SUMMARY OF REPORTED OUTBREAKS
WEST VIRGINIA
2003

In West Virginia, outbreaks should be reported to the local health department immediately. Investigation of outbreaks is performed by local, regional and state staff so that the disease can be brought under control and future outbreaks can be prevented. Outbreak investigations add to the base of knowledge, and help with improving disease surveillance. New ways to prevent disease are often identified through effective outbreak investigation. Outbreak investigation can also identify new diseases or new modes of transmission. This year, for example, outbreaks of community-acquired MRSA were identified in the state for the first time.

During 2003, West Virginia investigated 28 outbreaks, as below:

2003 Outbreak Investigations, West Virginia

Outbreak number	Date reported	Date of first case	Date of last case	County	Reported by:	Setting	Source, mode of transmission	Disease	Total cases
1	2/3/2003	*	*	Pocahontas	LHD	School	Person to person	Influenza B	*
2	2/3/2003	*	*	Lewis	LHD	School	Person to person	Influenza-like illness	*
3	2/3/2003	*	*	Jefferson	LHD	School	Person to person	Influenza-like illness	*
4	2/11/2003	1/8/2003	7/18/2003	Pocahontas	LHD	Community	Person to person	Hepatitis A	7
5	2/14/2003	1/13/2003	1/24/2003	Ohio	LHD	Nursing home	Person to person	Suspected Norovirus	60
6		2/17/2003	2/23/2003	Wetzel	LHD	Nursing home	Person to person	Suspected Norovirus	13
7	3/6/2003	12/2/2002	11/12/2003	Multiple	Citizen	Regional jails and correctional facilities	Person to person	Methicillin-resistant *Staphylococcus aureus* (MRSA)	48[a]
8	3/17/2003	2/1/2003	2/11/2003	Cabell	LHD	Daycare	Person to person	*Salmonella typhimurium*	3
9	4/16/2003	4/16/2003	4/17/2003	Monongalia	LHD	Nursing home	Point source	Gastroenteritis	24
10	4/17/2003	2/20/2003	5/4/2003	Multiple	Hospital	Community	N/A	Group A Streptococcal neck abscesses	7
11	6/25/2003	6/22/2003	6/28/2003	Multi-state	LHD	Community	Likely multiple environmental sources	*Campylobacter* enteritis	87[b]

12	7/8/2003	7/2/2003	7/8/2003	Kanawha	Nursing home	Nursing home	Likely person to person	Influenza-like illness	25
13	7/17/2003	6/1/2003	8/19/2003	Mingo and Kanawha	LHD	Community Hospital	Person to person	Pertussis	4
14	7/29/2003	6/30/2003	8/1/2003	Morgan	LHD	Community	Person to person	Pertussis	4
15	8/20/2003	8/19/2003	8/22/2003	Cabell	LHD	Community	Person to person	Pertussis	5
16	9/6/2003	2/1/2003	9/15/2003	Marshall	LHD	Extended family	Person to person	MRSA	6
17	9/23/2003	8/29/2003	9/16/2003	Multi-state	OLS	Community	unknown	*Salmonella montevideo*	10 [c]
18	9/25/2003	8/20/2003	10/2/2003	Pocahontas	Hospital	Community	Likely person to person	Pleurodynia	5
19	10/27/2003	10/23/2003	10/27/2003	Raleigh	citizen	Restaurant	Point source	Norovirus	49[d]
20	10/302003	9/01/2003	9/30/2003	Calhoun	Hospital	Community	Person to person	MRSA	4
21	11/3/2003	11/3/2003	11/11/2003	Fayette	School	Community	Person to person	Influenza A	*
22	11/4/2003	10/20/2003	11/20/2003	Multi-state	LHD	Restaurant	Point source	Hepatitis A	660[e]
23	11/5/2003	10/22/2003	11/12/2003	Multi-state	LHD	Home	Person to person	MRSA	8[f]
24	11/12/2003	11/3/2003	11/10/2003	Hampshire	LHD	School	Person to person	Chickenpox	38
25	11/14/2003	11/8/2003	11/16/2003	Nicholas	LHD	Nursing home	Person to person	Influenza-like illness	12
26	11/18/2003	11/12/2003	11/15/2003	Fayette	LHD	Nursing home	Person to person	Influenza A	6
27	12/4/2003	11/30/2003	12/5/2003	Putnam	Nursing home	Nursing home	Person to person	Influenza A	60
28	12/10/2003	12/03/2003	12/18/2003	Kanawha	LHD	Nursing home	Person to person	Influenza A	*

