

INFECTIOUS DISEASE OUTBREAK SUMMARY REPORT

2011



2011 Infectious Disease Outbreak Summary Report

Arizona Department of Health Services
Office of Infectious Disease Services
Infectious Disease Epidemiology and Investigations

OVERVIEW

Outbreak detection and response are key components of a state's epidemiologic 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.

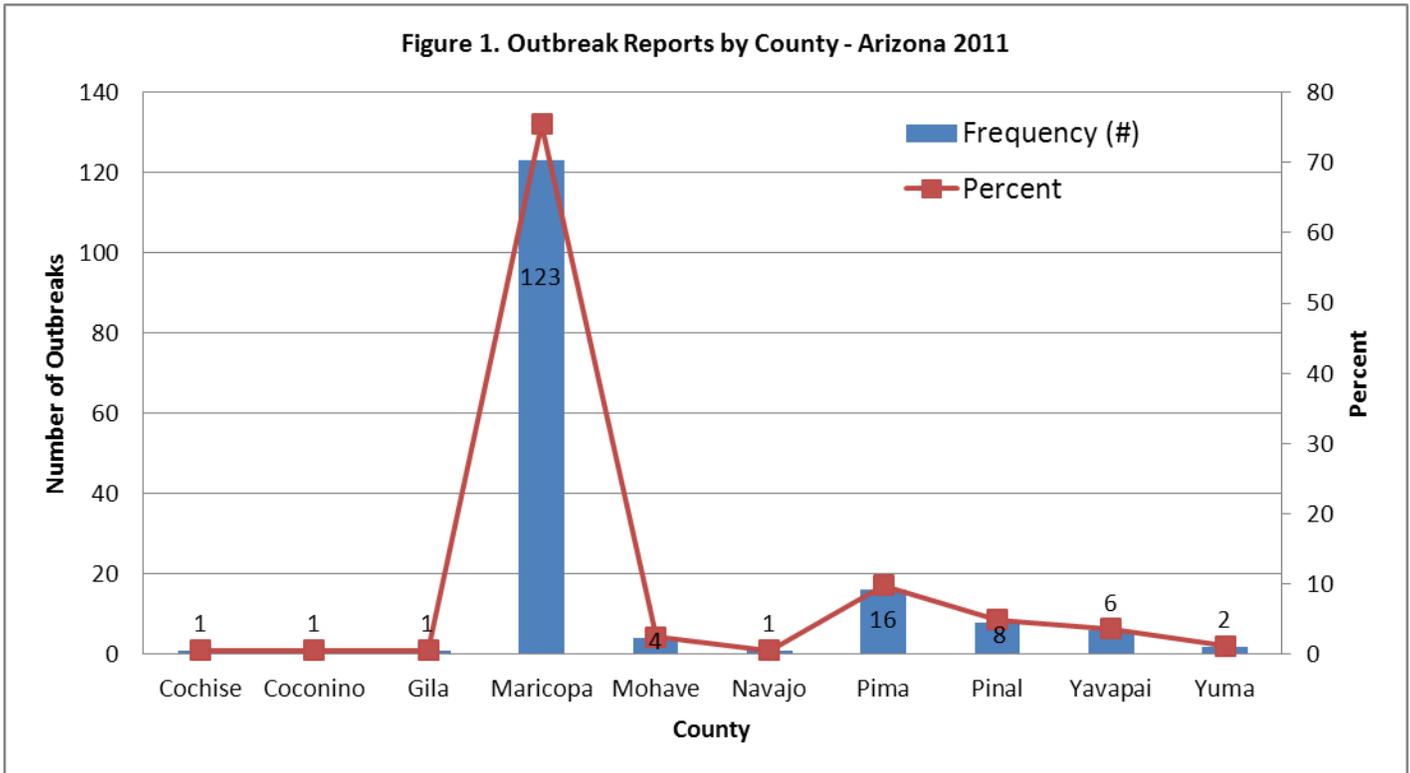
Specific performance goals for outbreak tracking and response were decided upon in Arizona and are as follows:

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 from the county health department within 30 days after completion of investigation

