



Infectious Disease Outbreak Summary Report
Arizona Department of Health Services
Office of Infectious Disease Services
Infectious Disease Epidemiology and Investigations
2009

OVERVIEW

Outbreak detection and response are key components of a state's capacity and are essential for prevention and control of illness in a population. To monitor Arizona's progress in detecting and responding to reported outbreaks, the Arizona Department of Health Services (ADHS), along with county health departments, developed a standardized outbreak summary form based on Centers for Disease Control and Prevention (CDC) performance indicators. These indicators are meant to be used by state and local health agencies to evaluate the performance of their outbreak response and control programs and identify specific needs for improvement. The overall goal of outbreak surveillance and investigations in Arizona is to track and record outbreaks in a centralized and standardized manner and use the results as a tool to respond to outbreaks appropriately.

In Arizona, healthcare providers (HCP), healthcare institutions, correctional facilities, and administrators of schools and shelters are required to report outbreaks of infectious diseases to their county health department under Arizona Administrative Code (A.A.C.) R9-6-203 and Arizona Revised Statutes (A.R.S.) Title 36. Hotels, motels, and resorts are also required to report contagious or epidemic diseases occurring in their establishments within 24 hours under A.R.S. Title 36, Chapter 6, Article 2. Outbreaks are reportable to ADHS within one working day after a county health department receives a report (A.A.C. R9-6-206F). The information provided at time of report includes location/setting of outbreak, number of cases and suspect cases, the date reported, the disease suspected, and important contact information.

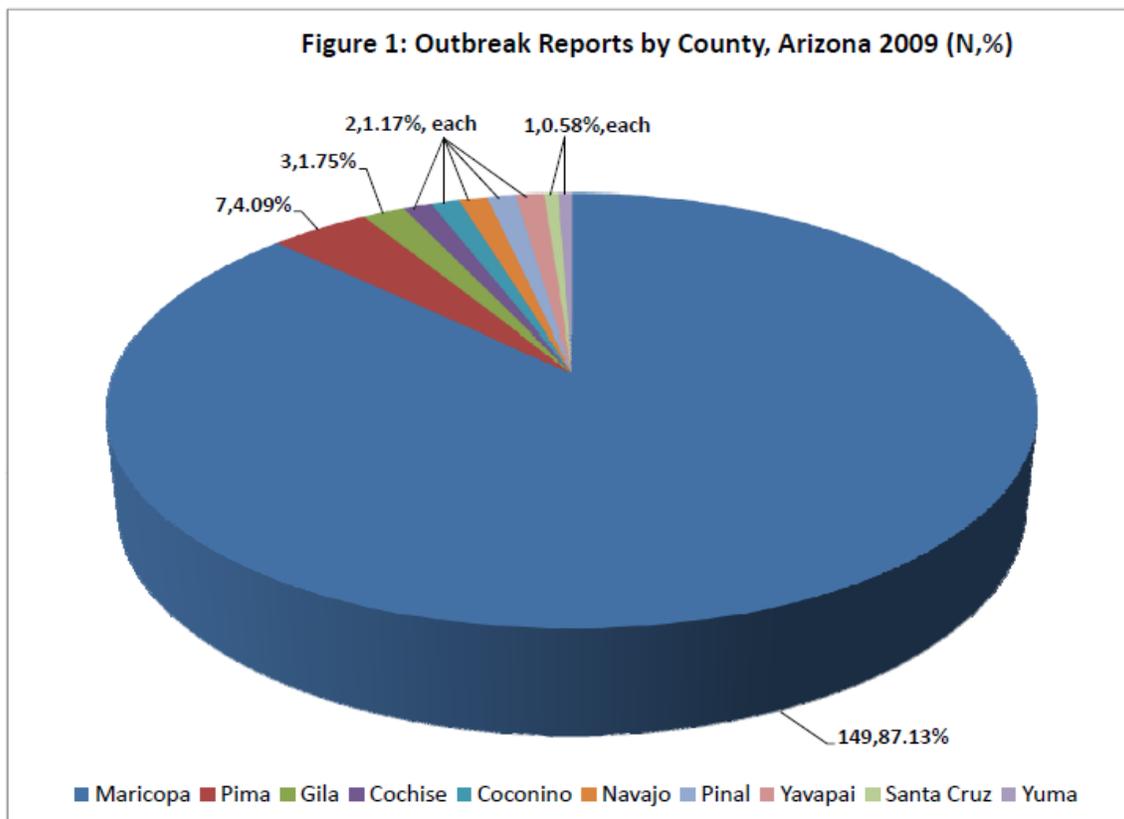
Certain performance goals for outbreak tracking and response were decided upon in Arizona and are as follows:

1. $\geq 90\%$ of reported outbreaks will have an investigation initiated within 24 hours of receipt of report.
2. $\geq 95\%$ of outbreaks will be reported to ADHS by the local health department within 24 hours of receipt of report.
3. Reports of 100% of investigations will be forwarded to ADHS within 30 days after completion of investigation

The outbreak descriptive epidemiology included in this report for 2009 is based on the state outbreak line list used to track and monitor outbreak reports and includes essential performance indicators included on the outbreak summary form. The outbreak information outlined here only includes local outbreaks and does not include national outbreaks in which Arizona may have cases.

