



**Infectious Disease Outbreak Summary Report
Arizona Department of Health Services
Office of Infectious Disease Services
Infectious Disease Epidemiology and Investigations
2010**

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 indicator variables. 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.

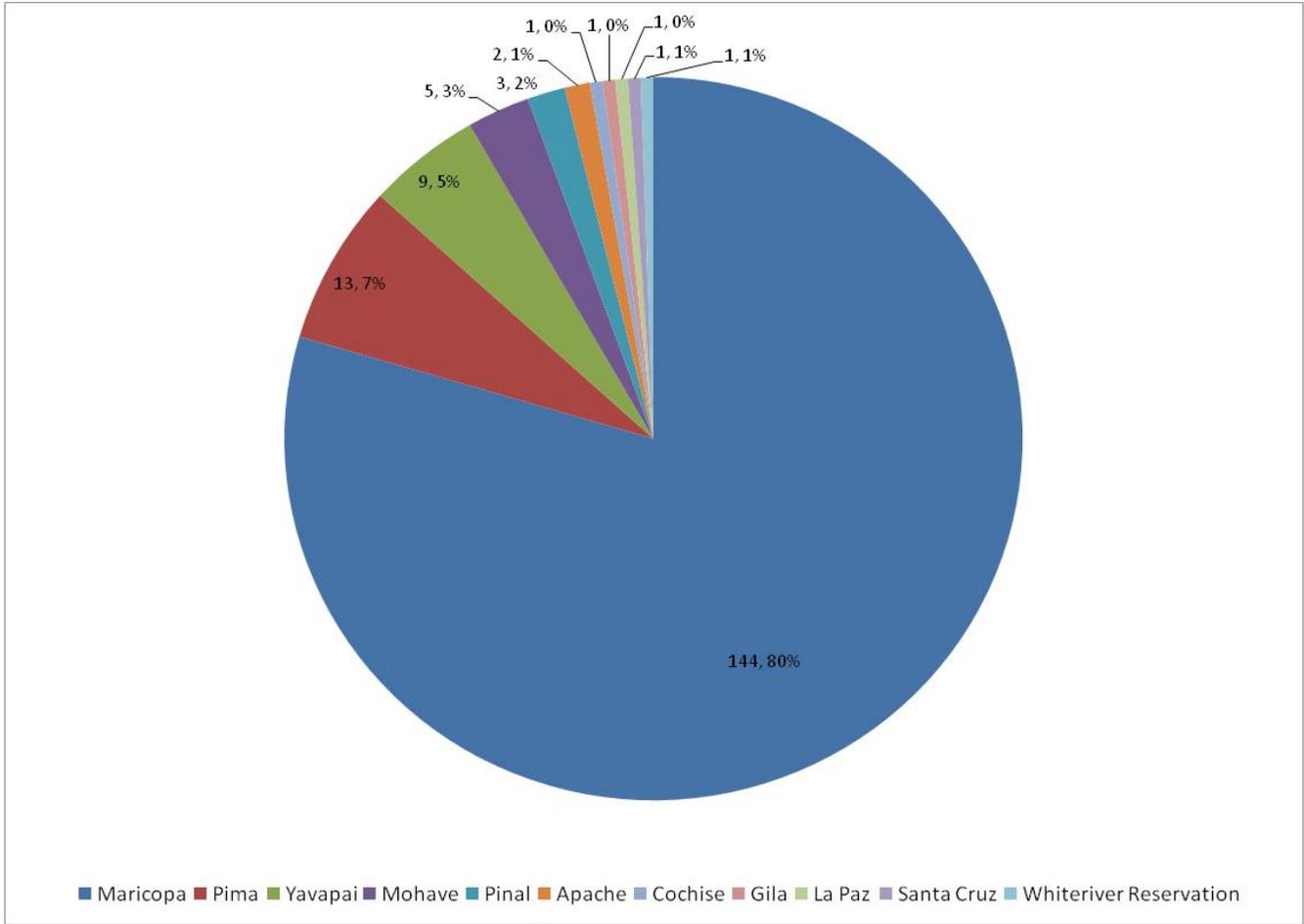
Certain performance goals for outbreak tracking and response were decided upon in Arizona and are as follows:

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 2010 is based on state outbreak line list used to track and monitor outbreak reports and includes essential performance indicators included on the outbreak summary form.

