



Infectious Disease Outbreak Summary Report
Arizona Department of Health Services
Office of Infectious Disease Services
Infectious Disease Epidemiology and Investigations
2008

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:

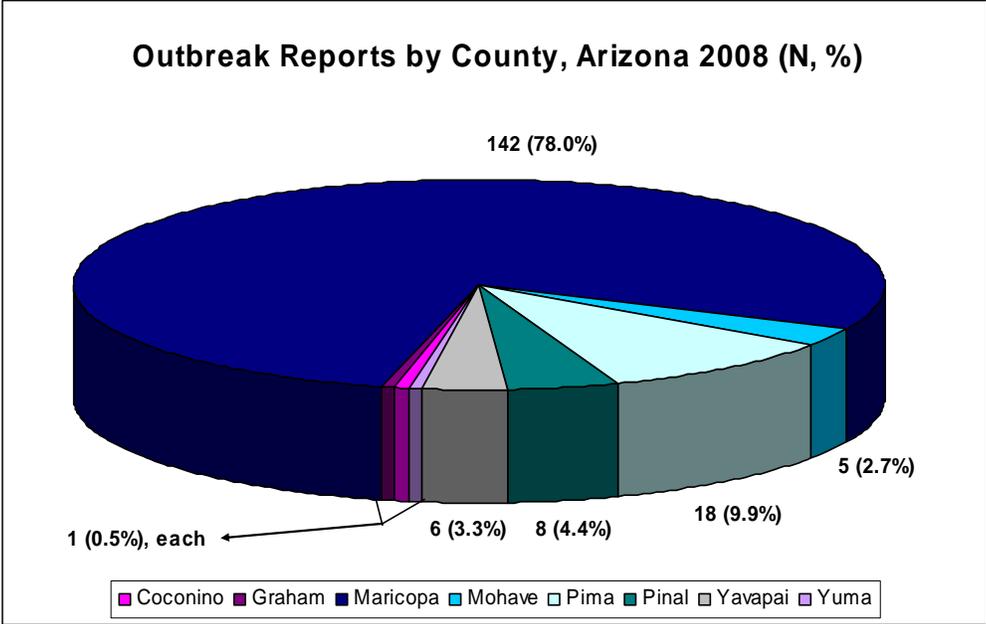
1. $\geq 90\%$ of reported outbreaks will have an investigation initiated within 24 hours of receipt of report.
2. $\geq 95\%$ of outbreaks will be reported to ADHS by the local health department within 24 hours of receipt of report.
3. Reports of 100% of investigations will be forwarded to ADHS within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

Since the new state outbreak summary form was implemented in the middle of the calendar year, the outbreak descriptive epidemiology included in this report for 2008 is based on state outbreak line list used to track and monitor outbreak reports and only includes a few of the essential performance indicators included on the outbreak summary form.

