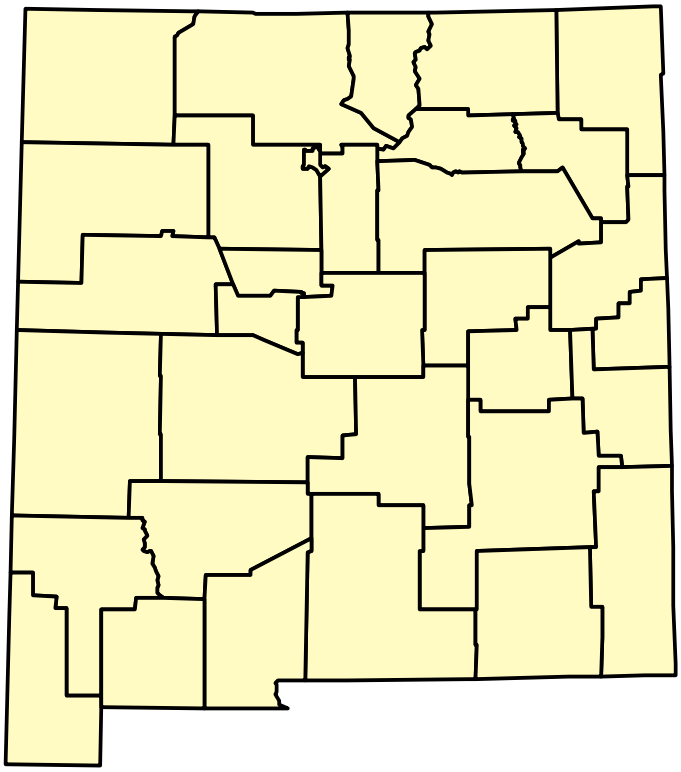
New Mexico
Waterborne Disease Surveillance Project
Annual Report
2004



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NEW MEXICO DEPARTMENT OF HEALTH

NEW MEXICO WATERBORNE DISEASE SURVEILLANCE PROJECT ANNUAL REPORT, 2004

INTRODUCTION

Purpose

The New Mexico Environment Department (NMED) and the New Mexico Department of Health (NMDOH) work together to ensure safe drinking water in New Mexico. The two specific bureaus within these agencies that ensure the safety of public drinking water are the Drinking Water Bureau (DWB) at NMED and the Environmental Health Epidemiology Bureau (EHEB) at NMDOH. These two agencies act as a team to prevent waterborne disease from public drinking water sources by: monitoring for potential waterborne diseases and water quality, and by notifying and educating the public about potential drinking water problems.

Background

Since 2000, EHEB maintains a waterborne disease surveillance project (WDSP). This project currently includes two parasitic agents (*Cryptosporidium sp. & Giardia sp.*), three bacterial agents (*Campylobacter sp.,* enterohemorrhagic *Escherichia coli, and Shigella sp.*), and one viral agent (Hepatitis A). All of the identified diseases are "notifiable conditions" and are reportable by law to NMDOH.

This report encompasses year four of the WDSP for the calendar year 2004. Weekly monitoring of reported cases of each disease is a priority. The EHEB works closely with the Infectious Disease Bureau at NMDOH and the NMED Drinking Water Bureau, on follow-up of potential cases. In addition, the EHEB systematically takes public calls and inquires on environmental health issues.

New Mexico has adopted all federal drinking water regulations established by the *Safe Drinking Water Act* as state regulations. The Environmental Protection Agency sets standards for approximately 90 contaminants in drinking water that requires New Mexico public water systems to monitor for 16 inorganic chemicals (non-transient, non-community systems monitor fourteen), 30 synthetic organic contaminants and 21 volatile organic contaminants. In addition, radionuclide levels for gross alpha, beta, radium-226 and radium–228 and uranium are monitored. Results of these analyses are reported to the NMED's DWB. In the past, enforcement of drinking water standards was limited, thus some water systems remain in violation of drinking water standards. Microbiological violations constitute the most common drinking water violations in the state, which represent threats of acute health risks. In order to improve the public health of New Mexicans, NMDOH and NMED continue to work on ways to collaborate to provide public education and information on any of these contaminants that consistently exceed drinking water standards.

Types of Public Water Systems:

Community water system: serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

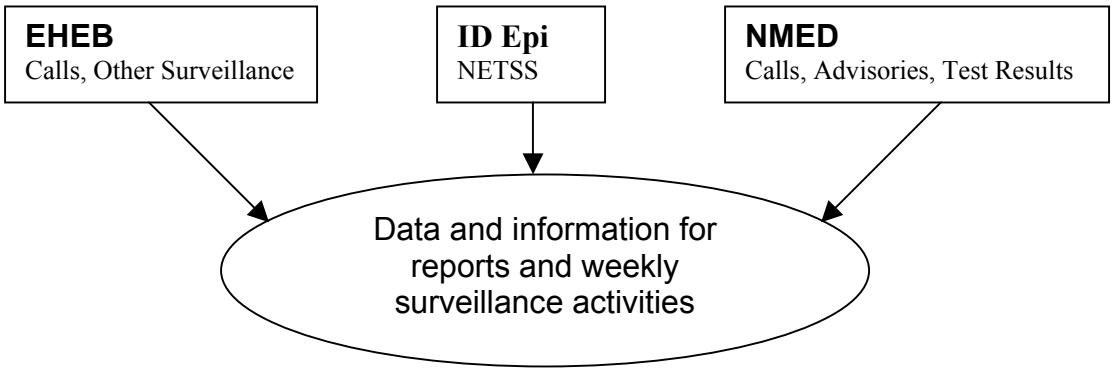
Non-transient non-community water system: serves at least 25 persons for more than 6 months per year, including but not limited to schools and factories.

Non-community water system: serves 25 or more persons who are not residents year-round (e.g. restaurants, rest areas, gas stations) or seasonal facilities (e.g. children's camps or recreational camping facilities).

Definitions: 20 NMAC 7.10.

METHODS

Information was compiled through a number of different sources. An EHEB incident database, the infectious disease database (National Electronic Telecommunications System for Surveillance - NETSS) and additional information from NMED were all mechanisms used to track potential and actual, exposures and diseases in New Mexico. In addition, water quality data was compared with disease reports and calls to identify any suspected waterborne disease cases.



The EHEB incident database was developed to track calls and emails received by the EHEB. Caller type, location, major/minor call topics, and other specific information are some variables collected in the database. EHEB staff rotated taking all environmental health calls on a given day; however, all water related calls are sent to the Environmental Waterborne Disease Epidemiologist for review.

The state of New Mexico conducts ongoing surveillance for notifiable conditions. Notifiable conditions are a list of diseases or organisms that are required to be reported to the state of New Mexico for surveillance purposes (Appendix 2). Laboratories and health care providers report notifiable conditions to the Office of Epidemiology. State surveillance staff then informs the local public health office of the reportable condition case; local public health nurses use a standard enteric disease report form to document the investigation of enteric disease cases. The Office of Epidemiology receives the completed forms, reviews, and enters them into the National Electronic Telecommunications System for Surveillance (NETSS) to the Centers for Disease Control and Prevention (CDC). When necessary, the EHEB calls upon the Infectious Disease Epidemiology Bureau for assistance with possible waterborne disease-related illness reports. Assistance may be followed-up by telephone calls and additional information gathering.