[a]A total of 48 cases were reported in 47 inmates by February, 2004.
[b]Of 1549 registered participants, 535 responded to a survey and 87 (16%) were ill. None of the ill respondents were from West Virginia.
[c]Includes 3 cases from West Virginia
[d]Of 79 persons surveyed, 49 reported illness. Based on this, it can be estimated that between 141 and 190 of 232 persons attending the luncheon were ill. These numbers are only estimates and the accuracy is limited, given that true random sampling of the population was not possible.
[e]This number includes 22 cases from West Virginia.
[f]Includes 3 culture-confirmed cases from West Virginia, 1 West Virginia case that was epi-linked, but not culture-confirmed, and 3 cases in Virginia that were epi-linked, including two culture-confirmed. An additional confirmed case from Virginia had no epidemiological link.

Outbreaks # 1,2,3 – Influenza B and Influenza-like illness in Pocahontas, Lewis and Jefferson Counties

The Infectious Disease Epidemiology Program (IDEP) received reports of high levels of absenteeism (ranging from 25 to 75 percent) from several schools in Pocahontas, Lewis and Jefferson counties. School nurses, physicians and hospitals reported students presenting with fever and respiratory symptoms including sore throat and cough. On Feb 5th, 2003, the outbreak in Pocahontas

County was laboratory-confirmed as influenza B. A health alert was sent emphasizing the importance of influenza vaccine in preventing influenza. Providers were asked to consider the use of antiviral medication for specific populations.

Outbreak # 4 – Hepatitis A in Pocahontas County

In February, a laboratory confirmed case of hepatitis A was identified in Pocahontas County. All known contacts were given immune globulin. Additional unrecognized contacts later developed Hepatitis A. Transmission occurred among household and sexual contacts of cases. A total of 6 cases were epi-linked to the index case. Ultimately, the outbreak was brought under control through effective contact tracing.

Outbreak # 5,6 – Outbreaks of Suspected Norovirus in Nursing Homes, Ohio and Wetzel Counties

Two outbreaks of gastroenteritis were reported early in 2003 from nursing homes in West Virginia. In the outbreak from Wetzel County, 13 of 63 residents were ill, for an attack rate of 20%. Clinical syndrome was characterized by acute onset of vomiting and/or diarrhea. No stool cultures were done to identify the causal agent. Onsets of illness were staggered over about a week, strongly suggesting person-to-person transmission. Proper infection control practices including hand-washing and isolation of sick patients were recommended. The likely etiologic agent was norovirus, based on the clinical syndrome and the presence of person-to-person spread.

The second outbreak occurred in a facility in Ohio County. Sixty one (51%) of 120 residents were ill with acute gastroenteritis, again characterized by acute onset of vomiting and diarrhea. Mean (median) duration of illness was 35 (34) hours. Seven stool specimens were collected and were negative for bacterial pathogens. No viral testing was performed. Infection control measures were recommended; however person-to person transmission continued over about 10 days (Figure 1). Norovirus outbreaks can be difficult to control because of the small infectious dose and the ease of person-to-person transmission. Effective control measures include isolation or cohorting of ill persons and vigorous environmental cleaning. Local health departments and nursing homes can follow the course of an outbreak with a line listing to assure that control measures are effective. Testing for norovirus will be available at the Office of Laboratory Services within the next year. This will help with investigation and management of norovirus outbreaks.

Outbreak # 7 – Methicillin-resistant *Staphylococcus aureus* (MRSA) Outbreak in Jails and Correctional Facilities; multiple counties, West Virginia

