

Infectious Diseases in New Mexico

2014 Annual Report

Alamosa



Midtown



Northwest Valley



Southwest Valley



Dexter



Roswell



Southeast Region



Grants



Raton



Clovis



De Baca



Anthony



Chaparral



Dona Ana Detention Center



Las Cruces Central



Sunland Park



Artesia



Carlsbad



Silver City



Guadalupe



Hildago



Hobbs



Lovington



Los Alamos



Luna

McKinley

Mora

Otero



Quay



Rio Arriba



Portales



Bloomfield



Farmington



San Miguel



Sandoval



Santa Fe



Sierra



Socorro



Taos



Torrance



Moriarty



Union



Belen



Los Lunas



With gratitude and thanks to the epidemiologists, nurses, and physicians in New Mexico Department of Health Public Health Offices throughout the State who participate in surveillance, investigation, and control of infectious diseases in New Mexico.

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Introduction

The New Mexico Department of Health (NMDOH) tracks outbreaks and conducts investigations to protect the public health of New Mexicans and for reporting to the Centers for Disease Control and Prevention (CDC). In addition to outbreaks of notifiable diseases, suspected foodborne or waterborne illness, acute illness of any type involving many people in the same geographical area, and any illness of public health significance also are investigated under the New Mexico (NM) Administrative Code 7.4.3.13.

This report highlights some of the infectious diseases occurring in NM during 2013. These chapters cover a range of topics including foodborne illness, plague, hepatitis A, giardiasis, and Human Immunodeficiency Virus (HIV). Appendix A provides a summary of notifiable disease rates in NM during 2013. Appendices B-E provide additional information, including a glossary, acronym definitions, methods, and notifiable diseases in NM for 2013.

This report has been prepared by NMDOH staff. Significant contributions from within NMDOH were provided by Infectious Disease Epidemiology Bureau (IDEB) and Public Health Division (PHD) staff. Gratitude goes to the public health nurses (PHNs), laboratorians, and regional epidemiologists whose efforts are critical to ongoing surveillance and investigation of infectious diseases in NM. The cooperation and active assistance from other organizations (e.g., healthcare providers, educational institutions) and individuals (e.g., infection preventionists) statewide also have been vitally important in conducting investigations and monitoring infectious diseases throughout the state.

Multistate Hepatitis A Outbreak: The New Mexico Experience

David Selvage, MHS, PA-C and Meg Adams-Cameron, MPH

Highlights

- In 2013 a large hepatitis A outbreak of 162 cases occurred in 10 southwestern states, including New Mexico.
- New Mexico was instrumental in first identifying the outbreak when two cases of hepatitis A were reported in the same week.
- New Mexico participated in a multistate investigation, coordinated by the Centers for Disease Control (CDC) and the Food and Drug Administration (FDA), to identify a common exposure and prevent further transmission of the disease.

Background

The hepatitis A virus is a picornavirus which is a small single stranded ribonucleic acid RNA virus. This virus causes inflammation of the liver. Hepatitis A infection can lead to asymptomatic illness, or more commonly cause a mild illness lasting only a few weeks, or a less frequently severe illness lasting months. The virus is transmitted through person-to-person contact (typically associated with poor hand hygiene) or through food or drinks contaminated by the feces of an infected person. Most cases within the United States are associated with travel to countries where the hepatitis A virus is endemic. The virus is not killed by freezing but is killed by high temperatures. It can survive within the human gastrointestinal tract and can live for months outside in the environment. The hepatitis A vaccine, introduced in 1995, has resulted in a decrease in the number of cases in the United States.

In 2013, on May 8th and May 13th, the New Mexico Department of Health (NMDOH) on-call epidemiologist received laboratory reports on two different people testing positive for the hepatitis A virus (HAV) IgM antibody---indicating they may have had a possible hepatitis A infection. This was unusual as typically there are fewer than ten cases reported annually in New Mexico. Telephone calls to the patients' healthcare providers determined that both cases had signs and symptoms of acute hepatitis. The occurrence of two temporally and geographically clustered cases prompted the initiation of an outbreak investigation. Initial interviews identified commonalities between the cases which further heightened the urgency of the investigation. This discovery led to an outbreak investigation lasting months that eventually involved ten states, the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), and the Costco Warehouse stores.

Multistate Hepatitis A Outbreak

The investigation

Initially, New Mexico cases were defined as people who had symptoms of acute hepatitis, a positive hepatitis A IgM test, and no international travel during the incubation period (15 – 50 days prior to illness onset). These first two cases were interviewed by NMDOH epidemiology staffs with a National Hypothesis Generating Questionnaire to ask about potential exposures 60 days prior to onset of jaundice. Both were men in their early 50's from Albuquerque, both reported a healthy lifestyle and eating habits, both shopped at Costco, and neither man reported any of the usual risk factors for acute hepatitis A (i.e., international travel, illegal drug use, or anal-oral sexual activity).

In addition to interviews, suspect Costco items collected from the two households were frozen shrimp, organic baby kale and an organic anti-oxidant frozen berry blend. Initially, these were held at the NMDOH Scientific Laboratory Division (SLD) until further information could be obtained regarding a suspect food product. Clinical serum specimens from the first two New Mexico cases were collected and sent to CDC for serotyping.

After initially identifying two cases with common exposures, the next step was to determine if other states were experiencing a greater number than expected of acute hepatitis A cases. A previous foodborne disease outbreak investigation in 2010 involving NMDOH had determined that some Western states shared a common distribution pattern in the Costco network. Therefore, the neighboring state health departments of Arizona (AZ), Colorado (CO), and Nevada (NV) were contacted and advised of a recent increase in New Mexico hepatitis A cases. This outreach resulted in increased vigilance and awareness and ultimately identification of additional cases meeting the case definition. In May, Colorado reported five hepatitis A cases, all Costco shoppers who also did not have any identified risk factors for acute hepatitis A infection.

After consultation with CDC, a multistate investigation including the United States Food and Drug Administration (FDA), CDC Division of Foodborne, Waterborne, and Environmental Diseases and Division of Viral Hepatitis, and the health departments from Arizona, Colorado, California (CA), New Mexico, Nevada, and Utah (UT) was initiated on May 23, 2013. On May 23rd, the Colorado Department of Public Health and Environment (CDPHE) obtained 60 day shopping records for the first two New Mexico cases and the first CO case to determine if any common food products had been consumed. CDC sent an announcement through the Epidemic Information Exchange (EPI-X) Network to alert other states about the outbreak. CDC began coordinating multi-state calls on May 28th.

(There were seven calls within the first 10 days). After multi-state conference calls began, FDA coordinated communication with Costco.

Between May 8th and August 9th, 13 additional New Mexico cases were identified and NMDOH submitted 13 clinical specimens from these cases to CDC. As more data were collected from cases in different states the case definition was revised by CDC to be a person with symptoms of acute hepatitis, positive HAV IgM, and no international travel 15-50 days prior to illness onset (incubation period). Soon the Townsend Farms “Antioxidant Berry Blend” (sold at Costco) emerged as the only common food item among all cases. Products from case homes that were unconsumed were forwarded to FDA for testing.

Results from product testing by the CDC Viral Hepatitis Laboratory revealed that the serum specimens collected from New Mexico’s outbreak-related cases were genetically identical (genotype 1B). The same strain was found in clinical specimens of 117 people in nine states: AZ, CA, CO, HI, New Hampshire (NH), NJ (New Jersey), NM, NV, and WI. This genotype is rarely seen in the Americas but circulates in North Africa and the Middle East. Genotype 1A is the predominant strain identified in cases from the United States. Historically, genotype 1B is rarely identified outside of countries in the Middle East. This fact, coupled with the common exposure to the frozen berry product, caused FDA to initiate a trace back on every component of the product. The genotype 1B was identified in a 2013 outbreak of hepatitis A virus infections in Europe linked to frozen berries and a 2012 outbreak in British Columbia related to a frozen berry blend with pomegranate seeds from Egypt. However, there was no evidence that those outbreaks were related to this United States outbreak in 2013.

Cases were considered outbreak-related if they reported eating the frozen berry blend or had a clinical specimen (typically feces) match the HAV outbreak genotype 1B. All states re-interviewed cases using a “Hepatitis A Frozen Berry focused Questionnaire” created by CDC on May 31st.

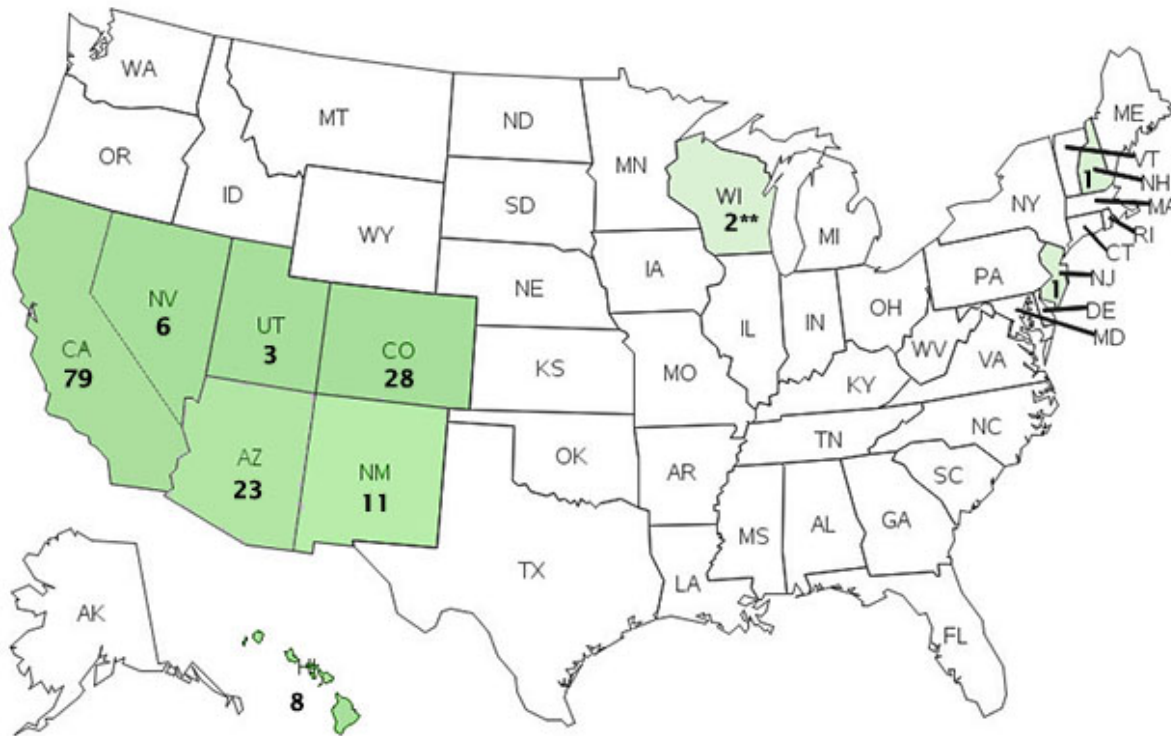
During the outbreak, there were two other acute hepatitis A cases reported to NMDOH. Neither of those patients reported consuming the implicated product, and specimens from both patients were genotype 1A. To determine if any cases had been missed, a retrospective review (back to January 2013) was conducted on previously completed investigations for suspect cases of hepatitis A in New Mexico that were determined to not meet the case definition.

New Mexico Cases

Eleven New Mexico cases of hepatitis A met the multistate outbreak case definition. Five (45%) of the outbreak cases were female. The mean age of New Mexico outbreak cases was 39 (ranging from 11 to 68 years). Although three cases (27.3%) were hospitalized, there were no deaths or severe complications among cases. None of the cases reported any commonly recognized risk factors for hepatitis A infection and none of the cases had previously been vaccinated for hepatitis A.

