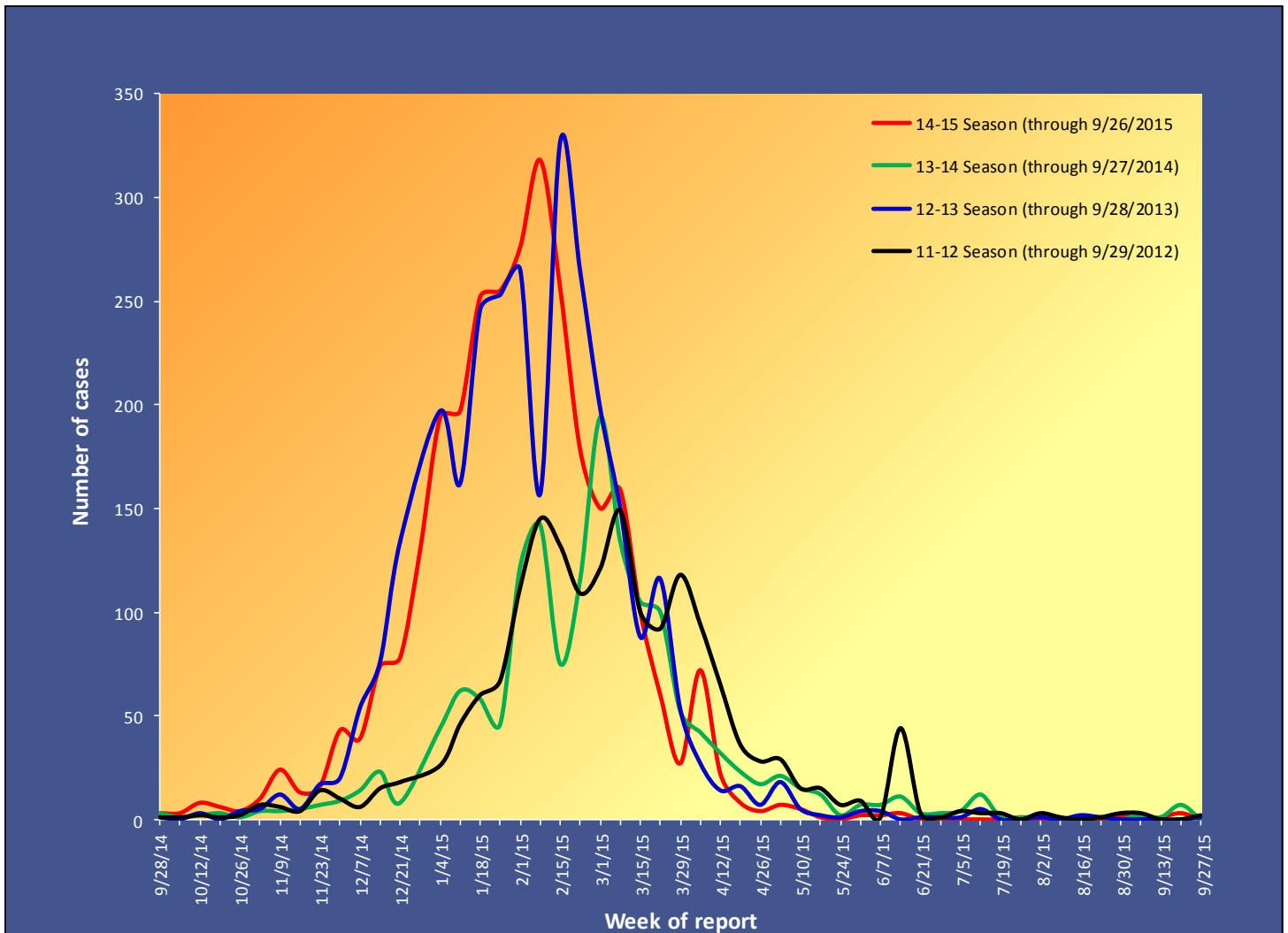


RSV SURVEILLANCE

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 2010-2015 are shown in [graph 14](#). In total, there were 2,555 individuals confirmed with an RSV test this season. RSV activity was highest from late December to the end of March. Peak activity occurred during week 6 (2/08/15), with 318 laboratory confirmed RSV cases ([graph 15](#)). The onset, offset, and peak of widespread RSV activity occurred earlier than in previous seasons. In general, the 2014-2015 RSV season was higher than the previous season.