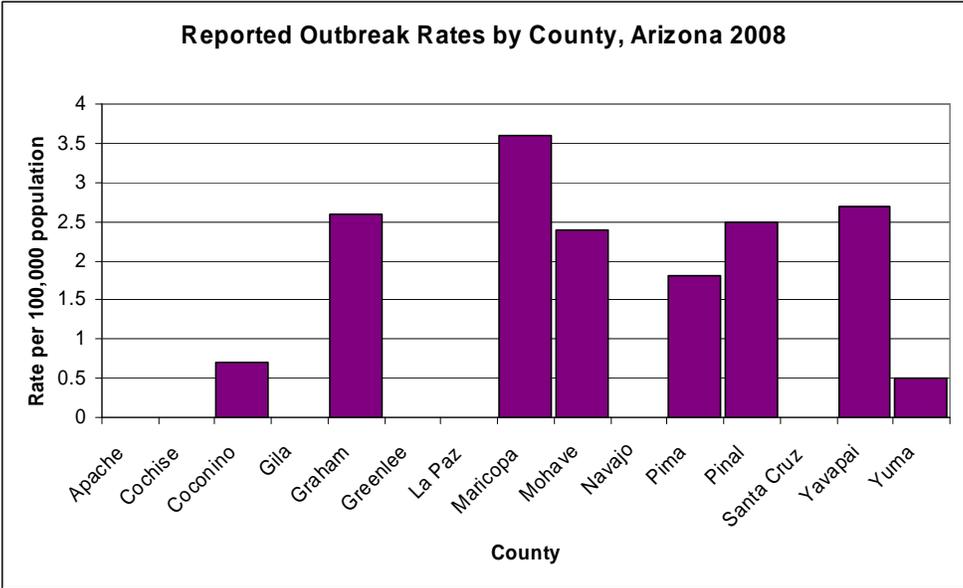
RESULTS

In 2008, 182 communicable disease outbreaks were reported and investigated from eight county health departments in Arizona (Graph 1). Outbreaks were reported predominately in Maricopa and Pima Counties with 142 and 18 outbreaks, respectively. This is due to a larger population size.

Maricopa County also had the highest rate of outbreaks reported at 3.6 per 100,000 population potentially due to increased awareness to outbreak reporting requirements. Other counties with an outbreak rate between 2.0 and 3.0 per 100,000 population include Graham, Mohave, Pinal and Yavapai Counties. Reported outbreaks in Pima County were high but the rate was lower at 1.8 per 100,000 population (Graph 2).



Graph 1: Outbreak Reports by County, Arizona 2008

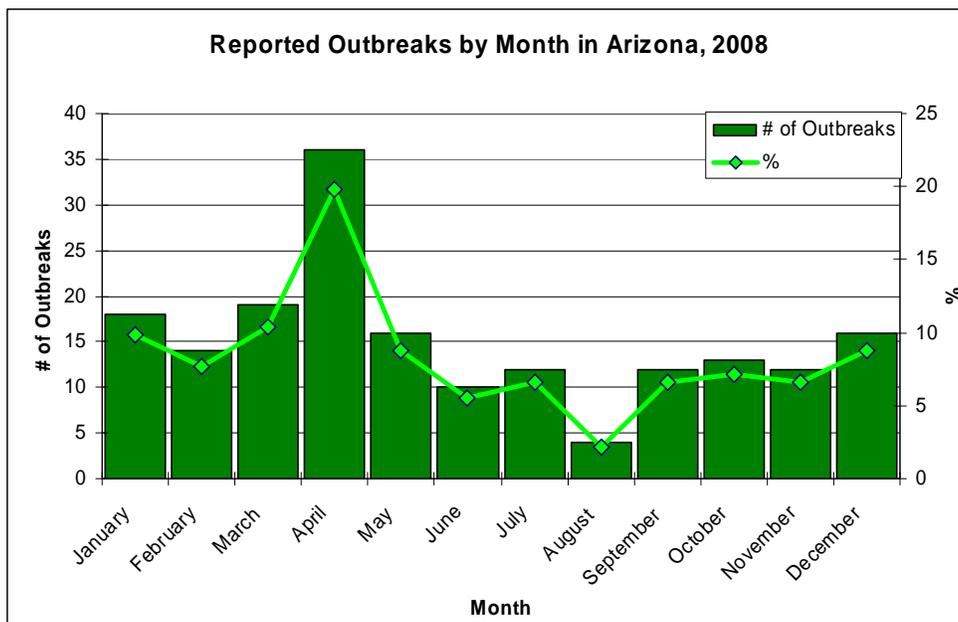


Graph 2: Reported Outbreak Rates by County, Arizona 2008¹

¹Rates for counties with small populations may be unreliable and should be viewed with caution.