All Cases

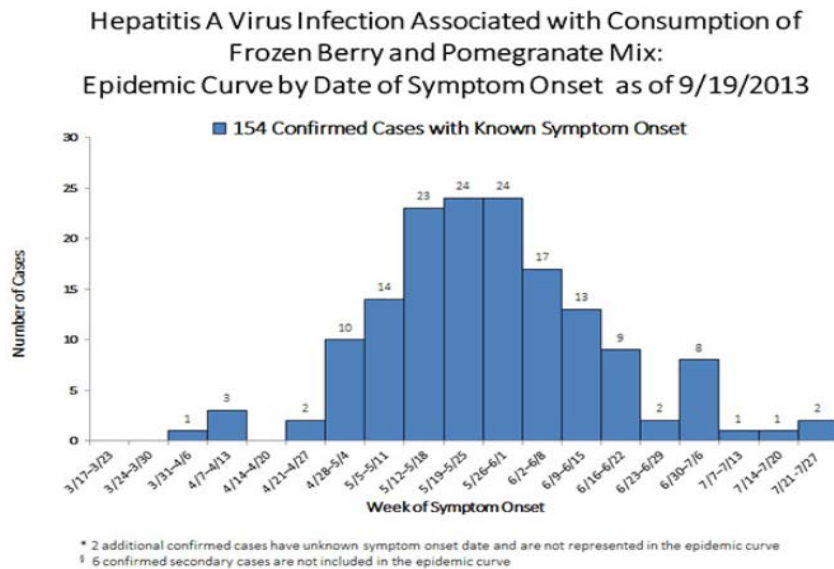
Nationally, 162 people were confirmed as hepatitis A outbreak cases. These cases came from 10 states as shown by the following map.



It is interesting to note that the Wisconsin and New Hampshire cases reported consuming the implicated berry blend product while travelling in California and Nevada, respectively. The New Jersey case was a household contact of a confirmed case from Colorado. There were six secondary cases (household contacts of confirmed cases) identified during the outbreak. All ill people, eating the berry blend product, reported purchasing it from Costco.

The characteristics of all United States cases were similar to the New Mexico cases. Fifty-five percent were women. No cases were previously vaccinated against hepatitis A. Illness onset dates ranged from March 31, 2013 to July 26, 2013. Cases ranged in age from 1 to 84 years old, with 58% of cases between 40 to 64 years old. Forty-four percent of all cases were hospitalized, and no deaths were reported.

The following graph shows the epidemic curve for hepatitis A cases associated with the outbreak.



The Public Health Response

NMDOH issued press releases on May 31st, June 5th, and June 28th to notify the public about the voluntary product recall, the possible risks associated with eating the product, early signs and symptoms of hepatitis A infection, appropriate disposal or return of any remaining product, and information about hepatitis A vaccine to prevent infections in anyone who may have been exposed. Costco records indicated that over 250,000 units of the implicated product had been shipped to stores in multiple Western states between January 2013 and late May 2013, and it was not known at the time what percentage of the units were potentially contaminated. NMDOH coordinated with the New Mexico Nurse Advice hotline and the New Mexico Poison and Drug Information Center to respond to people calling with questions regarding their potential exposure.

Anyone who had eaten the berry blend mix within two weeks was advised to receive post exposure prophylaxis (according to the Advisory Committee on Immunization Practices (ACIP) guidelines¹). NMDOH oversaw prevention measures, including statewide health alert notifications (HANs) to healthcare providers, dissemination of hepatitis A vaccine PEP recommendations (including where to find information on persons needing hepatitis A vaccine, or immunoglobulin, the point of contact in each NMDOH health region, and the inventory of hepatitis A vaccine doses available in each regional office), provision of hepatitis A vaccination clinics, and the purchase and shipment of additional hepatitis A vaccine doses as necessary.

The New Mexico Environment Department (NMED) coordinated product recall with the Albuquerque Environmental Health Department.

By combining information gained from FDA's traceback and traceforward investigations and the CDC's epidemiological investigation, FDA and CDC determined that the most likely vehicle for the hepatitis A virus outbreak was a common shipment of pomegranate arils (flesh surrounding the seed) from a single company in Turkey. These pomegranate



arils were used by Townsend Farms to make the Organic Antioxidant Berry Blends.

This conclusion resulted in FDA detaining shipments of pomegranate arils from the company prior to import into the US. FDA also worked with the firms that distributed pomegranate seeds from this shipment from Turkey to help ensure that all recipients of these seeds were notified.

Conclusions

This multistate outbreak was the largest hepatitis A outbreak in the US since 2003 and the first outbreak in the US to be caused by genotype 1B. NMDOH was the first health department to identify cases, the first health department to initiate contact with CDC and surrounding states, and the first health agency to submit clinical specimens to CDC for testing.

This investigation highlighted the ability of NMDOH to detect significant infectious disease clusters, even with small numbers of cases. Given the relatively small population size of New Mexico, and the centralized structure of infectious disease surveillance in the state,

New Mexico maintains a relative advantage over states with decentralized surveillance systems and multiple local health jurisdictions. For example, one large Western state health department that was part of this outbreak receives reports of acute hepatitis A cases from some local health jurisdictions only once every several months. In general, NMDOH does not experience systematic reporting delays and consequently may be in a better position to identify rapidly infectious disease outbreaks. Despite the fact that retrospective analysis has determined the vast majority of HAV IgM results are false positives, NMDOH investigates all HAV IgM results it receives. This outbreak highlights the importance of this practice and the importance of maintaining vigilance, especially in the era of low hepatitis A virus infection incidence.

This outbreak also demonstrated the importance of public health, food regulatory agencies, and industry working together to prevent further transmission of infectious agents. The combined efforts of state and local health departments, CDC, FDA and Costco prevented additional cases and hospitalizations. Early communication with CDC when events were first unfolding facilitated prompt testing of clinical specimens and relatively rapid identification of the outbreak strain. This information was vitally important in linking cases from multiple states and linking the outbreak to the pomegranate arils from Turkey. Even before the FDA results were available, the epidemiologic data prompted public health action and recall of the product. As soon as this occurred, a decline in cases was observed.

Finally, this outbreak demonstrates the importance of vaccination for preventing selected diseases. Hepatitis A is a vaccine preventable disease. New Mexico currently requires hepatitis A vaccination for childcare and pre-school age children. None of the New Mexico cases in this outbreak had been vaccinated.

Acknowledgement

The authors wish to thank Julianna Ferreira, New Mexico Department of Health, who contributed to this investigation.

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Giardiasis Cluster among Men who have Sex with Men (MSM)

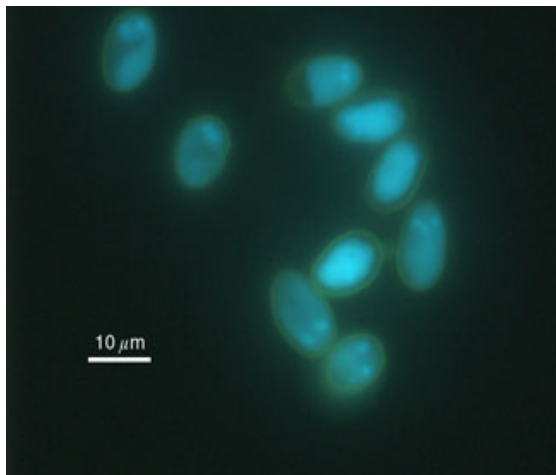
Julianna Ferreira, RN, MSN, MPH

Highlights

- Giardiasis is a parasitic intestinal disease infecting humans, domestic and wild animals.
- In 2013, just over 100 giardiasis cases occurred in New Mexico, with half in Bernalillo County.
- A small cluster of giardiasis in men who have sex with men (MSM) in Bernalillo County was identified and investigated in 2013.
- Additional surveillance and education of healthcare providers and the MSM community are important to prevent giardia transmission among MSM.

Background

Giardiasis is a parasitic intestinal disease caused by a flagellated protozoan parasite (*Giardia intestinalis*). The following photograph shows a fluorescence image of Giardia cysts.



In addition to humans, this parasite infects domestic animals (including dogs, cats, and cattle), and wild animals (e.g., deer, beavers, and other wild animals)^{1,12}. Giardiasis occurs as an asymptomatic infection in approximately 60% of infected individuals. It also may present as self-limited diarrhea (typically with mucous but no blood) or it may result in chronic intermittent symptoms.

Photo by H.D.A. Lindquist, United States Environmental Protection Agency

Symptoms may occur 1-4 weeks after exposure but usually occur within ten days. Other symptoms include dull epigastric pain, flatulence and foul-smelling stools, weight loss, bloating, and stomach cramps.

This disease is diagnosed by direct examination of the stool to identify the parasites or a stool antigen test. Giardia is treatable using several anti-parasitic agents although immunocompromised patients may require prolonged treatment. Good hand hygiene and avoiding drinking contaminated water or food may prevent giardia infection.

The disease is transmitted primarily person to person, often by poor hand washing practices, or through ingesting contaminated water or food. Infection can occur from drinking untreated surface water (e.g., streams) that are contaminated with giardia parasites.

Giardia is a notifiable condition in New Mexico and all cases are investigated by New Mexico Department of Health (NMDOH) personnel. A cluster of giardia cases was identified in Bernalillo County during June 2013. Although, the current investigation form used to investigate these cases does not specifically address sexual transmission, subsequent investigation found all three men reported having sex with men during June 2013. An investigation was initiated to identify additional cases and determine if there was a common exposure.

According to a review of the literature, giardiasis is prevalent in MSM communities nationally, although in New Mexico this has not previously been identified. It is hypothesized that men who have sex with men are at higher risk for contact with fecal material during sexual activity than other populations, and are at risk for fecal-oral transmission of giardia.

Giardiasis in MSM in New Mexico

A retrospective review of male giardia cases in the New Mexico Electronic Disease Surveillance System (NM-EDSS) with illness onset from January 1, 2013 through June 30, 2013 was conducted to determine if any other male cases had reported having sex with other men. There were 50 cases of giardiasis investigated in Bernalillo County in 2013, six of whom (since June 2013) were identified as MSM. Three original cases were identified as HIV positive.

Known giardia cases from the original cluster were cross-referenced with the Patient Reporting Investigating Surveillance Manager (PRISM) to determine their Human Immunodeficiency Virus (HIV) status. This information would be important to determine whether giardiasis is more prevalent among MSM who are HIV positive, and whether HIV-positive cases would be at higher risk for adverse health outcomes.

Expanded interviews were implemented to identify any new giardia cases among MSM in Bernalillo County. New giardia cases in men residing in Bernalillo County who were investigated by NMDOH were specifically asked during their interview about their sexual orientation and whether they had recently been sexually active with men.

NM-EDSS and the New Mexico Indicator Based Information System (NM IBIS) were used to determine giardia incidence in Bernalillo County and New Mexico during 2013 as compared to previous years.

Local educators and clinicians within the MSM community in Bernalillo County were interviewed to determine their level of knowledge and current practices regarding health issues associated with MSM.

A review of the literature was conducted to ascertain whether giardiasis was a known problem in the MSM community nationally.

The following table shows that the average number of giardia cases in Bernalillo County and New Mexico did not vary significantly over the past several years.

Year	Bernalillo County	New Mexico
2013	50	101
2012	51	100
2011	35	113

No additional MSM-associated cases were identified in the retrospective review of male giardia cases investigated by NMDOH during the first six months of 2013. However, three additional cases of giardiasis who were MSM were identified through enhanced investigation of cases in July through October, 2013. There were no previous giardiasis cases in 2013 that were identified retrospectively as MSM.

Review of Current Knowledge and Practices

Healthcare providers at the University of New Mexico Infectious Disease Clinic were asked about their knowledge about giardiasis in MSM and HIV-positive individuals. Providers indicated that giardiasis was seen periodically; they felt comfortable evaluating and treating patients, and did not need additional information. The majority of their HIV-positive clients have undetectable viral loads and, therefore, are not significantly immunocompromised. They felt that giardiasis did not pose significant health problems for their patients compared to an HIV-positive individual who had not been diagnosed or started on appropriate antiretroviral therapy. One nurse practitioner expressed concern that giardiasis can lead to other gastrointestinal problems such as irritable bowel

syndrome or lactose intolerance, and hypothesized that recurrent treatment of giardiasis could be leading to antibiotic resistance in one of her patients.

