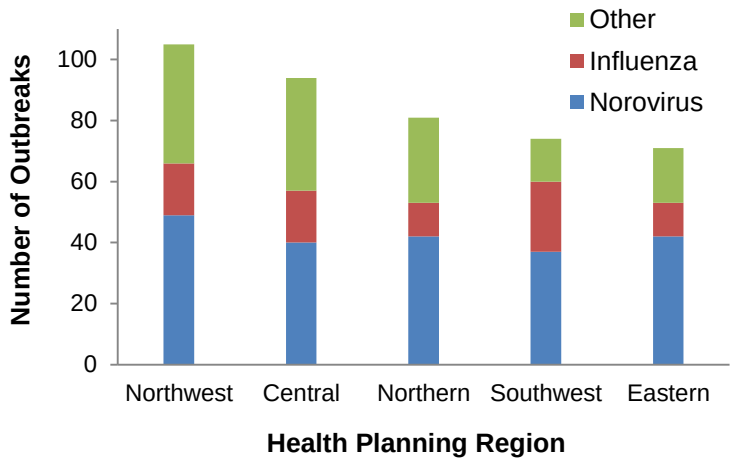
Outbreaks

Introduction

In 2015, a total of 435 outbreaks were reported to the Virginia Department of Health (VDH). Approximately two-thirds of the outbreaks (289, 66%) were suspected or confirmed to be caused by norovirus (210, 48%) or influenza (79, 18%). Other etiologic agents were suspected or confirmed to have contributed to the remaining outbreaks (146, 34%).

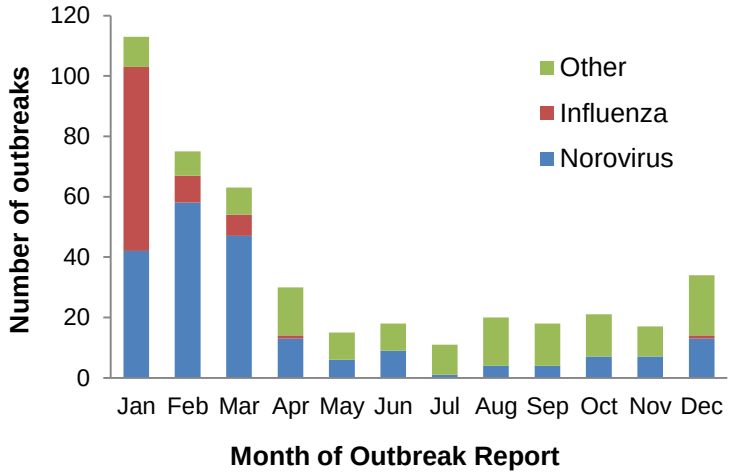
Geographically, 105 (24%) outbreaks were reported from the northwest region, followed in frequency by the central (94 outbreaks, 22%), northern (81 outbreaks, 19%), southwest (74 outbreaks, 17%), and eastern (71 outbreaks, 16%) regions (Figure 54). The VDH Central Office led investigations in 10 multi-state or multi-jurisdictional outbreaks (2%). In addition, VDH provided assistance to the investigations of three out-of-state outbreaks. These three outbreaks were not counted in the 435 Virginia outbreaks for 2015.

Figure 54. Outbreaks by Health Planning Region, Virginia, 2015



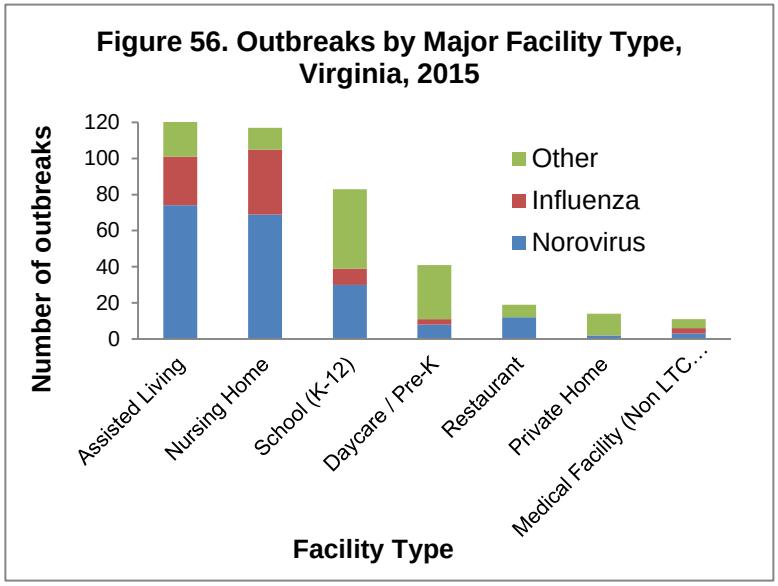
Outbreaks were reported throughout the year in 2015, but more outbreaks were reported in the colder months. Close to three-quarters of outbreaks occurred in January, February, March, April, or December of 2015 (314, 72%). Consistent with previous years, the majority of outbreaks during the colder months were confirmed or suspected to be caused by norovirus or influenza, reflecting the active circulation of these pathogens in colder months (Figure 55).