On March 6, 2003 an outbreak of skin infections was reported from a correctional facility in West Virginia by a family member of an inmate. By February 2004, 48 infections had been reported in 47 individuals (Figure 2) from 10 facilities. One infection in December, 2002 was recognized retrospectively. Inmates' age ranged from 20 to 64 with a mean (median) age of 34 (32). None of the infected inmates were on dialysis, and none had cancer or HIV infection. No inmates had an indwelling line. Only 4 (9%) had a previous burn or wound; 2(4%) had diabetes; 5 (11%) had a history of injection drug use, and 1(2%) had a history of hospitalization and surgery within the 6 months prior to onset. Nine (19%) inmates had a history of a recent tattoo acquired during incarceration; all of these were from one of two facilities. Information on the outbreak and Federal guidelines for MRSA control in correctional facilities were shared with state DOC officials in June. IDEP followed through with a mailing to corrections medical personnel later in the year. A cluster of 13 cases occurred at a single facility in September. Seven (54%) of these cases were associated with tattooing. It is likely that tattooing is underreported as a risk factor for MRSA and other infections occurring in jails or corrections. MRSA is very difficult to control in any setting; therefore, the rise of community-acquired MRSA in West Virginia is an ominous sign. Corrections officials and local health departments should assure that they have adequate surveillance for this pathogen, and that appropriate prevention and control measures are in place. Education of providers and the public about appropriate antibiotic use is extremely important to prevent emergence of resistant organisms.

Outbreak # 8 – *Salmonellosis* in Cabell County

In February, there was a cluster of 3 children with *Salmonella typhimurium* in Cabell County. Two cases attended the same day care. The third case was a sibling of one day care attendee. No additional cases were identified in other family members, day care attendees or day care employees. Daycare employees were educated on disease transmission and proper hand washing techniques.

Outbreak # 9 – Gastroenteritis in a Nursing Home, Monongalia County

On April 16th, IDEP was notified of an outbreak of gastrointestinal illness affecting 21 (36%) of 59 residents at a nursing home. A line listing showed all 21 individuals were ill between 2-3 am on April 16th with vomiting and diarrhea. Three employees were ill, however they became ill on April 17. The duration of illness was about 15 hours. Ten open-ended interviews were done on ill individuals, which revealed that all of them had eaten the exact same meals. A cohort study was attempted, looking for a common source for the outbreak.

Because some residents had problems with memory, the food history was obtained from their dietary cards. No single food item could be identified as a risk factor for illness, since the dietary cards essentially recorded that everyone had been served the same meal. Only two stool samples were sent to the Office of Laboratory Services. These were negative for all enteric bacteria, *Staphylococcus aureus*, and *Bacillus cereus*.

Outbreak # 10 – Cluster of neck abscesses due to Group A *Streptococcus*, multiple counties

An unexplained cluster of deep neck abscesses due to Group A Streptococcus occurred in south and central West Virginia during the early part of 2003. In addition to the cases recorded here, two additional cases were reported in May. Cases were reviewed to identify possible common risk factors, including medication nonadherence, untreated sore throat or URI or immunocompromising conditions. In addition the possibility of erythromycin resistance was explored. However, no common risk factors were identified. Typing of isolates was performed at CDC. Multiple isolates were identified, further confirming that these cases were not linked to each other. Thus, this cluster did not represent a true outbreak.

Outbreak # 11 – Multi-state outbreak of Campylobacteriosis

A local health department sanitarian reported that multiple participants in a bicycle tour of Maryland, West Virginia and Virginia had fallen ill with diarrhea. Interviews identified multiple potential sources of exposure, including environmental contamination by an ill person, inadequate hand washing at rest stops, food service located in an animal barn, and inadequate food handling practices. Ultimately, out of a participant list of 1549, 535 unduplicated individuals responded to a survey, and 87 respondents met the case definition. Onset of illness is shown in Figure 3. Water for drinking from multiple rest stops was associated with illness, as were multiple food items from an equestrian center where food was served in a barn. The potable water source at that barn was from a fecally contaminated well. Ten cases of *Campylobacter spp.* were confirmed by culture, and two strains of *C. jejuni* were documented by PFGE. Recommendations included provision of adequate hand washing, and collaboration with the local health department in setting up safe food services during subsequent years.

Outbreak # 12 – Outbreak of ILI in a nursing home, Kanawha County

On 7/8/03, a patient with *Haemophlius influenzae* type b pneumonia was reported from a 119 bed nursing home in Kanawha County. Pneumonia was reported in two other residents; however no etiologic agent was identified. Ultimately, 25 residents were identified with upper respiratory infection

characterized by cough, sore throat, nasal congestion and arthralgia. Several patients had conjunctivitis prior to development of URI symptoms. Cultures of conjunctivitis yielded only *Staphylococcus aureus*. Additionally, several persons were cultured for viral agents with negative results. Ill patients were isolated, and no new cases were identified after 7/9/03.