The NMDOH Disease Prevention Specialists (DPS) in Bernalillo County were asked about their knowledge of giardiasis in the MSM population. Many of them had not considered giardiasis to be a sexually transmitted disease (STD), and expressed an interest in having fact sheets for themselves as well as to distribute to clients.

Regional nurse epidemiologists at NMDOH had not considered giardiasis to be an STD and were very interested in learning more about the issue. They expressed an interest in having sexual risk factors addressed on enteric case investigation forms and in infectious disease investigation guidelines. Education for sexual risk reduction also was cited as an important update to the investigation form, as none of the nurse epidemiologists were comfortable asking about sexual history without guidance for the interview.

MSM with giardiasis who were interviewed had varying levels of knowledge about the risk of contracting giardia while engaging in sexual activity. One man acknowledged that he contracts giardiasis more than once every year, recognizes the symptoms, and sees the infection as a normal hazard of his sexual activity. Other cases verbalized an appreciation for the education provided during the interview, and stated an intent to follow-up with current sexual partners regarding testing, treatment, and risk reduction practices.

Literature Review on Sexual Orientation as a Risk Factor for Giardia Infection

Although giardiasis and other enteric diseases are associated with fecal-oral transmission, they are also increasingly being recognized as sexually transmitted diseases^{9,14,16}. Sexual transmission of *Giardia* is seen primarily in men who have sex with men (MSM)⁸.

In the urban population in the United States (US), the prevalence of giardia infections is 1-2%¹⁵. Another study estimates the prevalence to be 2-7% in developed countries⁵. However, the prevalence of giardia infections in MSM in the US is estimated at 4-18%^{6,17}. The prevalence also varies depending on the HIV status of MSM.

A study focusing on enteric diseases in Acquired Immunodeficiency Syndrome (AIDS) patients in Los Angeles County, California found that the odds of giardia infection was over 14 times greater for homosexuals compared with heterosexuals. This study found 18% of people with HIV infection also had giardia infections and 4% had cryptosporidiosis infection⁴. Another study evaluated giardia infection prevalence in MSM (with and without symptoms). This research found 12% of asymptomatic MSM had an enteric pathogen

(*C. trachomatis*, *Herpes Simplex Virus*, *Giardia lamblia*, *Campylobacter jejuni*, *E. histolytica*, *Shigella flexneri*, *N. gonorrhoea*) and 2.1% had giardia⁷. For symptomatic MSM, 63% had an enteric pathogen infection and 14% had giardiasis⁷.

Giardiasis may be considered to be an opportunistic infection in people living with HIV. The prevalence is high among those with HIV infections^{2,7}. For HIV-positive MSM, 54.9% with diarrhea had enteric pathogen infections and 4.4% had giardiasis. For asymptomatic HIV-positive MSM, the prevalence was 39.3% with any enteric infection and 5.3% with giardia infection⁷.

One study focused on specific sexual activities (e.g., insertive or receptive anal sex, number of sex partners, oral sex) as risk factors for enteric infections in MSM. This study found no statistical association between these activities and giardiasis¹⁰.

Although the majority of people infected with *Giardia* have diarrhea, one study found 15-20% of those infected are asymptomatic¹³. This makes detection less likely and increases the possibility of asymptomatic carriers infecting others. *Giardia* infections also may be undiagnosed due to healthcare providers being unfamiliar with the signs and symptoms caused by this pathogen¹¹. Another consequence of delayed diagnosis is delay in treatment and potentially unnecessary invasive testing. Research supports screening MSM who are HIV-positive for enteric pathogens, including giardia³.

Conclusions

Nationally, giardiasis has been documented in MSM populations. Because as many as 20% of individuals infected with giardiasis are asymptomatic it is difficult to determine the magnitude of occurrence of giardiasis.

There was not an increased number of reported giardiasis cases in New Mexico or Bernalillo County in 2013. It is unknown whether the number of MSM who contracted giardiasis has increased. There is a need for surveillance to determine the incidence of giardiasis in Bernalillo County and New Mexico within the MSM population. It does not appear that HIV status is relevant to the surveillance effort, since known HIV-positive people are usually undergoing treatment and are not considered immunocompromised or at increased risk for sequelae from giardiasis.

This investigation showed that local infectious disease healthcare providers acknowledge the risk of contracting giardiasis as a sexually transmitted disease. It also showed that patients, disease prevention specialists, and nurse epidemiologists need additional education regarding the risk of giardia infection in MSM. Additional surveillance and

education of providers as well as the MSM community are necessary to better understand the scope of the problem and prevent additional cases.

Epidemiology interviews of giardiasis cases in New Mexico should include questions regarding sexual risk factors. If a case has risk factors for future exposures, education should include harm reduction techniques as well as the potential risk to sex partners and the need for treatment of cases and their partners.

Providers and health promotion specialists seeing MSM clients in New Mexico should be alerted to the possibility that patients could have giardiasis to guide testing, education, and treatment. Fact sheets would be useful not only to guide epidemiology interviews, but also to assist providers and educators.

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Human Immunodeficiency Virus Surveillance in New Mexico: 2013 Update

Jeff Lauritsen, RN, MPH

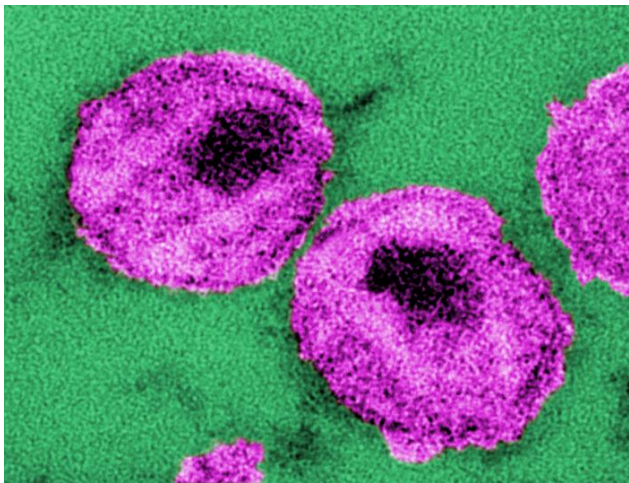
Highlights

- Human Immunodeficiency Virus (HIV) affects the immune system and infection may lead to progressive failure of the immune system.
- HIV surveillance requires a lifelong approach for those infected with the virus.
- The rate of newly diagnosed individuals in 2013 in New Mexico was 8.4/100,000 population.
- Improved treatments have resulted in improved prognosis for persons with HIV.

Background

HIV (human immunodeficiency virus) is a lentivirus in the Retroviridae family. These types of viruses are characterized by a long incubation period. HIV affects CD4 cells (T cells) that are part of the immune system. HIV infection may result in progressive failure of the immune system, resulting in Acquired Immunodeficiency Syndrome (AIDS).

Thin-section Transmission Micrograph (TEM) of HIV virions



HIV surveillance is based on a chronic disease surveillance system model with de-duplication occurring across all jurisdictions within the United States (US). Therefore, case counts and rates may change over time. HIV surveillance systems identify newly diagnosed HIV cases and capture data over the lifespan of the individual infected with HIV. This presents unique challenges when utilizing these longitudinal HIV data over time.

HIV in New Mexico

The New Mexico Department of Health (NMDOH) HIV Epidemiology Program has conducted confidential, name-based surveillance for AIDS since 1981 and confidential, name-based HIV reporting since 1998. Mandated reporting includes confirmed positive

HIV antibody tests (screening test plus confirmatory test), all tests for HIV RNA or HIV cDNA (viral load tests), all CD4 lymphocyte tests (count and percent), all HIV genotype tests, all positive HIV cultures, all tests to detect HIV proteins, and opportunistic infections as well as any other test or condition possibly indicative of HIV or AIDS. Reporting of HIV/AIDS cases to NMDOH is done through active surveillance methods. Reporters include clinical laboratories, medical and social services providers, infection preventionists, and local NMDOH public health staff. Since 1981, a cumulative total of over 7,400 persons with HIV or AIDS have been reported in the state. This number includes those who were diagnosed in other states and subsequently moved to New Mexico.

Active surveillance methods are used to complete new case reports, gather risk information, and improve data quality. The NMDOH HIV Epidemiology Program conducts routine medical record reviews at different agencies including HIV/AIDS service organizations, the Indian Health Service, the Veterans' Administration, and public and private hospitals. All data of new cases identified in New Mexico, or identified in another state and reported to New Mexico, are managed in by NMDOH Program staff in the enhanced HIV/AIDS Reporting System (eHARS) developed by the Centers for Disease Control and Prevention (CDC) and utilized throughout the United States.

The table at the end of this report summarizes 2013 HIV surveillance data for New Mexico. Case ascertainment was based on the 2008 revised HIV case definition for adults and adolescents age ≥ 13 years¹. HIV incidence rates in 2013 varied across the state, from a low of 3.0 per 100,000 population in rural southeastern New Mexico to a high of 11.6 per 100,000 population in the northeastern part of the state. Most new infections occurred among males (87%). Men who have sex with men (MSM) accounted for 63% of newly diagnosed infections. Over half of new HIV cases in 2013 occurred among Hispanics.

For the first time since 2009, there was an increase in the number of reported newly diagnosed cases of HIV in New Mexico. In comparing 2013 HIV summary data to 2012 summary data, there was an increase of 26 cases, which represents a 22% change. Ongoing national deduplication of cases in the US, including New Mexico, makes these data subject to changes in the future. The largest increase occurred in the number of newly diagnosed HIV cases in persons aged 13 to 24 years. In 2012 there were 23 new cases in this age group compared to 32 cases in 2013.

Conclusions

Ongoing surveillance, analysis of the data, and provision of conclusions derived from those data to stakeholders in New Mexico and nationally will continue to inform program

and policy development related to prevention and treatment of HIV infection based on the evolving epidemiology of this infection.

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HIV Infection and AIDS among Adults and Adolescents, New Mexico 2013

	Newly Diagnosed in 2013*			Persons Living with HIV or AIDS in New Mexico								
	N	%	Rate†	HIV			AIDS			Total		
				N	%	Rate†	N	%	Rate†	N	%	Rate†
Total	145	100	8.4	1265	100	73.6	1861	100	108.2	3126	100	181.8
Sex at birth												
Male	126	87%	14.9	1,077	85%	127.7	1,663	89%	197.2	2,740	88%	325.0
Female	19	13%	2.2	188	15%	21.5	198	11%	22.6	386	12%	44.1
Race/Ethnicity												
American Indian/Alaska Native	20	14%	14.0	106	8%	74.3	144	8%	100.9	250	8%	175.2
Asian/Pacific Islander	1	1%	0	8	1%	29.9	11	1%	41.2	19	1%	71.1
Black	7	5%	20.2	100	8%	288.2	98	5%	282.5	198	6%	570.7
Hispanic	80	55%	10.6	595	47%	78.9	810	44%	107.4	1405	45%	186.2
White	36	25%	4.7	443	35%	58.2	766	41%	100.7	1209	39%	158.9
Multi-race	1	1%	CNC	13	1%	CNC	32	2%	CNC	45	1%	CNC
Age‡												
13-24	32	22%	9.1	71	6%	20.2	17	1%	4.8	88	3%	25.1
25-34	44	30%	16.3	279	22%	103.2	136	7%	50.3	415	13%	153.5
35-44	32	22%	12.8	311	25%	124.3	350	19%	139.9	661	21%	264.2
45-54	23	16%	8.0	358	28%	124.2	736	40%	255.3	1094	35%	379.5
55+	14	10%	2.5	246	19%	44.0	622	33%	111.1	868	28%	156.2
Region§												
Northwest	17	12%	9.4	115	9%	63.7	155	8%	85.8	270	9%	149.5
Northeast	29	20%	11.6	232	18%	92.5	378	20%	150.8	610	20%	243.3
Metro	68	47%	9.1	603	48%	80.7	959	52%	128.4	1,562	50%	209.1
Southeast	7	5%	3.0	63	5%	26.9	110	6%	47.0	173	6%	73.9
Southwest	24	17%	7.8	252	20%	82.1	259	14%	84.4	511	16%	166.6
Transmission Category												
Men who have sex with men (MSM)	91	63%	CNC	744	59%	CNC	1172	63%	CNC	1916	61%	CNC
Intravenous Drug Use (IDU)	9	6%	CNC	93	7%	CNC	165	9%	CNC	258	8%	CNC
MSM/IDU	14	10%	CNC	91	7%	CNC	191	10%	CNC	282	9%	CNC
High-Risk-Heterosexual	14	10%	CNC	154	12%	CNC	180	10%	CNC	334	11%	CNC
Other	0	0%	CNC	2	0%	CNC	10	1%	CNC	12	0%	CNC
Perinatal Exposure	0	0%	CNC	4	0%	CNC	8	0%	CNC	12	0%	CNC
No Risk Identified	17	12%	CNC	177	14%	CNC	135	7%	CNC	312	10%	CNC

Footnotes

*All people who were initially diagnosed while residing in New Mexico during 2013 - age 13 and older

†Rates per 100,000 based on Bureau of Business and Economic Research Geospatial and Population Studies Program population estimates for 2013.