Figure 55. Outbreaks by Month of Outbreak Report, Virginia, 2015



Senior living facilities reported more than half of all outbreaks in 2015. These outbreaks included 121 (28%) in assisted living facilities and 117 (27%) in nursing homes, followed by 83 (19%) outbreaks in schools (K-12) and 41 (9%) outbreaks

in daycare centers. Outbreaks were also reported from restaurants (19, 4%), private homes (14, 3%), medical facilities (11, 3%), colleges (9, 2%), correctional facilities (8, 2%), camps (3, 1%), independent living facilities (2, 1%), and parks (2, 1%). One outbreak was reported from each of the following settings: adult daycare center, workplace, community event, hotel, and international learning center (Figure 56).



The following sections describe norovirus outbreaks that were transmitted through person-to-person contact, influenza outbreaks, outbreaks transmitted through foodborne, waterborne, or zoonotic mechanisms, vaccine-preventable disease outbreaks, outbreaks that occurred in healthcare facilities, and outbreaks related to other types of illnesses.

Person-to-person Norovirus Outbreaks

Please see the Foodborne Outbreaks section below for a description of norovirus outbreaks that had a foodborne route of transmission.

Norovirus was suspected or confirmed as the cause of 210 (48%) outbreaks in Virginia in 2015. Among these, 195 were transmitted through person-to-person contact and 13 through food. The mode of transmission could not be determined in two outbreaks. The average number of persons who became ill in person-to-person norovirus outbreaks was 34, with a range of 3 to 289 persons.

Person-to-person norovirus outbreaks were reported from all regions of Virginia in 2015. Overall, the most person-to-person norovirus outbreaks were reported from the northwest region (46, 24%), followed by the eastern region (41, 21%), northern region (38, 19%), southwest region (37, 19%), and central region (33, 17%).

The most frequent settings for person-to-person norovirus outbreaks were assisted living facilities (73, 37%), nursing homes (69, 35%) and schools (K-12) (29, 15%). Outbreaks from these three settings accounted for the majority (171, 88%) of all person-to-person norovirus outbreaks in 2015. This distribution pattern was similar to that of 2014, in which 38%, 29%, and 15% of person-to-person norovirus outbreaks occurred at assisted living facilities, nursing homes, and schools (K-12), respectively. Person-to-person norovirus outbreaks also occurred in other types of settings, including daycare facilities (8, 4%), colleges (4, 2%), medical facilities (3, 2%), correctional facilities (2, 1%), and independent living facilities (2, 1%). In addition, a restaurant, camp, hotel, learning center, and private home each reported one person-to-person norovirus outbreak.

Although person-to-person norovirus outbreaks occurred throughout the year in 2015, the majority of these outbreaks occurred in the colder months of January (38, 19%), February (54, 28%), March (45, 23%), April (12, 6%), and December (11, 6%).

Norovirus was confirmed by laboratory testing in over half (109, 56%) of the 195 person-to-person norovirus outbreaks. Sequencing analysis was performed for 65 (60%) of 109 confirmed outbreaks, which revealed that norovirus genotype *Sydney* (55, 85%) predominated among all norovirus with sequencing data in 2015. Other strains identified included *Miami* (4, 6%), *Ascension* (2, 3%), *Southampton* (1, 2%), *Musgrove* (1, 2%), *Kawasaki* (1, 2%), and *Vaals* (1, 2%). Sequencing data were not available for 44 (40%) of the confirmed outbreaks.

In addition to the 195 person-to-person norovirus outbreaks, there were two norovirus outbreaks in 2015 for which the transmission route could not be determined. These two outbreaks occurred in the northern region. One was associated with a restaurant and the other was associated with a school (K–12).

Influenza Outbreaks

After norovirus, influenza (79, 18%) was the most common suspected or confirmed etiologic agent responsible for causing outbreaks in Virginia in 2015. An average of 20 people became ill in each influenza outbreak, with a range of 2 to 91 people.