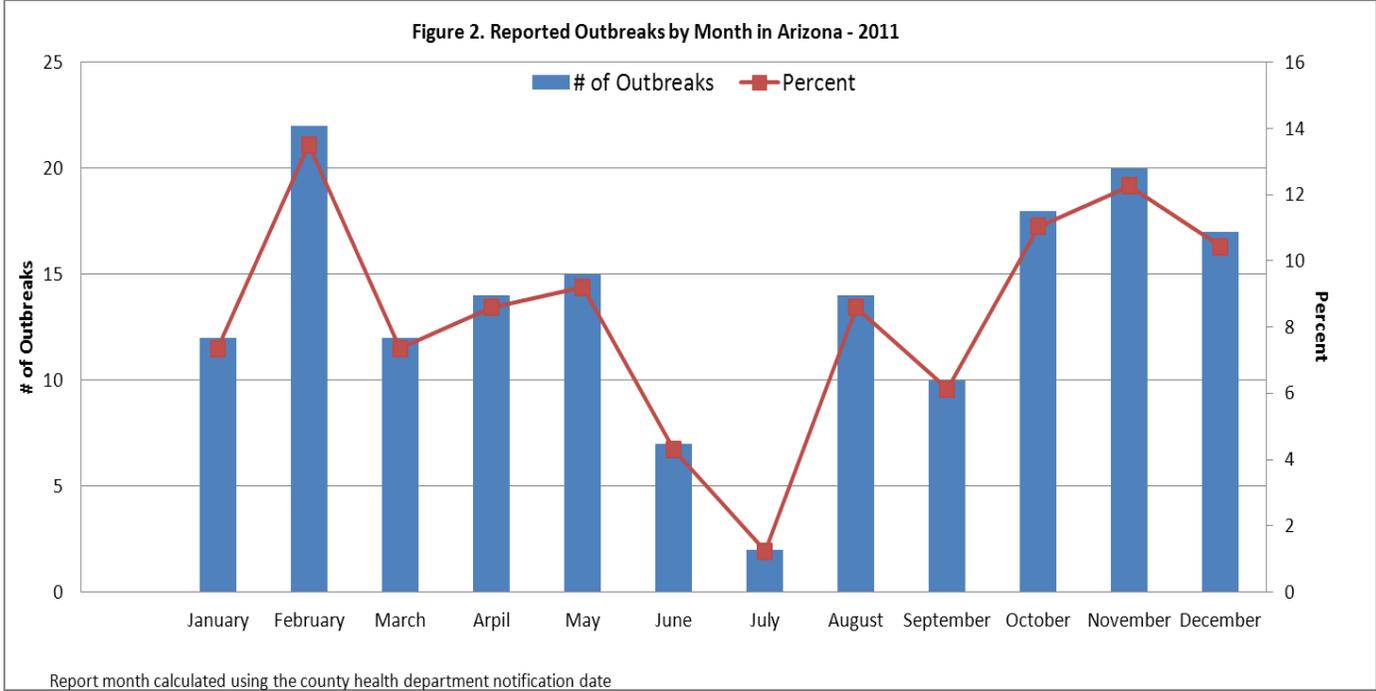
The outbreak descriptive epidemiology included in this report for 2011 is based on a state outbreak line list used to track and monitor outbreak reports and includes essential performance indicators included on the outbreak summary form.

RESULTS

In 2011, 162 communicable disease outbreaks and one environmental mercury outbreak were reported and investigated from ten county health departments in Arizona (Figure 1). Outbreaks were reported predominately in Maricopa County with 123 (75%). This is due to a larger population size.

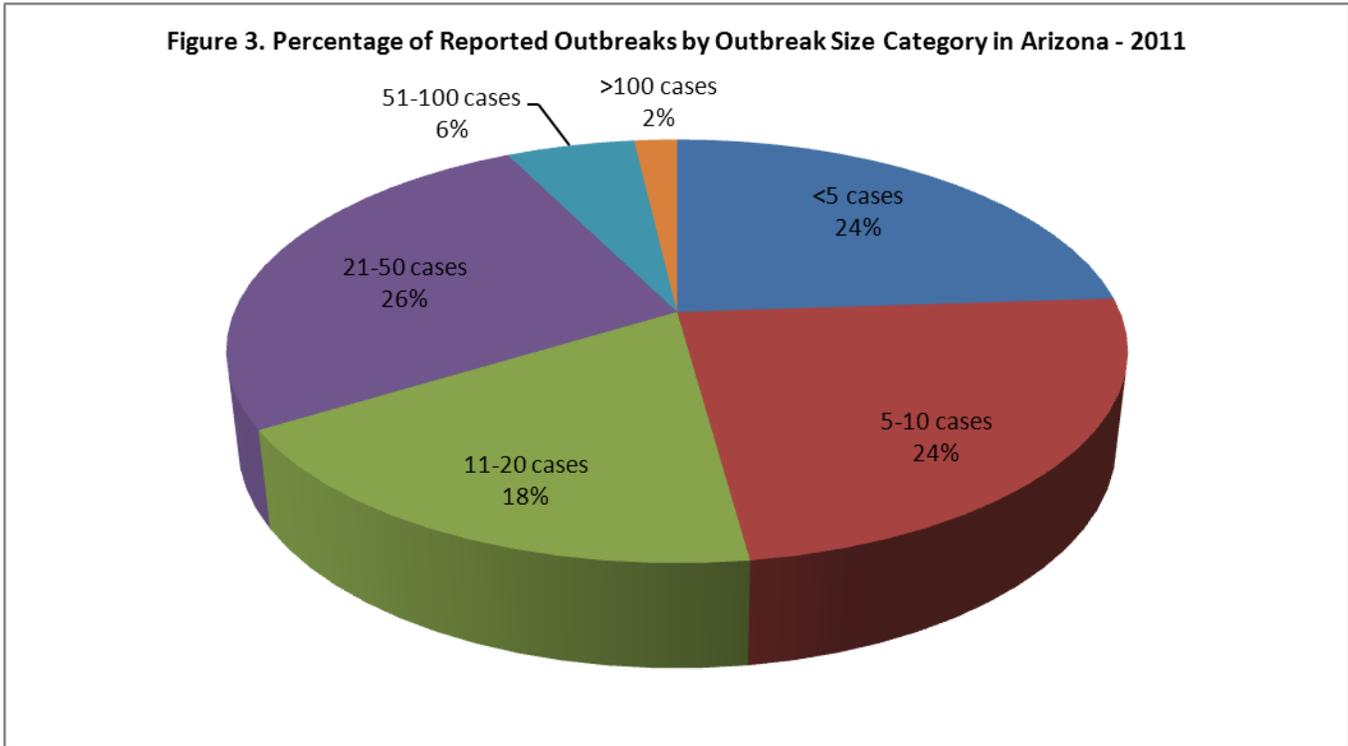


The most outbreaks investigated 22 (14%) were reported during the month of February (Figure 2). The median and mean number of outbreak reports received was 6 and 6.7 per month, respectively. Outbreaks were reported by the county health department to ADHS within 24 hours for 145 (89%) outbreaks. This 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. Investigations were begun within 24 hours of receipt of report for 157 outbreaks (96%) which is above the performance indicator goal of 90%. For 26% of the outbreaks, county health departments submitted to ADHS an outbreak report within 30 days of investigation closure. This is below the goal of 100% and is an area for improvement.