‡For new diagnoses, age at time of diagnosis. For persons living with HIV or AIDS, current age.

§For new diagnoses, residence at time of diagnosis. For persons living with HIV or AIDS, current residence.

CNC means Can Not Calculate - population data is unavailable

Red - Indicates greater than 20% change from previous year.

Cautions

N < 20: Rate calculations for small numbers may be statistically unreliable. Fluctuations in the associated rates

Region: New Mexico Department of Health constructed new health regions in 2012. Regional comparison to previous years is not recommended. A map depicting New Mexico's Health Regions is available for download from the New Mexico Department of Health at <http://ibis.health.state.nm.us/image/HealthRegions2012.png>.

Plague Update for North-Central New Mexico

Sandra D Melman, MS, Elizabeth S VinHatton, BS, Paul J Ettestad, DVM, MS

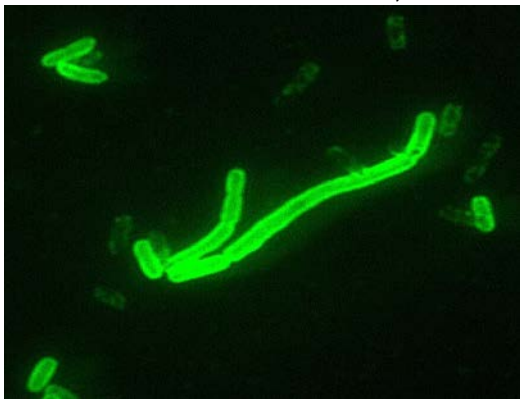
Highlights

- Human plague infections are typically caused by a flea bite which transmits the bacteria to the human host.
- In 2013, the majority of dog and cat plague cases and all four human cases in New Mexico occurred in the East Mountain area near Albuquerque.
- Prompt diagnosis and appropriate antimicrobial treatment are crucial to decrease illness severity and prevent death in infected people and animals.

Background

Plague is a zoonotic disease caused by the bacterium *Yersinia pestis*, a gram-negative coccobacillus⁵. Active enzootic foci exist in wild rodents (the natural reservoir) and flea populations in many regions of the world, including the western United States. Plague was first introduced to North America around 1899-1900 by rat infested ships coming from Asia to San Francisco^{5,10}.

Since 1970, most human plague cases in the United States occur in the Southwest, with 89% of cases from Arizona, California, Colorado, and New Mexico. New Mexico alone accounts for 53% of cases. The prevalence of plague in this region is believed to be due to a high diversity of susceptible rodent and flea species coupled with mild weather. Hot, dry early summers followed by monsoonal rains and milder temperatures later in the season favor both maturation and vector efficiency of fleas and dispersal and transmission of plague to pets and humans^{9,10}.



Yersinia pestis: Direct Fluorescent Antibody Stain, Centers for Disease Control and Prevention.

Human infection is most commonly acquired through the bites of infected fleas and has an incubation period of 1–7 days. Plague can also be contracted from handling infected animals, especially rodents (e.g., prairie dogs), rabbits and domestic cats, or through close contact with patients (or pets) with pneumonic plague⁴. Person-to-person transmission is extremely rare and has not been documented in the United States since 1924⁸.



Domestic cats and dogs infected with plague may develop signs including lethargy, anorexia, and fever, and often present with lymphadenopathy with purulent abscesses. These signs are usually transient and mild to moderate in dogs, whereas they can be severe and fatal in cats^{2,9}. Given the severity of illness in cats, humans are at higher risk of becoming infected after handling a sick cat, via direct contact with infected material from the cat, or by respiratory exposure to a cat with pneumonic plague. However, dogs can pose a risk to humans as they can serve as mechanical vectors for plague infected fleas^{6,9}.

The clinical forms of plague in humans are bubonic, septicemic and pneumonic. Signs and symptoms include high fever, headache, chills, malaise and weakness. Bubonic plague is characterized by the presence of an enlarged, tender lymph node (bubo). Septicemic and pneumonic plague progress rapidly and are usually fatal without prompt antibiotic treatment.

When plague in humans is caused by the bite of an infected flea, the illness usually presents as bubonic. The site of the flea bite determines which lymph node/s will become affected. A bite in the lower extremities will most likely result in inguinal or femoral lymphadenopathy whereas a bite in the upper extremities will more likely result in axillary lymphadenopathy. Occasionally, a person with plague will present with cervical lymphadenopathy. In New Mexico, these cases have been traced back to flea bites to the upper torso or head from fleas brought home by a family pet that slept in bed with the infected person.



Flea infected with *Y. pestis* (dark mass). National Institute of Allergies and Infectious Diseases.

Plague in New Mexico

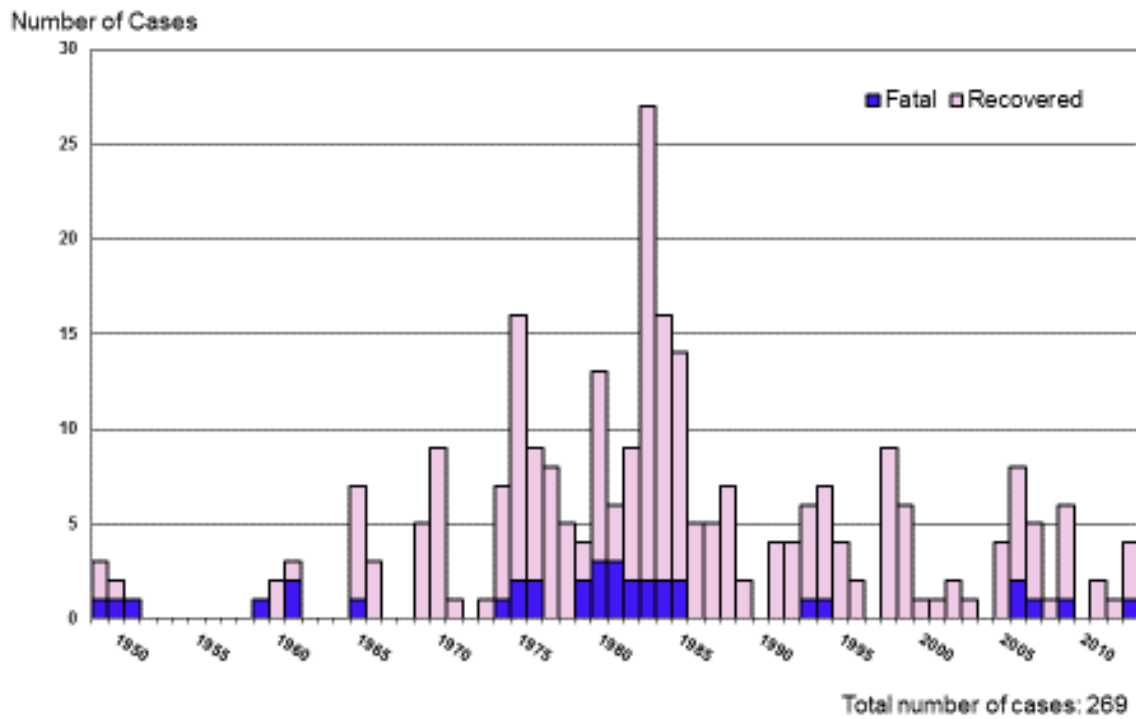
The New Mexico Department of Health (NMDOH) has a plague surveillance program to detect increased human risk associated with plague epizootics in rodents and cases of plague in domestic cats and dogs. All domestic animals, wildlife, and humans suspected to have plague infection are tested at the NMDOH Scientific Laboratory Division (SLD). All positive tests are investigated by the Zoonoses Team at NMDOH.

Case investigation activities include collecting and testing dead rodents reported by the public, interviewing veterinary staff and pet owners (if a potential exposure to plague has occurred),

following up on diagnostic specimens (serology and tissue samples) submitted by veterinarians from suspect dog and cat plague cases, and consultation and testing of human suspect cases. After each investigation, information on plague risks and prevention is provided to the neighbors living in the same area as the plague case. This includes delivering educational brochures door to door, presenting at community meetings and to local entities, including fire departments, family health clinics, schools, and neighborhood associations¹.

The number of human plague cases cycles up and down approximately every 5 to 7 years in New Mexico (as shown in Figure 1) due to local, site-specific climatic effects¹⁰. Late winter precipitation and cool summertime temperatures lead to increased reproduction and survival rates among rodent populations and the fleas that they carry³. New Mexico experienced a surge in cases in the early 1980s following above average precipitation from 1981-1986. In fact, 1983 was the year with the highest number of human cases (27) in a calendar year ever recorded in New Mexico, following a very intense El Niño event of 1982-1983¹⁰.

Figure 1. Number of human plague cases, New Mexico, 1949-2013

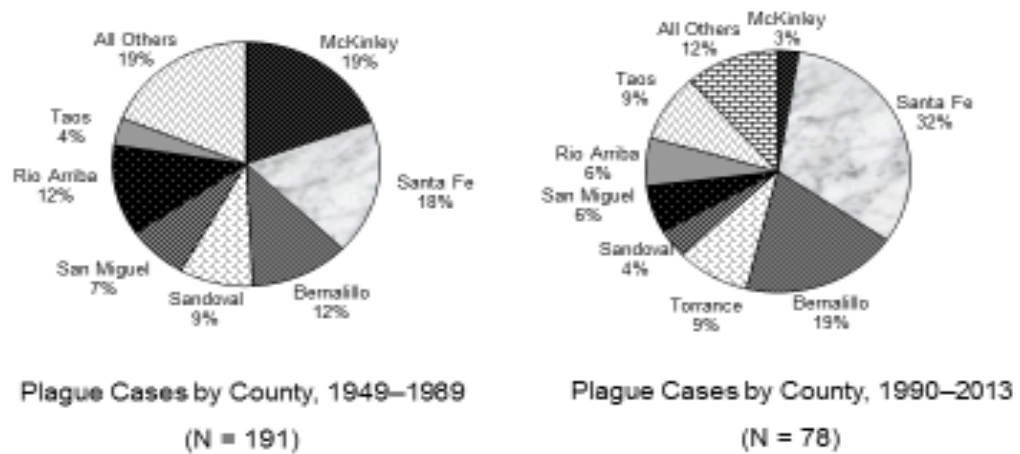


The geographic distribution of human plague cases is strongly associated with pinyon-juniper woodland habitat at elevations between 5,000 and 7,500 feet. Increasing human encroachment

into this habitat, especially in northcentral New Mexico, has led to a greater number of New Mexico residents at risk for plague (Figure 2).

Between 1990 and 2011, the populations of Santa Fe and Bernalillo counties increased 38% and 46%, respectively¹¹. The greatest proportion of plague cases occurs in the northcentral portion of the state, particularly in the area east of Albuquerque and the Sandia Mountains known locally as the East Mountain area and encompassing parts of Bernalillo, Santa Fe, and Torrance counties.