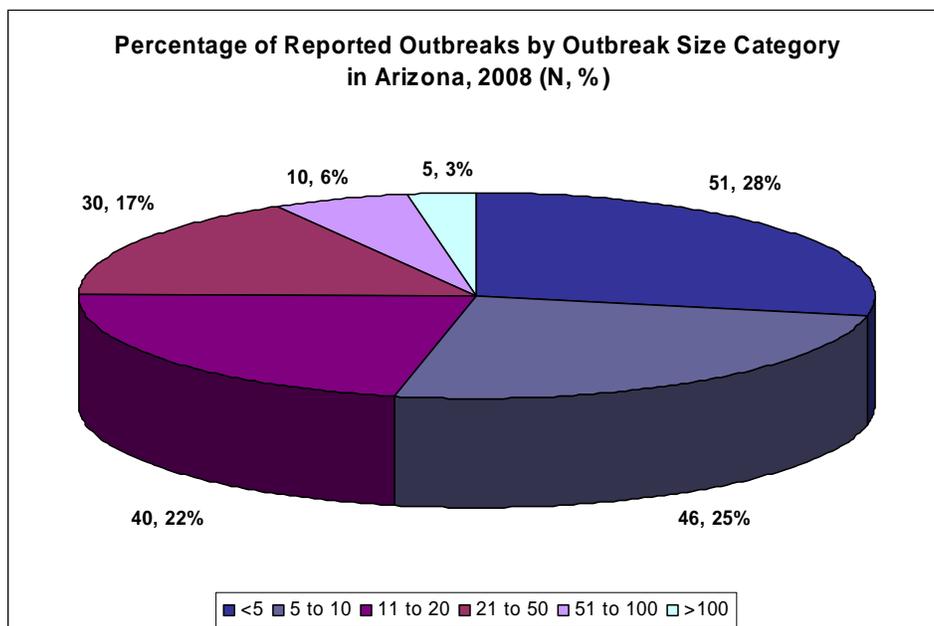
The most outbreaks investigated were reported in April with 36 (20%) (Graph 3). The median and mean number of outbreak reports received was 13.5 and 15.2 per month, respectively. Outbreaks were reported by the county health department to ADHS within 24 hours for 137 (75%) outbreaks. This did not meet our state performance goal of $\geq 95\%$ of outbreaks reported to ADHS within 24

hours. It should be noted that 5 (3%) outbreaks were reported to the county health department by ADHS. For 16% of the outbreaks, county health departments submitted to ADHS an outbreak report within 30 days of investigation closure.



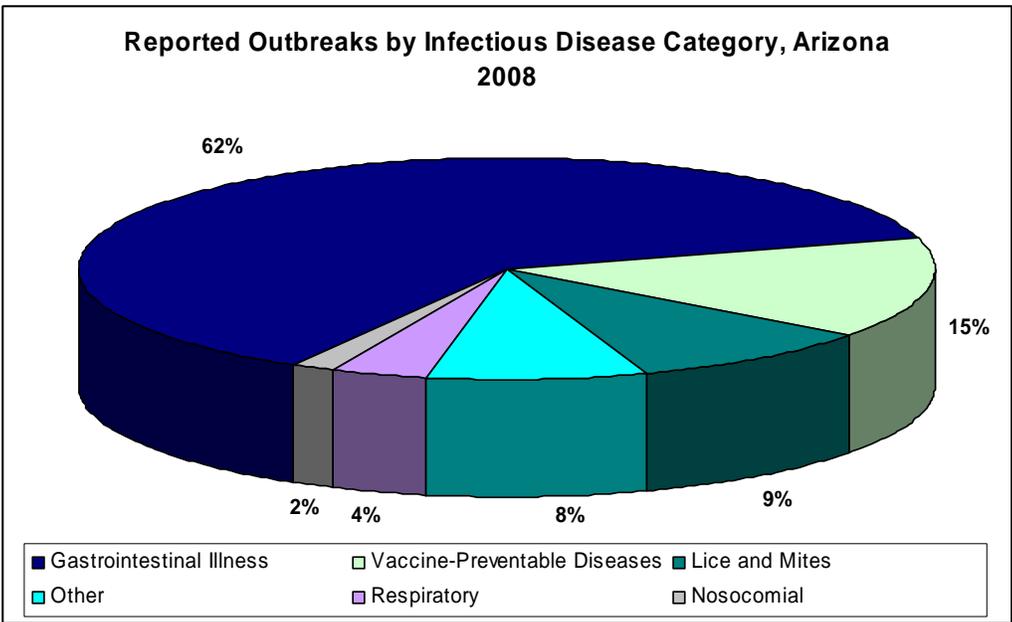
Graph 3: Reported Outbreaks by Month, Arizona 2008²
²Report month calculated using the county health department notification date

To characterize the reported outbreaks, analysis was conducted to describe the outbreak location category, mode of transmission, size, and infectious disease category. The most frequent outbreaks contained <5 people, representing 28% of the total reported outbreaks. Notably, there were five outbreaks reported in 2008 with more than 100 people involved (Graph 4). Approximately 85% of the reported outbreaks contained 20 people or less.