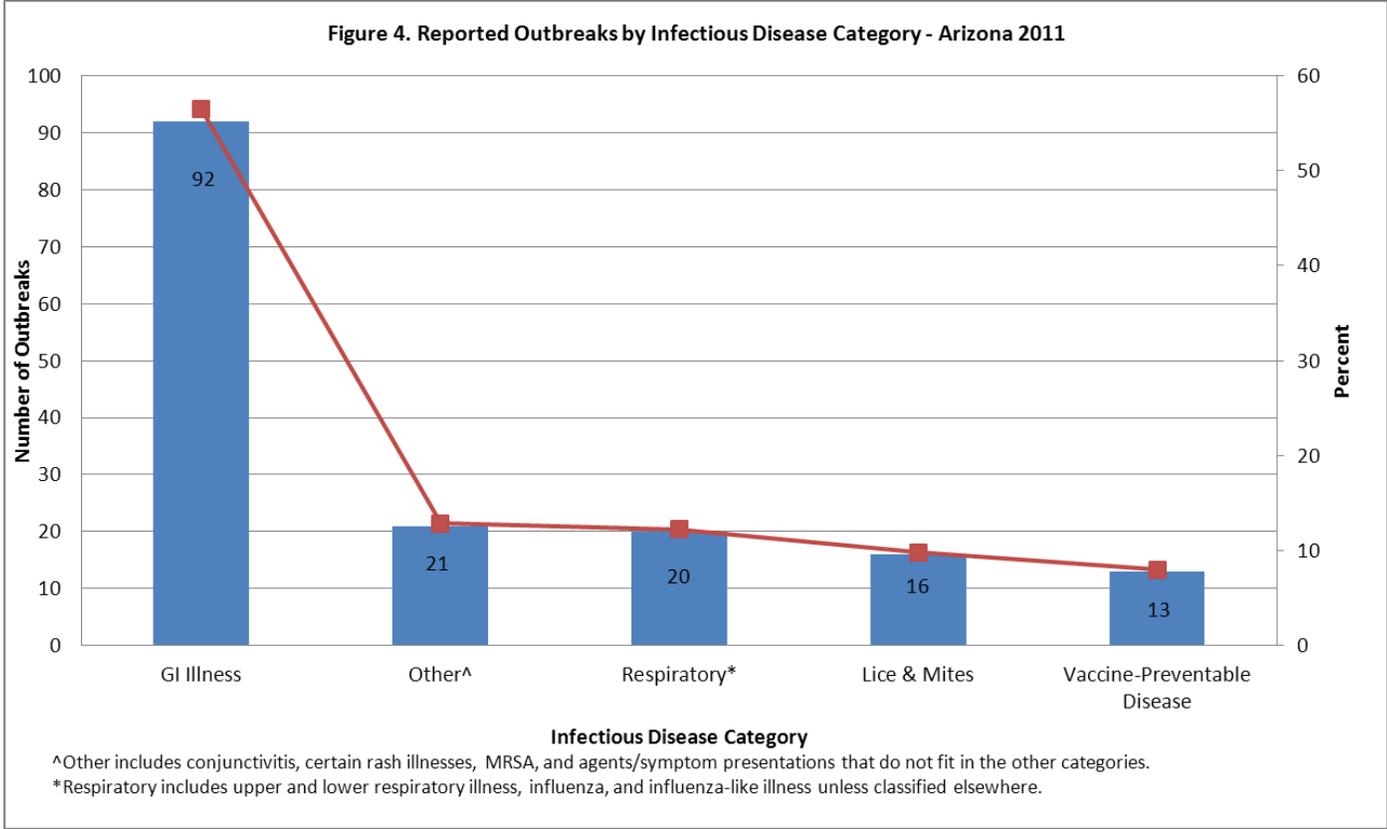


To characterize the reported outbreaks, analysis was conducted to describe the outbreak location category, mode of transmission, size, and infectious disease category.

In 2011, the majority of outbreaks contained less than 10 cases (48%) and 92% of outbreaks had less than 50 cases (Figure 3).



The most frequently reported type of outbreak was gastrointestinal illness representing 56% of the reports. Other frequently reported outbreaks include respiratory (12%) and other (13%) (Figure 4). The “other” category includes conjunctivitis, specified rash illnesses, MRSA and other agents and presentations not included in named categories.



The top six reported infectious agents causing outbreaks in Arizona for 2011 were norovirus (33%), scabies (9%), varicella (8%), ILI/influenza (8%), conjunctivitis (5%) and hand foot and mouth disease (5%) (Figure 5). Etiology for a total of 32% of outbreaks could not be determined. A more detailed description of infectious agents identified as causing outbreaks in 2011 is shown in Table 1.