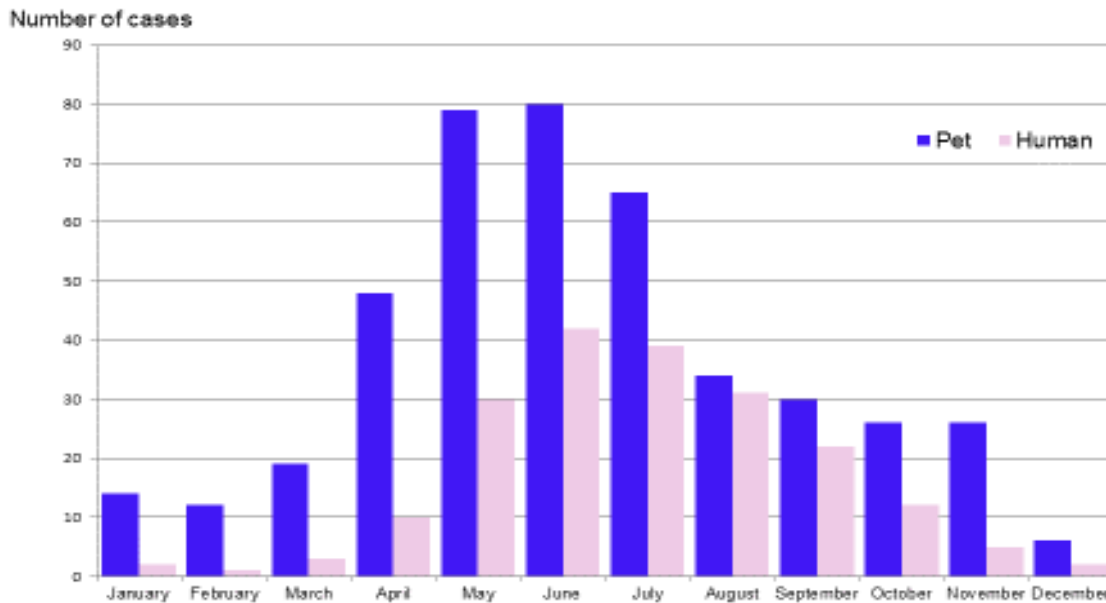
Figure 2. Human Plague Case Distribution by County, New Mexico



In 2013, seven of the eight cases of plague in dogs and cats and all four human cases in New Mexico occurred in the East Mountain area.

Plague cases in New Mexico, both in domestic animals and humans, can appear at any time during the year but the majority of cases occur in the warmer months of spring and summer with a peak of cases from May through July. Both pets and humans are more active doing outdoor activities during those months, increasing the chances of exposure to wild rodents and their fleas (Figure 3).

Figure 3. Distribution of human and pet plague cases by month of onset New Mexico. Human cases (1949 to 2013). Pet cases (2004 to 2013).



Pet cases often occur earlier than their human cases, and pets presenting with lethargy, anorexia and fever of unknown origin in enzootic areas, especially in animals allowed to roam and hunt, should be considered plague suspects. These pet cases can serve as sentinels for human cases. In fact, a study on dog-associated risk factors for human plague reported that individuals with plague were more likely to report a sick pet dog than matched controls, as well as more likely to have slept in the same bed as a pet dog during the two weeks before the onset of illness than their well family members⁶. Caring for, examining or burying sick cats have also been recognized as important risk factors for human plague cases⁵.

Given the increased risk for plague associated with pets in enzootic areas, pet owners should be advised to prevent their pets from roaming and hunting to reduce the chance that they will bring home infected fleas. They also should consult with their veterinarian on an appropriate flea control product for their pet and avoid sleeping in the same bed, to minimize flea transfer⁶.

Public health prevention strategies employed by NMDOH focus on physician and veterinary education and public education. Education is provided on eliminating or reducing rodent habitat around the home, signs and symptoms of plague so that infected people will seek medical care early in the course of their illness, encouraging people to control hunting behavior in pets in endemic areas, and using appropriate flea control products as recommended by a veterinarian.

Conclusions

Medical practitioners in the south western United States should be aware of atypical presentations of plague, particularly when coupled with a flea exposure or owners of domestic pets that are allowed to hunt. Prompt diagnosis and appropriate antimicrobial treatment are crucial to decrease illness severity and prevent death. In several instances, atypical clinical presentations have been confused with other diseases such as streptococcal pharyngitis, and some plague infected individuals have tested positive on a rapid-antigen detection streptococcal test. Studies suggest that rapid-antigen detection tests for group A streptococci (GAS) have variable levels of false-positive rates (up to 15% in culture negative samples)⁷. Plague patients diagnosed with GAS have been sent home with antibiotic treatment that is not effective against plague bacteria, and this may have contributed to the death of some individuals.

New Mexico has adopted an integrated approach to disease control and prevention that considers the interactions between human and animal health. This 'one health' strategy supports early detection of plague in wildlife populations and aims to prevent human and domestic animal cases in New Mexico.

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Foodborne Illness in New Mexico in 2013

Nicole West, MPH

Highlights

- Foodborne illness is a major contributor to the burden of disease in New Mexico.
- Foodborne illness is predominately caused by *Campylobacter* and *Salmonella* infections, followed by *Giardia*, *Cryptosporidium*, and Shiga toxin-producing *Escherichia coli* (STEC).
- Improving hand hygiene and proper food preparation practices may help reduce sporadic cases of foodborne illness.

Background

Each year, foodborne pathogens are responsible for a major disease burden in the United States (US), causing illness in 48 million individuals or one in six people in the US¹. Although many cases of foodborne illness are self-resolving, thousands still suffer from severe disease: Nationally, an estimated 128,000 individuals are hospitalized and 3,000 people die every year¹. The aggregate cost of foodborne illness—in terms of medical expenses, lost productivity, and reduced quality of life—is staggering. Each case of foodborne illness is estimated to cost, conservatively, an average of \$1,068. At a national level, the annual cost of foodborne illness in the US is estimated to be \$51 billion¹⁰.

In 2013, there were 1,039 reported cases of foodborne illness in New Mexico. The plurality of cases were due to salmonellosis, accounting for 34.6% of all cases, followed closely by campylobacteriosis at 33.0%. Other major causes of illness were giardiasis (10.0%), shigellosis (6.0%), cryptosporidiosis (4.7%), and infection with Shiga toxin-producing *Escherichia coli* (3.4%). Other comparatively rare conditions contributing to the burden of foodborne illness in New Mexico are amebiasis (1 case in 2013), foodborne botulism (3 cases), listeriosis (4 cases), vibriosis (4 cases), and yersiniosis (2 cases).

Major Foodborne Pathogens in New Mexico

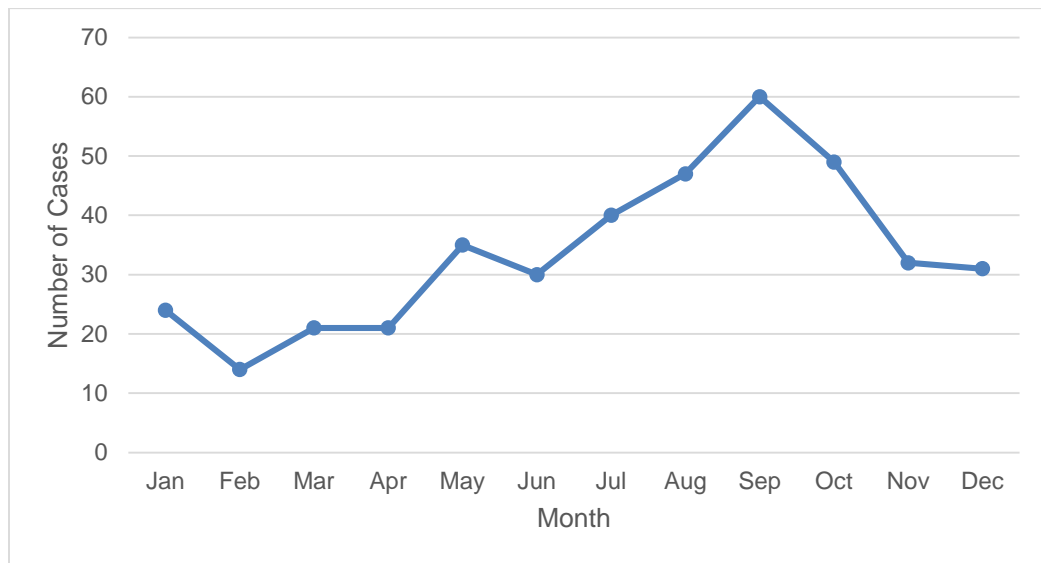
Campylobacter



Campylobacteriosis is a bacterial diarrheal illness that can result from eating contaminated foods, most commonly undercooked poultry or unpasteurized dairy products. Zoonotic transmission also occurs in cases of contact with infected animals or with water contaminated by the feces of infected animals. The incubation period is typically 2 to 5 days and illness usually lasts for 1-2 weeks^{6,8}.

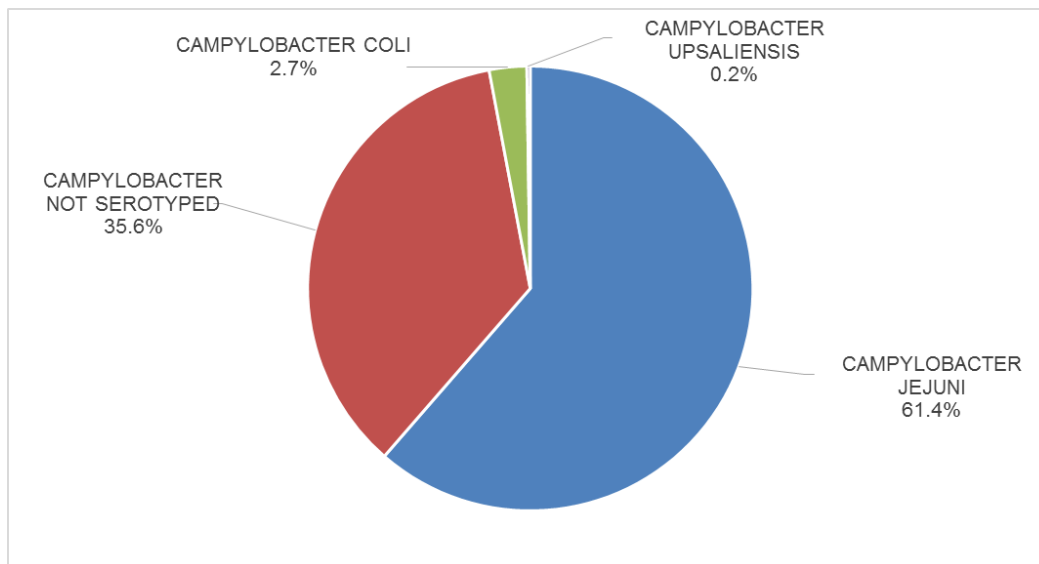
During 2013 there were 414 confirmed cases of campylobacteriosis in New Mexico, of which 52.7% were in males. *Campylobacter* infections clearly peaked in September (Figure 1), but there were no large outbreak clusters accounting for this increase.

Figure 1. Number of Campylobacter Cases by Month, New Mexico, 2013

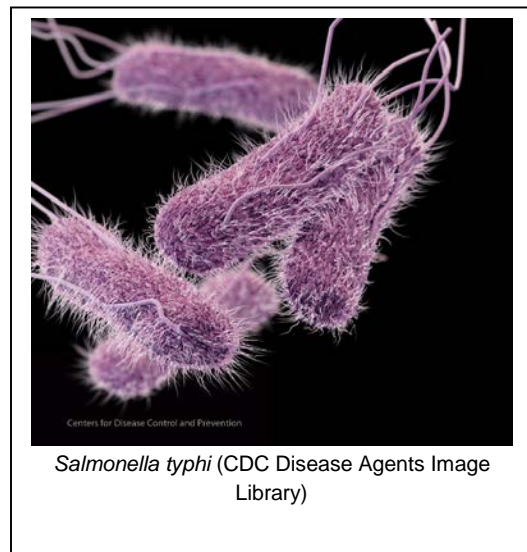


The overwhelming majority of infections were due to the serotype, *C. jejuni* (248, 61.4%; Figure 2). Of the 414 total campylobacter infections, eleven (2.7%) were due to *C. coli* and one (0.2%) was due to *C. upsaliensis*, while approximately a third were not serotyped (144, 35.6%).

