



IDAHO DEPARTMENT OF
HEALTH & WELFARE

Disease Bulletin

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- Continuing March of Antimicrobial Resistance in *Neisseria gonorrhoeae*
- Outbreaks in Idaho: a brief history and current perspective

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Diarrhea Fells Wildland Firefighters

On August 31, 2011, the Black Canyon Fire was ignited by lightning in the southern end of the Lemhi Mountain Range on the Salmon-Challis National Forest near Howe, Idaho. An incident command post and base camp were established in Howe by United States Forest Service fire managers. Responders from Idaho, Colorado, Nevada, New Mexico, Utah, and Wyoming arrived at camp on September 1. Responders included supervisory personnel, fire-fighting hand crews, crews for fire trucks, a camp crew, employees of a caterer, attendants of a mobile shower trailer, staff for water trucks, and a person delivering and servicing portable toilets.

On September 3, the incident safety officer reported an outbreak of acute gastrointestinal illness affecting about 30 of ~180 responders. An emergency medical response involving ambulances and personnel from multiple services ensued. The Idaho State Emergency Medical Services Communications Center was notified. Emergency departments able to accept patients from the fire camp were asked to collect stool samples for submission to the Idaho Bureau of Laboratories (IBL) for bacterial culture and norovirus testing. Southeastern Idaho Public Health (SIPH) and the Idaho Department of Health and Welfare's Office of Epidemiology, Food Protection, and Immunization (OEFI) conducted an epidemiologic and environmental investigation.

Clinical care was provided at area hospitals and at an alternate site near base camp. Nine ill persons were transported to two hospitals; two persons were hospitalized. Ill persons who were not transported to a hospital were housed in a church, facilitating treatment and segregating ill from well persons to reduce the potential for person-to-person transmission in camp, consistent with infectious diseases guidelines for wildland fire incident management teams. Because of the substantial number of ill responders and the potential impact

on local medical providers, one medical center sent medical personnel to the camp to provide clinical care. They were assisted by emergency services personnel. A mobile paramedic clinic responded to cover any additional medical requirements at the camp.

Epidemiologic investigation included a cohort study and case ascertainment. The cohort study, using the responder group as the unit of analysis, implicated a local restaurant as the initial source of illness. Eight (89%) of nine responder groups who had eaten at the restaurant on September 1 had ill persons. None who had eaten elsewhere were ill. A clinical case was defined as vomiting or diarrhea of any duration on or after September 2 in a person associated with the fire camp. Forty-nine cases directly associated with the fire camp were identified, including 5 secondary cases with exposure to the restaurant (Figure). Two secondary cases were among medical responders. Overall, approximately 25% of the ~180 fire and medical responders were ill and incapacitated for at least 1 day. Stool samples were submitted to IBL from two persons treated at one medical center, and both tested positive for norovirus GII by reverse transcriptase-polymerase chain reaction. Control measures implemented at the camp, in addition to cohorting of ill persons off-site, included increased sanitation frequency for common areas and portable toilets and increased emphasis on hand hygiene and maintenance of social distance. Environmental investigation included inspection of the local restaurant by an SIPH environmental health specialist; measures were taken to mitigate food safety deficiencies.

Norovirus is a highly contagious and common cause of foodborne illness. Infection usually presents as acute illness with nausea/vomiting and nonbloody watery diarrhea with abdominal cramps. Norovirus is transmitted primarily through the fecal-oral route, either by the consumption

FIREFIGHTERS CONTINUED ON PAGE TWO

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of contaminated food or water or by direct person-to-person spread. Symptoms typically resolve in 1–3 days among otherwise healthy persons. Dehydration is the most common complication, especially among young children and older persons. Outbreaks caused by norovirus are reported annually from such venues as nursing homes, cruise ships, and recreational camps. Norovirus is a reportable disease in Idaho; cases should be reported to your public health district or to OEFI.