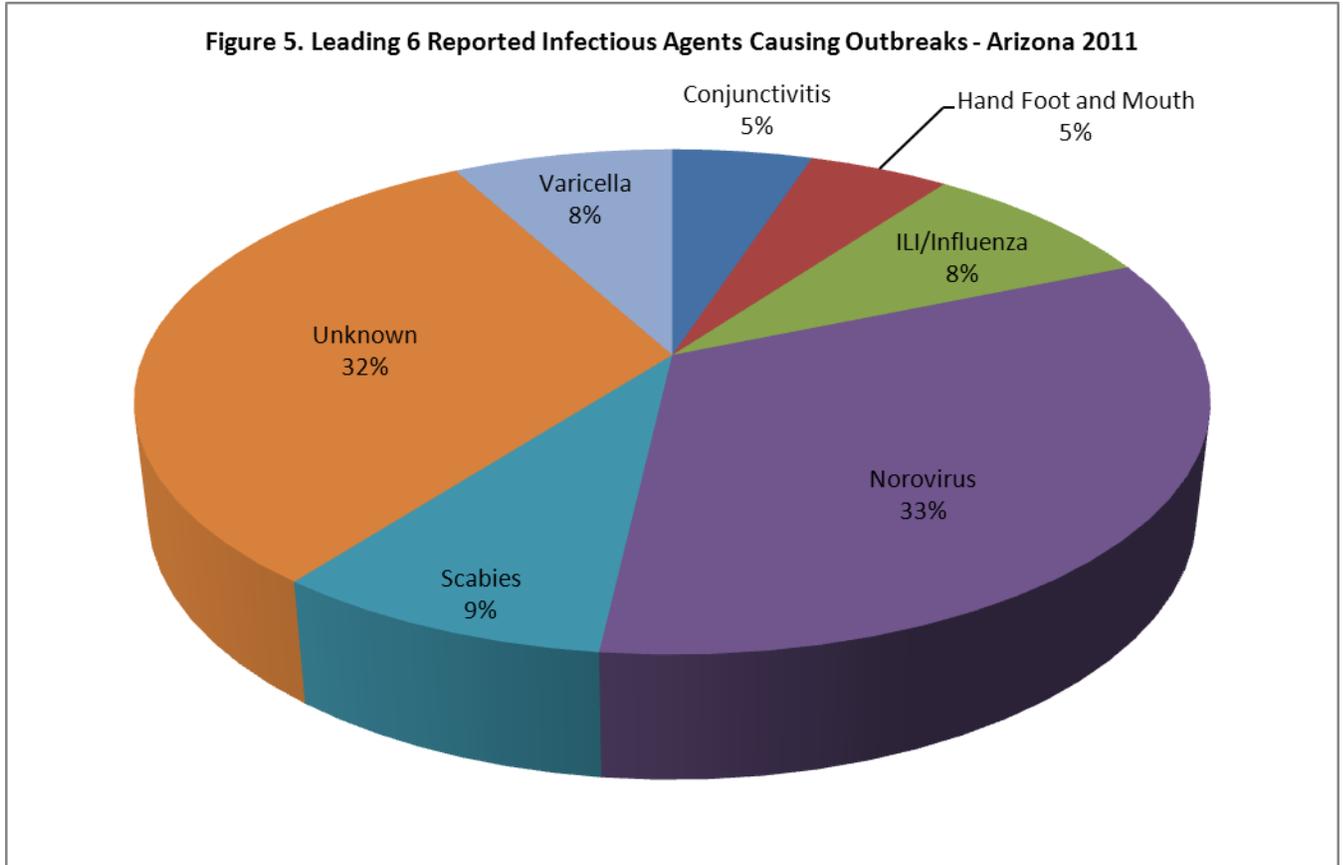
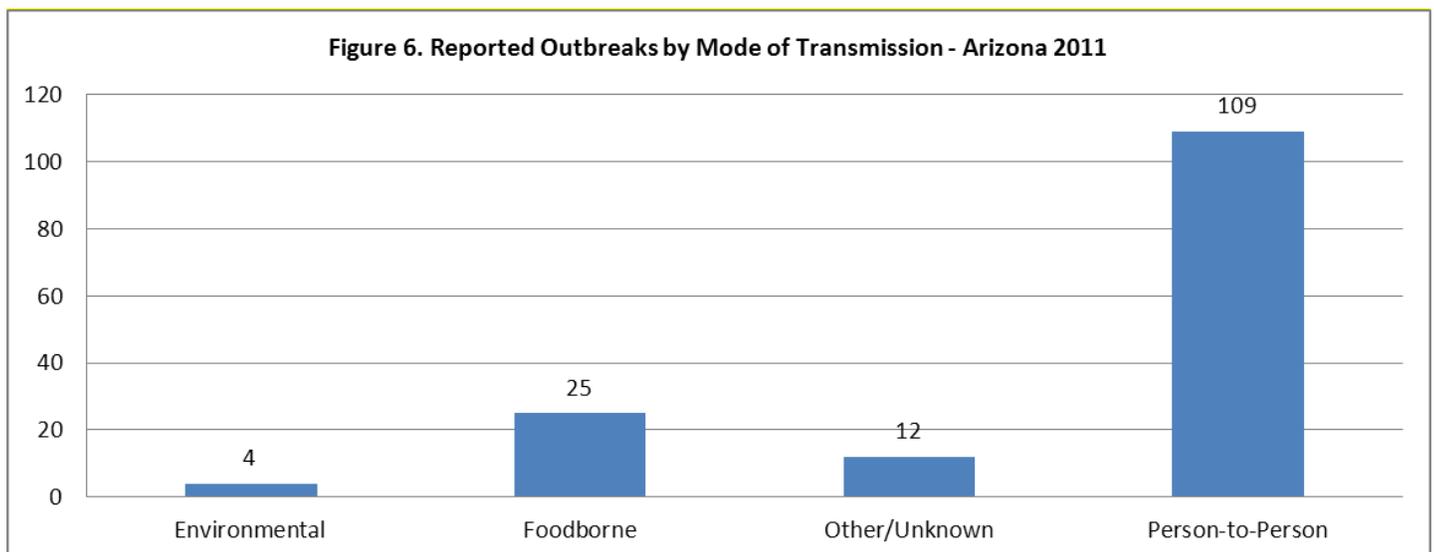


Table 1: Infectious Disease Agents Identified as causing an Outbreak in Arizona (N, %), 2011.