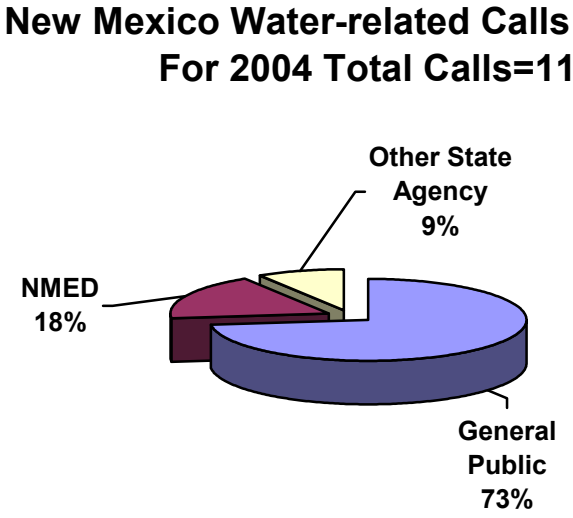
EHEB and the NMED Drinking Water Bureau follow a communication protocol specified in their JPA. Both agencies annually reviewed and updated this protocol as needed (Appendix 1). As specified in this protocol, NMED relays information regarding water system violations or refers concerned members of the public to EHEB. In turn, the EHEB relays information regarding waterborne disease cases and outbreaks to NMED or other potential water related public health issues. In addition, EHEB is responsible for notifying local public health offices when NMED issues drinking water advisories.

RESULTS

Calls

In 2004, there were 11 water-related calls entered into the "Incident Database." The four-year average is 31 calls per year. The number of calls during 2004 represents a 72% decrease from the previous year. However, reporting procedures changed in 2002 and during 2004, EHEB experienced a change in staff, which might explain some of the fluctuation in the number of reported calls. As for the type of caller, the general public was responsible for the majority of the calls (73%) followed by NMED with 18% of the calls. The remaining calls were from DOH. Figure 1, shows calls by caller type during 2004.

Figure 1. Water-related Calls by Type, New Mexico, 2004



Chemical Maximum Contaminant Level (MCL) Violations

The "Maximum contaminant level" or "MCL" means the maximum permissible level of a contaminant in water that is delivered to any user of a public water system. The Safe Drinking Water Act (SDWA) regulates MCLs for public drinking water. A Nitrate, Nitrite and Total Coliform MCL exceedence requires an acute response.

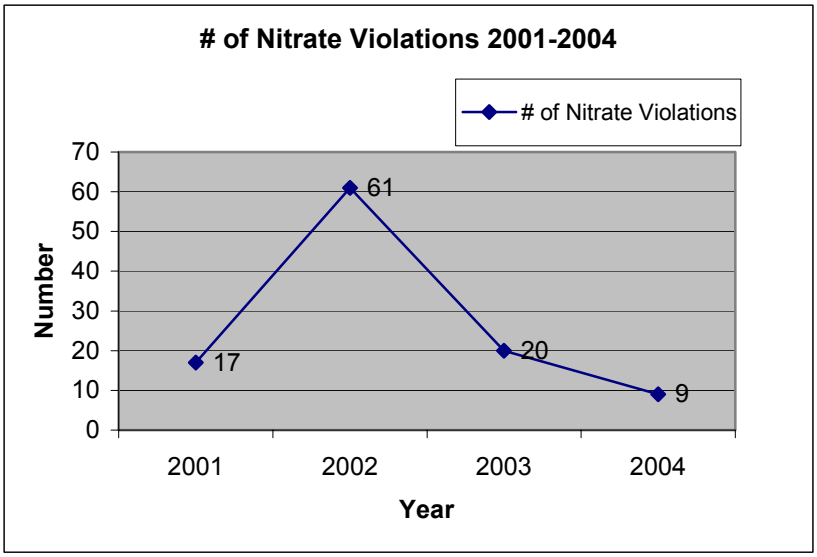
Nitrate

Nitrate is an inorganic chemical made up of nitrogen and oxygen that can cause some serious health effects in certain populations. Some of New Mexico's water systems have a history of violating the Nitrate MCL, which can produce potential adverse health effects such as a life-threatening condition known as "a blue baby syndrome" (or methemoglobinemia). However, there was a steady decline in Nitrate MCL violations since 2002 (figure 2) and a marked improvement of those water systems that had more than three nitrate MCL exceedences from 2001 through 2004 (table 1).

Table 1. Systems with more than 3 nitrate MCL violations from 2001-2004

WSS Code	Year				Total
	2001	2002	2003	2004	
NM3503621	2	6	3	1	12
NM3553405	0	3	3	0	6
NM3556821	3	1	0	1	5
NM3581726	1	2	3	0	6
NM3596013	0	2	3	0	5
NM3598501	2	6	0	0	8

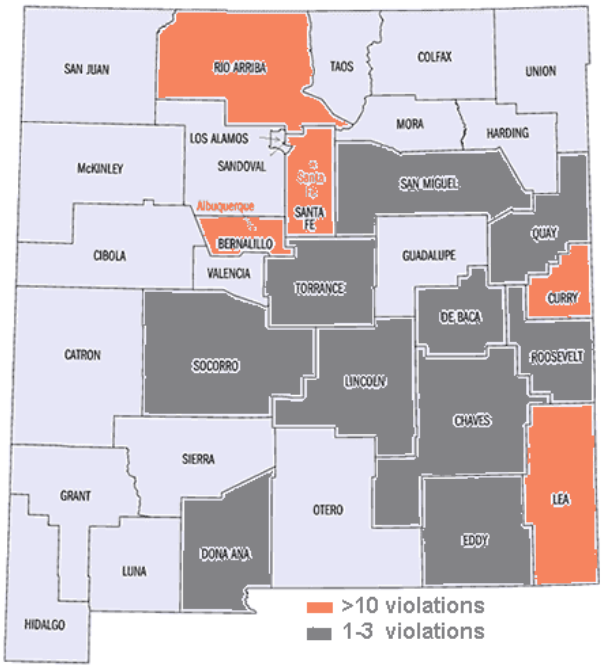
Figure 2. Number of Nitrate Violations for 2001-2004



The syndrome called methemoglobinemia occurs when the ingested nitrate interferes with the ability for blood to carry oxygen to the body tissues, which need a constant supply of oxygen to survive. This is a particular problem in infants, pregnant women, or the elderly, because of body chemistry.

An analysis of the NMED DWB's database indicated that for 2001 - 2004, 14 of the 33 (42%) counties in New Mexico had one or more public water systems that violated the MCL for nitrate. Figure 3, illustrates which counties had the highest number of water systems with nitrate violations during the 3-year period. The county with the highest percentage of water systems violating the MCL was Lea County in southeastern New Mexico. There were no reported cases of methemoglobinemia from 2002 through 2004, however it is currently not a reportable disease. Efforts are underway to add more notifiable conditions such as methemoglobinemia to the notifiable condition list. If successful, these efforts will indeed enhance surveillance efforts.