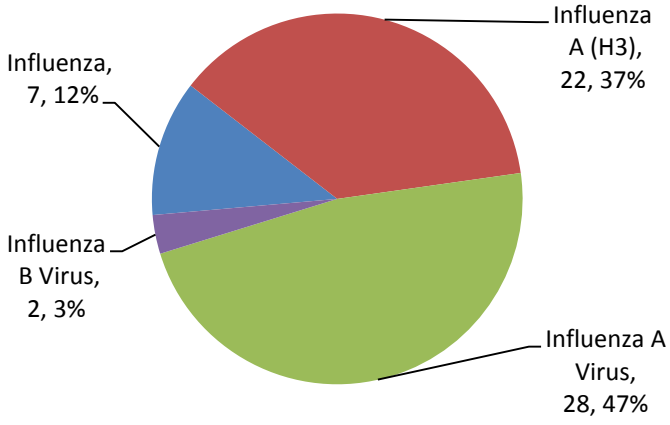
Influenza outbreaks were reported from all regions in Virginia in 2015. The southwest region had 23 (29%) influenza outbreaks, followed by the central (17, 22%), northwest (17, 22%), northern (11, 14%), and eastern (11, 14%) regions.

The majority of influenza outbreaks was reported from nursing home (36, 46%) or assisted living facility (27, 34%) settings in 2015. Schools (K-12) reported 9 (11%) influenza outbreaks, which was a decrease from 2014, during which schools (K-12) reported approximately one-third of all influenza outbreaks. Influenza outbreaks were also occasionally reported by other facilities, including child daycare centers (3, 4%), medical facilities (3, 4%), and an adult daycare center (1, 1%).

The majority of influenza outbreaks (61, 77%) were reported in January 2015. The remaining outbreaks were scattered throughout the following months of 2015: February (9, 11%), March (7, 9%), April (1, 1%), and December (1, 1%).

Among the 79 influenza outbreaks occurring in 2015, 59 (75%) were confirmed by laboratory testing. Influenza A virus predominated in 50 (85%) of these confirmed outbreaks. Specifically, among laboratory-confirmed influenza outbreaks, influenza A (H3) was identified in 22 (37%)

Figure 57. Strain of Influenza Virus in Confirmed Influenza Outbreaks, Virginia 2015



outbreaks, influenza A (not further specified) was identified in 28 (47%) outbreaks, and influenza B was identified in 2 (3%) outbreaks. In addition, influenza was identified by rapid test in another 7 (12%) outbreaks but information on the virus subtype was not available (Figure 57).

For information on influenza outbreaks that occurred in the 2015-2016 influenza season (rather than calendar year 2015, as described above), please see the "Outbreaks" section of the "Influenza" chapter of this annual report.

Foodborne Outbreaks

During 2015, 26 foodborne outbreaks were reported and investigated in Virginia (Table 9). This is similar to the 23 outbreaks reported in 2014. The average number of ill persons per outbreak was 26 and ranged from one to 181. VDH provided assistance in specimen testing for an out-of-state foodborne outbreak in 2015.

Foodborne outbreaks occurred throughout the year from January to December in 2015. Geographically, nine (35%) outbreaks occurred in the central health planning region, followed by five (19%) in the northern, three (12%) in the northwest, two (8%) in the eastern, and 1 (4%) in the southwest regions. In addition, six (23%) outbreaks were multi-state outbreaks that involved cases from Virginia and other states, which doubled the three multi-state outbreaks reported in 2014.

Etiologic agents were confirmed by laboratory testing in 23 (88%) of the 26 foodborne outbreaks. Among the 23 confirmed outbreaks, 12 (52%) were due to bacterial agents, higher than 38% of foodborne outbreaks caused by bacteria in 2014. The remaining 11 (48%) outbreaks were caused by viral agents. Specifically, the 23 confirmed etiologic agents included norovirus (11, 48%), *Salmonella* (5, 22%), *Escherichia coli* (3, 13%), *Campylobacter* (2, 9%), *Clostridium perfringens* (1, 4%), and *Listeria monocytogenes* (1, 4%). Norovirus was suspected in two outbreaks and the etiologic agent was unknown in one outbreak.

Most foodborne outbreaks were associated with food prepared in restaurant (16, 62%) or private home (6, 23%) settings. The remaining outbreak settings included two colleges, one assisted living facility, and one school (K-12). Etiologic agent was detected in bean sprouts in the *Listeria monocytogenes* outbreak. The following food items were suspected in eight outbreaks: green pea salad and salad each were suspected in two norovirus outbreaks; imported frozen raw tuna, imported cucumbers, and chicken each were suspected in three *Salmonella* outbreaks; leafy green vegetables and chicken salad each were suspected in two *Escherichia coli* outbreaks; and pork barbecue was suspected in one *Clostridium perfringens* outbreak. Food items could not be determined in 17 outbreaks.