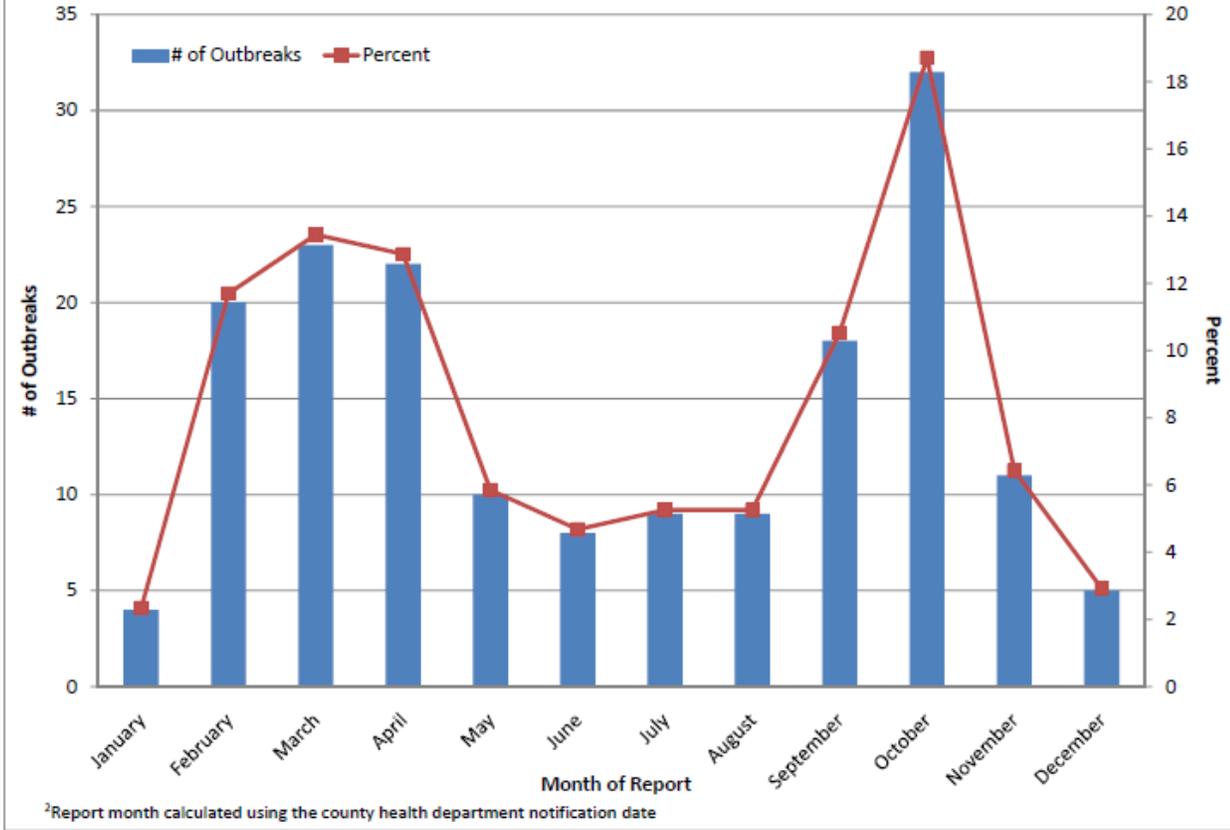
RESULTS

In 2009, 171 communicable disease outbreaks were reported and investigated from ten county health departments in Arizona ([Figure 1](#)). Outbreaks were reported predominately in Maricopa County with 149 (87%). This is due to a larger population size.