Figure 3. Number of Nitrate Violation (by County), New Mexico, 2001 - 2004

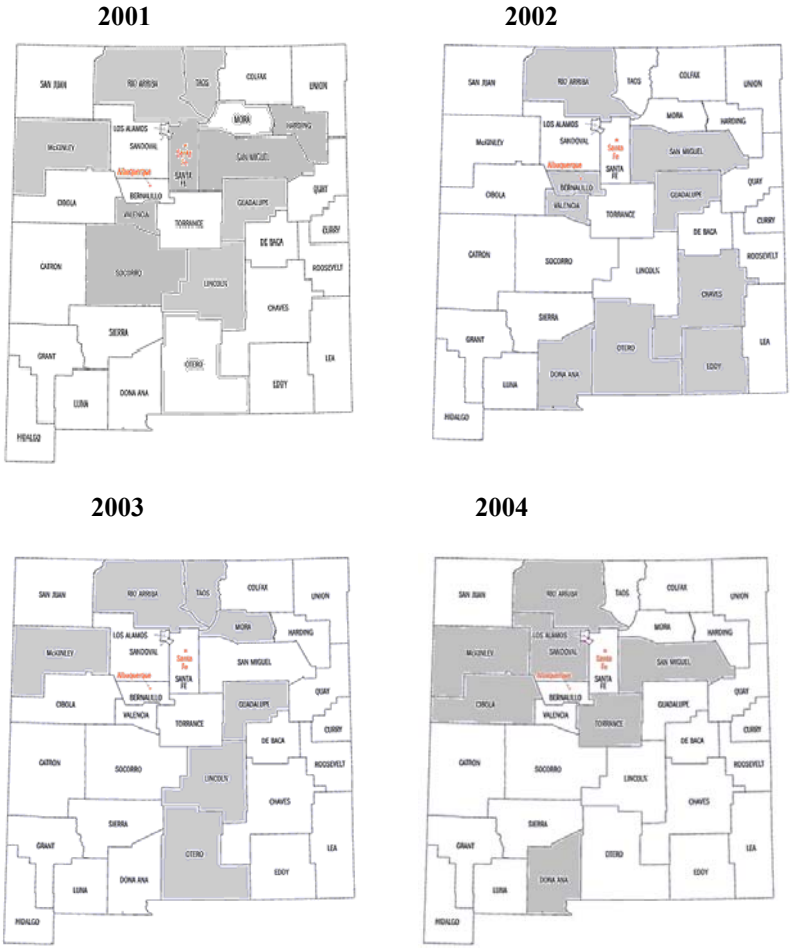


Biological Contamination of Water Systems

Drinking water systems are sampled on a routine basis for total coliforms (TCs) to assure compliance with federal drinking water standards. Total coliforms are a group of bacterial organisms that are present in the natural environment. If a water system tests positive for TC, further testing is performed to determine the absence or presence of fecal coliform (FC) or *E. coli*, one of the fecal coliform organisms. FCs are organisms that are present in intestinal systems of all warm-blooded animals; most are not dangerous to humans, however, some may cause adverse health effects. Fecal coliforms are also used as an indicator organism. Because fecal coliforms occur naturally in animal intestines, contamination may indicate that other disease-causing organisms spread through feces (bacteria, parasites, and viruses) could be present in the water.

When fecal contamination is identified in a system, confirmatory samples are taken immediately to rule out sampling or other errors. If the confirmatory samples show fecal contamination, NMED issues an acute violation and confers with NMDOH to decide whether to issue a "Boil Water Advisory." Figure 4 maps the "Boil Water Advisories by year and county. A situation in which an advisory might not be issued is when the water source is not being used as drinking water. Upon issuance, NMDOH notifies district public health offices to be on alert for cases of gastrointestinal illness and are provided with educational material for the public. Water system consumers are notified by the water system through an interagency press release or individual notification.

Figure 4. Map of Water Advisories by County, New Mexico,

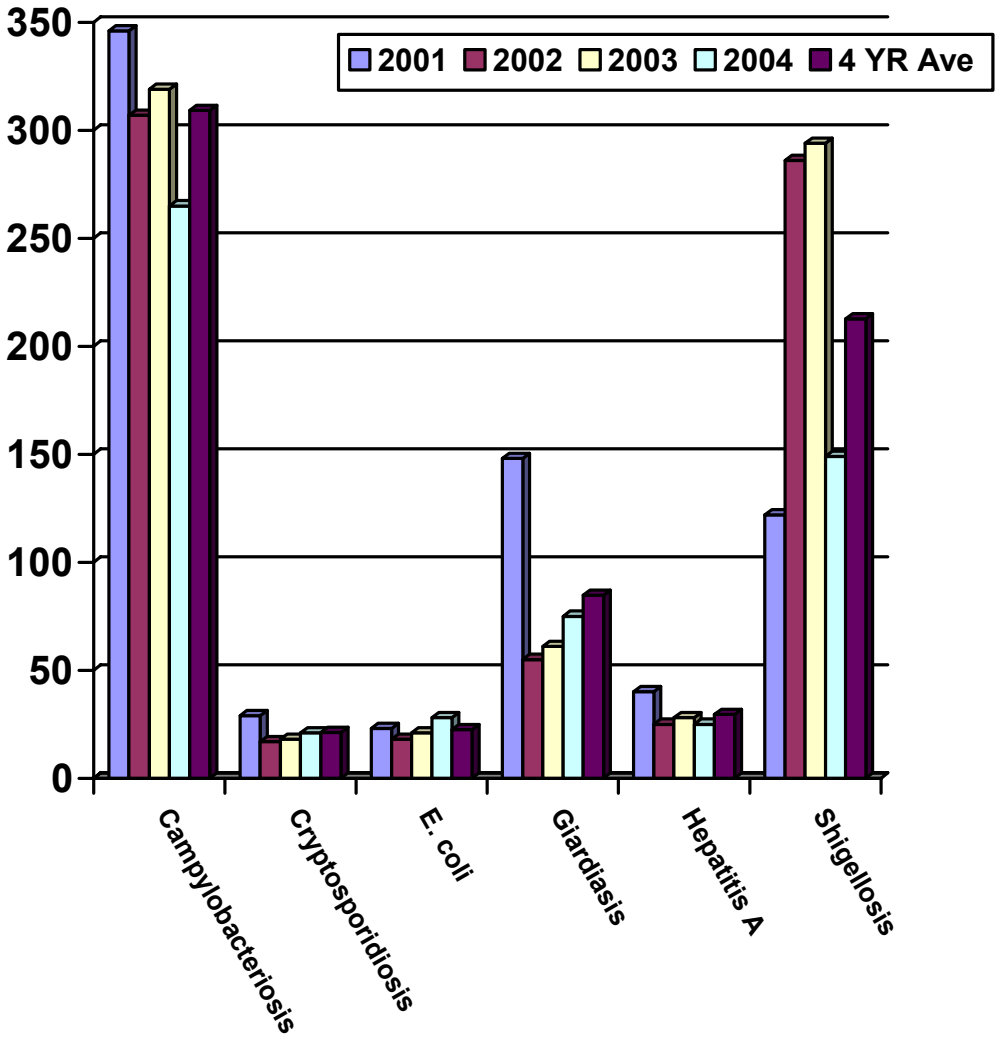


The pattern of “Boil Water Advisories” during the four years appears random. However, Rio Arriba County has had an advisory each year.

Cases of Potential Waterborne Disease

There were no confirmed disease incidents related to public drinking water systems in 2004; however data were collected on potential waterborne disease events to ensure that no waterborne outbreaks were missed. Absolute confirmation of disease etiology is difficult, as it involves a timely stool sample and water sample, and a laboratory comparison of organisms identified in each. Often, diseases are not reported to the Office of Epidemiology until many days or weeks after symptom onset, which makes sample collection problematic. In 2004, there were 663 potential waterborne disease cases reported of the selected six notifiable conditions.

Figure 5. Yearly Number of Potential Waterborne Cases



Based on estimates by the US Centers for Disease Control & Prevention, nearly half of the 663 reported cases are probably foodborne (Mead et al, 2000). Table 2 indicates the counts of each disease that are **not** likely to be foodborne. Because the actual foodborne cases could not be separated from the others, all reported cases of the selected diseases were used in the analysis.

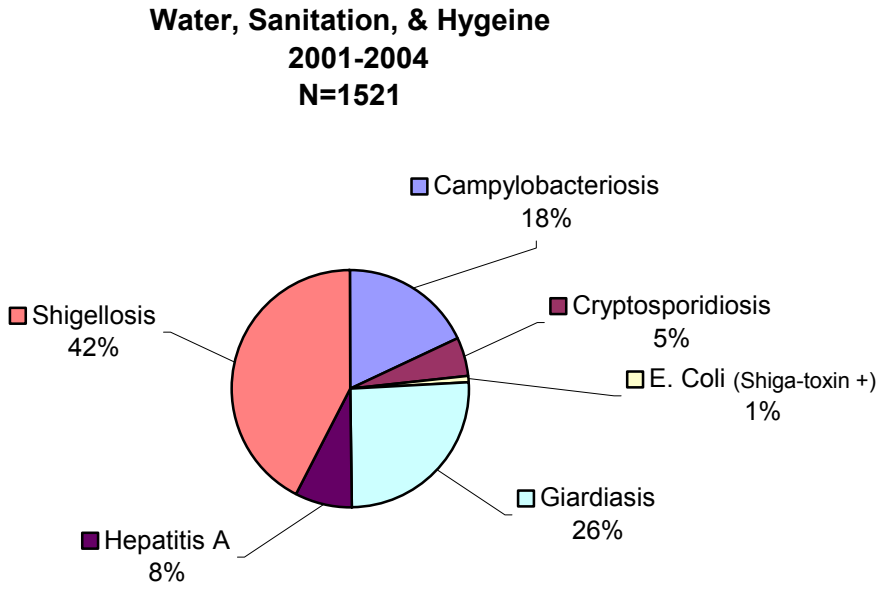
Table 2. Diseases **Estimated NOT** to be Foodborne, New Mexico, 2004

Disease	2004 Reported NM Cases	% Estimated to be waterborne or other**	% Estimated to be Foodborne*	**Estimated # waterborne or other etiology****
Campylobacteriosis	365	20	80	**73**
Cryptosporidiosis	21	90	10	**19**
E. coli (O157:H7 & TX+)	28	15	85	**4**
Giardiasis	75	90	10	**68**
Hepatitis A	25	95[Ŧ]	5	**24[Ŧ]**
Shigellosis	149	80[Ŧ]	20	**119[Ŧ]**
Total	663			**307**

**Estimated percents from Mead, et al, (2000). Food-related illness and death in the United States, Emerging Infectious Diseases, 5 (5).*
***Other etiology could include person-to-person or animal-to-person*
[Ŧ]Hepatitis A and Shigella organisms are more often spread from person-to-person than through water.