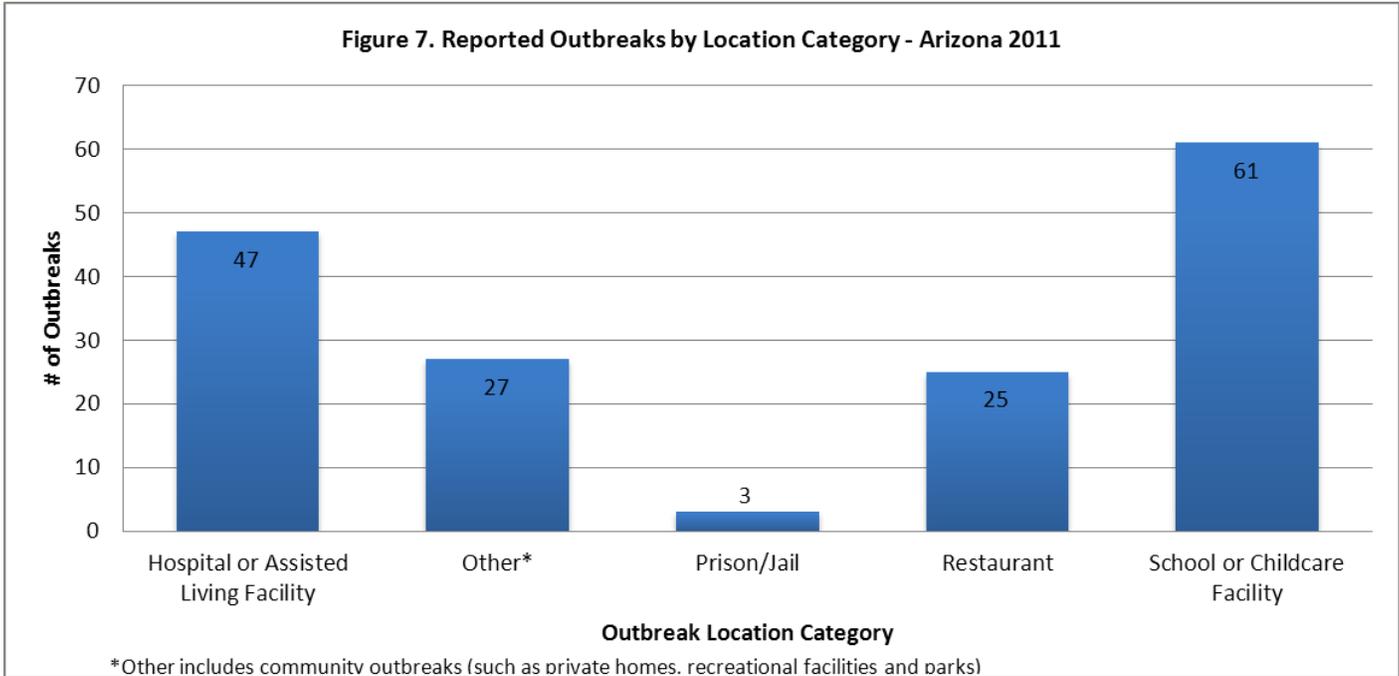
Agent	Frequency (N)	Percentage
Campylobacter	2	1.23%
Conjunctivitis	7	4.29%
Giardia	2	1.22%
Hand Foot and Mouth	7	4.29%
Influenza-like Illness (ILI)	6	3.68%
Influenza	6	3.68%
Lice	5	3.07%
Mercury	1	0.61%
Mycoplasma pneumonia	1	0.61%
Norovirus (GI and GII)	46	28.21%
Pertussis	2	1.23%
RSV	1	0.61%
Scabies	12	7.36%
Shigella	1	0.61%
Staph aureus	2	1.23%
Strep throat	6	3.68%
Toxin	1	0.61%
Varicella	11	6.75%
Unknown	44	26.99%
TOTAL	163	100%

The mode of transmission was determined for 138 (85%) of the reported outbreaks. Person-to-person transmission was the most common, representing about 73% of the total outbreaks reported (Figure 6). The majority of outbreaks exhibited person-to-person transmission (109, 73%). There were also 25 (17%) foodborne outbreaks reported. The mode of transmission could not be determined for 12 (8%) reported outbreaks in Arizona for 2011.