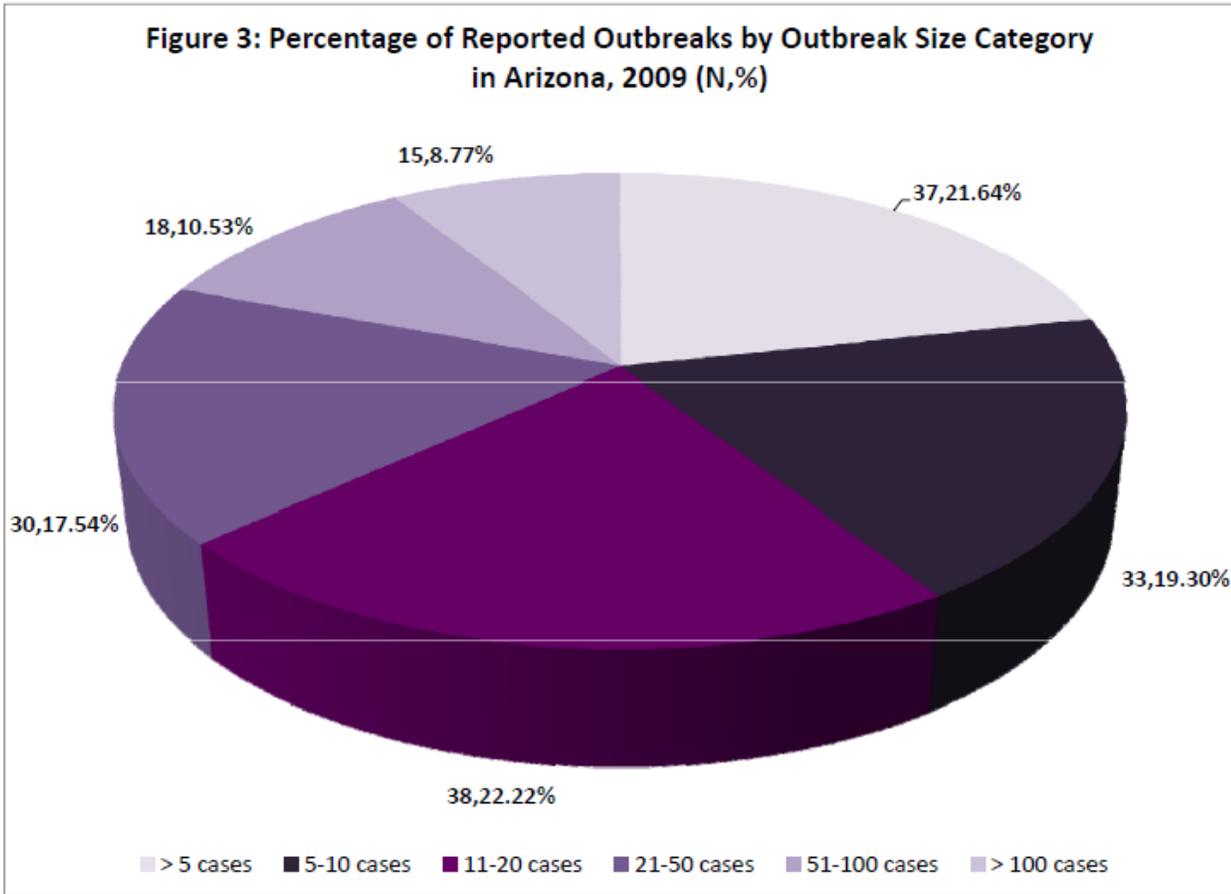


The most outbreaks investigated were reported in October with 32 (19%) ([Figure 2](#)). The median and mean number of outbreak reports received was 6 and 6.4 per month, respectively. Five (3%) outbreaks were reported to the county health department by ADHS. Of the remaining 166, 141 (85%) were reported by the county health department to ADHS within 24 hours. This did not meet our state performance goal of $\geq 95\%$ of outbreaks reported to ADHS within 24 hours. For 12% of the outbreaks, county health departments submitted to ADHS an outbreak report within 30 days of investigation closure.

Figure 2: Reported Outbreaks by Month in Arizona, 2009²

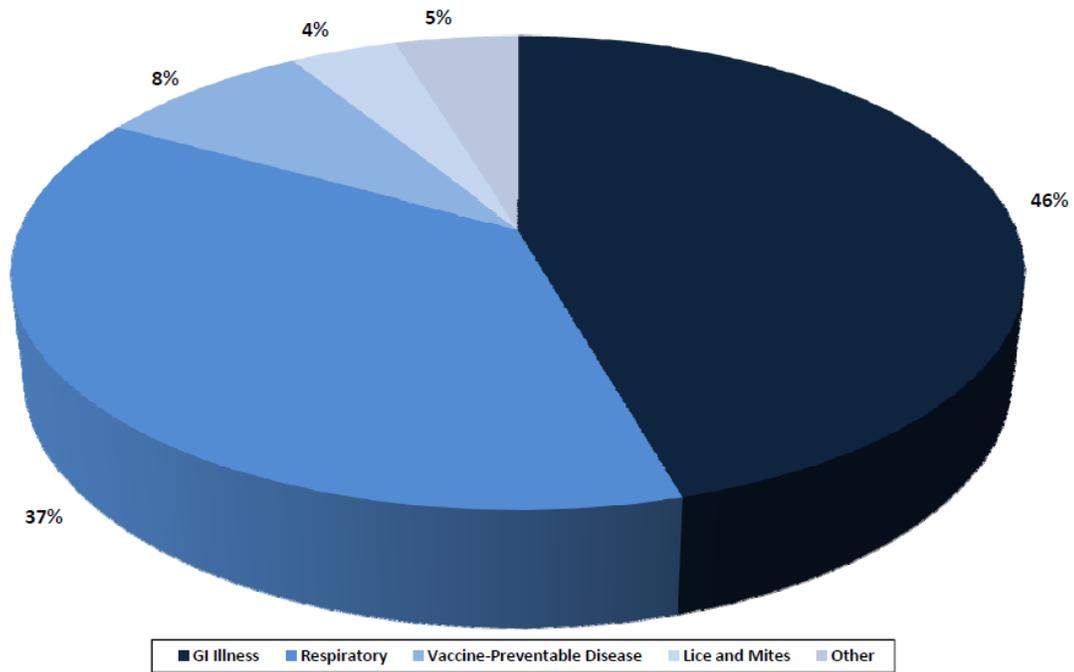


To characterize the reported outbreaks, analysis was conducted to describe the outbreak location category, mode of transmission, size, and infectious disease category. The most frequent outbreaks contained 11-20 cases, representing 22% of the total reported outbreaks (Figure 3). Notably, there were fifteen outbreaks reported in 2009 with more than 100 people involved. Approximately 63% of the reported outbreaks contained 20 people or less.



The most frequently reported type of outbreak was gastrointestinal illness representing 46% of the reports. Other frequently reported outbreaks include respiratory illness (37%) and vaccine-preventable diseases (8%) ([Figure 4](#)).

Figure 4: Reported Outbreaks by Infectious Disease Category, Arizona 2009^{3,4}



³Respiratory includes upper and lower respiratory illness, influenza, and influenza-like illness unless classified elsewhere.
⁴Other includes conjunctivitis, certain rash illnesses, MRSA, and agent/symptom presentations that do not fit in the other categories.

The top five reported suspect infectious agents causing outbreaks in Arizona for 2009 were influenza (32%), norovirus (19%), varicella (8%), *Shigella* spp. (8%) and *Streptococcus* Group A (5%) (Figure 5). Other infectious agents represented 13% of the total outbreak reports and in 15% of the outbreaks an agent could not be determined. A more detailed description of infectious agents identified as causing outbreaks in 2009 is shown in Table 1.