Figure 6, illustrates a chart of illnesses reported in years 2001 through 2004 that are estimated to be related to water, sanitation and hygiene. Unlike the previous year, Shigellosis represents the highest percentage. Transmission is mainly from person-to-person contact so poor hygiene may be a reason for this high percentage. Giardiasis, which is more commonly related to contaminated water ingestion, makes up 26% of the three-year sample.

Figure 6. Percentage of Reported Illnesses Estimated to be due to Water, Sanitation, and Hygiene, NM, 2001-2004



Analysis of infectious disease NETSS data was performed for each of the selected potential waterborne diseases on a weekly basis. The weekly data were compared with, a baseline rate, our 12-year average rate. Each time the weekly rate exceeded one standard deviation above the average rate, a line listing which includes the case's city of residence and street address was run for that week and surrounding two weeks to determine if there was any unrecognized spatial clustering of disease. With the help of the Infectious Disease Epidemiology Bureau, enteric disease report forms were reviewed to see if there was any evidence of waterborne transmission. The surveillance charts for each disease are included in Appendix 3.

Maps were produced to analyze the spatial distribution of potential water-related disease cases throughout New Mexico (Appendix 3 for disease-specific maps).

Table 3 compares 2004 New Mexico data with 2001 US rates (the most recent data available) for the selected diseases. However, any rate for New Mexico that is above the national rate (table 3) should only be consider as a general reference because some states, such as Nebraska, did not report Shigellosis to the Public Health Laboratory Information System (PHLIS) causing the national rate to be underestimated. Furthermore by only having one national rate, variance in yearly rates cannot be distinguished, so if all the states saw an increase in Hepatitis A in 2004 it would not be reflected here.

Table 3. Selected Disease Rates* in New Mexico (2004) and the US (2001)

Disease	NM Rate per 100,000 Persons	US Rate per 100,000 Persons**
Campylobacteriosis	19.2	**NA**
Cryptosporidiosis	1.1	**1.3**
***E. coli* (O157:H7 & STX+)**	1.5	**1.2**
Giardiasis	3.9	**7.4*** **
Hepatitis A	1.3	**3.8**
Shigellosis	7.8	**7.2**

**Rates were calculated using US Census 2004 population estimates.*
***2001 US data from Summary of Notifiable Diseases – United States, 2001 MMWR Volume 50/No. 53; amebiasis and campylobacteriosis are not nationally reportable diseases.*
****Giardiasis Surveillance Summaries MMWR January 28, 2005 / 54(SS01);9-16*

Trends in selected enteric diseases

Six enteric diseases were selected for surveillance of waterborne illness. There were 663 reported cases of the selected potential waterborne diseases; however, there was no evidence that any of these cases were related to a public water system. Initial information such as gender, age, onset date, and address was collected for most cases. In addition, supplemental information was collected via the "Enteric Disease Report Form." This form included information on water supply, recreational water exposure, sewage exposure, various types of high-risk food exposure, travel history, and daycare exposure. Unfortunately, over 40% of these responses were marked "unknown."

The reported cases for all the diseases combined were distributed statewide, with the highest frequency of elevated reported disease rates in De Baca, McKinley and Curry Counties (see map, Appendix 3). As is often the case with enteric disease, rates were highest for children under 5 years of age. Most symptom onset occurred during summer months (June, July, and August). Appendix 3 contains charts and maps that graphically represent case characteristics and potential risk factors. The higher numbers of reported cases were for Campylobacteriosis and are significantly driving these numbers.

Campylobacteriosis

This bacterial disease is one of the most frequently reported causes of gastroenteritis in the US and in the world. The organism is often found in the gastrointestinal tracts of a wide range of birds (especially poultry) and animals, and can frequently be isolated from surface water (Hunter, 1997). Eating undercooked chicken or contact with farm animals are important risk factors for *campylobacter* infection. The incubation period (the amount of time from ingestion of the organism to symptom onset) is approximately two to five days.

In 2004, Campylobacter enteritis was the most frequently reported disease of the six selected potential waterborne diseases for New Mexico with 365 reported cases. This is strikingly consistent over the past seven years. Thirty-four percent of cases reported onset during summer months (mostly in July and August); 28% reported onset during the fall. While this disease had a statewide distribution, disease rates were highest in McKinley, De Baca and Curry Counties; Bernalillo (22%), Dona Ana (12%), and McKinley (11%) had the highest numbers of cases. As with many enteric diseases, children aged 0 to 4 had the highest disease rates. Of the 365 cases, additional risk factor information from the enteric report form was unknown for less than half (147 cases – 40%).

Although the weekly rate exceeded the 1 standard deviation several times this year, the cases were sporadically reported throughout the state indicating no unusual spatial clustering of disease that would indicate water system involvement.

Cryptosporidiosis

The organism responsible for this disease is a parasite. This organism is especially resistant to chlorine disinfection, and thus is a potential problem in both surface and recreational waters and in groundwater systems that may have experienced sewage contamination or infiltration of surface water. Cryptosporidium has a variable incubation period, ranging from two to twenty-eight days, but it is typically about a week between infection and illness. The most common symptom is watery diarrhea but some people can be asymptomatic.

There were 21 reported cases of cryptosporidiosis in New Mexico during 2004. Due to the small number of cases, generalizations and associations of possible causes are problematic.

Children under five years old had the highest rates of cryptosporidiosis. Of all the reported cases, 13 (61.90%) were from Curry County. The ages in this group ranged

from 1 to 80 but were mostly in children less than 6 years old and were equally distributed between males and females. For 8 (61.54%) of these cases the water system was unknown and there was nothing that links these cases to a public drinking water system. Long incubation periods for this organism can lead to difficulties in pinpointing risk factors. Because an outbreak of cryptosporidiosis was not suggested in Curry County in 2004, no further investigation was done. One explanation, as to why there were so many cases in Curry County, might be that there was better case reporting combined with increased testing by attentive medical professionals or testing error.

Enterohemorrhagic *Escherichia coli* infections

Enterohemorrhagic *E. coli* was first identified in 1982 and became a nationally reportable disease in 1993; the most commonly reported serotype is E. coli O157:H7. This type of *E. coli* produces a Shiga toxin that can cause severe damage to the lining of the intestine, and complications can result in serious kidney damage (Hemolytic Uremic Syndrome – HUS). The incubation period ranges from two to eight days. Infection with this organism is most commonly associated with the ingestion of undercooked beef and other foods contaminated by cattle feces. However, waterborne transmission has also been documented. Contamination of a municipal water system in Walkerton, Ontario, Canada resulted in several deaths and significant illness in a small community. A report by the US Food and Drug Administration indicated that in the Pacific Northwest, *E. coli* O157:H7 was suspected to be second only to Salmonella as a cause of bacterial diarrhea, and mild infection was thought to be vastly under-reported (FDA, 2001).