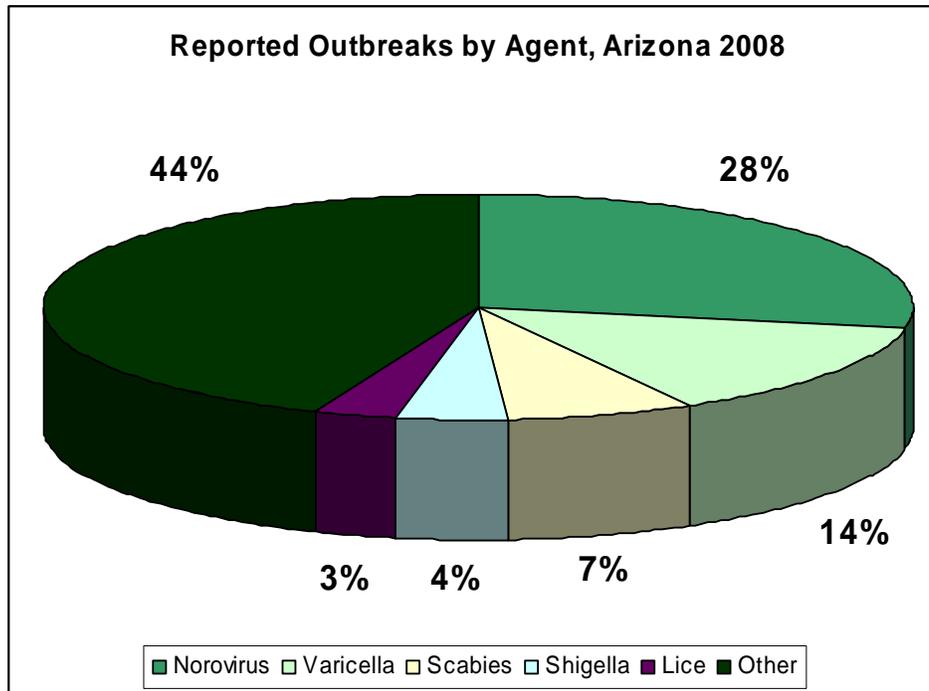
Graph 4: Percentage of Reported Outbreaks by Outbreak Size Category in Arizona, 2008

The most frequently reported type of outbreak was gastrointestinal illness representing 62% of the reports. Other frequently reported outbreaks include vaccine-preventable diseases (15%) and lice and mites (9%) (Graph 5).



Graph 5: Reported Outbreaks by Infectious Disease Category, Arizona 2008^{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 2008 were norovirus (28%), varicella (14%), scabies (7%), shigella (4%) and lice (3%) (Graph 6). Other infectious agents represented 44% of the total outbreak reports. A more detailed description of infectious agents identified as causing outbreaks in 2008 is shown in Table 1.