Figure 2. Proportion of Campylobacter Serotypes, New Mexico, 2013

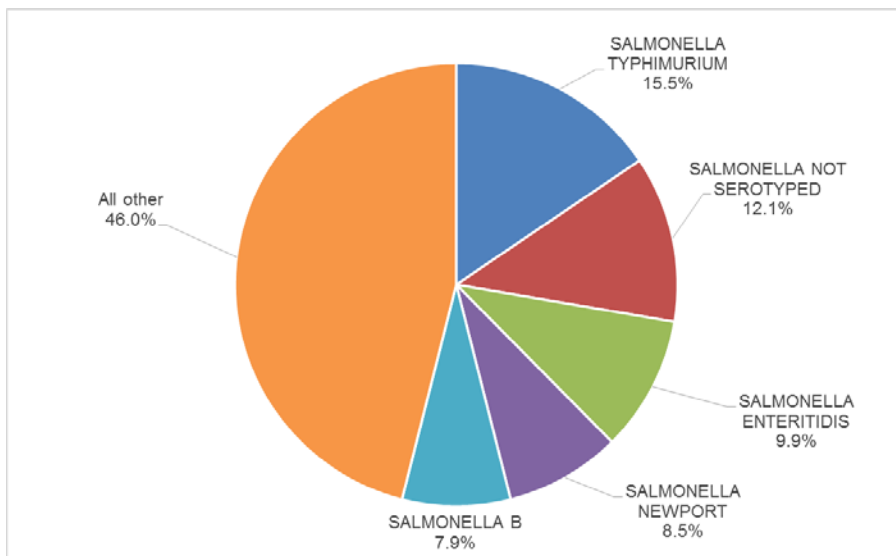


Salmonella



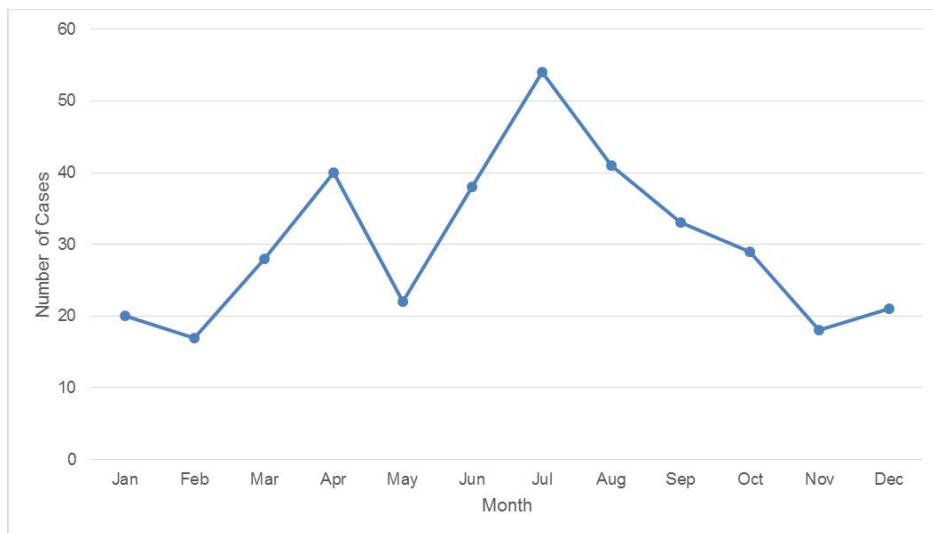
Nationally, *Salmonella* species are the leading cause of bacterial foodborne illness, as well as both hospitalizations and deaths due to foodborne illness⁵. The incubation period is typically 12-36 hours (ranging from 6-72 hours), and infected individuals can shed the bacteria for weeks after signs and symptoms resolve. Although primarily causing diarrheal disease transmitted through the oral-fecal route, *Salmonella* also can cause focal infections in specific tissues, urinary tract infections, and septicemia. *Salmonella typhi* and *paratyphi* can cause the potentially severe sequelae associated with typhoid fever^{6,8}.

Figure 3. Proportion of Salmonella Serotypes, New Mexico, 2013



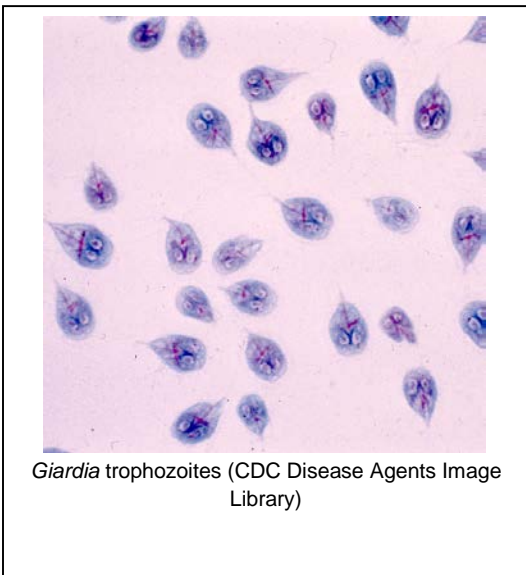
The 361 New Mexican cases of salmonellosis identified in 2013 were the result of 48 different identified *Salmonella* serotypes. The most common serotypes were *S. typhimurium* (accounting for 15.5% of all *Salmonella* infections), *S. enteritidis* (9.9%), *S. newport* (8.5%), *Salmonella B* (7.9%), and *S. javiana* (6.4%) (Figure 3). All other identified serotypes comprised less than 5% of the total and almost 12% of *Salmonella* cases were not serotyped. Among all persons with *Salmonella* infections, 46.7% were in males. There were two peaks (in April and July) in the frequency of *Salmonella* cases (Figure 4).

Figure 4. Number of Salmonella Cases by Month, New Mexico, 2013



Although *Salmonella typhimurium* is a common serotype, one contributor to the preponderance of this serotype in 2013 was a large multistate outbreak that spanned several months. After investigations of Pulse Field Gel Electrophoresis (PFGE) matched cases across 39 states, the *S. typhimurium* infections were determined to be associated with live poultry exposures, primarily with the handling of baby chicks and ducklings³. New Mexico had 19 confirmed cases in this outbreak. In addition, nine environmental samples collected from duck and chicken distributors also were PFGE matched to the clinical isolates, further strengthening the epidemiological link.

Giardia

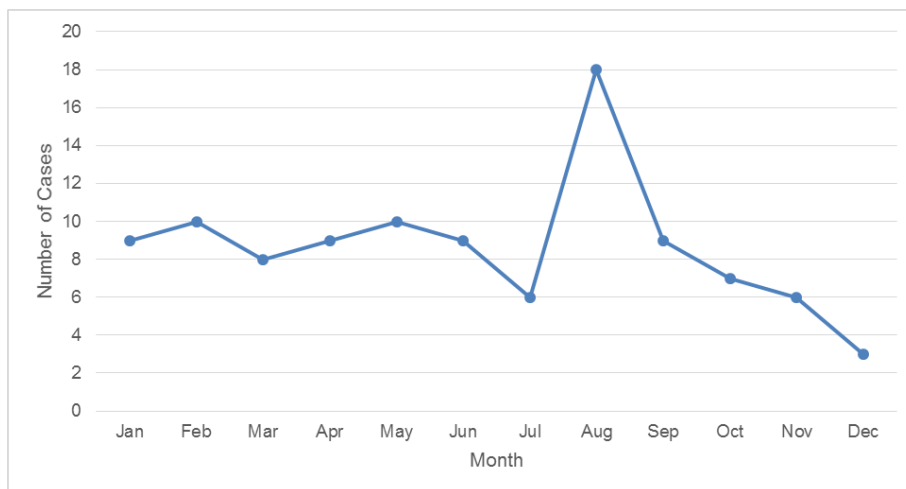


Giardiasis is a parasitic disease caused by protozoans of the genus *Giardia*. It is a common cause of chronic diarrhea in travelers and in people who drink untreated water, often while camping⁴. The incubation period is typically 7-10 days, with a range of 3-25 days, and infected individuals can transmit the *Giardia* cysts throughout the course of their infection^{6,8}.

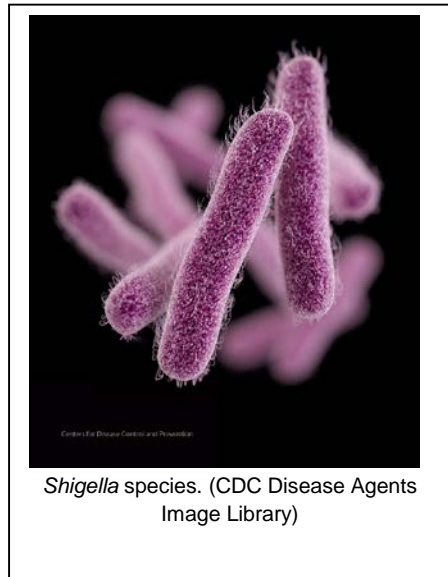
While *Giardia* infections are not routinely serotyped, the seasonality of the infections is informative (Figure 5). Given the association of giardiasis with recreational water exposures and travel, it is unsurprising that the number of cases

increases during the summer months.

Figure 5. Number of Giardia Cases by Month, New Mexico, 2013



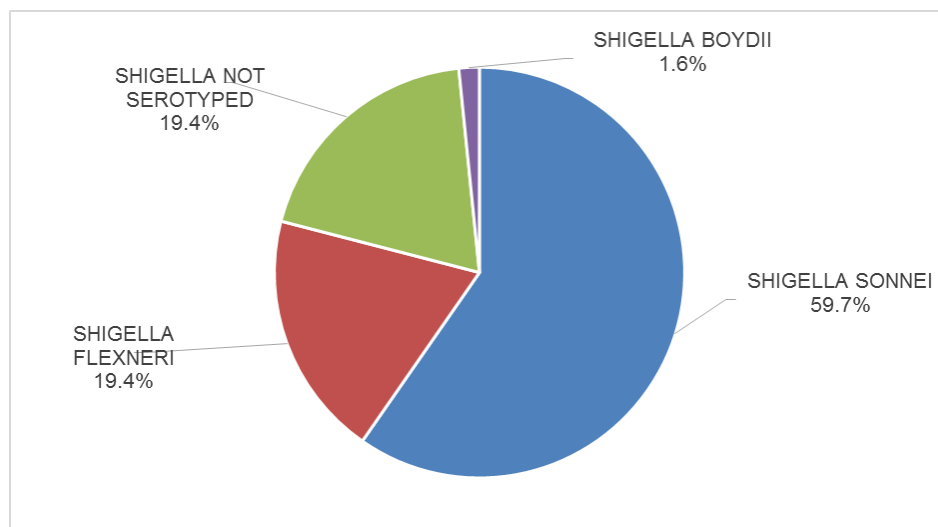
Shigella



Shigellosis can be transmitted through both foodborne and person-to-person routes, with secondary infections spreading readily through households^{8,11}. Shigellosis varies in degree based on the causative serotype: *Shigella dysenteriae* is characterized by its outbreak epidemiology and greater severity of disease, including complications such as hemolytic uremic syndrome (HUS). However, *Shigella dysenteriae* is more commonly seen in developing countries. *Shigella sonnei* predominates in developed countries and causes less severe disease. The incubation period is 1-3 days in most cases, and infected individuals usually shed the bacteria for four weeks following illness^{6,8}.