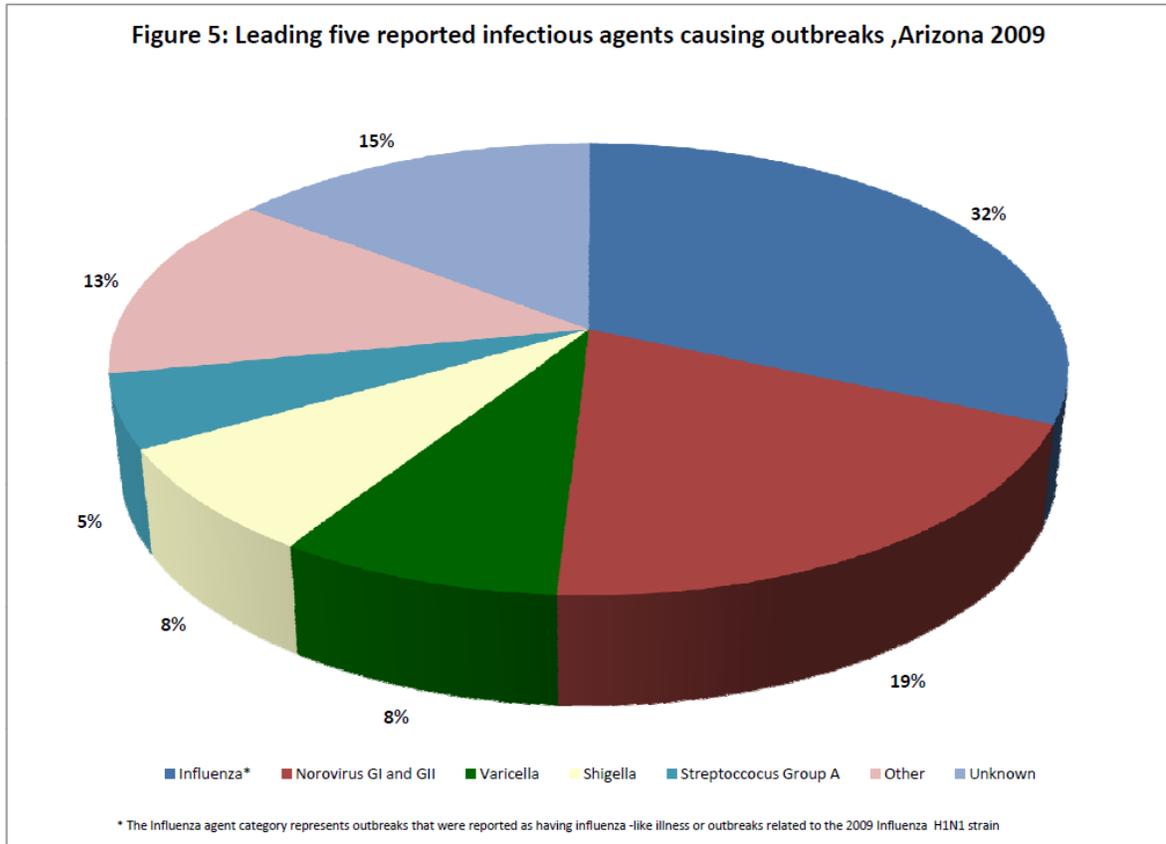
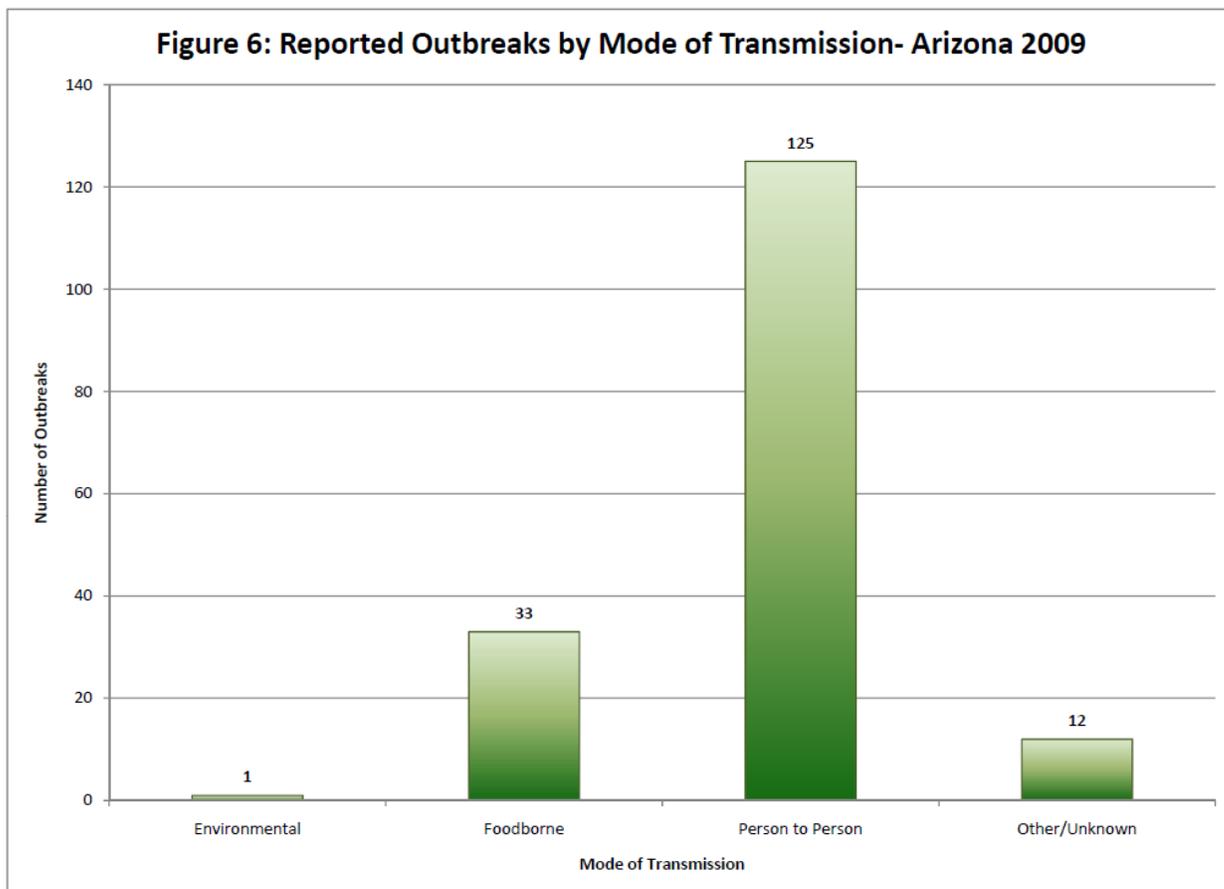