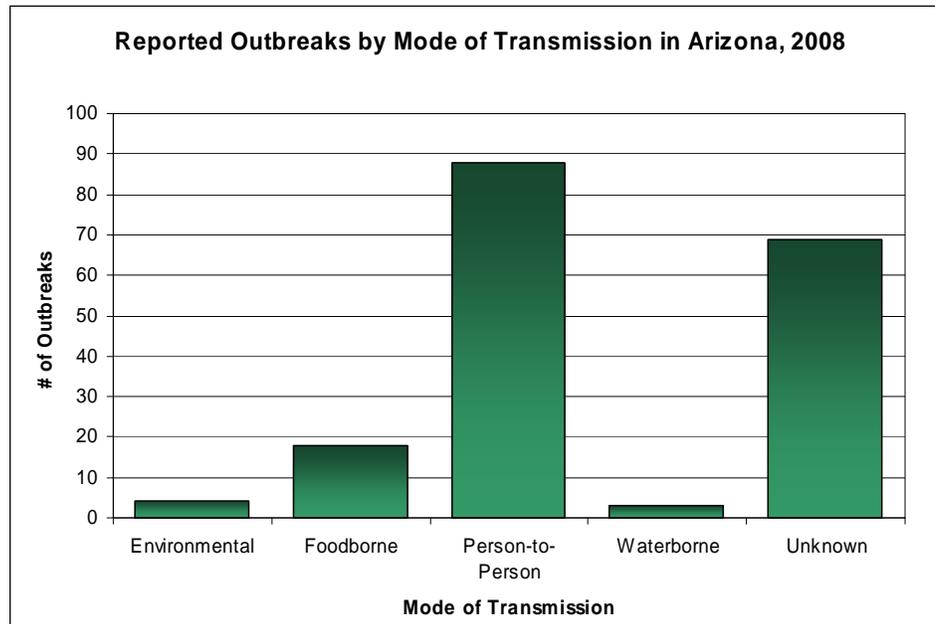


Graph 6: Reported Outbreaks by Agent, Arizona 2008.

AGENT	FREQUENCY (N)	PERCENT (%)
<i>Acinetobacter baumannii</i>	1	0.5%
<i>Burkholderia cepacia</i>	1	0.5%
Campylobacter	1	0.5%
Conjunctivitis	3	1.6%
Contact Dermatitis	1	0.5%
Cryptosporidium	5	2.7%
Enterovirus	1	0.5%
Fifth Disease	1	0.5%
Influenza	3	1.6%
Influenza-like Illness	2	1.1%
<i>Legionella</i>	3	1.6%
Lice	6	3.3%
<i>Methicillin-resistant Staphylococcus aureus</i>	2	1.1%
Measles	2	1.1%
<i>Neisseria meningitis</i>	1	0.5%
Norovirus	51	28.0%
RSV	2	1.1%
Rotavirus	1	0.5%
Salmonella	3	1.6%
Scabies	12	6.6%
Shigella	8	4.4%
<i>Staphylococcus aureus / B.cereus</i>	1	0.5%
Strep Throat	3	1.6%
Varicella	25	13.7%
Unknown	43	23.6%
TOTAL	182	100%

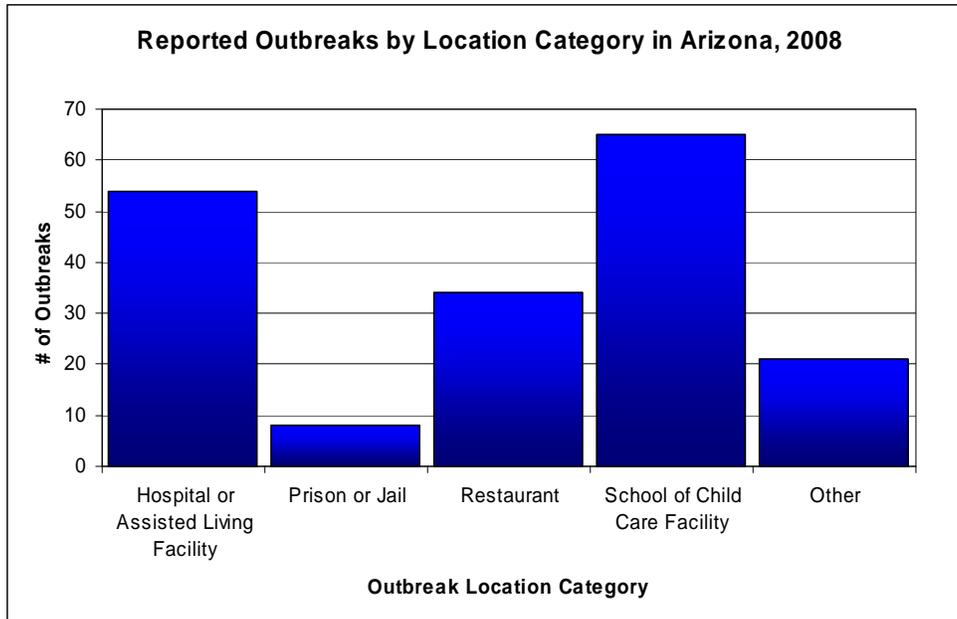
Table 1: Infectious Disease Agents Identified as causing an Outbreak in Arizona (N, %), 2008.