Outbreak # 13 – Pertussis in Mingo and Kanawha Counties

Kanawha-Charleston Health Department reported an infant diagnosed with pertussis from a hospital in Kanawha County. The baby was actually a resident of Mingo County. A line listing of contacts was performed during the investigation. Mingo County Health department identified 56 close contacts of the case of whom 21 (38%) had cough. Several nasopharyngeal swabs were collected from symptomatic individuals and tested at OLS. OLS reported preliminary positive results on a few specimens from this outbreak but all were later reported as negative. Multiple contacts were prophylaxed with appropriate antibiotics. Contact tracing was also performed in hospital staff in Kanawha County. Three additional cases met the case definition for pertussis. All were treated with appropriate antibiotics. Close contacts of these additional cases were also identified and prophylaxed.

Outbreak # 14 – Pertussis in Morgan County

On 4/29/03, Morgan County Health Department reported an infant with culture confirmed pertussis. The infant had received one dose of pertussis vaccine. A line listing was done to investigate the case. Seventeen contacts were identified and 14 (82%) were prophylaxed or treated. Close contacts of the case were educated about the disease transmission and prevention. A physician alert was sent out to inform the providers in the community. Investigation helped to identify three additional cases for a total of 4 cases (one laboratory-confirmed and 3 epidemiologically-linked).

Outbreak # 15 – Pertussis in Cabell County

Cabell County Health Department reported a PCR-confirmed case of pertussis in an infant. A line listing was done to investigate the case. Investigation identified 118 contacts of the patient (including some hospital staff who were exposed during the 6-day admission). Of the 118 contacts, 81 were close contacts and were prophylaxed with appropriate antibiotics. Several specimens were collected from symptomatic contacts and tested at the Office of Laboratory Services. All specimens were negative for pertussis. Overall there were 5 confirmed cases from this outbreak (one culture-confirmed and four epidemiologically-linked). Since the child was seen at a hospital in Columbus, Ohio prior to hospitalization in West Virginia, both the hospital and the Ohio Health Department performed additional contact tracing.

Outbreak # 16 - MRSA in Marshall County

Several members of an extended family in two households were diagnosed with methicillin-resistant *Staphylococcus aureus* infections beginning with the index case who had onset in February. Four individuals presented with boils, two had cellulitis, one had a blister and one had an abscess. Two individuals had more than one type of skin lesion/infection. One case could not be contacted for an interview, and an epidemiological link for this person could not be ascertained. No isolates were available for PFGE. Three individuals, including a child required intravenous vancomycin for treatment.

Outbreak # 17 -- *Salmonella montevideo* cluster; Randolph and Raleigh Counties, West Virginia; North Carolina

During August and September, Office of Laboratory Services (OLS) identified a small cluster of three WV residents with *Salmonella Montevideo* and identical Pulsed Field Gel Electrophoresis patterns (PFGE). Two cases resided in Raleigh County and the other resident was from Randolph County. North Carolina had 7 cases that PFGE matched to the WV pattern. Investigations were completed for West Virginia cases using the supplemental enteric investigation form. One of the WV residents had been vacationing in North Carolina during the incubation period. No other common link was identified.

Outbreak # 18 -- Pleurodynia, Pocahontas County

IDEP was contacted about a possible community cluster of pleurodynia. Response included collection of basic epidemiological and clinical data. In addition, persons who met the case definition were cultured for enterovirus at the Charleston Area Medical Center Virology Laboratory. One person had positive cultures. Because the number of reported cases was small, extensive epidemiological investigation was not undertaken, and no specific control measures were recommended other than routine hygiene. No further cases were reported after 10/2/2003.

Outbreak # 19 – Norovirus, Raleigh County

On October 28, 2003, Infectious Disease Epidemiology Program (IDEP) learned about gastrointestinal disease amongst a group of 232 individuals attending a meeting on October 23, 2003. At lunch, attendees were served identical plates of food, followed by an ice cream social. During breaks drinks were served with ice. Ice was self-serve with use of a scoop. The initial reports suggested that all attendees had acute onset of nausea, vomiting and diarrhea on or after October 24, 2003 with an average duration of 30 hours. Beckley-Raleigh County Health Department performed 11 open-ended interviews of persons who self-reported illness. All 11 (100%) individuals had vomiting, 9 (90%) had diarrhea, 3 (27%) had chills, 3 (27%) had headaches), 7 (64%) had muscle aches, and 1 (9%) had