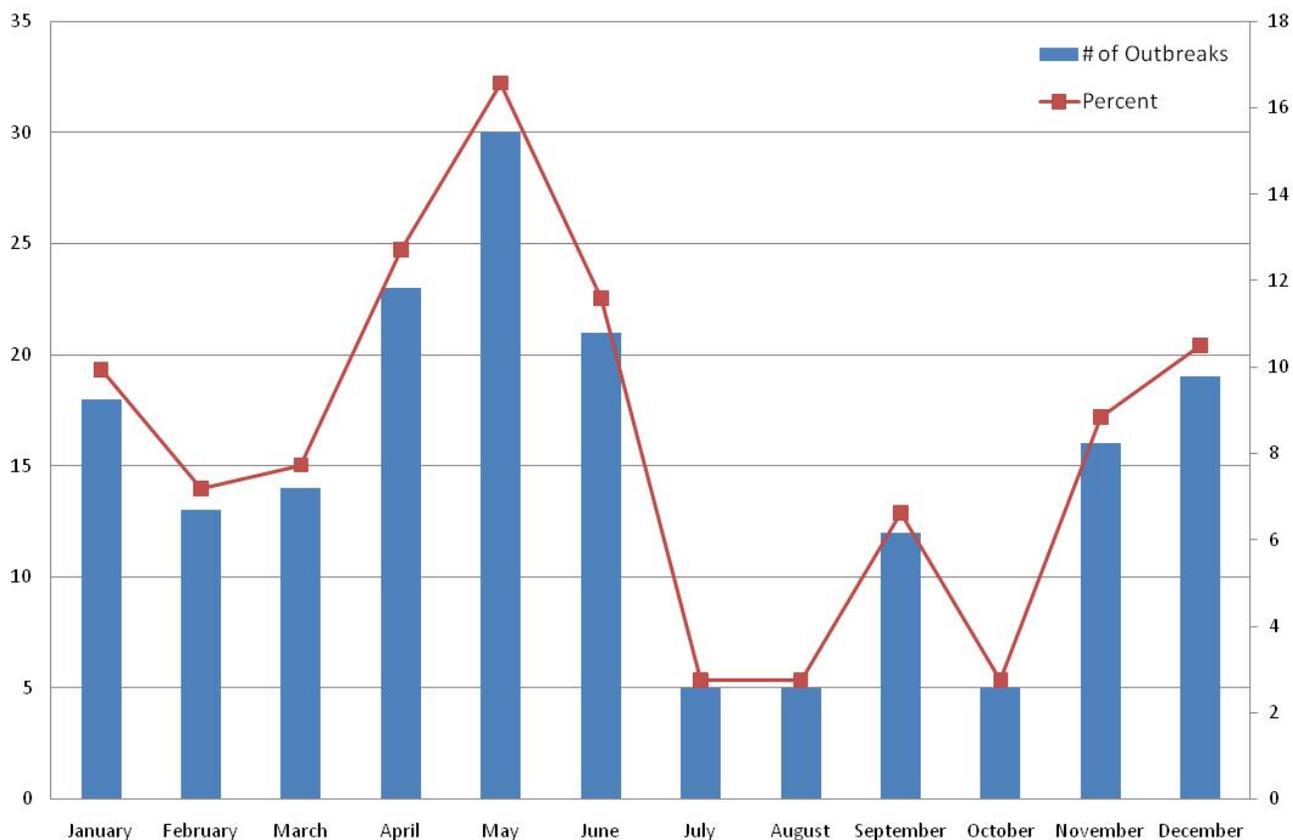
RESULTS

In 2010, 182 communicable disease outbreaks were reported and investigated from eleven county health departments and one reservation in Arizona (Figure 1). Outbreaks were reported predominately in Maricopa County with 144 (79%). This is due to a larger population size.



The most outbreaks investigated were reported in May with 30 (17%) (Figure 2). The median and mean number of outbreak reports received was 5 and 6.0 per month, respectively. Outbreaks were reported by the county health department to ADHS within 24 hours for 150 (82%) outbreaks. This did not meet our state performance goal of $\geq 95\%$ of outbreaks reported to ADHS within 24 hours. It should be noted that 2 (1%) outbreaks were reported to the county health department by ADHS. For 39% of the outbreaks, county health departments submitted to ADHS an outbreak report within 30 days of investigation closure.

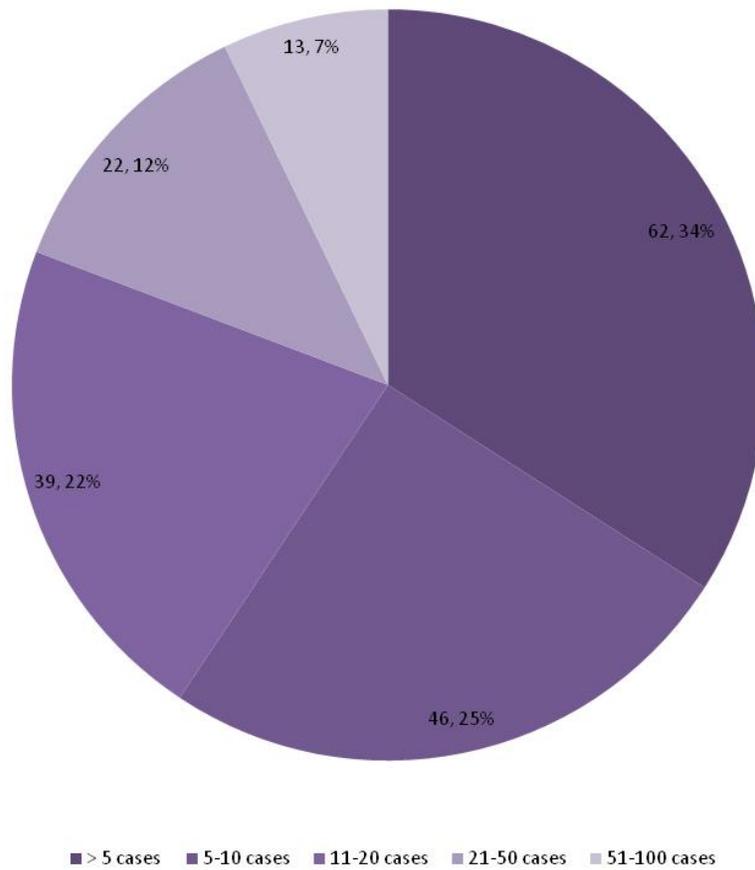
Figure 2: Reported Outbreaks by Month in Arizona, 2010



