MONTANA PUBLIC HEALTH

August, 2014
Vol.9, Issue 8
www.dphhs.mt.gov/PHSD

PREVENTION OPPORTUNITIES UNDER THE BIG SKY

Detectives at Work: Outbreak Investigations in Montana, 2013

Outbreak investigations are an essential function of public health. Outbreaks occur when there is a greater than expected frequency of illnesses. Sometimes outbreaks are associated with a common source of exposure. In 2013, 69 outbreaks were reported in Montana. More than 2450 individuals became ill as part of those reported outbreaks resulting in almost 100 hospitalizations and 7 deaths. Gastroenteritis outbreaks accounted for to the largest burden of morbidity and mortality in these outbreaks. Respiratory outbreaks were frequently reported, but caused fewer illnesses compared to GI outbreaks (Table).

Gastroenteritis outbreaks

Forty-four enteric illness outbreaks were reported in 2013. Of these, 26 (59%) were caused by norovirus and five others caused by *Campylobacter, Cryptosporidium, Shigella, Legionella* and histamines; 13 (30%) were categorized as acute gastroenteritis for which a pathogen could not be confirmed. Three-quarters of norovirus isolates that were sequenced confirmed the new strain GII.4 Sidney. More than 1300 Montanans became ill in those outbreaks, 53 of them were hospitalized and six died.

The majority of gastroenteritis outbreaks (60%) occurred in long-term care facilities, assisted living centers or similar institutions. An increased risk for person-to-person transmission occurs when persons live in crowded spaces or gather at meetings. Shared community meals, densely populated living spaces, and lack of personal hygiene, such as poor hand washing techniques, exacerbate the spread of enteric illnesses. Other locations with outbreaks included child daycare settings and schools (16%) and restaurants (5%). Communitywide outbreaks, as well as outbreaks at hospitals, pools and private homes were reported as well.

Respiratory outbreaks

Sixteen respiratory outbreaks were reported in 2013. Of these 9 (56%) were influenza or influenza-like illnesses, 6 (38%) were upper respiratory infections and one was a statewide pertussis outbreak. The etiologic agent for 7 (44%) respiratory outbreaks was confirmed. At least 1000 individuals became ill as part of reported respiratory outbreaks, 43 were hospitalized and one person died.

The majority (44%) of those outbreaks occurred at schools and daycare settings, whereas 6 (38%) occurred at long-term care facilities.

Other outbreaks

Seven outbreaks of hand-foot and mouth disease (HFMD) were reported, one Group A streptococcus and one varicella outbreak occurred as well. All of those outbreaks affected schools and daycare settings and sickened 80 individuals. No one was hospitalized or died as a result of those outbreaks.

Table: Burden of illness in outbreaks, by category in Montana 2013

OUTBREAK CATEGORY	# ill	# hosp.	# died
Gastroenteritis	1335	53	6
Respiratory	1043	43	1
Other	80	0	0

Multi-state outbreaks

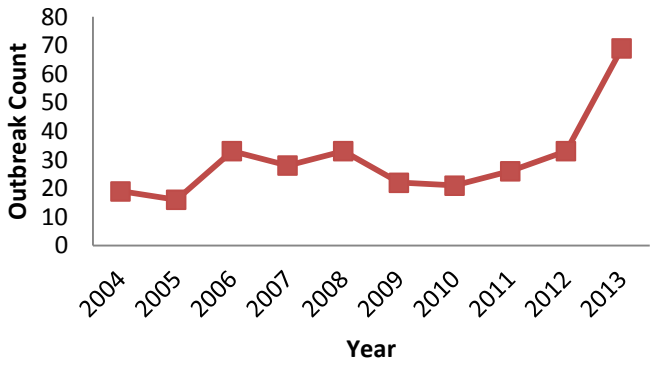
Illness in ten Montanans was linked to several multistate outbreaks. Most of these were caused by Salmonella and linked to baby chicks. A few of them were part of foodborne outbreaks at restaurants that occurred out of state. The large norovirus outbreak affecting Yellowstone National Park and Grand Teton National Park in 2013 had an impact on Montana residents as well. Several individuals became ill with norovirus during the outbreak in the parks. Laboratory testing allows linking illness to national outbreaks.

Importance of reporting and investigating

Timely reporting of reportable diseases including unusual clusters of illness is key to identifying and investigating outbreaks. The number of recognized outbreaks has increased in recent years (Figure).

Timely reporting allows prompt collection of pertinent information, acquisition of specimens for laboratory testing, and implementation of control measures.

Figure: All outbreaks reported in Montana, 2004-2013



Laboratory findings, especially for bacterial isolates, are transmitted to a national database (PulseNet) and used to identify multi-state outbreaks.

Data from outbreak investigations are used to assess the burden of disease related to certain causative agents and settings, identify groups at high risk for disease, implement and evaluate disease control measures, and provide feedback to healthcare providers and the public about disease detection and control.

Healthcare providers including laboratory workers play an essential role in outbreak detection. The public's health is best protected when the healthcare and public health systems work closely together.

Recommendations for Healthcare Providers

- Maintain a high index of suspicion for reportable enteric illnesses in patients presenting with acute diarrhea
- For patients presenting with acute diarrhea, perform a thorough clinical and epidemiological evaluation (*e.g.*, stool characteristics, travel history, ingestion of raw or undercooked meat, exposure to recreational water) as recommended by the Infectious Disease Society of America (IDSA) (http://www.idsociety.org)
- Use stool cultures and tests as recommended by IDSA (http://www.idsociety.org)
- For patients suspected of having a bacterial enteric illness, the choice of antimicrobial agents should be based on stool culture results
- Report any suspected or confirmed cases of campylobacteriosis, *E. coli* enteritis (STEC), listeriosis, salmonellosis, and shigellosis immediately to the local public health department (Administrative Rule Montana [ARM] Rule: 37.114.203)
- Report any suspected enteric illness outbreaks immediately to the local public health department (ARM: 37.114.203)

References:

1. Montana Infectious Disease Information System (MIDIS) [accessed May 14, 2014]
2. CDC. Norovirus. http://www.cdc.gov/norovirus/index.html [accessed July 29, 2014].
3. CDC. Burden of foodborne illness. http://www.cdc.gov/foodborneburden/ [accessed July 29, 2014].

1,930 copies of this public document were published at an estimated cost of $0.67 per copy, for a total cost of $1,293.10; which includes $ 284.48 for printing and $1008.62 for distribution.

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