a fever. Five individuals had onset of illness on October 24th and another five had onset on October 25th. Duration of illness ranged from 2-5 days. Environmental investigation revealed that foodhandlers at the restaurant were ill before and after the event; but not on October 23. A case-control study was performed by IDEP. Onset of illness for the larger sample in this study is shown in Figure 4. At least two food items served at the luncheon were associated with illness; however, ice and drinks served during breaks could not be excluded as a cause of illness. Four (40%) of ten specimens submitted to CDC have been reported as positive for Norovirus. Results of the investigation were shared with the local health department, the restaurant and the persons organizing the meeting. Exclusion of ill foodhandlers and strict attention to hygiene was recommended, since norovirus can be shed for prolonged periods in the stool after recovery from illness. In addition, the restaurant was discouraged from serving ice with a scoop.

Outbreak # 20 - Community-acquired MRSA, Calhoun County

A hospital reported a cluster of abscesses due to MRSA among 4 members of a close-knit social group living in a small town. Age ranged from 18 to 40, and none of the individuals had a history of hospitalization or underlying disease. Three of the four individuals required hospitalization and incision and drainage. The local health department investigated further and did not identify any additional risk factors for MRSA. Several isolates were submitted for PFGE, and all were identical and matched the strain from the prison outbreak. However, no epidemiological link was identified with the prison outbreak. It is imperative that state and local health departments raise awareness about the issue of antimicrobial resistance and begin to educate patients and providers on appropriate antibiotic use during 2004.

Outbreak # 21 – Influenza A, Fayette County

In November 2003, IDEP received reports of high levels of absenteeism due to influenza-like symptoms (fever, headache, cough, body aches, vomiting) in a middle school in Fayette County. The county health department investigated the outbreak and collected specimens from a few symptomatic schoolchildren for testing at OLS. OLS confirmed the outbreak as influenza A. The state epidemiologist sent out a health alert announcing the first isolation of influenza A of the season. Children and their parents were educated about influenza and the importance of vaccination, hand hygiene and respiratory etiquette.

Outbreak # 22 – Hepatitis A. multi-state

In November, Pennsylvania State Health Department reported a Hepatitis A outbreak among patrons of a local restaurant. As of 12/31/03 there were a total of 660 individuals positive for Hepatitis A, including 22 West Virginia residents who had eaten at the restaurant during the incubation period. CDC has

concluded that contaminated green onions imported from Mexico were the source of this outbreak. Three viral isolates from this outbreak matched strains from an earlier restaurant-associated outbreak in another state. That outbreak was also linked to green onions.

Outbreak # 23 – Community-Acquired MRSA

On 10/22/03, Mercer County Health department reported MRSA from a wound culture on an adult female. Investigation revealed an asymptomatic infant in the household also colonized with MRSA. Two additional cases among family members living in a second household were also identified in West Virginia; only one was culture-confirmed. These family members did their laundry at the index household. Three further cases in Virginia were epi-linked to the index case, including two with positive cultures. All symptomatic individuals were treated with antibiotics. The pediatrician chose to decolonize the infant, and after therapy, repeat culture was negative. Two isolates underwent PFGE at the Virginia State Laboratory. The isolate from the West Virginia infant and one Virginia resident were identical. These isolates also match strains of MRSA from the West Virginia corrections and regional jail outbreak. An eighth case of MRSA in Virginia was culture-confirmed, but no epidemiological link could be established. All cases occurred in healthy young adults or children. This fourth example of an outbreak due to community-acquired MRSA in West Virginia highlights the emergence of this disease. Health departments and providers are encouraged to be vigilant during 2004.

Outbreak # 24 – Chickenpox in Hampshire County

On 11/12/2003, Hampshire County reported several cases of chickenpox from two schools. Both outbreaks were in elementary schools and affected only children. The local health department promptly investigated all cases to determine immunization status. Of the ill children, 15 (39%) of 38 were unvaccinated against chickenpox. Previously vaccinated children had milder illness. Eleven (29%) of the cases were physician-diagnosed and 27 (71%) were diagnosed by parents. Several measures were taken to prevent further spread. A letter was sent to parents advising that they immunize their children against chickenpox. A health alert was also sent to providers informing them about an increase in chickenpox cases in the community.