As generally documented, contributing factors for foodborne outbreaks usually included bare-hand or glove-hand contact by an infected food handler, foods contaminated by a non-food handler who was suspected to be infectious, contaminated raw product that was consumed without undergoing the intended kill step (such as cooking to the required temperature), food intended to be served raw was contaminated, failure to control food temperature or the length of time food was out of temperature control, improper cold holding or hot holding due to improper procedure or protocol, improper/slow cooling, and insufficient time and/or temperature control during initial cooking/heat processing or during reheating.

Table 9. Foodborne Outbreaks Reported in Virginia, 2015

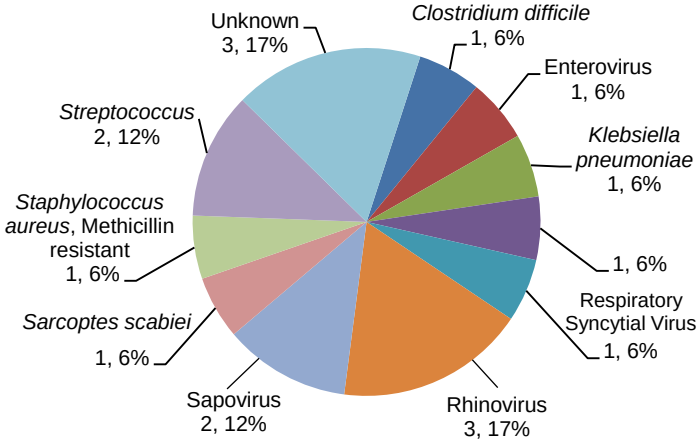
Onset Date	Health District	Number of Cases	Etiologic Agent	Vehicle	Facility Type
Unknown	Multi-state	11 VA 81 US	*Salmonella* Enteritidis	Unknown	Restaurant
6/16/2014	Fairfax and Virginia Beach	2	*Listeria monocytogenes*	Bean sprouts	Private Home
1/4/2015	Southside	20	Norovirus suspected	Unknown	Restaurant
1/10/2015	Virginia Beach	9	Norovirus GII.4 Sydney	Unknown	Restaurant
1/25/2015	Piedmont	181	Norovirus GII.4 Sydney	Unknown	College
1/25/2015	Thomas Jefferson	21	Norovirus suspected	Unknown	Restaurant
1/27/2015	Rappahannock	106	Norovirus GII.4 Sydney	Unknown	Assisted Living
2/2/2015	Henrico	13	Norovirus GII.4 Sydney	Unknown	Restaurant
2/3/2015	Chesterfield	5	Norovirus GII	Unknown	Restaurant
2/8/2015	Fairfax	26	Norovirus GII.4 Sydney	Green pea salad suspected	Private Home
3/1/2015	Henrico	25	Norovirus GII		Restaurant
3/3/2015	Alexandria	9	Unknown	Unknown	Restaurant
3/15/2015	Richmond	34	Norovirus GII.4 Sydney	Unknown	Restaurant
3/31/2015	Multi-state	1 VA 69 US	*Salmonella*	Imported frozen raw tuna suspected	Private Home
4/15/2015	Multi-state	1 VA 7 US	*Escherichia coli*	Leafy green vegetables suspected	Private Home
4/20/2015	Alexandria	7	Norovirus GII.17 CS-E1	Unknown	Restaurant
4/27/2015	Rappahannock	19	*Campylobacter*	Unknown	Restaurant
5/13/2015	Southside	13	Norovirus GII	Salad suspected	Restaurant
6/11/2015	Chesterfield	8	*Escherichia coli*	Unknown	School (K-12)
7/6/2015	Fairfax	3	*Campylobacter*	Unknown	Restaurant
8/5/2015	Chesterfield	7	*Salmonella* Enteritidis	Unknown	Restaurant
8/14/2015	Multi-state	1 VA 907 US	*Salmonella* Poona	Imported cucumbers suspected	Private Home
10/6/2015	Multi-state	1 VA 19 US	*Escherichia coli* O157	Chicken salad suspected	Private Home
10/7/2015	New River	121	*Clostridium perfringens*	Pork barbecue suspected.	College
11/1/2015	Three Rivers	10	*Salmonella* Enteritidis	Chicken suspected	Restaurant
12/27/2015	Alexandria	9	Norovirus	Unknown	Restaurant

Healthcare-Associated Outbreaks

A healthcare-associated outbreak is a group of illnesses with a common etiology among patients, residents, or staff in a healthcare setting (e.g., hospital, medical center, nursing home, physician's office, dialysis center, or other healthcare facility), where the illness is associated with that setting. Note that prior to 2008, only outbreaks that occurred in hospitals and nursing homes (facilities meeting the definition of a medical care facility in 12VAC5-90-10) were included in these statistics.