The mode of transmission was determined for 113 (62%) of the reported outbreaks. Person-to-person transmission was the most common representing about 48% of the total outbreaks reported (Graph 7). There were 18 (10%) foodborne outbreaks in 2008 and both environmental and waterborne each represented about 2% of the total reported outbreaks. The mode of transmission could not be determined for 69 (38%) reported outbreaks in Arizona for 2008.



Graph 7: Reported Outbreaks by Mode of Transmission in Arizona, 2008

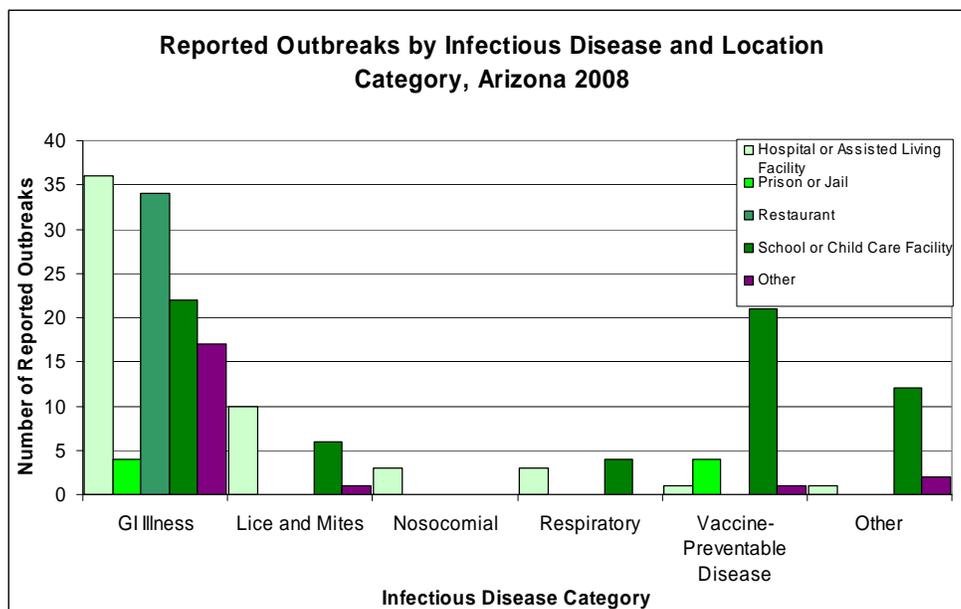
Reported outbreaks were classified into five categories based on location: hospital or assisted living facility, prison or jail, restaurant, school or child care facility, and other. The most common outbreak location was a school or child care facility with 65% of the reports (Graph 8). The next most common outbreak locations included hospital or assisted living facility and restaurant, respectively. Less than 10 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 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.