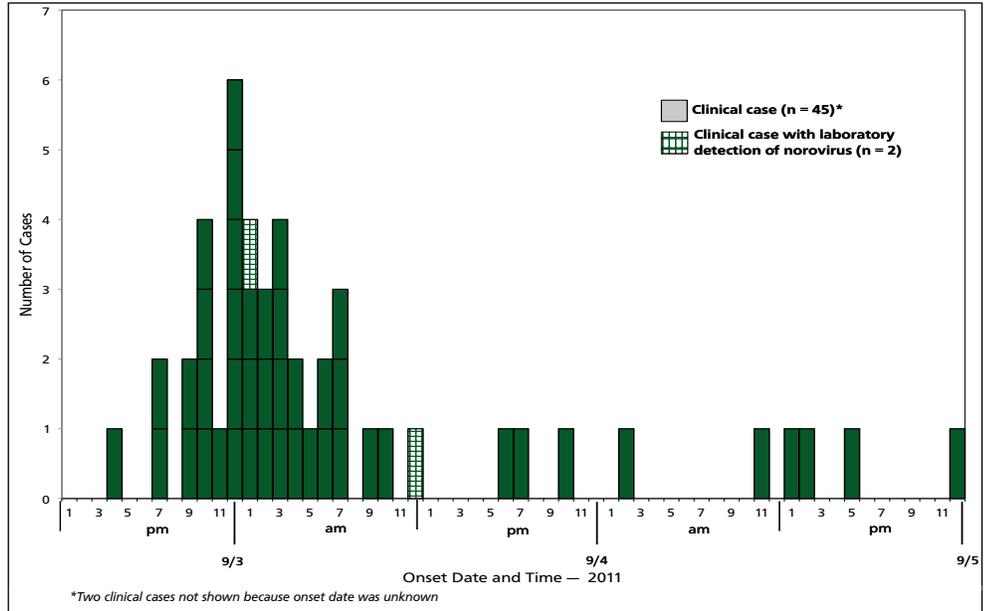
During years of high fire activity, >20 wildland fires large and complex enough to require that responders be housed at base camps can occur in Idaho. Base camps might house as many as 1,000 responders and exist for days or weeks. Medical care for certain responder injuries and illnesses is available at the camps, but since patients with conditions beyond the scope of practice for the medical providers at the camps are referred to local clinics and hospitals for care, local clinicians might be the first to identify an illness cluster. Clusters of unexplained acute illness and early stage disease symptoms are reportable within one working day (IDAPA 16.02.10.260).

Providers are encouraged to collect appropriate clinical specimens to

identify the etiology of a cluster or outbreak. Collecting stool samples from ≥5 ill persons is recommended. Patients are not charged for laboratory testing at IBL when specimens are collected at the request of Idaho public health and submitted to IBL as part of an outbreak investigation. See www.healthandwelfare.idaho.gov/Default.aspx?TabId=99 for IBL services, sampling and submission guidelines, and sample submission forms.

The American Medical Association offers the primer “Diagnosis and Management of Food-borne Illnesses” free at www.ama-assn.org/ama/pub/physician-resources/medical-science/food-borne-illnesses/diagnosis-management-foodborne.page. Continuing medical education credits related to foodborne illness are available online at www.netce.com/coursecontent.php?courseid=594 (expiration date September 30, 2012).

Figure. Epidemic curve (n = 47*), norovirus outbreak in a fire camp — Idaho, September 2011.



Continuing March of Antimicrobial Resistance in *Neisseria gonorrhoeae*

Increases in antimicrobial resistance of *Neisseria gonorrhoeae* isolates since 2008 could present clinicians with few options for curing their patients of gonorrhea infection. In the last three years, reports in the literature have shown increased resistance of *N. gonorrhoeae* to azithromycin¹ and cephalosporins^{2,3,4} raising the concern that prevalent gonorrhea could soon carry enough resistance to eliminate these drugs as recommended treatments. National sentinel surveillance data indicate the proportion of specimens with resistance to cephalosporins increased during 2000–2010 and is highest in the western United States and among men who have sex with men (MSM)⁵. These findings have become so concerning, the Centers for Disease Control and Prevention (CDC) announced in February that it’s time to “sound the alarm” over reduced gonorrhea

Box 1. Recommended treatment¹ for gonorrhea*

Ceftriaxone 250 mg IM in a single dose[†]
OR, if not an option,

Cefixime 400 mg orally in a single dose
OR

Single-dose injectable cephalosporin regimens
PLUS

Azithromycin 1 g orally in a single dose[‡]
OR

Doxycycline 100 mg orally twice daily for 7 days

*Dual antibiotic treatment should be given regardless of any chlamydia test result.
[†]Ceftriaxone is the only recommended treatment for pharyngeal infection.
[‡]Azithromycin is preferred over doxycycline for dual antibiotic treatment due to high rates of co-existing tetracycline resistance among gonococcal isolates with elevated cefixime minimum inhibitory concentrations (MICs)⁵.

antimicrobial susceptibility⁶, calling for clinicians to treat all cases of gonorrhea with the most effective regimen, be vigilant for treatment failure, and retest by culture patients with persistent or recurrent symptoms shortly after treatment without intervening exposures and submit those isolates for antimicrobial susceptibility testing.