There were 28 reported cases of enterohemorrhagic E. coli infection in New Mexico in 2004, 13 of which were attributable to *E.coli* O157:H7. Again, due to the small number of cases, generalizations are problematic. However, 54 percent were in males and summer was the season with the greatest onset of disease. Typically, more disease is seen in the fall. Risk factor information was available for less than half the cases. While this family of organisms is frequently associated with undercooked food, none of the high-risk food variables (e.g., eating undercooked meat) seemed to play a role in the New Mexico cases.

Giardiasis

Giardia lamblia is a protozoa that is the most frequently identified cause of non-bacterial diarrhea in North America. It survives in the environment as a cyst, and is more resistant than most other waterborne pathogens (except Cryptosporidium) to chemical disinfection. *Giardia lamblia* infects a wide range of birds, amphibians, and other animals in nature, and is frequently found in surface water as a result of animal fecal contamination (especially beavers). The incubation period can be lengthy, ranging from three to twenty-five days.

There were 75 reported cases of giardiasis in New Mexico in 2004. The greatest numbers of cases were reported in summer but were somewhat evenly distributed throughout the year as well as within the age groups and gender. Risk factor information was unknown in only about 1/3 of the cases. Also, about 14% of the cases,

reported swimming in some type of recreational water (i.e., swimming pool, reservoir, lake, river) or reported traveling preceding their illness.

Hepatitis A

Hepatitis A is a viral organism that can result in the following symptoms: fever, malaise, nausea, anorexia, and abdominal discomfort, followed by jaundice. Hepatitis A has a long incubation period (between 10-50 days, with an average of 30 days), making it difficult to determine water or foodborne etiology. The FDA estimated that in 1988, 7.3% of cases (nationally) were foodborne or waterborne, however direct contact (fecal-oral) was the most common route of infection. A targeted immunization program begun in 1996 and has been instrumental in reducing morbidity due to Hepatitis A in New Mexico.

Because of the long incubation period, additional food-related risk factor information was not analyzed for the 25 reported cases. There was no information recorded about international travel but one case had contact with children in daycare and two other cases were determined to be daycare associated.

Shigellosis

Shigella sp. is a bacterium that almost exclusively infects humans (other primates may be infected), and some species can result in death. The species endemic in developed countries (*S. sonnei* and *S. flexneri*) typically produce milder symptoms (in those with adequate immune response) than *Shigella dysenariae*, the species more common in developing countries. Shigellosis (bacillary dysentery) is mainly spread from person to person by direct contact (the fecal-oral route), but can occur through direct fecal contamination of water and food sources. The infectious dose is small, between 10 and 100 organisms, and the incubation period is relatively short (12 to 26 hours). Because this organism frequently causes bloody diarrhea, Mead et al. (1999) estimate that treatment is more often sought for shigellosis than other diarrheal illnesses, and is therefore more likely to be reported to health authorities.

In 2004, there were 149 reported cases of shigellosis in New Mexico this rate for Shigellosis has remained fairly consistent since 1996. Of all the cases, children less than 5 years old had the highest rates, followed by 5 to 14 year olds. Spatially, the highest disease rates were in De Baca, McKinley, Union, and Dona Ana counties. Of the cases with additional information available, 32% (N=47) were a case contact.

DISCUSSION

2004 was the fourth complete year of the waterborne disease surveillance project. Currently, this system is a tracking system for enteric disease, of multiple and frequently unknown etiology. Utilization and fine-tuning of the databases and protocols will allow for the implementation of a surveillance system that has the potential to differentiate waterborne disease from diseases of other etiology. With the additional information provided by this system, future surveillance systems such as NM-EDSS (New Mexico Electronic Disease Surveillance System) projected to be implemented in 2006, can be modified towards better differentiation of disease etiology.

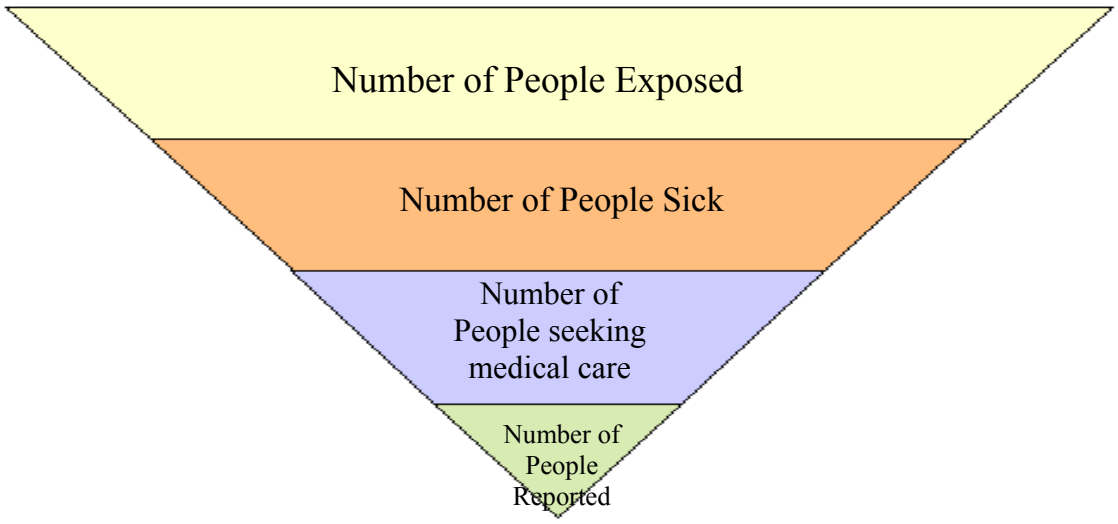
Limitations

Generalizations are problematic for disease with low case counts (such as cryptosporidiosis, enterohemorrhagic *Escherichia coli* infections, and Hepatitis A) and there are some limitations in using reported enteric disease as a surveillance system for waterborne disease, including source determination, timeliness of reporting, recall bias, and reporting bias. However, this is the best surveillance system available. Other systems, such as, over- the-counter (OTC) and sydromic surveillance systems are not available and have shown to be impractical for New Mexico.

Source determination is difficult for some diseases, especially those with relatively long incubation periods. To be a confirmed waterborne disease, the potential source must be identified in time to test it for the organism in question. In addition, most of the selected enteric illnesses can not only be transmitted by waterborne transmission but also via person-to-person, food, or animal transmission.

Timeliness of reporting is a limitation because some disease reports are not brought to the public health practitioners' attention until after many days or weeks of symptoms. After such a delay, it is difficult for most people to recall food and activity histories for events that happened many weeks in the past. However, if there was a boil water advisory or a boil water order issued, the public health practitioners for that area would have been alerted to look for waterborne diseases.

Another reporting bias issue might occur because certain infections are more likely to be reported than others; also, specific populations may be more likely to be tested, for example those with HIV/AIDs, or other immune-suppressing disorders. In addition, an otherwise healthy person may be diagnosed based on clinical symptoms rather than a confirmatory test, and therefore, never reported because traditionally, laboratories, not providers, report most cases. Furthermore, most people don't seek medical care for diarrheal illness, preferring to self-medicate with over-the-counter medicines. As a result, the number of people exposed to an organism is always larger than the number of people reported with the disease because not everyone exposed gets sick, and not everyone who gets sick, seeks medical care or is tested.



As with all data, it is subject to reporting bias. Still, reporting is mandatory for all the disease included in this report. However, reporting is not enforced and is therefore a passive system. Nonetheless, 99% (n=659) of the potential waterborne disease cases are laboratory confirmed.

Lastly, basing the surveillance system on reportable diseases may omit waterborne outbreaks of diseases that are not reportable. For example, some viruses, such as noroviruses, can be transmitted through water but are not reportable to the State. However, whenever a large number of people are reported of becoming ill to the NMDOH, steps are taken to capture as many cases as possible so that the information about the disease can be used for public education and disease diagnoses, treatment and prevention.