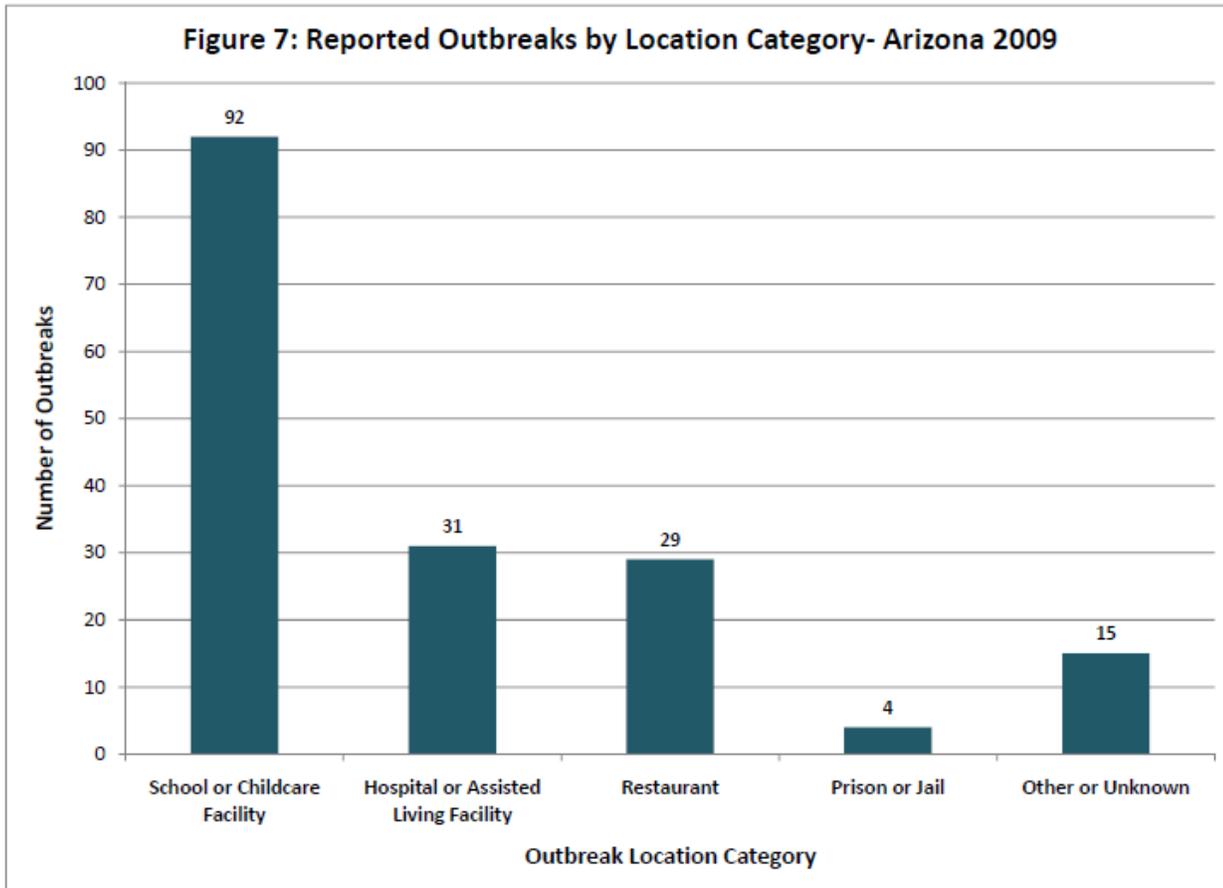
Table 1: Suspect Infectious Disease Agents causing an Outbreak in Arizona (N, %), 2009.

AGENT	FREQUENCY (N)	PERCENT (%)
<i>Borellia</i> spp.	1	0.58
<i>Enterococcus faecalis</i>	1	0.58
Enterovirus (Hand, Foot and Mouth Disease)	1	0.58
<i>Giardia</i> spp.	1	0.58
Influenza virus	54	31.58
Methicillin Resistant <i>Staphylococcus aureus</i>	1	0.58
Norovirus GI/ GII strain	33	19.30
Parvovirus B (Fifth Disease)	1	0.58
Respiratory Syncytial Virus	4	2.34
<i>Salmonella</i> spp.	4	2.34
Scabies	7	4.09
<i>Shigella</i> spp.	13	7.60
<i>Staphylococcal</i> enterotoxins	1	0.58
<i>Streptococcus</i> Group A	9	5.26
Toxin Exposure- Mercury	1	0.58
Varicella	14	8.19
Unknown	25	14.62
TOTAL	171	100%

The mode of transmission was determined for 159 (93%) of the reported outbreaks. Person-to-person transmission was the most common representing about 73% of the total outbreaks reported (Figure 6). There were 33 (19%) foodborne outbreaks in 2009 and one (0.5%) environmental outbreak. The mode of transmission could not be determined for 12 (7%) reported outbreaks in Arizona for 2009.