Figure 6. Reported Outbreaks by Mode of Transmission - Arizona 2011

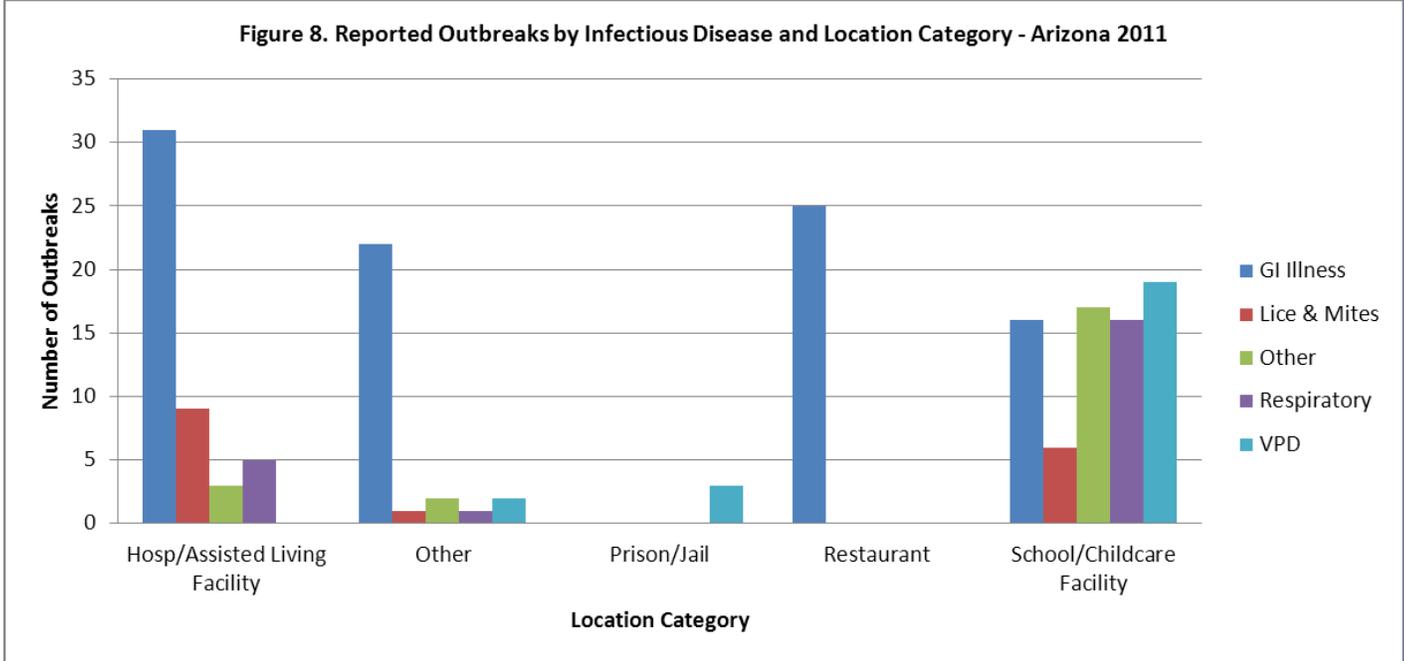


Reported outbreaks were classified into five categories based on location: hospital or assisted living facility, prison or jail, restaurant, school or child care facility, and other. The most common outbreak location was a school or child care facility with 37% of the reports (Figure 7). The next most common outbreak location included hospital or assisted living facility with 29% of outbreaks being reported from this type of facility. 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.