²Report month calculated using the county health department notification date

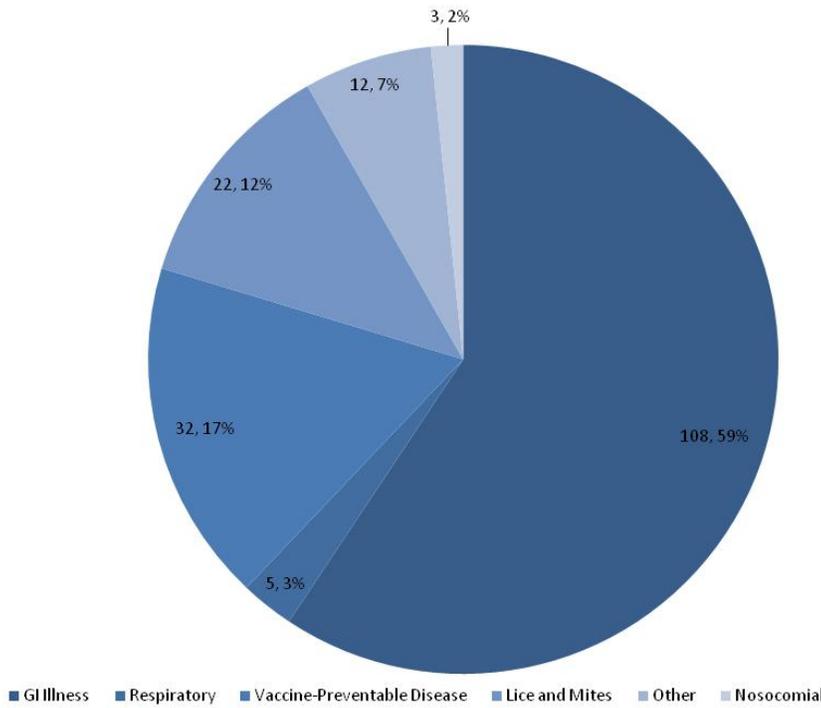
To characterize the reported outbreaks, analysis was conducted to describe the outbreak location category, mode of transmission, size, and infectious disease category. Outbreaks most frequently contained 5 or fewer cases, representing 34% of the total reported outbreaks (Figure 3). Approximately 81% of the reported outbreaks contained 20 people or less.

Figure 3: Percentage of Reported Outbreaks by Outbreak Size Category in Arizona, 2010 (N,%)



The most frequently reported type of outbreak was gastrointestinal illness representing 59% of the reports. Other frequently reported outbreaks include lice and mites (12%) and vaccine preventable diseases (18%) (Figure 4).

Figure 4: Reported Outbreaks by Infectious Disease Category, Arizona 2010^{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 infectious agents causing outbreaks in Arizona for 2010 were Norovirus (28%), Varicella (14%), Scabies (10%), *Streptococcus* Group A (3%), and *Salmonella* (2%) (Figure 5). Other infectious agents represented 14% of the total outbreak reports and in 28% of the outbreaks an agent could not be determined. A more detailed description of infectious agents identified as causing outbreaks in 2010 is shown in Table 1.