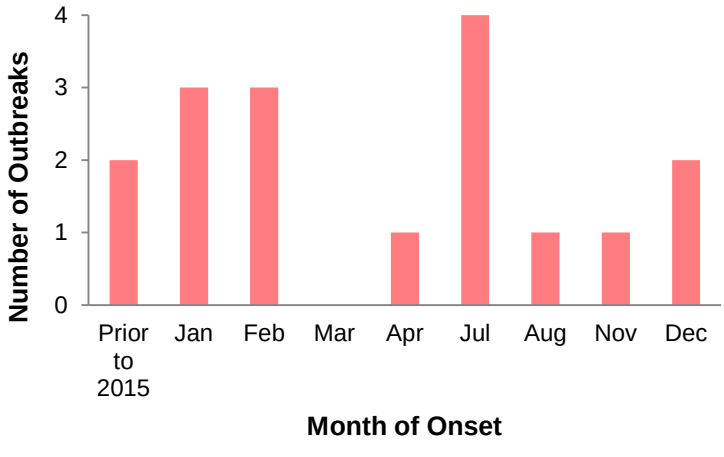
During 2015, 17 healthcare-associated outbreaks with suspected or confirmed etiologic agents other than norovirus or influenza were reported in Virginia. This is 37% lower than the 27 non-norovirus, non-influenza outbreaks reported from healthcare facilities in 2014. The average number of ill persons per healthcare-associated outbreak in 2015 was 25, and ranged from two to 41 persons. The majority of healthcare-associated outbreaks occurred in nursing homes (12, 71%) and the remaining outbreaks (5, 29%) occurred in medical facilities, including three hospitals, a dialysis center, and a treatment center for youth.

Figure 58. Healthcare-Associated Outbreaks: Etiologic Agent Confirmed or Suspected, Virginia, 2015



The majority of the healthcare-associated outbreaks (15, 88%) were attributed to person-to-person transmission. The route of transmission could not be determined in two outbreaks (11%). Etiologic agents were confirmed in 10 (59%) of the outbreaks, suspected in 4 (24%) and unknown in 3 (18%). Specifically, rhinovirus was confirmed in three outbreaks and sapovirus in two outbreaks, respectively. *Clostridium difficile*, *Klebsiella pneumoniae*, respiratory syncytial virus, methicillin resistant *Staphylococcus aureus*, and *Streptococcus* were each responsible for one confirmed outbreak (Figure 58). In addition, *Sarcoptes scabiei* (scabies), *Streptococcus*, and enterovirus were each suspected in one outbreak, and in another outbreak, multiple organisms were suspected but none was confirmed.

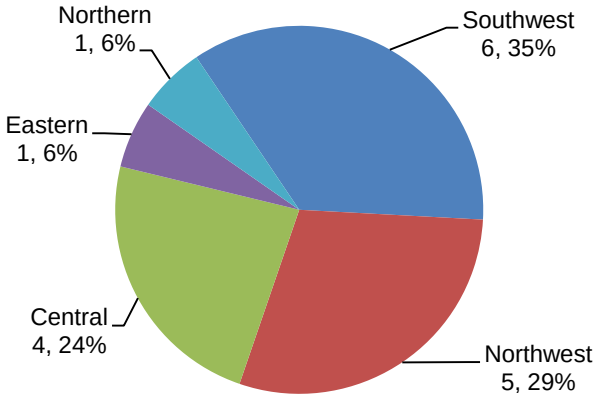
Figure 59. Healthcare-Associated Outbreaks: Month of Onset, Virginia, 2015



Healthcare-associated outbreaks were reported throughout the year and did not show particular seasonality in 2015 (Figure 59), while in 2014 more than half (59%) of healthcare-associated outbreaks had onsets in the summer time between May and September.

In 2015, healthcare-associated outbreaks were reported most frequently from the southwest (6, 35%), northwest (5, 29%) and central (4, 24%) regions. The eastern (1, 6%) and northern (1, 6%) regions each reported one healthcare-associated outbreak from their respective regions (Figure 60).