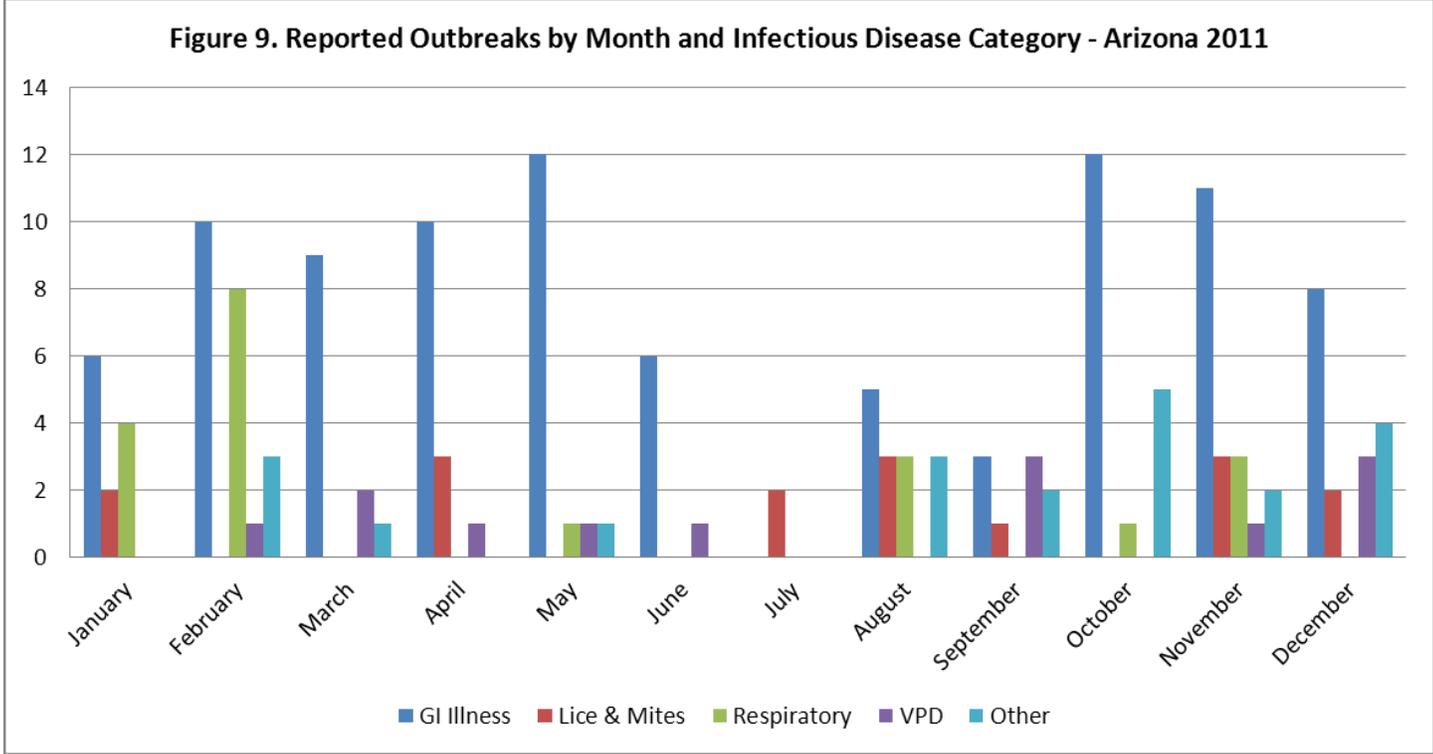


Outbreak locations were further characterized by infectious disease category. Gastrointestinal illness outbreaks were most frequently reported in hospital or assisted living facilities (31, 33%) or restaurants (25, 27%) (Figure 8). For respiratory outbreaks, 16 (73%) were reported by a school or childcare facility. For vaccine preventable diseases, 19 (79%) of the outbreaks were reported from a school or childcare facility. For lice and mites, 9 (56%) were reported in a hospital or assisted living facility and 6 (38%) were reported from schools or childcare facilities.

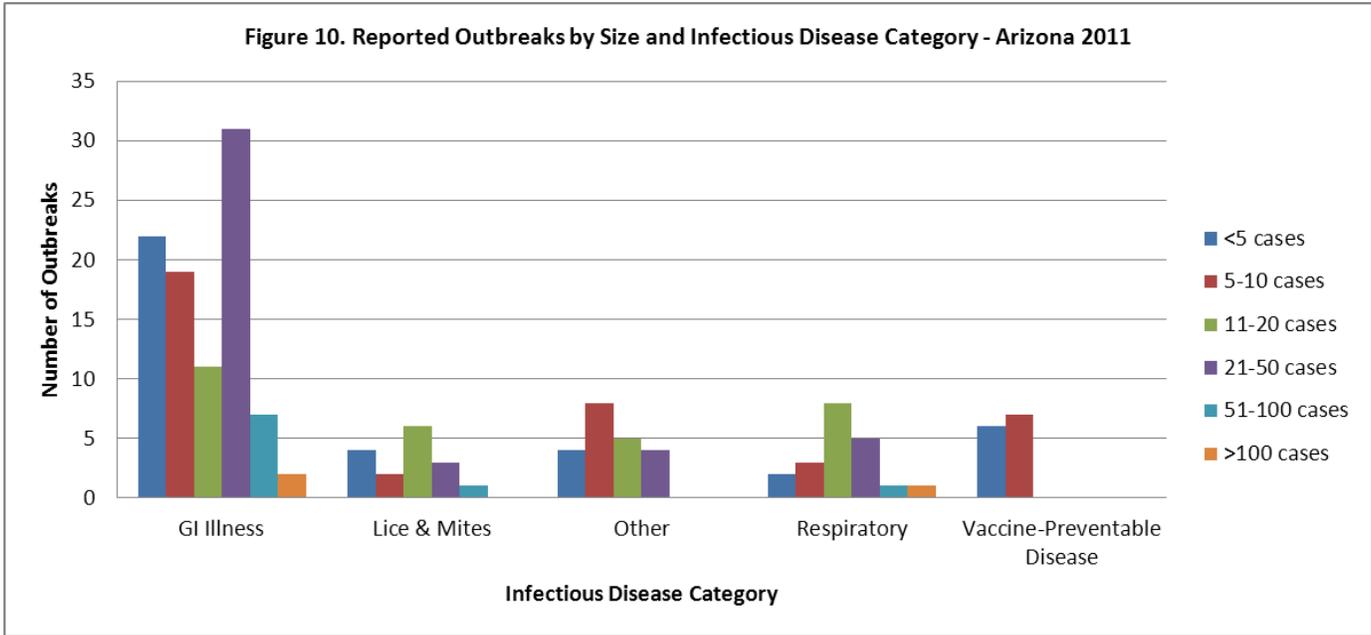
Prisons and jails only reported vaccine-preventable disease (varicella) outbreaks and restaurants only reported gastrointestinal outbreaks in 2011 (Figure 8). Hospitals or assisted living facilities reported gastrointestinal illness outbreaks most frequently. Schools and child care facilities most frequently reported a mix of infectious diseases.



A description of infectious disease categories over time was conducted (Figure 9). As mentioned earlier, February had the most reported outbreaks with 22 (13%) of the total outbreaks. Gastrointestinal outbreaks were most frequent from January through May and October through December, accounting for 85% of the total gastrointestinal outbreaks for the year. Respiratory outbreaks occurred most often in January and February (12, 60%). Vaccine-preventable disease outbreaks tended to occur more frequently during the school year.