Figure 5: Leading 5 reported infectious agents causing outbreaks, Arizona 2010

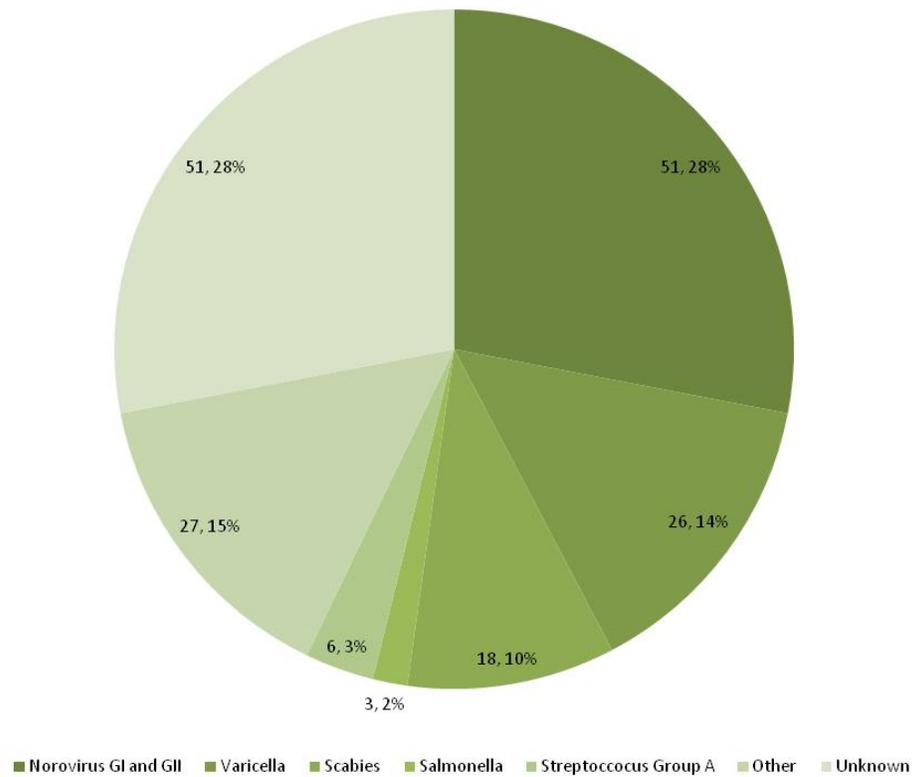
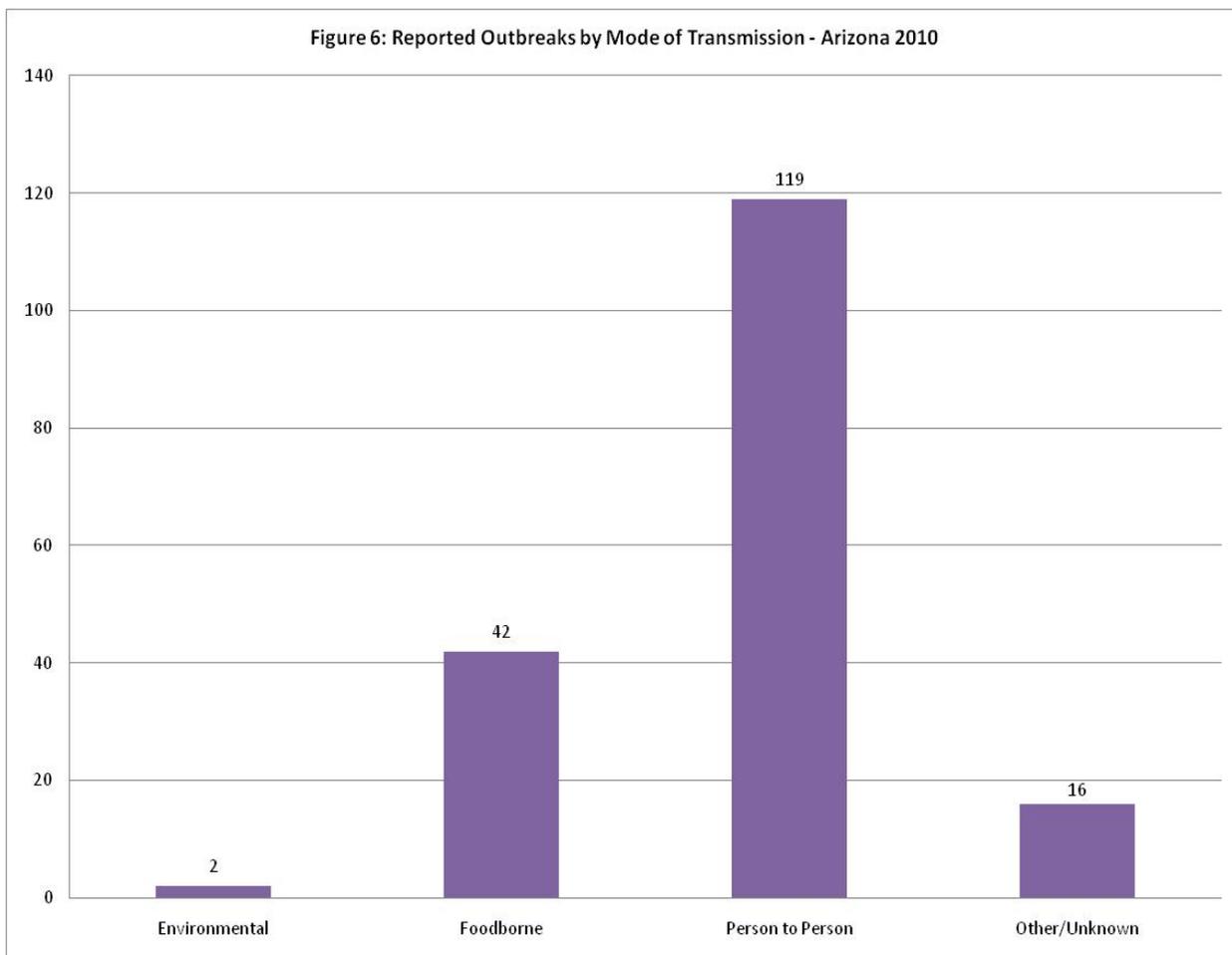


Table 1: Infectious Disease Agents Identified as causing an Outbreak in Arizona (N, %), 2010.