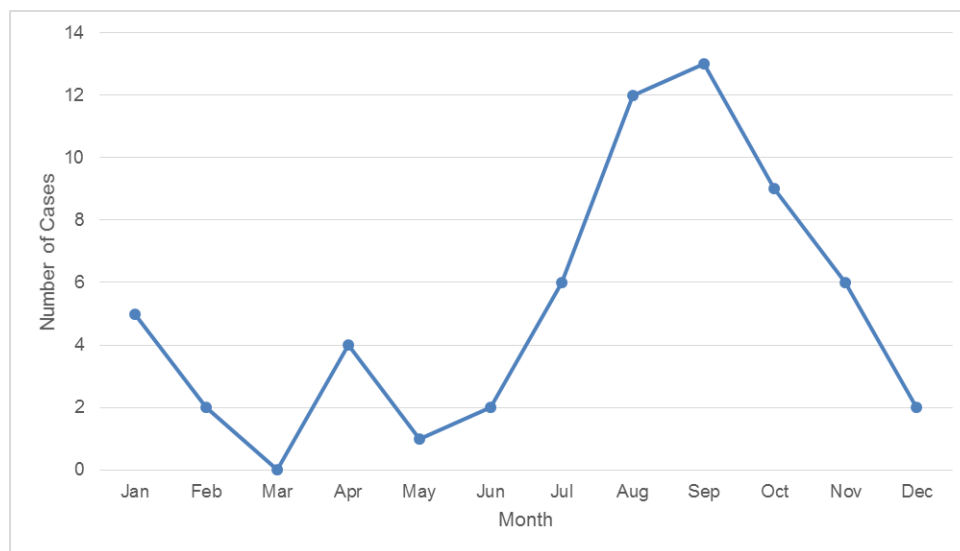
There were 62 cases of shigellosis in New Mexico in 2013. Males accounted for 48.4% of *Shigella* infections. These infections were caused by three serotypes of *Shigella*: *S. sonnei* (59.7%), *S. flexneri* (19.4%), and *S. boydii* (1.6%). Almost 20% of cases were not serotyped; Figure 6). The defining feature of the seasonal trends in shigellosis in 2013—a large peak in August-September (Figure 7)—is shaped in large part due to an increase in *S. sonnei* infections, which were partly due to an outbreak.

Figure 6. Proportion of Shigella Serotypes, New Mexico, 2013

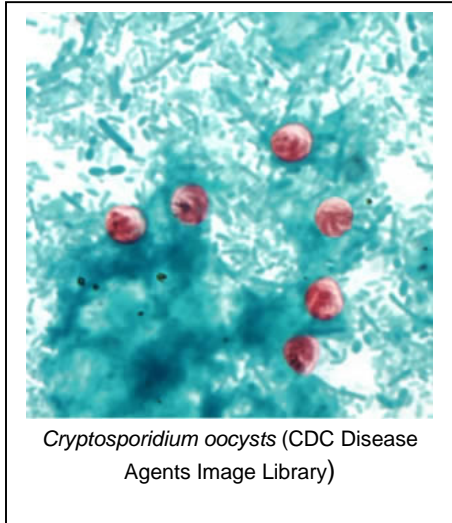


In late summer, six PFGE-matched cases of *Shigella sonnei* were all determined to be associated with a single day care center. There were eight additional probable cases that were epidemiologically linked to this outbreak through this daycare, for a total of fourteen cases in this outbreak (including both children and adults). This case is illustrative of the ease with which this foodborne pathogen can spread person to person in a daycare scenario, as well as the problems of foodborne surveillance more broadly. Less than half of the cases in this outbreak had laboratory testing and were PFGE-matched. The additional eight cases were identified as a result of active surveillance initiated after the PFGE cluster was identified. Routine, passive surveillance can identify such outbreaks and lead to the identification of related cases, but because the surveillance system depends on patients' care-seeking behavior as well as the proclivity to test (or lack thereof) of healthcare providers, unknown numbers of foodborne illness are not counted.

Figure 7. Number of Shigella Cases by Month, New Mexico, 2013



Cryptosporidium

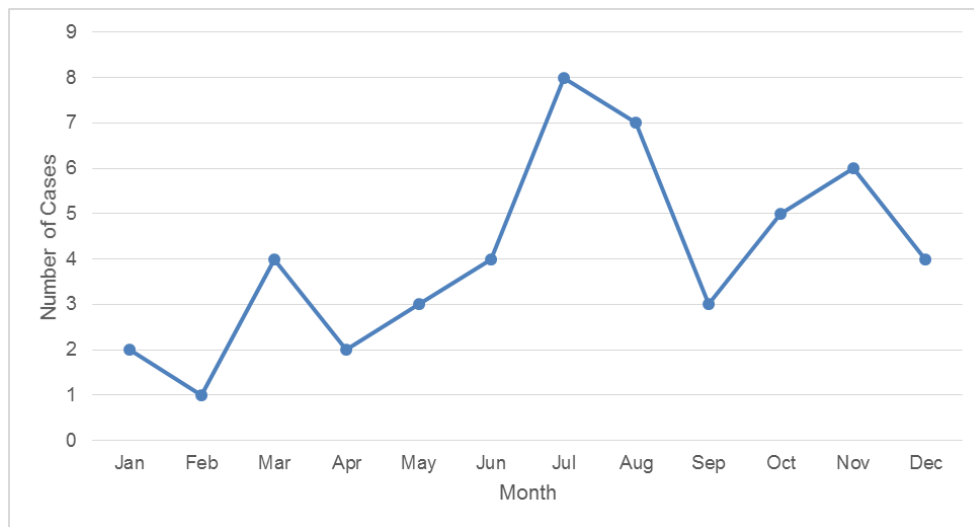


Cryptosporidiosis is a waterborne parasitic disease that can cause outbreaks associated with public swimming pool use due to the ability of *Cryptosporidium* to persist for days in the levels of chlorine commonly used in pools. Although outbreaks have typically been associated with recreational water exposures and contamination of public drinking water systems, zoonotic (though direct contact with infected animals or infected animal feces in water) and foodborne transmission are also possible². *Cryptosporidium* has an average incubation period of seven days and the infective oocysts continue to be shed for weeks after illness. Following excretion, these oocysts can persist

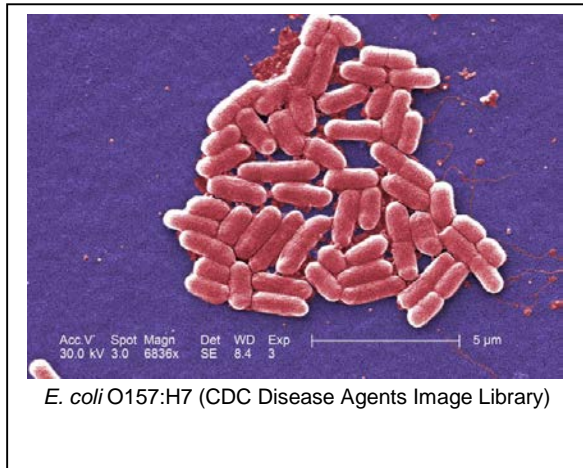
in the environment, maintaining their infectivity for 2-6 months or longer if conditions remain moist^{6,8}.

There were 49 confirmed cases of cryptosporidiosis in New Mexico in 2013. Males accounted for 61.2% of cases. The association of cryptosporidiosis with recreational water exposure can be seen in the increase in cases in the summer months of July and August (Figure 8). Even though outbreaks may not occur, it is typical to seek an increase in cases in this time of year.

Figure 8. Number of Cryptosporidium Cases by Month, New Mexico, 2013



Shiga Toxin-producing *Escherichia coli* (STEC)



Shiga toxin-producing *Escherichia coli* (STEC) is a significant point of concern in public health and foodborne illness prevention because of the severity of illness it causes. Young children are at increased risk of developing severe sequelae, such as hemolytic uremic syndrome (HUS), which in turn can lead to renal failure or death^{6,7}. STEC encompasses many serotypes, although *E. coli* O157 is the most common in North America^{5,8}. Nationally, the incidence of *E. coli* O157 has declined over the last decade

following targeted initiatives in public health and food production and regulation⁵. The incubation is typically 3-4 days (with a range of 2-10 days). Bacterial shedding tends to last only a week in adults, but may extend to up to three weeks in some children⁸.

In New Mexico, there were 34 confirmed cases of STEC in 2013, 41.2% of which were among males. Over the course of the year, cases peaked in April and again in the summer in July and August (Figure 9). These overall STEC trends were driven by those of the predominant serotype, *E. coli* O157, which accounted for 58.8% of cases (Figure 10). Other serotypes identified included *E. coli* O26 (20.6% of cases), O111 (11.8%), and O103 (5.9%). Additionally, almost 3% of STEC cases were identified as non-O157 but were not specifically serotyped.

Figure 9. Number of STEC Cases by Month, New Mexico, 2013

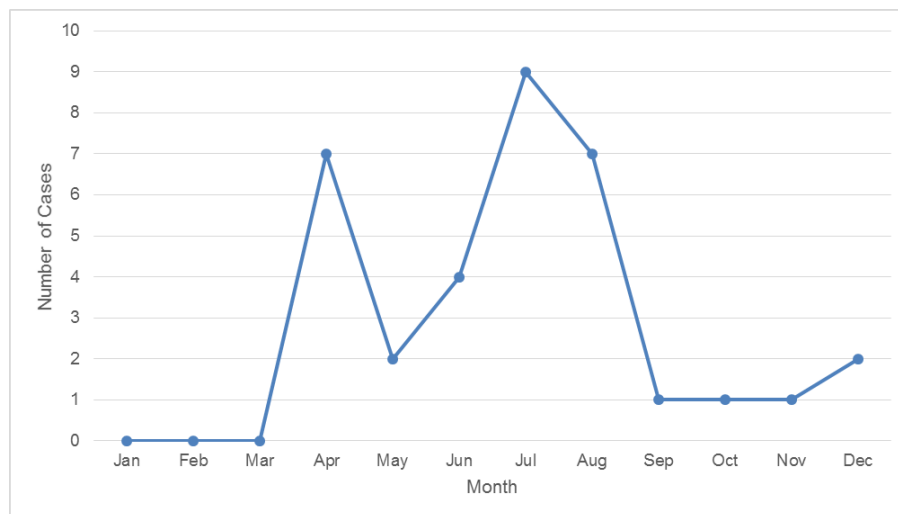
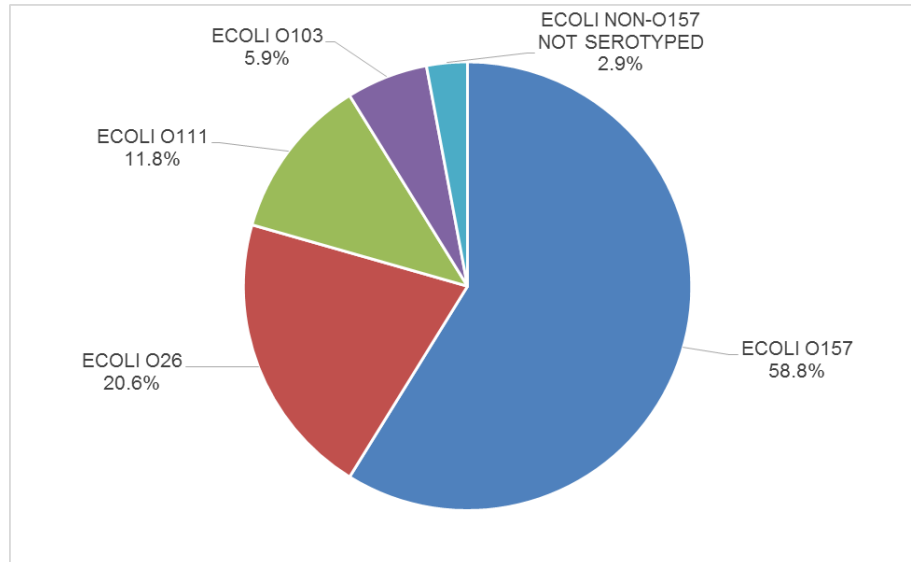


Figure 10. Proportion of STEC Serotypes, New Mexico, 2013



Conclusions

Foodborne illness is a substantial contributor to the burden of disease in the state of New Mexico. Most infections are caused by about a dozen different pathogens and a wide range of serotypes. While outbreaks occur, most infections are sporadic, and transmission may slide between foodborne, waterborne, zoonotic and person-to-person transmission routes, depending on the pathogen and the specific context of infection. The pervasiveness of foodborne illness in New Mexico—as well as the nation at large—calls for continuing public outreach and education regarding the importance of and the proper methods for hand washing and the safe preparation of food.