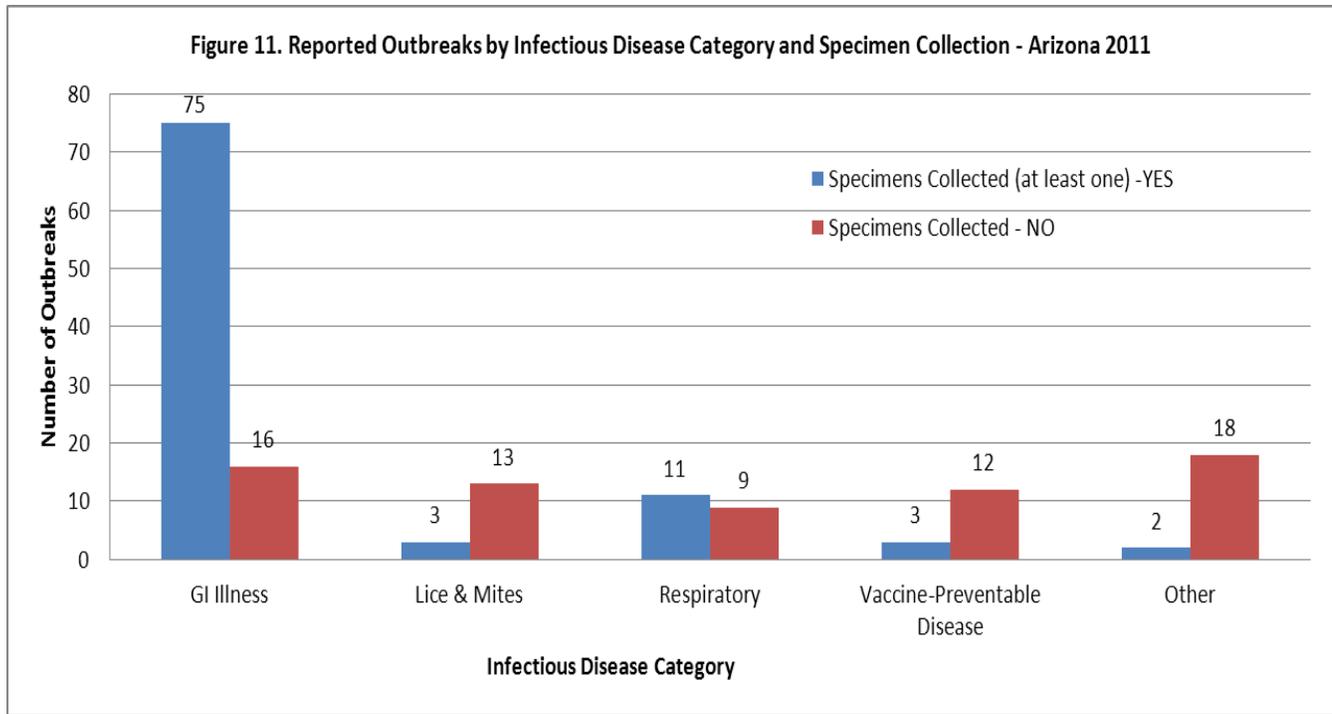


Vaccine-preventable disease, lice and mites and respiratory outbreaks were usually small with <5 people per outbreak report (Figure 10). Gastrointestinal illness outbreaks were usually medium in size with five to 50 people per outbreak report.



One of the measured outcomes for outbreaks in Arizona is to determine if two or more specimens were collected for a particular outbreak. Specimens are not typically collected for outbreaks of lice and mites, strep throat, Group A Steptococcus infections, influenza or ILI, conjunctivitis or hand, foot and mouth disease. Excluding these outbreaks, the total number of outbreaks where a specimen should have been collected was 118. Specimens were submitted for 92 (79%) of these outbreaks. Specimens were most frequently collected for gastrointestinal illness outbreaks (82%; 75 of 91) (Figure 11). In 61% (45 of 75) of the gastrointestinal outbreaks where specimens were collected, norovirus was determined to be the agent. Two or more specimens were collected in 70% (64 of 92) of the outbreaks where specimens were collected. In the other 28 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 Arizona State Public Health Laboratory performs the testing to identify the infectious agent.



MULTI-STATE OUTBREAK CLUSTERS:

In 2011 there were a total of 24 multi-state outbreak clusters identified where Arizona had a least one case associated with the outbreak. These numbers are not included in the above analyses. Three of the clusters were identified as *Escherichia coli* (2 *E. coli* O157:H7 and 1 *E. coli* O103) while the remaining 21 clusters were identified as *Salmonella*. Outbreaks were associated with:

- Ground beef
- Pocket pets
- Laboratory exposure
- Aquatic frogs
- Pet treats
- Ground turkey

- Baby chicks
- Papaya
- Kosher broiled chicken
- Romaine lettuce

CONCLUSION

During outbreak investigations, local and state health departments work with the reporting facility to identify the causative agent and make recommendations for control and prevention of future cases. In 2011, 162 infectious disease outbreaks were reported to Arizona public health agencies. There was also one environmental mercury exposure investigation during this year that was determined to be associated with face cream. This number does not include national outbreaks in which Arizona had cases. Including national outbreaks with Arizona cases, a total of 187 outbreaks were investigated within the state of Arizona in 2011.

The majority of the reported outbreaks occurred in Maricopa County (75%), in the month of February (14%), in a school/child care facility (37%), had symptoms consistent with gastrointestinal illness (56%), were spread person-to-person (73%) and involved fewer than 20 people (66%). The causative agent identified in the most outbreaks (28%) in 2011 was norovirus. For 2011, 89% of outbreaks were reported to ADHS within 24 hours, which was below the performance goal set of $\geq 95\%$. Only 26% 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 the goal was not met; likely explanations include limited resources and accuracy of documenting when the investigation was closed. However, 96% of all outbreaks were investigated within 24 hours of receipt of report at the local health department, surpassing the 90% goal. Further efforts will need to be taken to improve outbreak tracking and management to help accomplish the outbreak goals for the state.