Outbreak # 25 – Influenza-like illness in a nursing home, Nicholas County

In November, an outbreak of influenza-like illness was reported from a nursing home in Nicholas County. Investigation identified several cases with influenza like symptoms (fever, headache, cough, body aches, vomiting). Several specimens were collected from ill residents and tested at OLS. Unfortunately these specimens were collected 3-4 days after the start of treatment with anti-virals and thus were negative. Investigation further revealed that all three health

care workers (HCW) at the nursing home were unvaccinated for influenza. One unvaccinated HCW had ILI symptoms 3-4 days prior to any other illness at the facility. Fortunately, the residents had all been vaccinated in October. The nursing home was educated regarding vaccination of HCW. The following public health interventions were instituted: isolation of symptomatic cases, antiviral medications for all residents, vaccination for the unvaccinated HCW and regular tracking of the cases with a line list.

Outbreak # 26 – Influenza A in a Nursing Home, Fayette County

Fayette County health department reported an outbreak of influenza in a nursing home on 11/18/03. Investigation identified several cases with influenza-like symptoms (fever, headache, cough, body aches, vomiting). Specimens tested at OLS/CDC confirmed the outbreak as Influenza A H3N2 with antigenic profiles common to the many recent viruses similar to the A/Fujian/411/2002 reference virus. HCWs and residents were given antiviral prophylaxis and emphasis was placed on influenza vaccination. Symptomatic cases were isolated and nursing home staff and resident were educated about hand hygiene and respiratory etiquette.

Outbreak # 27 - Influenza A in Putnam County

An infection control nurse reported several cases of influenza-like Illness in a nursing home in Putnam County. Investigation was promptly initiated to identify cases, prevent new cases and control the outbreak. Sixty (52%) of 116 residents were found to have flu like symptoms (nausea, vomiting, diarrhea, fever, cough, fever, and congestion). Only 60% of the residents had received influenza vaccination. Four specimens were positive by quick tests for flu A and influenza A H3N2 was subsequently confirmed by culture at the Office of Laboratory Services. All residents were prescribed antiviral agents and ill patients were isolated (dining areas and common room were shut down). Vaccination was offered to all health care workers and residents who had not yet received them. Nursing home staff and resident were educated about hand hygiene and respiratory etiquette.

Outbreak # 28 - Influenza A in Kanawha County

On 12/10/03, Kanawha County Health Department reported several influenza like illness outbreaks from nursing homes in the county. Four different nursing homes were impacted. Specimens from ill nursing home residents were tested at OLS and confirmed as influenza A H3N2. Control measures were recommended as outlined above.

Figure 1
Onset of Gastroenteritis in Six Hour Increments in Residents of a Nursing Home, Ohio County, 2003, N = 60