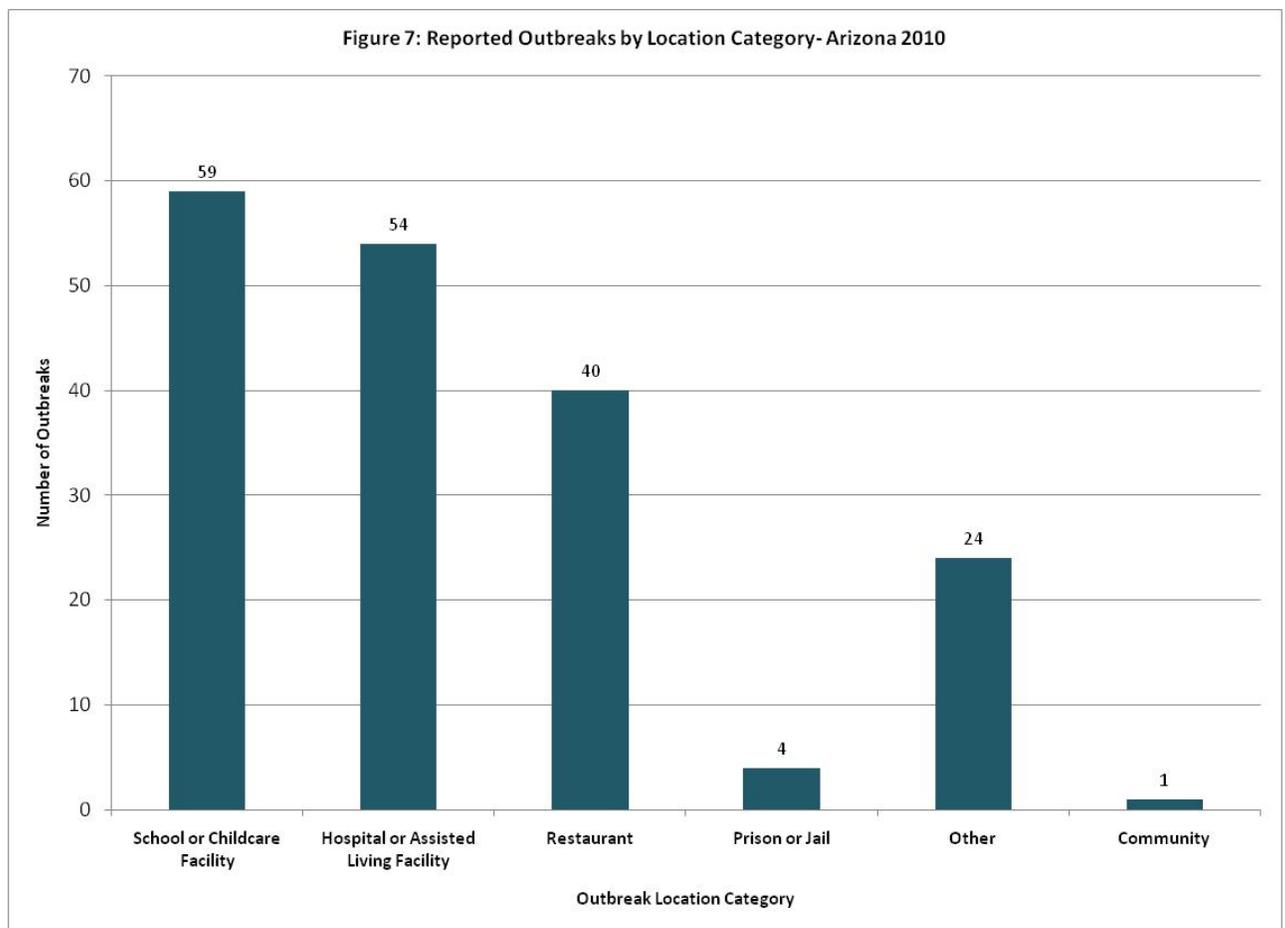
Agent	Frequency (N)	Percentage
Acinetobacter baumannii	1	0.55%
Aspergillus fumigatus	1	0.55%
Campylobacter	1	0.55%
Clostridium difficile	1	0.55%
Conjunctivitis	5	2.75%
E.coli STEC	1	0.55%
Giardia	1	0.55%
Haemophilus influenzae, type B	1	0.55%
Hand Foot and Mouth Disease	2	1.10%
Head Lice	4	2.20%
ILI	1	0.55%
Influenza A H3	2	1.10%
Legionella	1	0.55%
Measles	1	0.55%
MRSA	1	0.55%

Norovirus GI and Norovirus GII	51	28.02%
Pertussis	1	0.55%
Rash	1	0.55%
Rubella	1	0.55%
Salmonella	3	1.65%
Scabies	18	9.89%
Streptococcus Group A	6	3.30%
Unknown	51	28.02%
Varicella	26	14.29%
TOTAL	182	100%

The mode of transmission was determined for 166 (91%) of the reported outbreaks. Person-to-person transmission was the most common representing about 65% of the total outbreaks reported (Figure 6). The majority of outbreaks exhibited person-to-person transmission (119, 72%). There were 42 (23%) foodborne outbreaks. The mode of transmission could not be determined for 16 (9%) reported outbreaks in Arizona for 2010.