CONCLUSION

Because every surveillance system has its' limitations, the waterborne disease surveillance project (WBDP) is more than just a basic surveillance or monitoring system. It includes collaborative activities that help ensure the prevention of waterborne disease though public drinking water sources. Consequently, there were no waterborne diseases detected in 2004. This is due to the joint activities between the bureaus, to:

- Educate the public and the water systems on waterborne disease prevention
- Inform the public and the water systems, as soon as possible when they occur, about potential public health risks
- Investigate all potential reported waterborne diseases

RECOMMENDATIONS

1. **Identify and monitor "susceptible water systems:"** With the help of NMED, compare orders, advisories and exceedences with both nitrates and fecal coliform results.
2. **Continue to provide periodic training for district NMED and NMDOH personnel:** New Mexico is a large, rural state. Because it is not always possible for state personnel from Santa Fe to be on scene immediately during a disease outbreak, it is essential to train staff from local district offices in appropriate disease investigation protocol. NMDOH and NMED will continue to work together to provide statewide training opportunities.
3. **Provide easy accessible language appropriate information** for the general public, healthcare providers, and water system operators**.**
4. **Collaborate with DWB** to perform an analysis of the DWB database to help prioritize development of health information (e.g., radionuclides, volatile organic compounds [VOCs], synthetic organic compounds [SOCs], disinfection by products).

5. **Add the *Salmonella* group of organisms to the weekly list of surveillance organisms.** A study of the New Mexico Middle Rio Grande demonstrated that avian fecal material contributes the highest amount of all fecal material found in the Rio Grande. Since several communities' use or will be using surface water as a source for drinking and since avian carry *Salmonella*, it deems prudent to add this organism to the list of potential water borne disease organism and was added to the list of diseases or agents included in the project in 2005.

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Appendix 1,
Definition of Terms
Communication Protocol

Definition of Terms:

Rates: Rates were calculated as number of cases per 100,000 people using the 2000 US Census population, increased by the overall estimated 2001 New Mexico population increase (1.6%).

Seasons: (Season of symptom onset)
- Winter: January, February, and December
- Spring: March April and May
- Summer: June, July, and August
- Fall: September, October, and November

Residential water source: source of drinking water at home.

Recreational water exposure: exposure to lake, pond, swimming pool, river, or other source of water for recreational purposes.

Potential sewage exposure: Combined variable includes any case that reported exposure to raw sewage, or have a home septic system or cesspool.

Case contact: Case reported contact with someone with diarrhea within two weeks before or after onset of illness.

Restaurant: Case reported eating at a restaurant within one week for a bacterial infection, two weeks for parasitic infections.

Underlying illness: Case reported some sort of underlying illness. Those with underlying illnesses may have a higher likelihood of being tested than the general population.

Travel: Case reported travel (any, outside New Mexico, or outside the US) within two weeks of symptom onset.

Farm: Recent visit to a farm reported.

Sick animal: Contact with sick animals, including reptiles, poultry, cattle, or any other (e.g. sick pet).

Food exposures: Nine different questions are asked regarding various food exposures, including raw meats (beef, chicken, eggs, shellfish, jerky), unpasteurized dairy products or cider, and unwashed fruits/vegetables. Different foods may be associated with each illness; for example, E. coli infection is often associated with undercooked beef, while campylobacter infection is more likely to be associated with undercooked chicken.

Contaminated drinking water: Drinking water with documented microbial contamination at the time the illness occurred. This variable is unknown in all cases.

Note: Reporting a positive risk factor does not necessarily indicate source of illness, for example, if a case reports swimming in a lake then reports illness, the illness may not necessarily be related to the lake water exposure.

None of the variables is mutually exclusive; a single individual can be positive for more than one risk factor.

A risk factor graph was not produced for amebiasis due to lack of data. A limited graph was produced for Hepatitis A, which generally has a long incubation period.

Waterborne Disease Surveillance Project (WDSP)
Communication Protocol

NMED Drinking Water Bureau
NMDOH Office of Epidemiology

PURPOSE:
To establish a mechanism for routine communication between the two agencies in regard to the sharing of water quality and health information/data that may have public health implications or that is necessary to complete aspects of the waterborne disease surveillance project.

NATURE OF COMMUNICATION
Initial communication of or requests for information between agencies should occur at the level of WDSP designees. It will be the responsibility of these designees to convey this information or involve relevant individuals within the respective agency. As this document currently stands, this initial communication would occur between Julie Desai (NMED) and the Waterborne Disease Epidemiologist (NMDOH). The Waterborne Disease Epidemiologist position is currently vacant, so Amy Lay will be the point of contact. Julie's backup is Retta Prophet and Amy's backup is Ron Voorhees.

Because of the importance and urgency in being able to contact an individual from the other agency, such as in an outbreak scenario, each project participant will identify their preferred means of being contacted (e.g., phone, e-mail, etc.). In addition, during any short- or long-term absence of a designee from work, he/she will assure that communication will be maintained through the either the designation of an alternate designee and/or notification of his/her counterpart in the other agency.

Regardless of the reason for communication, the WDSP Designees at each agency may involve or notify other intra-agency staff in any investigation/follow-up activities. The WDSP Designee will also determine whether certain communication on a case should occur directly between field/technical staff and the other agency's WDSP Designee. If communication does occur between a WDSP Designee and field/technical staff in the other agency, the other agency's designee should be kept apprised of developments (usually by being cc'd on e-mails sent by both the field/technical staff and the other agency's Designee).

CONTACT INFORMATION--WDSP Designees

N M E D—D r i n k i n g W a t e r B u r e a u

Julie Desai, Water Resource Specialist 2
Phone: 827-1400 x1014
Fax: 827-7545
E-mail: julie_desai@nmenv.state.nm.us

Preferred modes of contact (in order):
1. phone
2. Email
3. fax

Retta Prophet, Manager
Phone: 827-1400, x1023 1. email
Fax:827-7545 2. phone
E-mail: retta_prophet@nmenv.state.nm.us 3. fax

Fernando Martinez, Bureau Chief
Phone: 827-7536 1. phone
Fax: 827-7545 2. email
E-mail: fernando_martinez@nmenv.state.nm.us 3. fax

NMDOH—Office of Epidemiology

Preferred modes of contact (in order):

Amy Lay, Environmental Epidemiologist
Phone: 476-3758 1. Phone
Fax: 827-0013 2. E-mail
E-mail: amy.lay@doh.state.nm.us 3. Fax

Ron Voorhees, Acting Program Manager
Phone: 476-3583 1. Phone
Fax: 827-0013 2. E-mail
E-mail : ronv@doh.state.nm.us 3. Fax

On-Call Person (variable), Physician/Nurse 1. Phone
Phone: 827-0006 2. Fax
Fax: 827-0013

ROLE OF NMED FIELD OFFICES AND NMDOH LOCAL HEALTH OFFICES

- If field/local office staff receives a health or environmental complaint relating to water, he/she should communicate this to his/her agency's respective WDSP Designee.
- Field/local office staff should consult with their Designee to verify the appropriate release of information relating to agency activities to the general public.
- Field/local office staff is expected to provide technical support and follow-up at the local levels of any investigation or follow-up activities.
- Staff will also participate in any scheduled trainings/workshops relating to waterborne disease or water quality issues.

REASONS FOR COMMUNICATION (detail follows this list)

1. Suspected waterborne illness reports (to include public complaints)
2. Boil water notices
3. MCL violations (microbiological and nitrates)

4. Surface/Source Water Protection Issues (e.g., plume)
5. Surface water plant non-compliance?
6. Data sharing/data requests
7. Outbreak control
8. Data/sample collection
9. Public meetings or information dissemination
10. Other acute events

1. SUSPECTED WATERBORNE ILLNESS REPORTS

Waterborne illness reports to NMED may come in the form of phone calls/complaints suggesting waterborne illness from general public. Waterborne illness reports to NMDOH may also come in the form of phone calls/complaints from general public or health care providers. In addition, NMDOH will evaluate lab reports for select notifiable diseases and will report to NMED suspected cases of waterborne illness (which will be determined through waterborne illness questionnaire and/or identification of a cluster of cases believed to have a common water source).