The prevalence of increased antimicrobial resistance among gonorrhea cases in Idaho is unknown due to the lack of surveillance for resistance patterns in Idaho and the almost exclusive use of nucleic acid amplification testing (NAAT) for diagnosis. Specimens for NAAT are less invasive to collect; NAAT has the advantage of being very sensitive and specific, but currently does not detect the genetic markers for antimicrobial resistance.

Current treatment recommendations for uncomplicated gonorrhea are described



Outbreaks in Idaho: a brief history and current perspective

From 1997 through 2011, 468 probable and confirmed outbreaks were reported to the Idaho Office of Epidemiology, Food Protection, and Immunization (OEFI); an annual average of 31 outbreaks. In 2011, 62 outbreaks were reported to OEFI, the highest number ever reported in a single year. The proportion of outbreaks with an undetermined etiologic agent has decreased as the availability of methods for detecting viral agents has increased (Figure). In recent years, OEFI has received an increasing number of reports of outbreaks associated with influenza and norovirus, frequently occurring in institutions and residential facilities.

Etiologic agents: old friends and new acquaintances

Similar to previous years, the most common etiologic agent associated with outbreaks in 2011 was norovirus (34%) (Table 1) followed by *Salmonella* spp. (11%), *Bordetella pertussis* (11%), influenza (11%), and Shiga-toxin producing *Escherichia coli* (10%). Reported outbreaks of influenza rose to an all-time high in 2011, likely due to efforts by public health districts to increase awareness of rules regarding reporting of illness clusters. The number of reported pertussis outbreaks remained at a five-year high in 2011. The increase in reported pertussis outbreaks since 2009 parallel the increase in reported cases of pertussis nationwide and in Idaho.

Figure. Number of probable and confirmed outbreaks reported in Idaho by etiologic agent.

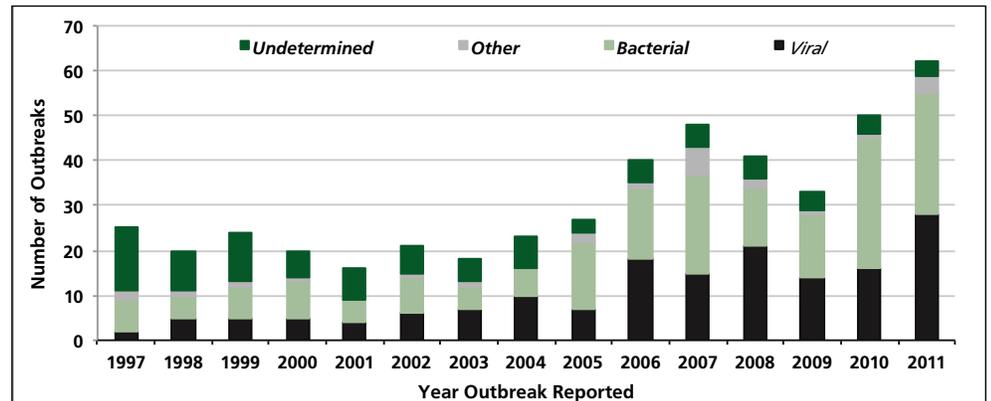


Table 1. Etiology of reported outbreaks in Idaho, 2007–2011

Etiologic Agent	2007		2008		2009		2010		2011	
	Count	%								
Norovirus	12	25.0%	18	43.9%	12	36.4%	15	30.0%	21	33.9%
<i>Salmonella</i>	9	18.8%	5	12.2%	3	9.1%	8	16.0%	7	11.3%
Pertussis	1	2.1%	1	2.4%	6	18.2%	7	14.0%	7	11.3%
STEC	6	12.5%	4	9.8%	1	3.0%	5	10.0%	6	9.7%
Gastroenteritis of unknown etiology	5	10.4%	5	12.2%	4	12.1%	3	6.0%	3	4.8%
<i>Campylobacter</i>	2	4.2%	3	7.3%	3	9.1%	6	12.0%	2	3.2%
Influenza	1	2.1%	1	2.4%	1	3.0%	0	0.0%	7	11.3%
Other*	12	25.0%	4	9.8%	3	9.1%	6	12.0%	9	14.5%
TOTAL	48		41		33		50		62	