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Appendix A: Summary of Select Notifiable Diseases, New Mexico, 2013

	Number	Rate (per 100,000 population)
Foodborne Diseases		
Botulism, foodborne	0	0.0
Botulism, infant	3	0.14
Campylobacteriosis	343	16.5
Cholera	0	0.0
Cryptosporidiosis	50	2.4
Cyclosporiasis	0	0.0
Giardiasis	100	4.8
Hepatitis A, acute	21	1.01
Hemolytic uremic syndrome	3	0.14
Listeriosis	4	0.19
Salmonellosis	359	17.2
Shiga toxin-producing <i>Escherichia coli</i> (STEC)	31	1.5
Shigellosis	61	2.9
Typhoid fever (<i>Salmonella typhi</i>)	1	0.05
<i>Vibrio parahaemolyticus</i>	0	0.0
<i>Vibrio</i> species, non-toxigenic	3	0.14
Yersiniosis	2	0.1
Vaccine Preventable Diseases		
Measles (Rubeola)	0	0.0
Mumps	1	0.05
Pertussis	626	30.0
Tetanus	1	0.05
Varicella (Chickenpox)	67	3.2
Bacterial Invasive Diseases		
Group A <i>Streptococcus</i> , invasive	137	6.6
Group B <i>Streptococcus</i> , invasive	229	11.0
<i>Haemophilus influenzae</i> , invasive	48	2.3
Necrotizing Fasciitis	24	1.2
<i>Neisseria meningitidis</i> (Meningococcal disease)	2	0.1
<i>Streptococcal pneumoniae</i> , invasive	328	15.7
Zoonotic Diseases		
Brucellosis	0	0.0

Dengue Fever	0	0.0
Lyme disease	6	0.29
Hantavirus pulmonary syndrome	3	0.14
Malaria	1	0.05
Plague	4	0.19
Tularemia, human	4	0.19
Rabies, animal	11	0.53
West Nile virus neuroinvasive disease	23	1.1
West Nile virus non-neuroinvasive disease	15	0.72
Bloodborne Diseases		
Hepatitis B virus infection, chronic	120	5.8
Hepatitis B virus infection, acute	3	0.14
Hepatitis C virus infection, chronic or resolved*		
Hepatitis C virus infection, acute	14	0.67
Respiratory Diseases		
Coccidioidomycosis	32	1.5
Legionellosis	11	0.53

*Not reported due to incomplete data at the time of publication.

Appendix B: Glossary

Acute	Rapid onset of illness.
Aril	Fleshy part of fruit (e.g., pomegranate) surrounding seed.
Antimicrobial	Agent that kills or inhibits the growth of bacteria and viruses.
Asymptomatic	Person who is infected but not ill.
Axillary	Relating to the armpit.
Bacteria	Plural of bacterium.
Bacterium	Single-celled microorganism existing or as a parasite (dependent on another organism for life).
Bubo	Painful, enlarged lymph nodes.
Case	Person or animal identified as having a particular disease, infection, or condition under investigation.
Cervical	Relating to the neck.
Chronic	Long-term or ongoing disease.
Contagious	Disease that is easily transmitted.
Enteric	Relating to the small intestine.
Enzootic	A disease that affects animals in a particular geographic location or during a specific season.
Epidemiology	Methodology focusing on causes, patterns, and prevention of disease or injury within a population.
Epigastric	Relating to the upper central region of the abdomen.
Femoral	Near the thigh.
Foodborne	Type of illness associated with eating contaminated food.
Genotype	Genetic makeup of an organism.
Genus	Biological classification.
Gram-negative	Bacteria that do not stain dark blue/purple by a Gram stain.
Immunocompromised	Immune system is compromised or absent and not able to fight infectious diseases.
Immunoglobulin	Protein produced by the immune system which neutralizes bacteria and viruses.

Incidence	The number of new cases of a specific disease occurring in a population during a specified time period.
Incubation period	The interval of time between the infection and the onset of symptoms of disease.
Infectivity	Ability of pathogen to cause infection.
Inguinal	Relating to the groin.
Invasive	Disease that spreads to surrounding body tissues.
Lymphadenopathy	Lymph nodes that are abnormal.
Oocyst	Stage in life cycle of some protozoans.
Parasitic	Relationship between an organism where one organism (i.e., parasite) benefits at the expense of the other.
Pathogen	Biological agent causing disease.
Pneumonic	Affecting the lungs.
Post-exposure Prophylaxis	Preventive treatment started after exposure to a bacteria or virus causing disease.
Pulse Field Gel Electrophoresis	Laboratory test to identify microorganisms based on DNA patterns.
Reservoir	Long term host or source of pathogen.
Risk factor	Anything that increases a person's chance of developing a disease.
Septicemic	Bacteria in blood.
Serotype	Variation within a subspecies of bacteria or virus.
Surveillance	On-going, systematic collection, analysis, and interpretation of health data.
Symptomatic	Showing symptoms of disease or injury.
Transmission	Spread of infectious diseases or pathogens.
Viron	Single virus particle.
Virus	Small infectious agent replicating only inside living cells.
Zoonotic	Transmitted by animals to humans.

Appendix C: Acronyms

ACIP	Advisory Committee on Immunization Practices
AIDS	Acquired Immunodeficiency Syndrome
CD4	White blood cell that is part of the immune system
CDC	Centers for Disease Control and Prevention
DNA	Deoxyribonucleic Acid
DPS	Disease Prevention Specialist
EPI-X	Epidemic Information Exchange
FDA	Food and Drug Administration
HIV	Human Immunodeficiency Virus
HUS	Hemolytic Uremic Syndrome
NM	New Mexico
NMED	New Mexico Environment Department
NMEDSS	New Mexico Electronic Data Surveillance System
NM DOH	New Mexico Department of Health
PFGE	Pulse field Gel Electrophoresis
PHN	Public Health Nurse
SLD	Scientific Laboratory Division
RNA	Ribonucleic Acid
US	United States

Appendix D: Methods

Standard Council of State and Territorial Epidemiologists (CSTE) case definitions are used by NMDOH to classify the infectious diseases in this report.

Rates were calculated for January 1, 2013 through December 31, 2013 and displayed as numbers of cases per 100,000 population. The numerators represent the number of reported cases that were confirmed or, for some diseases, the number of confirmed plus probable cases. The data source used to obtain the numerators was the New Mexico (NM) National Electronic Data Surveillance System (NM-EDSS). NM denominators were based on 2012 population estimates from the Geospatial and Population Studies (GPS) program, University of New Mexico. All data are considered provisional.

Appendix E: New Mexico Notifiable Diseases

NOTIFIABLE DISEASES OR CONDITIONS IN NEW MEXICO

7.4.3.13 NEW MEXICO ADMINISTRATIVE CODE

ALL REPORTS INCLUDING ELECTRONIC LABORATORY REPORTS OF NOTIFIABLE CONDITIONS MUST INCLUDE:

1. The disease or condition being reported;
2. Patient's name, date of birth/age, gender, race/ethnicity, address, patient's telephone numbers, and occupation;
3. Physician or licensed healthcare professional name and telephone number; and
4. Healthcare facility or laboratory name and telephone number, if applicable.

Laboratory or clinical samples for conditions marked with [*] are required to be sent to the Scientific Laboratory Division.

EMERGENCY REPORTING OF DISEASES OR CONDITIONS

The following diseases, confirmed or suspected, require **immediate reporting** by telephone to Epidemiology and Response Division at 505-827-0006. If no answer, call 1-866-885-6485.

Infectious Diseases

Anthrax*	<i>Haemophilus influenzae</i> invasive infections*	Rubella (including congenital)
Avian or novel influenza*	Measles	Severe Acute Respiratory Syndrome (SARS)*
Bordetella species*	Meningococcal infections, invasive*	Smallpox*
Botulism (any type)*	Plague*	Tularemia*
Cholera*	Poliomyelitis, paralytic and non-paralytic	Typhoid fever*
Diphtheria*	Rabies	Yellow fever

Other Conditions

Acute illnesses or conditions of any type involving large numbers of persons in the same geographic area	Severe smallpox vaccine reaction	Suspected waterborne illness or conditions in two or more unrelated persons*
Illnesses or conditions suspected to be caused by the intentional or accidental release of biologic or chemical agents*	Suspected foodborne illness in two or more unrelated persons*	Other illnesses or conditions of public health significance

Infectious Diseases in Animals

Anthrax	Rabies
Plague	Tularemia

ROUTINE REPORTING OF DISEASES OR CONDITIONS

Infectious Diseases (Report case within 24 hours to Epidemiology and Response Division at 505-827-0006; or contact the local health office)

Brucellosis	Hemolytic uremic syndrome	Relapsing fever
<i>Campylobacter</i> infections*	Hepatitis A, acute	Rocky Mountain spotted fever
<i>Clostridium difficile</i> *	Hepatitis B, acute or chronic	Salmonellosis*
Coccidioidomycosis	Hepatitis C, acute or chronic	Shigellosis*
Colorado tick fever	Hepatitis E, acute	St. Louis encephalitis infections
Cryptosporidiosis	Influenza-associated pediatric death	<i>Streptococcus pneumoniae</i> invasive infections*
Cysticercosis	Influenza, laboratory confirmed hospitalization only	Tetanus
Cyclosporiasis	Legionnaires' disease	Trichinellosis
Dengue	Leptospirosis	Toxic shock syndrome
<i>E. coli</i> 0157:H7 infections*	Listeriosis*	Varicella
<i>E. coli</i> , shiga-toxin producing (STEC) infections*	Lyme disease	<i>Vibrio</i> infections*
Encephalitis, other	Malaria	West Nile Virus infections
Giardiasis	Mumps	Western equine encephalitis infections
Group A streptococcal invasive infections*	Necrotizing fasciitis*	<i>Yersinia</i> infections*
Group B streptococcal invasive infections*	Psittacosis	

Central line-associated bloodstream infections (CLABSI) events
Clostridium difficile infections

Cancer

Report to NM DOH designee: New Mexico Tumor Registry, University of New Mexico School of Medicine, Albuquerque, NM 87131.
Report all malignant and in situ neoplasms and all intracranial neoplasms, regardless of the tissue of origin.

Human Papillomavirus (HPV)

Report to NM DOH designee: Laboratories report the following tests to the New Mexico HPV Pap Registry, 1816 Sigma Chi Rd NE, Albuquerque, NM 87106, phone 505-272-5785 or 505-277-0266.

Papanicolaou test results (all results)	Cervical, vulvar and vaginal pathology results (all results)	HPV test results (all results)
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Birth Defects Report to Epidemiology and Response Division, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 505-827-0006.

All birth defects diagnosed by age 4 years, including:

Defects diagnosed during pregnancy	Defects found in chromosome testing on amniotic fluid, chorionic villus sampling and products of conception for Trisomy 13, Trisomy 18 and Trisomy 21
Defects diagnosed on fetal deaths	

Genetic and Congenital Hearing Screening

Report to Children’s Medical Services, 2040 S. Pacheco, Santa Fe, NM 87505; or call 505-476-8868.

Neonatal screening for congenital hearing loss (all results)	Suspected or confirmed congenital hearing loss in one or both ears	All conditions identified through statewide newborn genetic Screening program
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For details online of 7.4.3 NMAC see:

<http://www.nmcpr.state.nm.us/nmac/parts/title07/07.004.0003.htm>