Upon receipt of a suspected waterborne illness report by either agency, the following should occur:

a. Contact the other agency via the respective WDSP Designees to provide a synopsis of the situation and determine next steps.
b. Epidemiology staff will review health information and Drinking Water Bureau staff will review recent water quality data for water system in question.
c. Jointly determine likelihood of association of illness to water.
d. Proceed with case-specific decisions.

Time Frame: Within 1 working day.

2. BOIL WATER NOTICES

Upon determination by NMED that a boil water notice must be issued, NMED should notify NMDOH of this decision and provide details such as:

- system/community affected
- reason for the notice
- expected time of notification
- steps being taken to remedy situation, and
- an electronic or hard copy of the boil water notice.

Once NMED field/office staff determine that there is sufficient environmental/lab evidence to lift a boil water notice, NMED should consult with NMDOH to ensure that there is no ongoing investigation/follow-up of water-related health effects before rescinding the notice.

Time Frame: Within 1 working day

3. MCL VIOLATIONS (microbiological, nitrates, or chemical)

NMED will regularly notify NMDOH via e-mail of any non-acute MCL violations for microbiological organisms (coliforms, fecal coliforms, E. coli, viruses, parasites, etc.), chemicals, or nitrates as an indicator of the presence of other microbes. NMDOH will track this water quality information in case any health complaints are received that may correspond to a water system that has a history of non-acute MCL violations.

Time Frame: Within 1 (?) working day

4. SURFACE/SOURCE WATER PROTECTION ISSUES

NMED will contact NMDOH when there are problems identified that are related to the possible contamination of surface or other source (ground) water by contaminant plumes in ground, proximity of liquid or other waste, etc.

Time Frame: Variable

5. SURFACE WATER TREATMENT PLANT NON-COMPLIANCE

NMED will contact NMDOH if they identify a surface water treatment facility that is not in compliance. Details regarding the treatment facility and reasons for non-compliance should be forwarded to NMDOH. Information will also be provided as to how the treatment non-compliance relates to MCLs and possible health implications.

Time Frame: Within *2* working days

6. DATA SHARING/DATA REQUESTS

Data sharing between NMED and NMDOH will take place both when investigating suspected waterborne disease incidents and while NMDOH is working on the historical characterization of potential waterborne disease occurrence.

NMDOH will submit requests to NMED for water quality data, which may include the following variables:

- system ID & name
- city/community/population served
- MCL violation and other water quality information

NMDOH will provide requested health data (stripped of personal identifiers) and/or summaries, as related to waterborne disease surveillance, to NMED staff.

NMDOH and NMED will both work within their own Information Systems groups to allow read-only access to each other's databases.
Time frame: Within **1** working day when investigating potential waterborne disease incidents and within **5** working days for historical characterization or other less urgent data matters.

7. OUTBREAK CONTROL

Protocol for communicating during investigation and/or control of suspected waterborne disease outbreaks is described in the NMED/NMDOH Memorandum of Agreement for enteric disease outbreaks.

Time frame: Variable

8. DATA/SAMPLE COLLECTION

If a situation (e.g., outbreak) deems it necessary for the collection of health data (e.g, via questionnaire) or environmental data (additional water samples), coordination of such efforts will take place between WDSP designees. The requesting agency will submit

their request via phone or e-mail, and the responding agency will provide results via phone, with follow-up via e-mail.

Time frame: Variable

9. Public Meetings and Information Dissemination
NMED and NMDOH will collaborate on any joint public meetings relating to water-related problems in a community. The two agencies will also consult with one another on the development and/or editing of documents for public consumption at such meetings.

10. OTHER ACUTE EVENTS (NON-MCL OR BOIL WATER NOTICE RELATED)
NMED will notify NMDOH in other acute situations requiring action, such as cross-connection problems or chemical spills into drinking water source, which can affect a community water system's integrity.

MEDIA CONTACT
During the investigation and control of confirmed or potential waterborne disease outbreaks, media contacted will be conducted pursuant to protocol established in the NMED/NMDOH Enteric Disease MOA. If other instances of media contact are deemed relevant as a result of activities of the waterborne disease surveillance project representatives of both agencies should coordinate them.

Initial discussions should take place between WDSP designees at each agency. Once there is some consensus about what is being considered for media release, then each agency's public information officer should be notified and appropriate approvals be obtained. Each WDSP designee will be responsible for informing the appropriate media representatives within their own agencies.

Within the Office of Epidemiology, all communication with media is coordinated with Dr. C. Mack Sewell, State Epidemiologist. Dr. Sewell will either communicate with the media directly or will approve other communication via the Public Information Officer for NMDOH.

Within NMED, all communication with media is coordinated with Jon Goldstein, Department Information Officer. Communication will be from the person approved by NMED for media communications for the individual site and situation.

Public Information Officers

Environment Department
Jon Goldstein
Phone: 827-2855
Fax: 827-2836
E-mail: jon_goldstein@nmenv.state.nm.us

Department of Health
Beth Velasquez
Phone: 827-2613
Fax: 827-2530
E-mail: beth.velasquez@doh.state.nm.us

QUARTERLY MEETINGS

WDSP staff from both agencies will meet quarterly to discuss progress on the project, any identified waterborne disease outbreaks, and any other issues pertaining to collaborative efforts.

CONTACT LIST (Attached)

A list of waterborne disease surveillance contacts, including WDSP designees, NMED District, NMDOH District, State Lab Division, and Office of Epidemiology staff is attached. This list will be reviewed and updated quarterly.

Appendix 2,
Notifiable Conditions List

NOTIFIABLE CONDITIONS IN NEW MEXICO

12.1 ALL REPORTS MUST INCLUDE:

12.1.1 The disease or problem being reported;
12.1.2 Patient's name, date of birth/age, gender, race/ethnicity, address, telephone number, and occupation;
12.1.3 Physician (or laboratory) name and telephone number.
12.1.4 Laboratory or clinical samples for conditions marked with [‡] are requested to be sent to the Scientific Laboratory Division.

12.2 EMERGENCY REPORTING OF COMMUNICABLE DISEASES:

The following diseases, confirmed or su spected, require immediate reporting by telephone to the Office of Epidemiology at 505-827-0006. If no answer, call 505-984-7044.

12.2.1 Infectious Diseases

Anthrax‡
Meningococcal infections, invasive‡
Rubella (incl congenital)
Botulism (any type) ‡
Pertussis‡
Severe Acute Respiratory Syndrome (SARS)‡
Cholera
Plague‡
Smallpox‡
Diphtheria‡
Poliomyelitis, paralytic
Tularemia‡
Haemophilus influenzae invasive infections‡
Q fever
Typhoid fever‡
Measles
Rabies
Yellow fever

12.2.2 Other Conditions

Suspected foodborne illness in two or more unrelated persons‡

Illnesses suspected to be caused by the intentional or accidental release of biologic or chemical agents‡

Severe smallpox vaccine reaction (includes accidental implantation, eczema vaccinatum, generalized vaccinia, progressive vaccinia)

Suspected waterborne illness in two or more unrelated persons‡

Acute illnesses of any type involving large numbers of persons in the same geographic area

Other conditions of public health significance

12.2.3 Infectious Diseases in Animals

Anthrax
Rabies
Plague
Tularemia

12.3 ROUTINE REPORTING

12.3.1 Infectious Diseases (Report case within 24 hours to Office of Epidemiology at 1-800-432-4404 or 505-827-0006; or contact the local health office)

Brucellosis
Hemolytic uremic syndrome, postdiarrheal
Relapsing fever
Campylobacter infections
Hepatitis A, acute
Rocky Mountain spotted fever
Coccidioidomycosis
Hepatitis B, acute or chronic
Salmonellosis‡
Colorado tick fever
Hepatitis C, acute or chronic
Shigellosis‡
Cryptosporidiosis
Hepatitis E, acute
St. Louis encephalitis infections
Cysticercosis
Influenza, laboratory confirmed only
Streptococcus pneumoniae invasive infections‡
Cyclosporiasis
Legionnaires' disease
Tetanus
E. coli 0157:H7 infections‡
Leprosy Trichinosis
E. coli , shiga-toxin producing (STEC) infections‡
Leptospirosis
Toxic shock syndrome
Encephalitis, other
Listeriosis‡
Varicella
Giardiasis
Lyme Disease
Vibrio infections‡
Group A streptococcal invasive infections ‡
Malaria
West Nile Virus infections
Group B streptococcal invasive infections ‡
Mumps
Western equine encephalitis infections
Hantavirus pulmonary syndrome
Psittacosis
Yersinia infections‡

12.3.2 Infectious Diseases in Animals (Report case within 24 hours to Office of Epidemiology at 1-800-432-4404 or 505-827-0006; or contact the local health office)

Arboviral, other
Psittacosis
Brucellosis
West Nile Virus infections

12.3.3 Tuberculosis‡ or Other Nontuberculous Mycobacterial Infections

Report suspect or confirmed cases within 24 hours to Tuberculosis Program, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 505-827-2474 or 505-827-2473.