Graph 14. Number of Laboratory Confirmed RSV Cases Reported by Week, 2011-2015, Maricopa County



Graph 15. Number of Laboratory Confirmed RSV Cases Reported by Week, 2014-2015, Maricopa County (N=2,555)

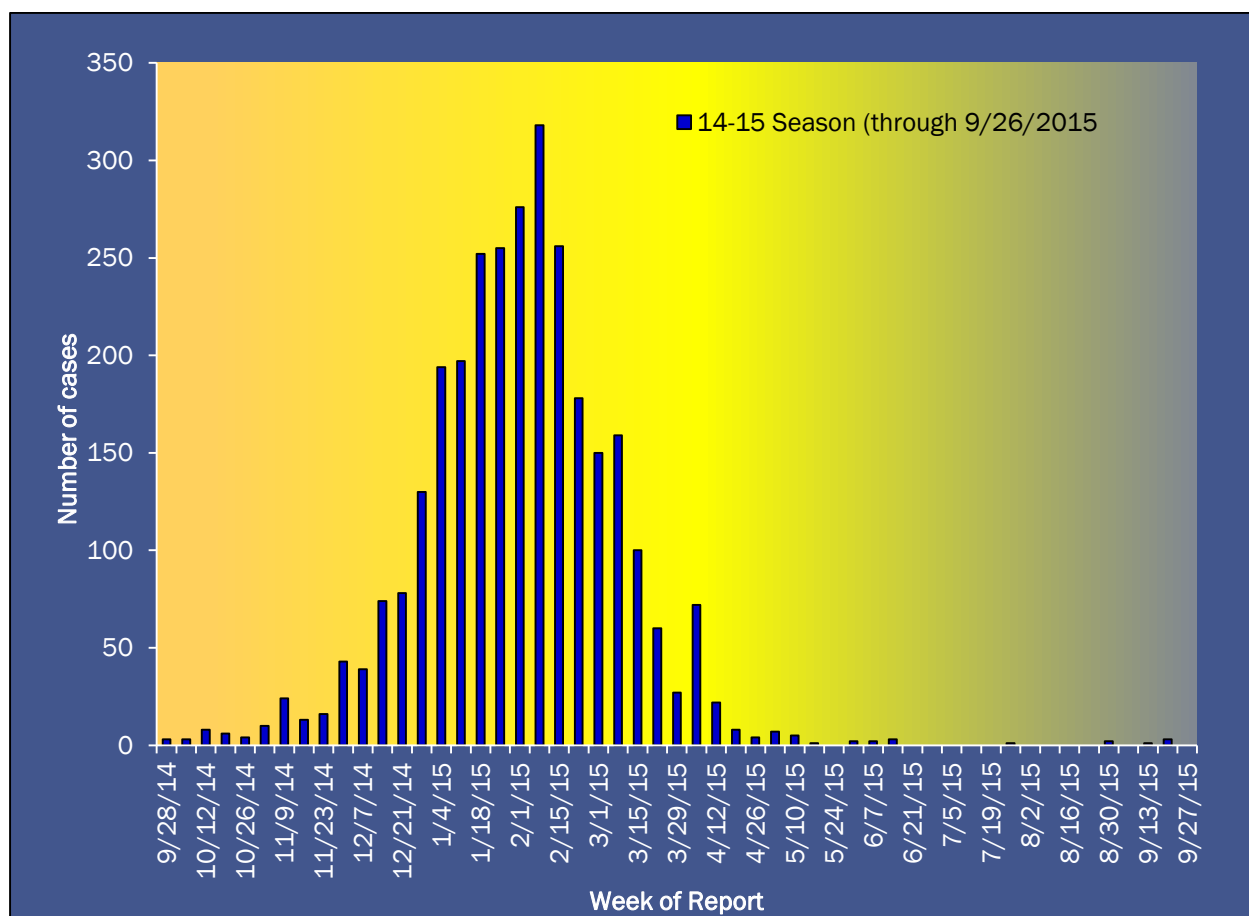


Table 5: Laboratory-Confirmed RSV Cases by Age Group in Maricopa County, 2014-2015

2014-15 Season Laboratory-Confirmed RSV Cases by Age Group, Maricopa County		
Age Group	Cases	Cases per 100,000 population
Age <1	1653	3044
Age 1 - 4	853	373
Age 5 - 17	136	19
Age 18 - 64	147	6
Age 65 +	195	42

APPENDIX

Baseline and Threshold

The baseline is defined as the mean of the state ILI% in weeks in the 2014-2015 flu seasons in which two or more consecutive weeks each accounted for less than 2% of the season's total number of specimens testing positive for influenza at the Arizona State Public Health Laboratory. The epidemic threshold is defined as the mean plus two standard deviations.

Baseline analysis is important for monitoring any disease that is endemic in a population. For viruses like influenza, which exists year round within a population, it is important to track cases of the disease in order to prevent potential outbreaks as well as create viable public health interventions. While most influenza cases are seen during the yearly "flu season," the disease persists within the population year-round and determining the baselines will provide advanced warning of the influenza activity even during the off-season in Maricopa County.