Figure 60. Healthcare-Associated Outbreaks: Region of Occurrence, Virginia, 2015



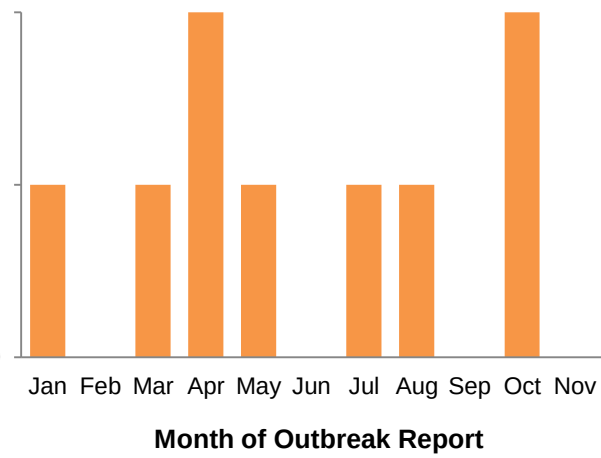
Vaccine-Preventable Disease Outbreaks

During 2015, a total of 15 vaccine-preventable disease outbreaks were reported in Virginia. This is similar to 2014, when 17 outbreaks were reported. Of these 15 outbreaks, pertussis was confirmed in 10 outbreaks, mumps and varicella each was confirmed in one outbreak, and varicella was suspected in three outbreaks.

The average number of ill persons per outbreak in the 10 pertussis outbreaks was 13, with a range from two to 78 persons. Nine (90%) of the 10 pertussis outbreaks occurred in schools (K-12) and one (10%) occurred in a daycare center.

Pertussis outbreaks occurred fairly evenly throughout the year, with one outbreak in each of the following months: January, March, May, July, August, and December. April and October each had two pertussis outbreaks (Figure 61).

Figure 61. Pertussis Outbreaks: Month of Onset, Virginia, 2015



In 2015, the northern and northwest regions of the state had substantially more pertussis outbreaks (9, 90%) than other regions. This is similar to 2014, in which 13 (81%) outbreaks occurred in these two regions. In 2015, the northwest region reported the most pertussis outbreaks (8, 80%) while the northern region reported one pertussis outbreak (1, 10%). In addition, the eastern region reported one pertussis outbreak (1, 10%). Pertussis outbreaks were not reported in the central and the southwest regions in 2015.

Four chickenpox outbreaks, one confirmed and three suspected, were reported in 2015. This is higher than the one chickenpox outbreak in 2014. Chickenpox outbreaks occurred in two separate correctional facilities, one in the eastern region (confirmed) and the other in the northwest region (suspected). In addition, one suspected chickenpox outbreak occurred in a school (K-12) in the northwest region and another suspected chickenpox outbreak occurred in a daycare center in the southwest region. On average, six people were affected per chickenpox outbreak, with a range from five to seven persons.

One suspected mumps outbreak was reported in a college in the northwest region in 2015. Twenty-one people were affected in this outbreak.

Lack of compliance with the recommended immunization schedule usually contributes to vaccine-preventable disease outbreaks. For the 15 pertussis outbreaks, up-to-date immunizations were reported among all case-patients in only five outbreaks (33%). In the other 10 outbreaks, the affected persons were either unvaccinated, had not received all recommended doses of vaccine, or had no documentation to confirm that all recommended doses had been received. No other outbreaks caused by vaccine-preventable diseases such as measles, rubella, or *Haemophilus influenzae* type B were reported in 2015.

Waterborne Outbreaks

In 2015, four waterborne outbreaks were reported in Virginia (Table 10), compared to one outbreak reported in 2014. All of these outbreaks occurred in warmer months and were associated with outdoor water. Two of the four outbreaks were associated with spray parks, which had previously not been widely documented. In addition, one outbreak was associated with drinking improperly treated water from streams at a camp, and another was associated with a swimming pool at a campground. Three outbreaks were reported in the northern region and one was reported in the northwest region. All four outbreaks have been confirmed, two with *Cryptosporidium,* one with *Campylobacter jejuni,* and one with *Giardia lamblia.*

Table 10. Waterborne Outbreaks Reported in Virginia, 2015

Onset Date	Health District	Number of Cases	Etiologic Agent	Suspected Vehicle	Place Where Outbreak Occurred
5/27/2015	Arlington	4	*Campylobacter jejuni*	Spray water	Spray Park
8/2/2015	Arlington	4	*Cryptosporidium*	Spray water	Spray Park
7/10/2015	Loudoun	4	*Giardia lamblia*	Stream water	Camp
7/17/2015	Lord Fairfax	96	*Cryptosporidium*	Swimming pool	Campground

Zoonotic Outbreaks

In 2015, five zoonotic outbreaks were reported, all involving residents in the northwest region. One outbreak was caused by *Cryptosporidium* and was associated with ill calves. Another outbreak was also associated with ill calves and *Cryptosporidium* was suspected of causing illness. In this outbreak, *Cryptosporidium* was confirmed in specimens from calves, but not in human specimens. The three remaining outbreaks were multi-state and involved residents in Virginia and residents in other states. The vehicle for these outbreaks was live poultry and each was confirmed to be caused by *Salmonella* Hadar, *Salmonella* Muenster, or *Salmonella* Enteritidis (Table 11).