Graph 8: Reported Outbreaks by Location Category in Arizona, 2008

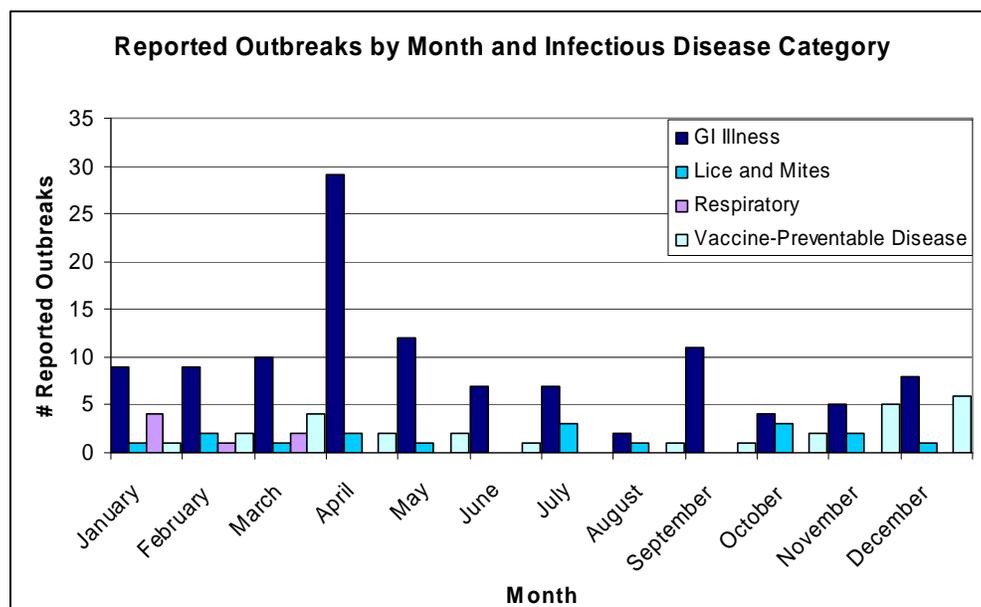
Outbreak locations were further characterized by infectious disease category. Gastrointestinal illness outbreaks were most frequently reported in a hospital or assisted living facility and restaurant with 36 (32%) and 34 (30%) reported outbreaks, respectively (Graph 9). For lice and mites, 94% (16 of 17) were located in a hospital or assisted living facility (10, 59%) or school or child care facility (7, 41%). For respiratory outbreaks, 3 (42.9%) were located in a hospital or assisted living facility compared to 4 (57%) located in a school or child care facility.

Prisons and jails only reported gastrointestinal illness and vaccine-preventable disease outbreaks and restaurants only gastrointestinal outbreaks in 2008 (Graph 9). Hospitals or assisted living facilities reported gastrointestinal illness outbreaks most frequently (36, 67%). Schools and child care facilities most frequently reported gastrointestinal illness and vaccine-preventable disease outbreaks, 22 (34%) and 21 (32%), respectively.



Graph 9: Reported Outbreaks by Infectious Disease Category and Location Category, Arizona 2008

A description of infectious disease categories over time was conducted (Graph 10). As mentioned earlier, the month of April had the most reported outbreaks with 30 (20%) of the total outbreaks. This month also had over a quarter of the total gastrointestinal illness outbreaks for 2008. As expected, respiratory disease outbreaks were reported solely in the winter months with the most occurring in the month of January (57%). Both lice and mite and vaccine-preventable disease outbreak reports remained constant over the year with a slight increase in vaccine-preventable disease outbreaks at the end of the year.

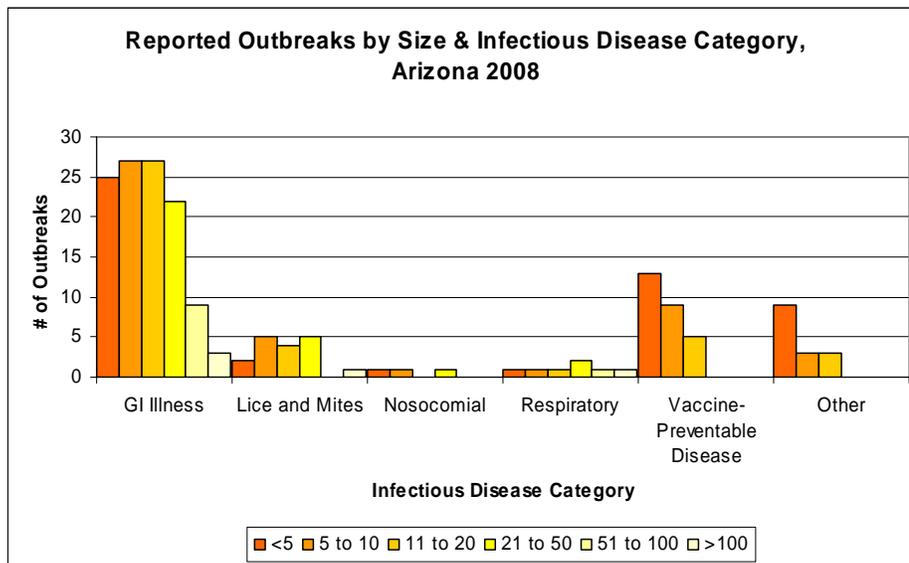


Graph 10: Reported Outbreaks by Month and Infectious Disease Category, Arizona 2008⁵

⁵ Excludes nosocomial and other outbreak infectious disease categories due to small number of outbreak reports.