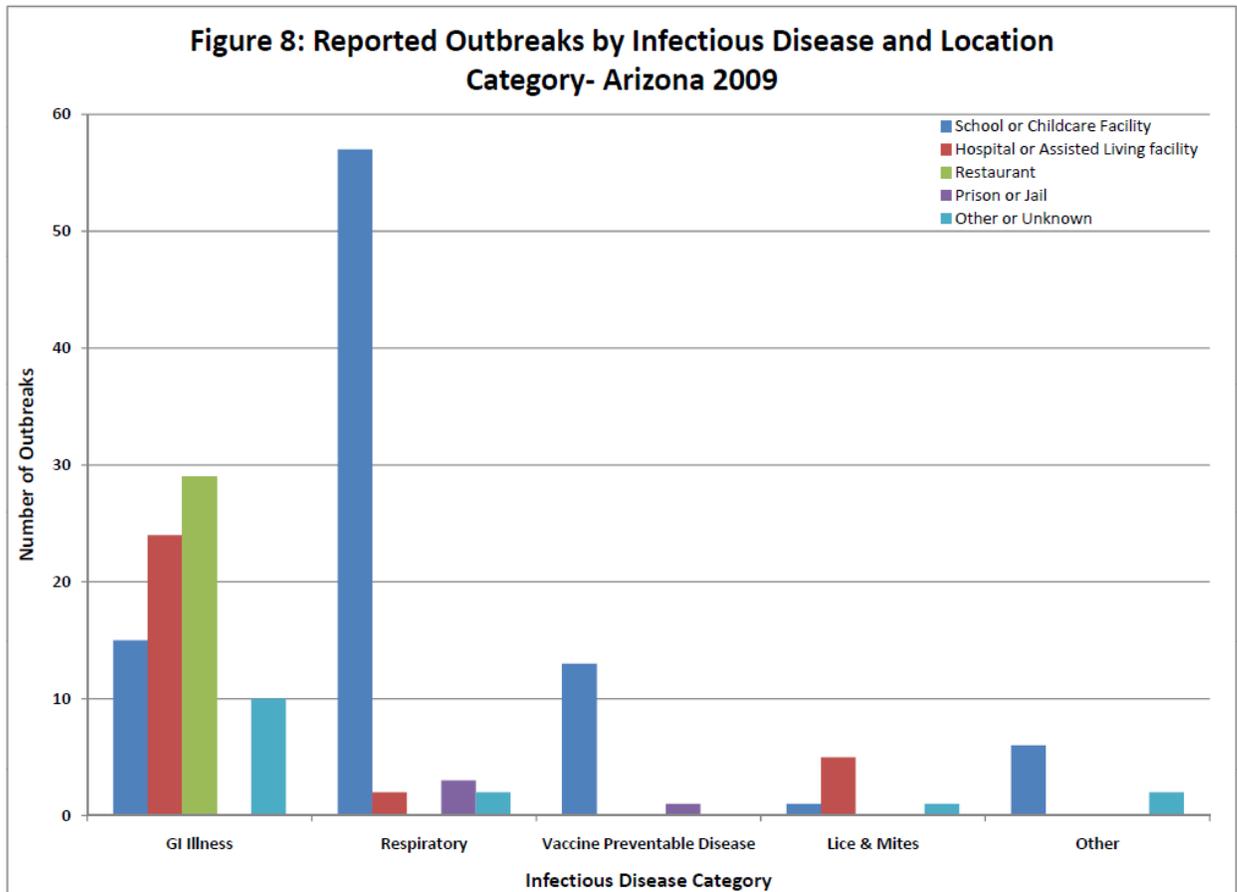


Reported outbreaks were classified into five categories based on location: hospital or assisted living facility, prison or jail, restaurant, school or child care facility, and other. The most common outbreak location was a school or child care facility with 54% of the reports (Figure 7). The next most common outbreak locations included hospital or assisted living facility (18%) and restaurant (17%). Fewer than five outbreaks were reported from prison or jail settings. These results are dependent on awareness of reporting requirements and the number of facilities in the state. Increased reporting in a school or healthcare facility was expected as healthcare professionals are at a location to assist in identification of such outbreaks and outreach regarding reporting requirements is conducted by public health agencies. Reporting of restaurant outbreaks relies on individual illness complaints and outreach to the public may be less effective. Reported outbreaks in prisons or jails may be lower because there are fewer facilities in the state, they have less infectious disease outbreaks, and/or facilities are unaware of reporting requirements.