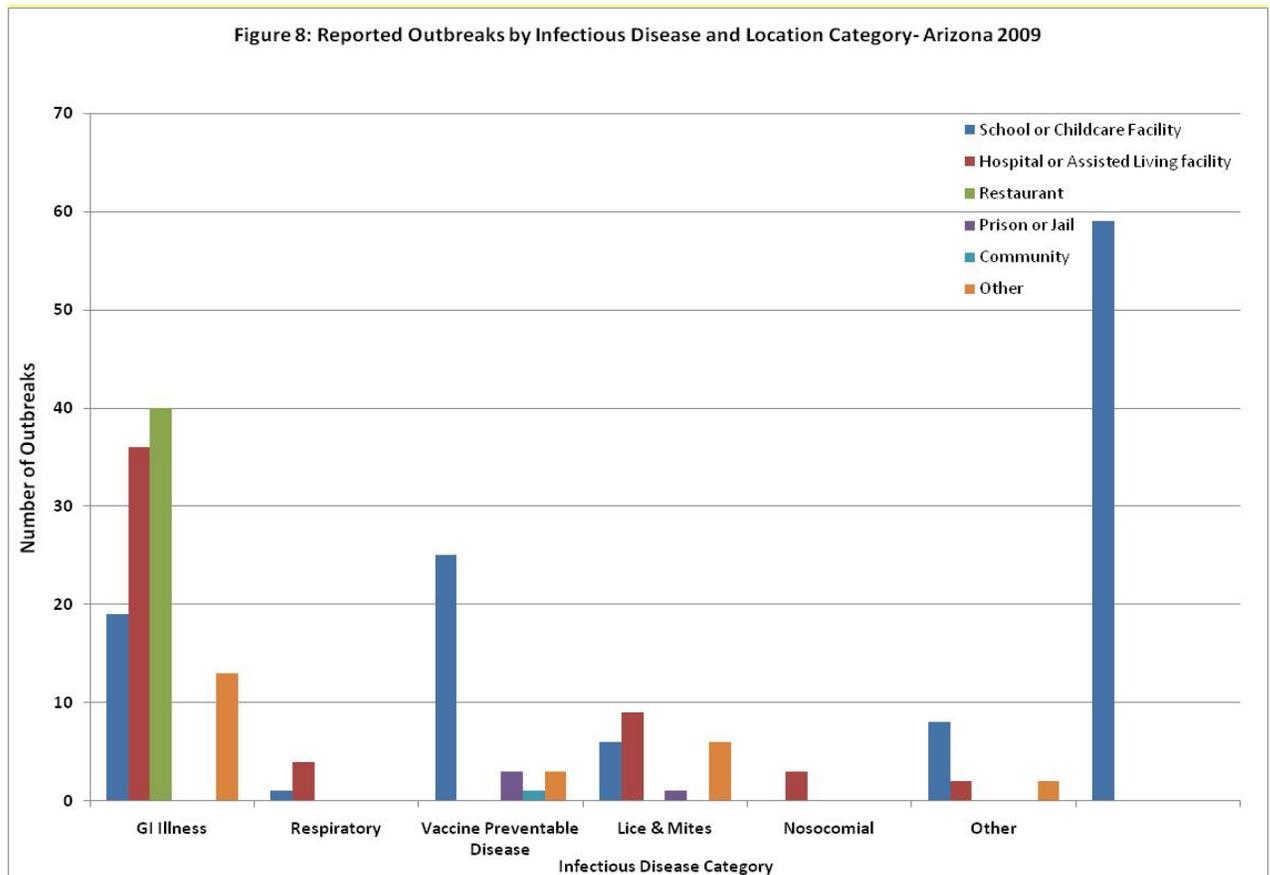


Reported outbreaks were classified into five categories based on location: hospital or assisted living facility, prison or jail, restaurant, school or child care facility, and other. The most common outbreak location was a school or child care facility with 32% of the reports (Figure 7). The next most common outbreak locations included hospital or assisted living facility and restaurant, respectively. Less than 5 outbreaks were reported from the community, 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 located at the location to assist in identification of such outbreaks and outreach regarding reporting requirements is conducted by public health agencies whereas 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.



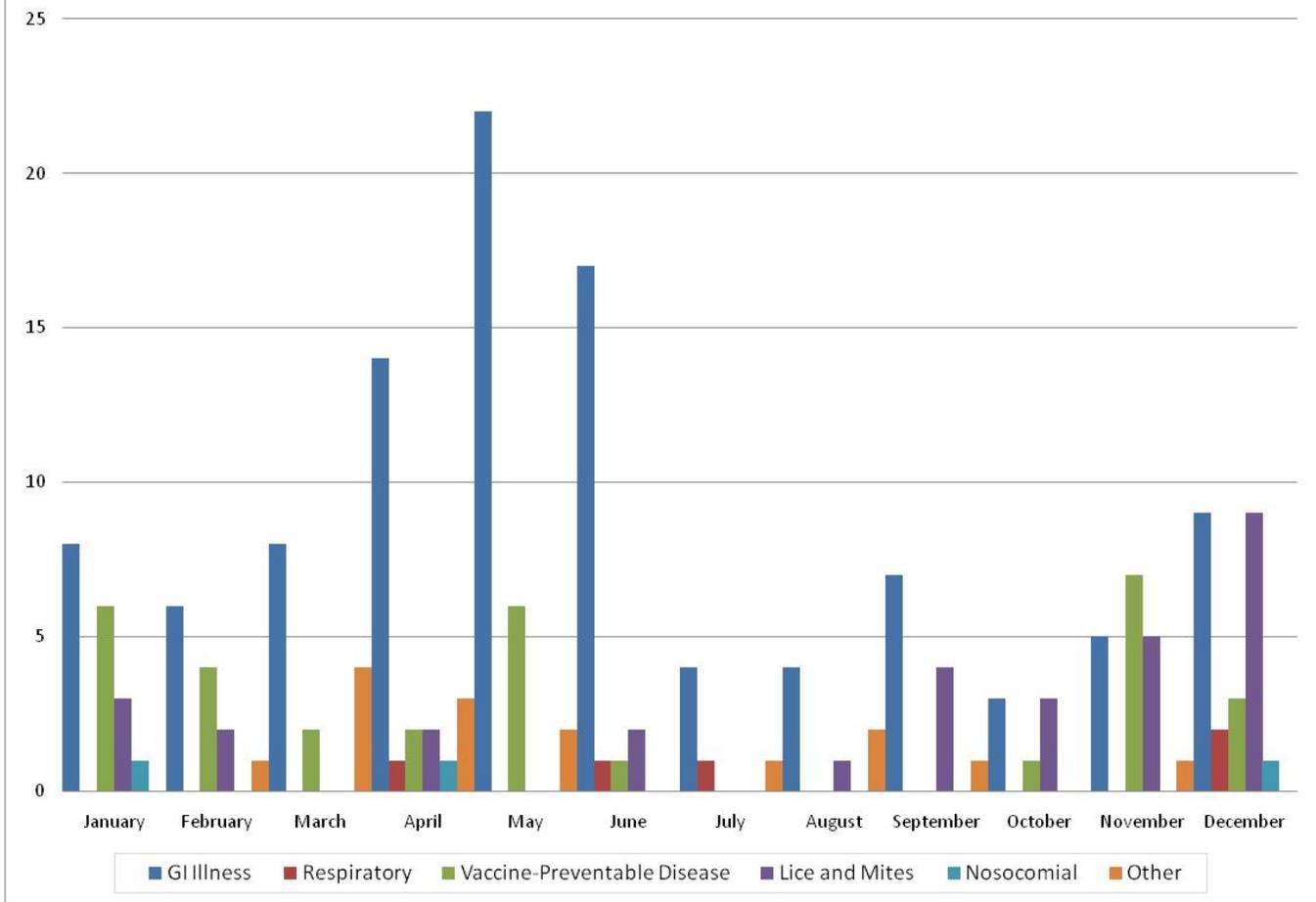
Outbreak locations were further characterized by infectious disease category. Gastrointestinal illness outbreaks were most frequently reported in a restaurant and hospital or assisted living facility with 40 (37%) and 36 (3%) reported outbreaks, respectively (Figure 8). For respiratory outbreaks, 4 (80%) were located hospital or assisted living facility. For vaccine preventable diseases, 25 (78%) of the outbreaks were reported from a school or childcare facility. For lice and mites, 9 (41%) were located in a hospital or assisted living facility.