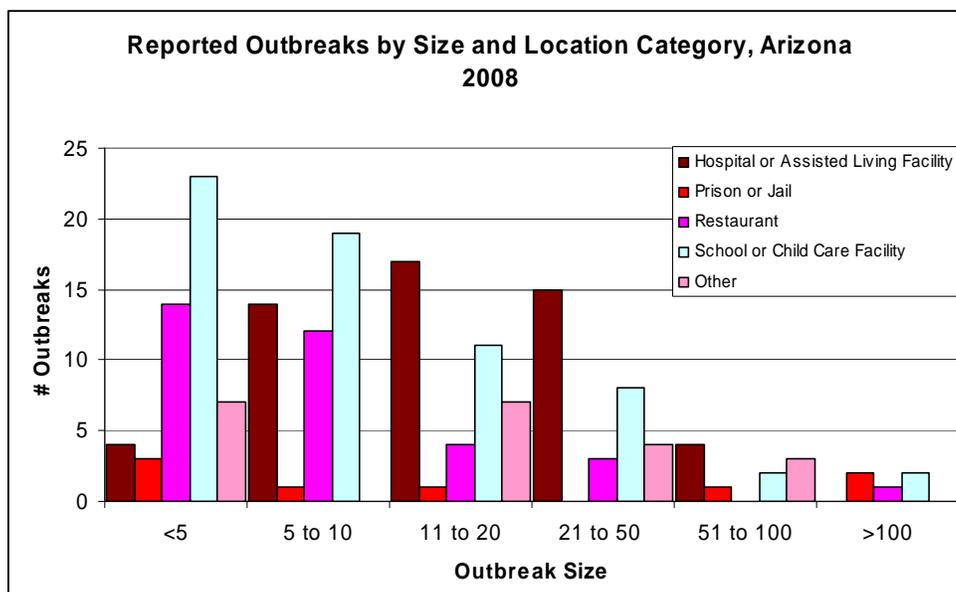
Vaccine-preventable disease outbreaks and other reported outbreaks were usually small with <5 people per outbreak report (Graph 11). Both nosocomial and respiratory outbreaks had

approximately an equal number of outbreak reports across all outbreak size categories. Gastrointestinal illness outbreaks were usually medium in size with five to 20 people per outbreak report but also had the greatest number of outbreak reports with 51 to over 100 people per report. Lice and mite outbreak reports were small to medium in size with the most frequently outbreak size category reported of 5 to 10 and 21 to 50.



Graph 11: Reported Outbreaks by Size and Infectious Disease Category, Arizona 2008

In schools or child care facilities, as the outbreak size increased the number of outbreak reports decreased (Graph 12). Outbreak reports from restaurants also followed this trend. Hospital or assisted living facility outbreaks were more often medium in size with the most outbreak reports containing 11 to 20 people (32%). Prisons and Jails had the most outbreaks in the smallest and largest outbreak size category.



Graph 12: Reported Outbreaks by Size and Location Category, Arizona 2008

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, 182 infectious disease outbreaks were reported to Arizona public health agencies in 2008. This number does not include national outbreaks in which Arizona may have cases. The majority of the reported outbreaks occurred in Maricopa County (78%), in the month of April (20%), in a school/child care facility or hospital/assisted living facility (65%), had symptoms consistent with gastrointestinal illness (62%), were spread person-to-person (62%) and involved fewer than 20 people (85%). The causative agent identified in the most outbreaks (28%) in 2008 was norovirus. The performance goal of initiating an investigation within 24 hours of receipt of report by local health departments could not be evaluated based on the information available. For 2008, 75% of outbreaks were reported to ADHS within 24 hours, which was below the performance goal set of $\geq 95\%$. Only 16% 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. This is the first infectious disease outbreak summary report for Arizona and is the first step in an effort to increase our state's capacity to detect and respond to outbreak reports.