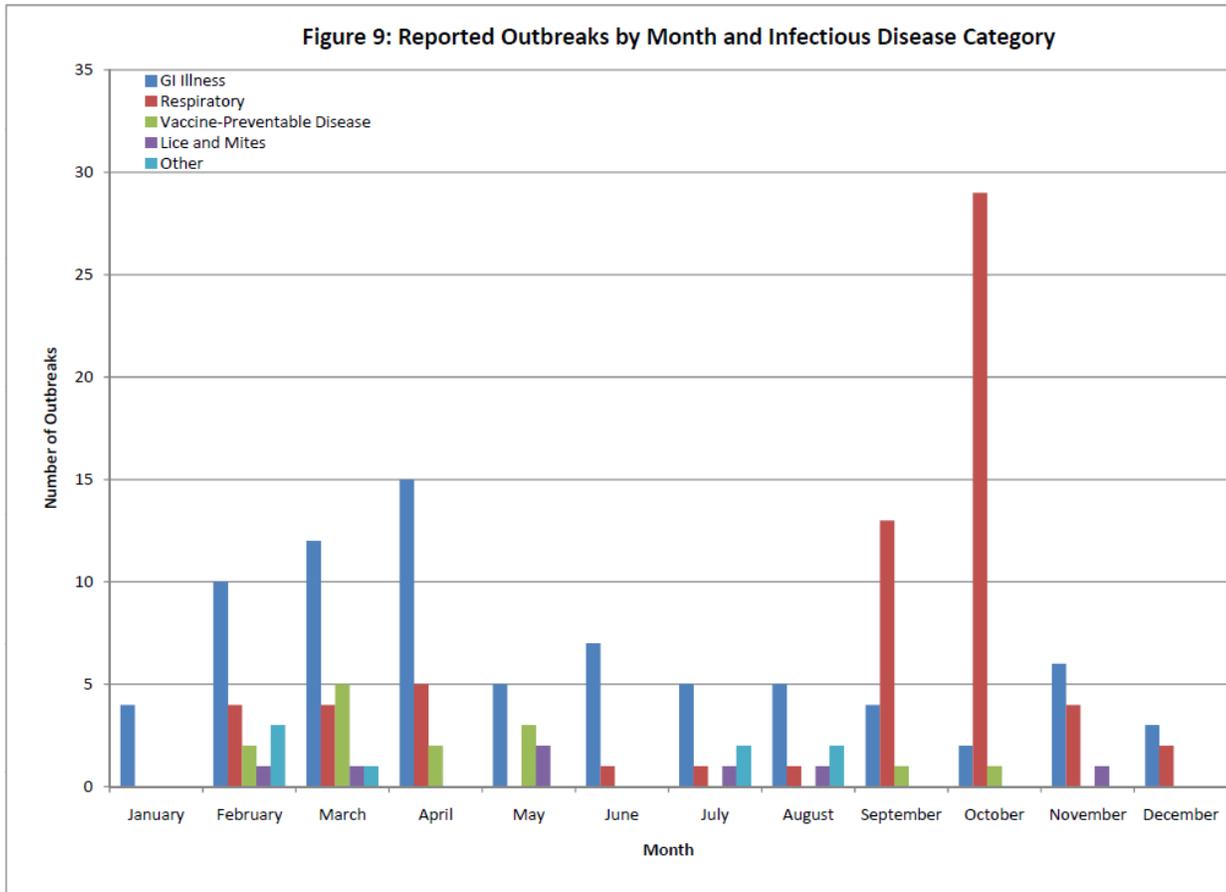


Outbreak locations were further characterized by infectious disease category. Gastrointestinal illness outbreaks were most frequently reported in a restaurant and hospital or assisted living facility with 29 (37%) and 24 (31%) reported outbreaks, respectively (Figure 8). For respiratory outbreaks, 57 (89%) were located at a school or childcare facility, and three (5%) located in a prison or jail. For vaccine preventable diseases, 13 (93%) of the outbreaks were reported from a school or childcare facility. For lice and mites, 5 (71%) were located in a hospital or assisted living facility and one outbreak was reported from a school or child care facility.

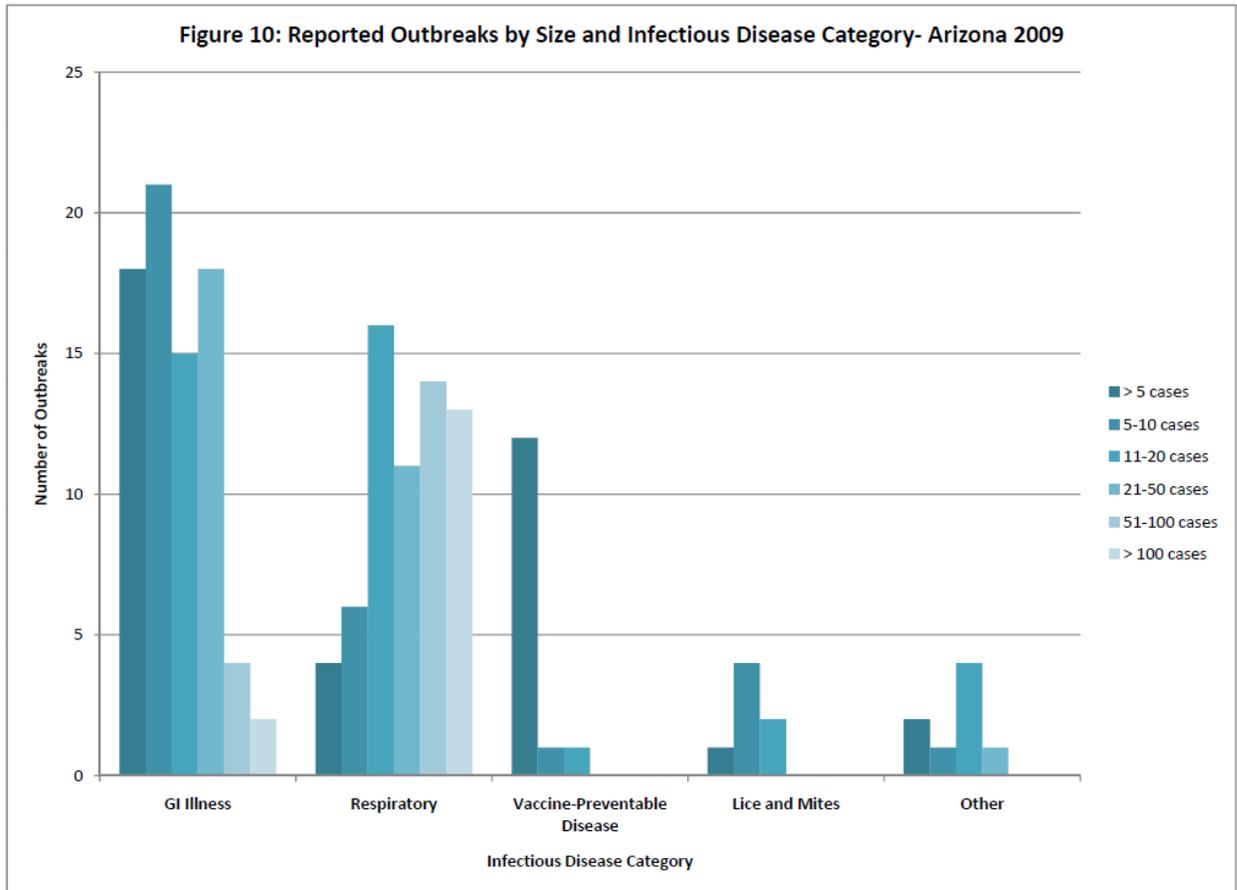
Prisons and jails only reported respiratory and vaccine-preventable disease outbreaks and restaurants only gastrointestinal outbreaks in 2009 (Figure 8). Hospitals or assisted living facilities reported gastrointestinal illness outbreaks most frequently (24, 77%). Schools and child care facilities most frequently reported respiratory illnesses, gastrointestinal illnesses and vaccine-preventable disease outbreaks, 57 (62%), 15 (16%), and 13 (14%) respectively.