Prisons and jails only reported lice and mite and vaccine-preventable disease outbreaks and restaurants only gastrointestinal outbreaks in 2010 (Figure 8). Hospitals or assisted living facilities reported gastrointestinal illness outbreaks most frequently. Schools and child care facilities most frequently reported respiratory illnesses, gastrointestinal illnesses and vaccine-preventable disease outbreaks.

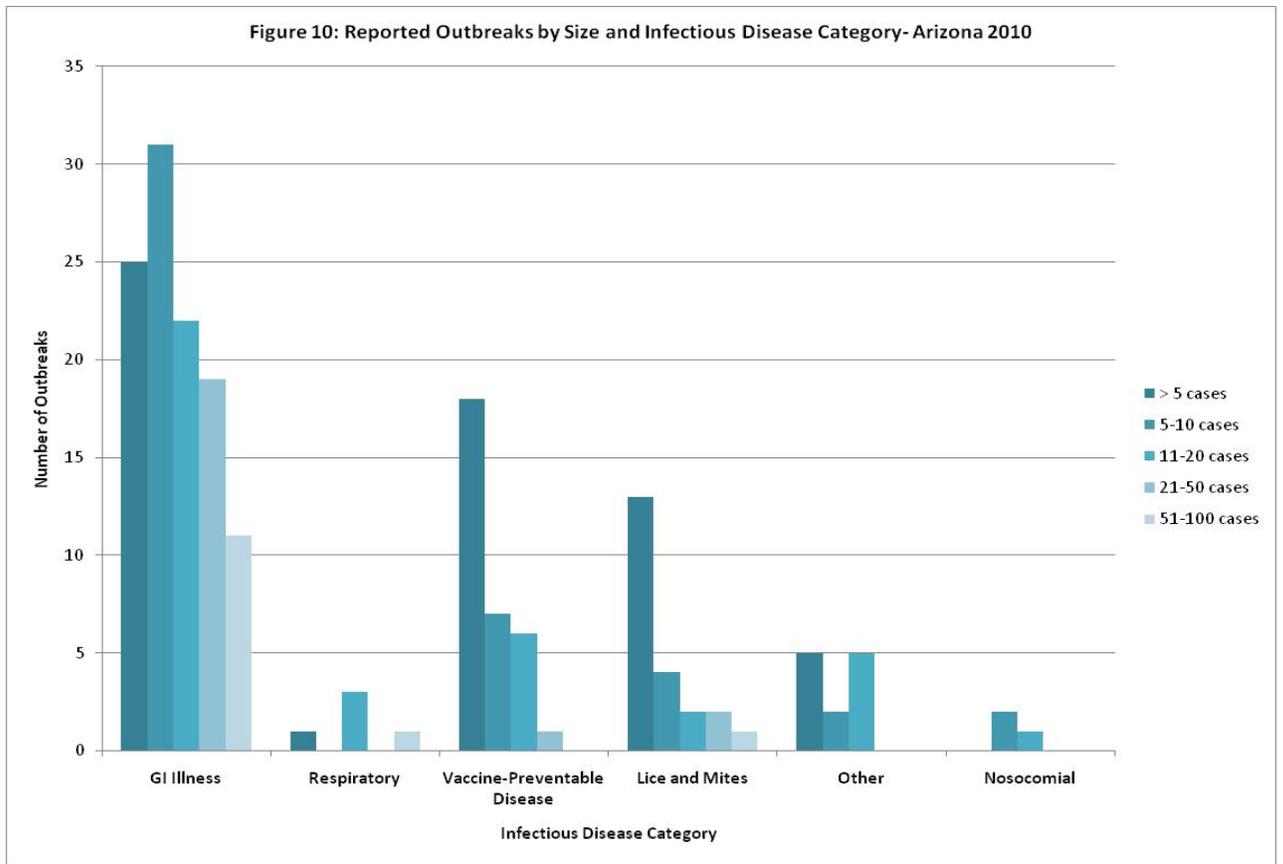


A description of infectious disease categories over time was conducted (Figure 9). As mentioned earlier, May had the most reported outbreaks with 30 (16%) of the total outbreaks. Gastrointestinal outbreaks were most frequent from March through June accounting for 67% of the total gastrointestinal outbreaks for the year. Lice and mite outbreak had the highest number of reports in November and December (14, 45%). Vaccine-preventable disease outbreaks tended to occur during the school year.