*Other etiologies include (in descending order): *Cryptosporidium*, *Giardia*, *Shigella*, *Listeria*, HIV, West Nile virus, *Streptococcus pneumoniae*, *Neisseria gonorrhoeae*, cancer, *Bacillus cereus*, varicella, mumps, *Sarcoptes scabiei* (scabies), *Staphylococcus aureus*, Respiratory Syncytial virus, syphilis, and environmental lead.

OUTBREAKS CONTINUED ON PAGE 4

ANTIMICROBIAL CONTINUED FROM PAGE 2

in Box 1. A recommended cephalosporin regimen together with azithromycin or doxycycline provides additional coverage for potentially resistant gonorrhea. Additionally, dual antibiotic treatment enhances efficacy against pharyngeal infection when using oral cephalosporins and is effective against commonly-occurring chlamydia co-infection.

Treatment failure might be the first indicator a clinician has that antimicrobial resistant-gonorrhea is present. When treatment failure is suspected, providers should retreat the patient with 250 mg ceftriaxone intramuscularly and 2 g azithromycin orally⁵, seek consultation with an infectious disease

specialist, request culture and susceptibility testing, and report the treatment failure to public health. Although test of cure 1–3 weeks post-treatment is not recommended unless symptoms persist, retesting of all gonorrhea patients at three months post-treatment to detect potential reinfection by untreated partners is advised.

When treatment failure is suspected, the Idaho Bureau of Laboratories (IBL) will accept primary specimens for culture and gonorrhea isolates for antimicrobial susceptibility testing by CDC. Additionally, IBL performs NAAT on urine, urogenital, and pharyngeal specimens transported in Gen-Probe APTIMA collection kits for routine identification of gonorrhea.

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**ROUTINE 24-Hour
Disease Reporting Line
1.800.632.5927**

**EMERGENCY 24-Hour
Reporting Line
1.800.632.8000**

An electronic version of the Idaho Reportable Rules may be found at <http://adminrules.idaho.gov/rules/current/16/0210.pdf>.

Current and past issues are archived online at www.idb.dhw.idaho.gov.

OUTBREAKS CONTINUED FROM PAGE THREE

Venues: there's no place like home

Twenty-one (34%) of the 62 outbreaks reported in Idaho in 2011 occurred in assisted living or long-term care facilities resulting in 483 confirmed or probable illnesses. Most outbreaks occurring in these facilities were attributed to norovirus (57%) and influenza (29%) (Table 2). The next most common outbreak venues were households (31%) and restaurants (10%).

Transmission modes: who you know and what you eat matters

In 52 (84%) of the 62 outbreaks reported in 2011, the most likely mode of transmission was noted (Table 3). The most common modes of disease transmission reported were person-to-person (79%) and foodborne (21%); more than one transmission mode was reported in 9 (17%) outbreaks.

¹ Pertussis Rising in Idaho. *Idaho Disease Bulletin*. August 2010. 17(3):1-2. www.healthandwelfare.idaho.gov/LinkClick.aspx?fileticket=d-vkpoT4Lbc%3d&tabid=682&cmid=7107

Table 2. Etiology of outbreaks in long-term care and assisted living facilities and number of associated confirmed and probable cases—Idaho, 2011

Etiologic Agent	Number of	
	Outbreaks	Cases
Norovirus	12	213
Influenza	6	186
Gastroenteritis – unknown etiology	2	62
<i>Salmonella</i>	1	22
TOTAL	21	483

Table 3. Transmission mode of outbreaks reported—Idaho, 2011

Transmission Mode (n=52)	Number of Outbreaks	Percent of Outbreaks*
Person to Person	41	78.8%
Foodborne	11	21.2%
Environmental	5	9.62%
Animal	3	5.8%
Water	1	1.9%

*Percentages will sum to greater than 100% due to multiple transmission modes reported for 9 outbreaks.