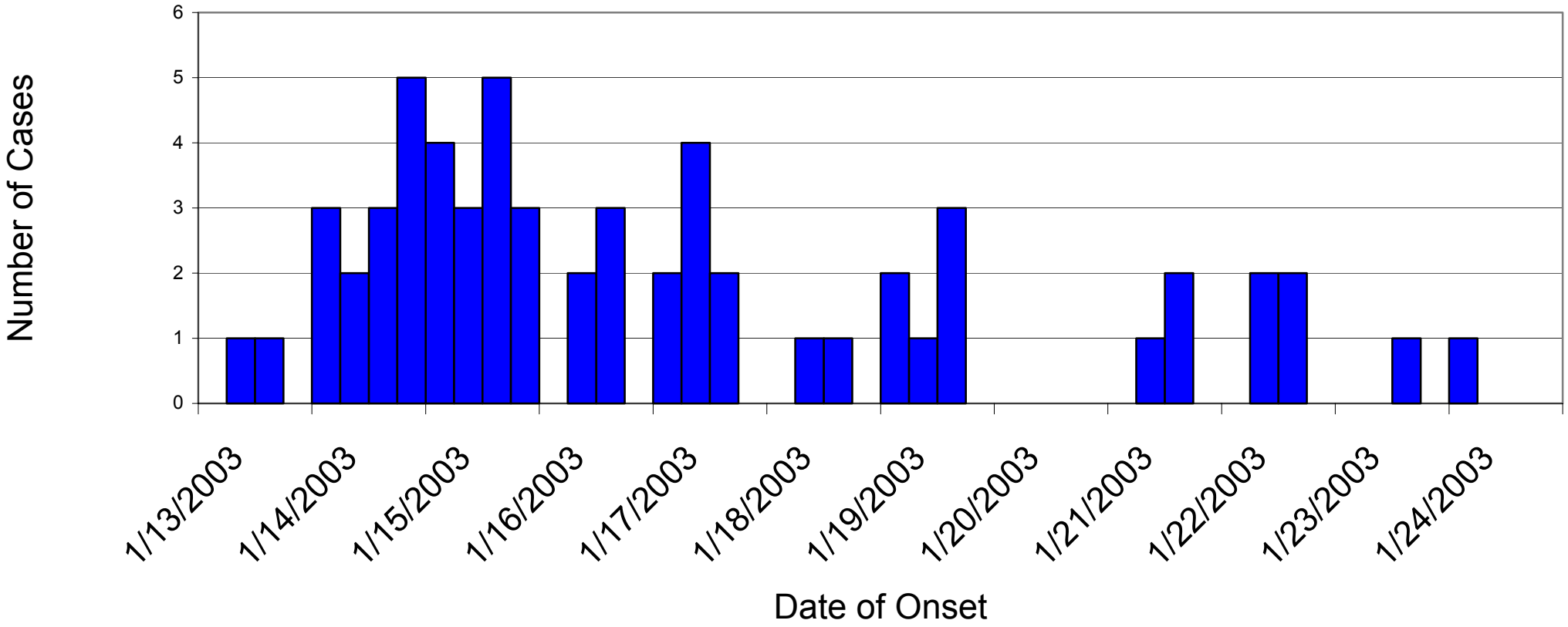

Figure 2 Reported Cases of Methicillin Resistant *Staphylococcus aureus* Skin Infections by Month, West Virginia Corrections and Regional Jails, Current Through February 3, 2004; N=48 infections in 47 inmates