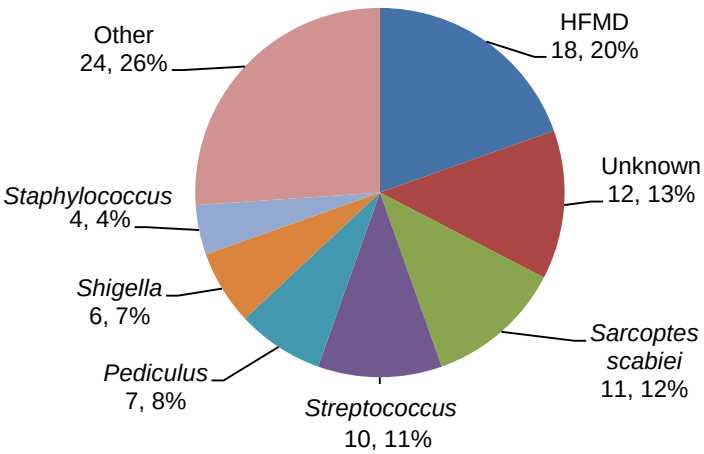
Table 11. Zoonotic Outbreaks Reported in Virginia, 2015

Onset Date	Health District	Number of Cases	Etiologic Agent	Vehicle	Place Where Outbreak Occurred
4/9/2015	Multi-state	9 VA 80 US	*Salmonella* Hadar	Live Poultry	Private Home
4/25/2015	Multi-state	1 VA 41 US	*Salmonella* Muenster	Live Poultry	Private Home
5/10/2015	Multi-state	7 VA 65 US	*Salmonella* Enteritidis	Live Poultry	Private Home
6/30/2015	Thomas Jefferson	13	*Cryptosporidium*	Calves	Private Home
11/6/2015	Central Shenandoah	5	*Cryptosporidium* suspected	Calves	Private Home

Other Outbreaks

In addition to the norovirus, influenza, foodborne, healthcare-associated, vaccine-preventable, waterborne, and zoonotic disease outbreaks discussed above, 92 outbreaks related to other types of illness were reported in Virginia in 2015. This was a 24% decrease compared to the 121 outbreaks reported in this category in 2014. The average number of ill persons per outbreak was 15, and ranged from two to 98 persons. As in previous years, the majority of these outbreaks (85, 92%) were attributed to person-to-person transmission. Chemical exposure contributed to two outbreaks (2%). The remaining five (5%) outbreaks were attributed to undetermined factors.

Figure 62. Other/Miscellaneous Outbreaks: Etiologic Agent Confirmed or Suspected, Virginia, 2015



The most frequent causes of illness reported from these other outbreaks were confirmed or suspected hand, foot, and mouth (HFM) disease (18 outbreaks, 20%), scabies (11, 12%), *Streptococcus*

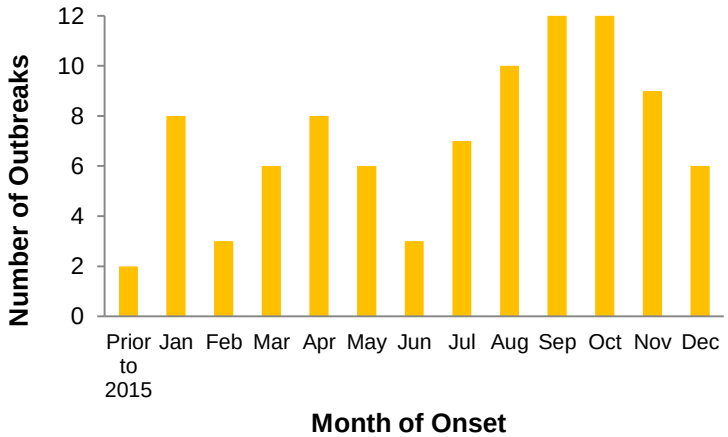
(10, 11%), *Pediculus* (7, 8%), *Shigella* (6, 7%), or *Staphylococcus* (4, 4%) (Figure 62). The number of HFMD outbreaks decreased dramatically compared to the prior year. In 2014, there were 71 HFMD outbreaks, representing 59% of all outbreaks in this category. The remaining 36 outbreaks in 2015 were suspected or confirmed to be caused by a variety of etiologic agents. Specifically, three outbreaks each were suspected or confirmed to be caused by respiratory syncytial virus, rhinovirus, and rotavirus. Two outbreaks each were suspected or confirmed to be caused by *Adenoviridae* and *Clostridium difficile*. In addition, single outbreaks were confirmed or suspected to be caused by *Campylobacter*, carbon monoxide, clenbuterol, *Escherichia coli*, *Mycoplasma pneumonia*, parainfluenza virus, parvovirus B19, *Salmonella*, sapovirus, *Stenotrophomonas maltophilia*, and tinea corporis (ringworm). The etiologic agent was unknown in nine respiratory illness outbreaks, two gastrointestinal illness outbreaks, and one conjunctivitis outbreak.