Figure 9: Reported Outbreaks by Month and Infectious Disease Category - Arizona 2010

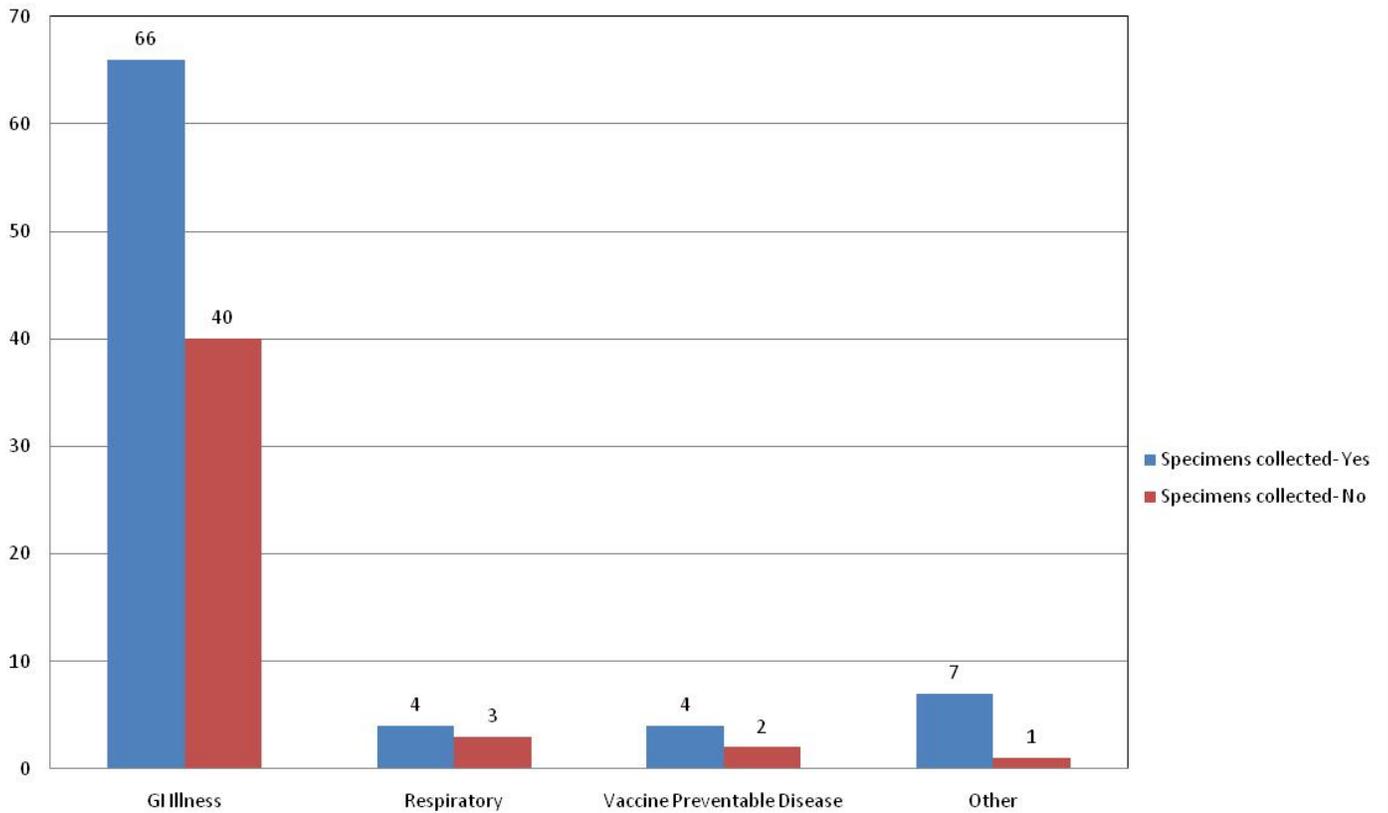


Vaccine-preventable disease lice and mites outbreaks were usually small with <5 people per outbreak report (Figure 10). Gastrointestinal illness outbreaks were usually medium in size with five to 50 people per outbreak report.



One of the measured outcomes for Outbreaks in Arizona is to determine if more than two specimens were collected for a particular outbreak. Specimens are not typically collected for outbreaks involving Varicella, Scabies (lice), Strep Throat infections, *Streptococcus* Group A infections, Conjunctivitis and Influenza like Illnesses. Excluding these outbreaks, the total numbers of outbreaks where a specimen can and should have been submitted are 126 outbreaks. Specimens were submitted for 81(64%) of these outbreaks. Specimens most frequently collected gastrointestinal illness outbreaks 62% (66 of 106) (Figure 11). In 77% (51 of 66) of the gastrointestinal outbreaks where specimens were collected, Norovirus was determined to be the agent. Two or more than two specimens were collected in 69% (56 of 81) of the outbreaks where specimens were collected. In the other 25 outbreaks, only one specimen was collected. 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 increase the opportunity for accurate laboratory detection of the agent of infection. The laboratory testing performed to identify the infectious agent is performed by the Arizona State Laboratory.

Figure 11: Reported Outbreaks by Infectious Disease Category and Specimen Collection - Arizona 2010⁵



⁵ The number of outbreaks where specimens should be collected n=126 (excludes varicella, lice/mites, strep throat infection, staphylococcus group A, conjunctivitis, and influenza like illness)

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. In 2010, 182 infectious disease outbreaks were reported to Arizona public health agencies. This number does not include national outbreaks in which Arizona had cases. The majority of the reported outbreaks occurred in Maricopa County (80%), in the month of May (17%), in a school/child care facility (32%), had symptoms consistent with gastrointestinal illness (59%), were spread person-to-person (72%) and involved fewer than 20 people (81%). The causative agent identified in the most outbreaks (28%) in 2010 was norovirus. For 2010, 82% of outbreaks were reported to ADHS within 24 hours, which was below the performance goal set of $\geq 95\%$. Only 39% 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.