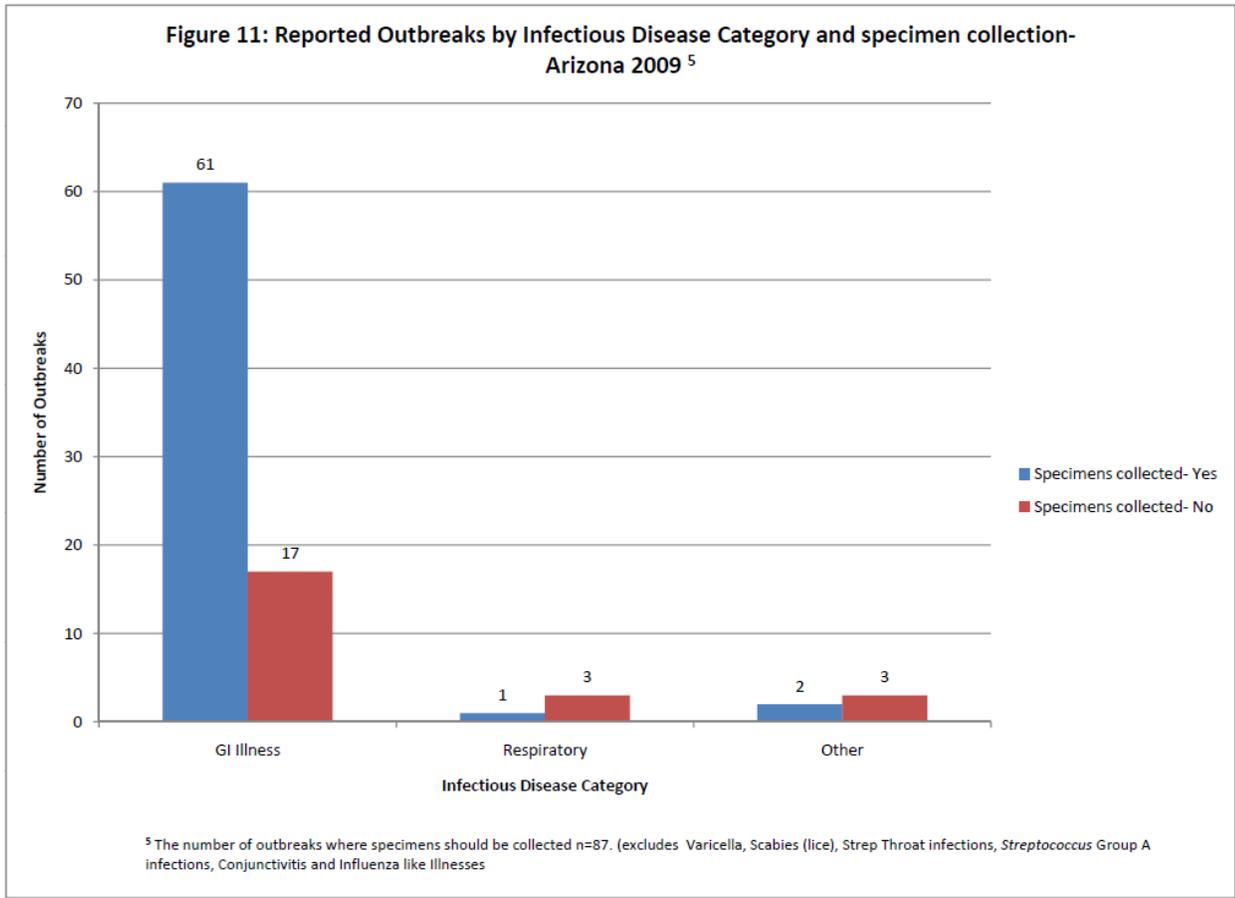
A description of infectious disease categories over time was conducted ([Figure 9](#)). As mentioned earlier, the month of October had the most reported outbreaks with 32 (19%) of the total outbreaks. This month also had over a quarter of the total respiratory illness outbreaks for 2009. Gastrointestinal outbreaks were the most common type of reported outbreaks seen every month except September and October, and many were confirmed to be norovirus. Vaccine-preventable disease outbreaks also peaked early in the year with a few outbreaks reported in September and October. Lice and mite outbreak reports remained constant over the year.



Vaccine-preventable disease outbreaks were usually small with <5 people per outbreak report ([Figure 10](#)). Respiratory outbreaks accounted for most of the outbreaks reported involving over 100 people. Gastrointestinal illness outbreaks were usually medium in size with five to 50 people per outbreak report. Lice and mite outbreak reports were small to medium in size with outbreaks most frequently reported in 5 to 10 people.



One of the measured outcomes for outbreaks in Arizona is collection of two or more specimens for each outbreak. All counties and tribes have a written outbreak protocol that details the process in which they will collect, package and ship specimens in the event of an outbreak. Facilities reporting outbreaks are encouraged to submit two or more specimens to the Arizona State Laboratory to increase the opportunity for accurate laboratory detection of the agent of infection. Specimens are not typically collected for outbreaks of varicella, scabies (lice), strep throat, *Streptococcus* Group A infections, conjunctivitis or influenza-like illnesses. Excluding these outbreaks, there were 87 outbreaks where a specimen should have been submitted; at least one specimen was submitted for 64 (73%). Specimens were predominantly collected in gastrointestinal illness outbreaks 78% (61 of 78) ([Figure 11](#)). In 50% (32 of 64) of the outbreaks where specimens were collected, norovirus was determined to be the agent. Two or more specimens were collected in 55% (48 of 87) of the outbreaks.



CONCLUSION

During outbreak investigations, local and state health departments work with the reporting facility to identify the causative agent as well as make recommendations for control and prevention of future cases. Overall, 171 infectious disease outbreaks were reported to Arizona public health agencies in 2009. This number does not include national outbreaks in which Arizona may have cases. The majority of the reported outbreaks occurred in Maricopa County (87%), in the month of October (19%), in a school/child care facility (89%), had symptoms consistent with gastrointestinal illness (46%), were spread person-to-person (73%) and involved fewer than 20 people (63%). The suspect agent determined to be the cause of most outbreaks (32%) in 2009 was influenza. For 2009, 82% of outbreaks were reported to ADHS within 24 hours, which was below the performance goal set of $\geq 95\%$. Only 12% of outbreak reports were submitted to ADHS within 30 days of investigation closure. This is well below the performance goal set at the beginning of the calendar year and will be further evaluated to determine why our goal was not met, but likely explanations include limited resources and accuracy of documenting when the investigation was closed. Further efforts would need to be taken to examine outbreak tracking and management to help accomplish the outbreak goals for the state.

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