Overall, the most common settings for these 92 outbreaks were schools (K-12) (33, 36%), daycare/pre-K facilities (28, 30%), and assisted living facilities (20, 22%). In addition, four (4%) outbreaks were reported from correctional facilities, and two outbreaks each were reported from two colleges (2%) and two private homes (2%). Furthermore, three single outbreaks occurred at a restaurant, a workplace, and a community event.

Although these outbreaks occurred throughout the year, more outbreaks (56, 61%) occurred in the second half of the year than in the first half of the year (Figure 63).

Regionally, "other" outbreaks occurred throughout the state in 2015, with the largest proportions in the central (31, 34%), northern (21, 23%), and northwest (19, 21%) regions, followed by the eastern (14, 15%) and southwest (6, 7%) regions.

Figure 63. Other/Miscellaneous Outbreaks: Month of Onset, Virginia, 2015



Outbreak spotlight: Scabies

Twelve scabies outbreaks were reported statewide in 2015 without a particular seasonality. Of these, 11 were reported as other outbreaks, and one as healthcare-associated. The majority of scabies outbreaks occurred in assisted living facilities (8, 67%). Two outbreaks occurred in school (K-12) settings, one occurred in a nursing home, and one occurred in a daycare center. Human scabies is caused by the human itch mite (*Sarcoptes scabiei* var. *hominis*). The microscopic mite can burrow into the upper layer of the skin where it will live and lay its eggs. The most common symptoms of scabies are intense itching and a pimple-like skin rash. However, symptoms may not appear immediately, and an infested person can transmit scabies even in the absence of symptoms. The scabies mite usually is spread by direct, prolonged, skin-to-skin contact with a person who has scabies. Scabies can spread

rapidly under crowded settings such as nursing homes, assisted living facilities, and prisons. Preventive measures include handwashing, avoiding direct contact with an infested person or with soiled items used by an infested person, and thoroughly cleaning rooms used by a patient.

Outbreak spotlight: Streptococcal infection

Twelve outbreaks of streptococcal disease were reported during 2015. Of these, ten were reported as other outbreaks and two as healthcare-associated. Three outbreaks were due to invasive streptococcal infections, and nine were due to non-invasive infections. The outbreaks of invasive infections occurred in a nursing home, a medical facility (non-long term care), and an assisted living facility. The outbreaks of non-invasive infections caused respiratory or rash illnesses (primarily presenting as "strep throat") in five school (K-12) settings and four daycare/pre-K settings. Streptococcal infections are caused by the bacterium *Streptococcus pyogenes*. Most streptococcal infections are mild (non-invasive), but rarely, the organism can lead to a severe invasive infection if the bacteria enter a normally sterile site (blood, internal body fluids). Preventive measures include proper hand washing and prompt identification and treatment of non-invasive infections. Wounds should be kept clean and medical care should be sought at the first sign of infection.

Outbreak spotlight: Hand, foot, and mouth disease

Among the 92 other outbreaks in 2015, 18 (20%) were outbreaks suspected to be due to hand, foot, and mouth (HFM) disease, a viral illness that can cause fever, blister-like sores in the mouth, and a skin rash. This is a 75% decrease from the 71 HFM outbreaks reported in 2014. Two-thirds of the HFM disease outbreaks occurred in daycare facilities (12, 67%), and the remaining outbreaks occurred in school (K-12) settings (6, 33%), consistent with the pattern in 2014. HFM disease usually affects infants and children younger than five years of age, but can sometimes occur in adults. HFM disease is caused by the Enterovirus group of viruses, which includes polioviruses, coxsackieviruses, echoviruses, and enteroviruses. There is no vaccine to protect against hand, foot, and mouth disease. Effective preventive measures include handwashing, cleaning and disinfecting touched surfaces and soiled items, and avoiding close contact with people with hand, foot, and mouth disease.