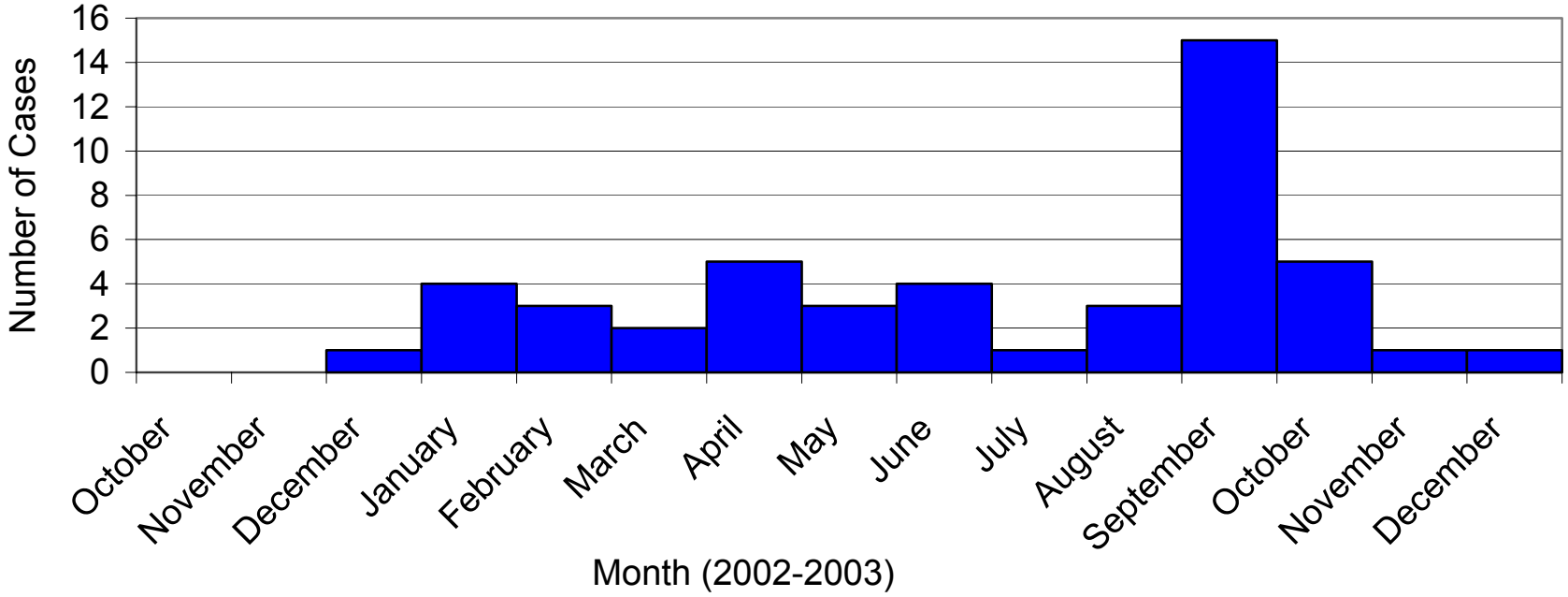

Figure 3
Date of Onset of Diarrhea in a Multi-State Outbreak of Campylobacteriosis, 2003, N=86

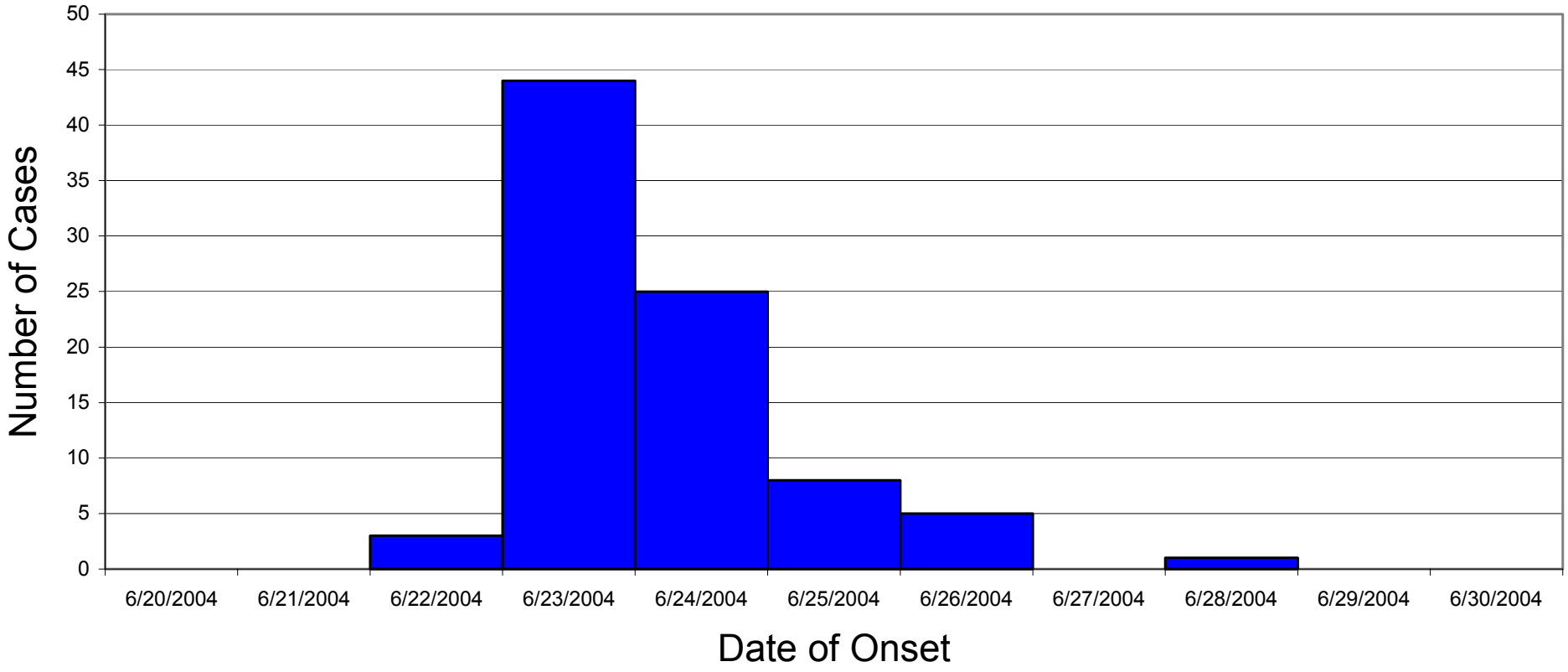

Figure 4
Onset of Illness in 6 Hour Increments Among Attendees at a Meeting, Raleigh County, 2003, N = 46