12.3.4 Sexually Transmitted Diseases

Report to Infectious Disease Bureau - STD Program, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110, Fax 505-476-3638;or call 505-476-3636.

Chancroid
Gonorrhea
Chlamydia trachomatis infections
Syphilis

List of Notifiable Diseases/Conditions in New Mexico revised date of publication

12.3.5 HIV (Human Immunodeficiency Virus) and AIDS (Acquired Immunodeficiency Syndrome).

Report to Office of Epidemiology, HIV/AIDS Epidemiology Unit, 625 Silver SW Suite 412, Albuquerque, NM 87102, Fax 505-841-5985; or call 505-841-5893 or 1-888-878-8992.

HIV: (1) confirmed positive HIV antibody test (screening test plus confirmatory test), or (2) any test for HIV RNA or HIV cDNA ('viral load'),or (3) any test to detect HIV proteins, or (4) any positive HIV culture, or(5) any other test or condition indicative of HIV infection as defined bythe United States Centers for Disease Control and Prevention.

AIDS: Opportunistic infections, cancers, CD4 lymphocyte count (<200per μL or <14% of total lymphocytes), or any condition indicative ofAIDS.

12.3.6 Occupational Illness and Injury
Report to New Mexico Occupational Health Registry, MSC 105550, 1 University of New Mexico, Albuquerque, NM 87131-0001.

Asbestosis
Hypersensitivity pneumonitis
Silicosis
Chronic beryllium lung disease
Mesothelioma
Other illnesses related to occupational exposure
Coal worker's pneumoconiosis
Noise induced hearing loss
Heavy metal poisoning
Occupational asthma

12.3.7 Health Conditions Related to Environmental Exposures and Certain Injuries
Report to Office of Epidemiology, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 1-800-432-4404 or 505-827-0006.

Drug overdose Pesticide poisoning
Other environmentally-induced health conditions
Firearm injuries Spinal cord injuries
Lead (all blood levels)
Traumatic brain injuries

12.3.8 Adverse Vaccine Reactions
Report to Vaccine Adverse Events Reporting System, http://www.vaers.org. Send copy of report to Immunization Program Vaccine Manager, NM Department of Health, P.0. Box 26110, Santa Fe, NM 87502-6110; fax 505-827-1741.

12.3.9 Cancer
Report to New Mexico Tumor Registry, University of New Mexico School of Medicine, Albuquerque, NM 87131. Report all malignant and in situneoplasms and all intracranial neoplasms, regardless of the tissue of origin.

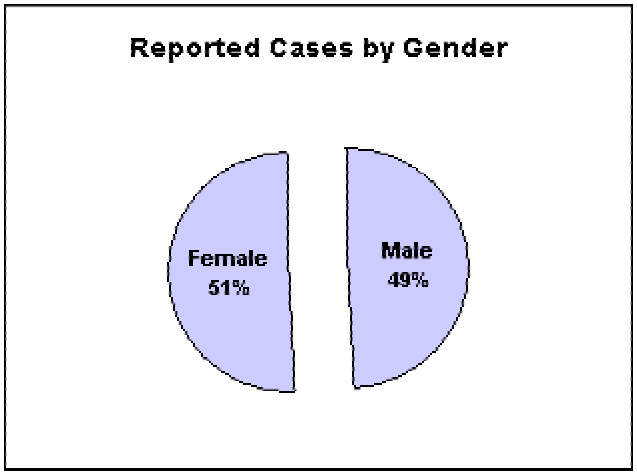
12.3.10 Birth Defects
Report to Birth Defects Registry, Children's Medical Services, 2040 S. Pacheco, Santa Fe, NM 87505; or call 505-476-8854.

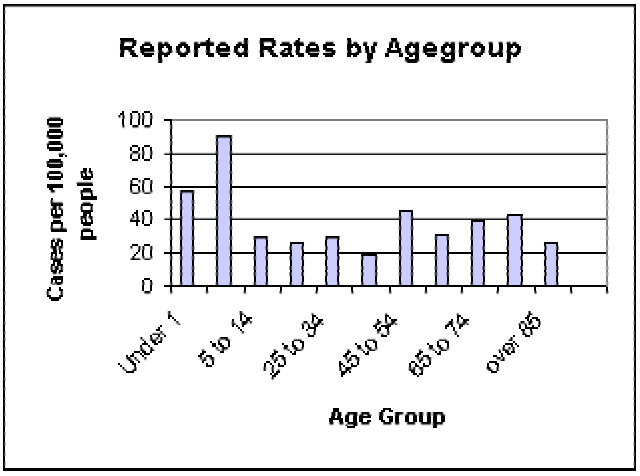
All birth defects diagnosed by age 14 years, including:
Defects diagnosed during pregnancy
Defects diagnosed on fetal deaths
[7.4.3.13 NMAC - Rp, 7 NMAC 4.3.12, 8/15/2003]

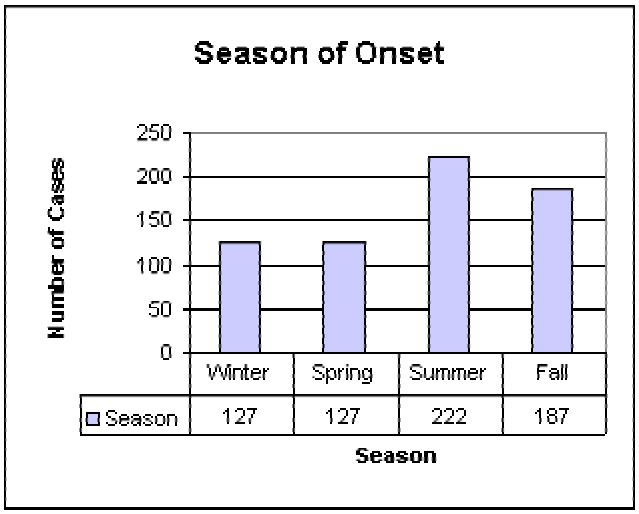
List of Notifiable Diseases/Conditions in New Mexico revised August 15, 2003

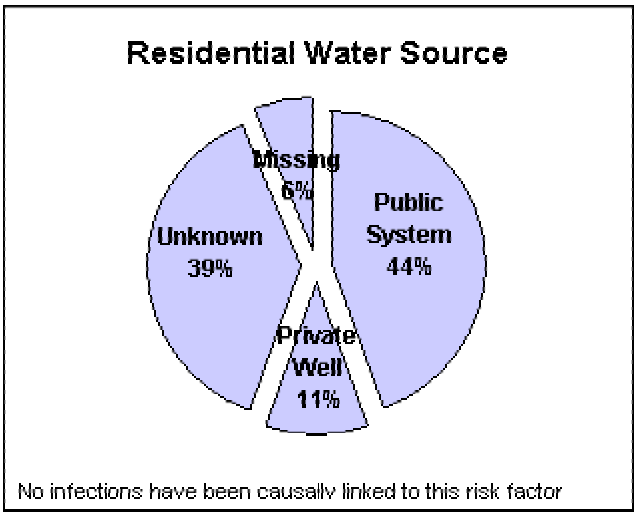
Appendix 3,
Disease Specific Charts and Maps

All Potential WBD New Mexico, 2004
Total reported cases: 663

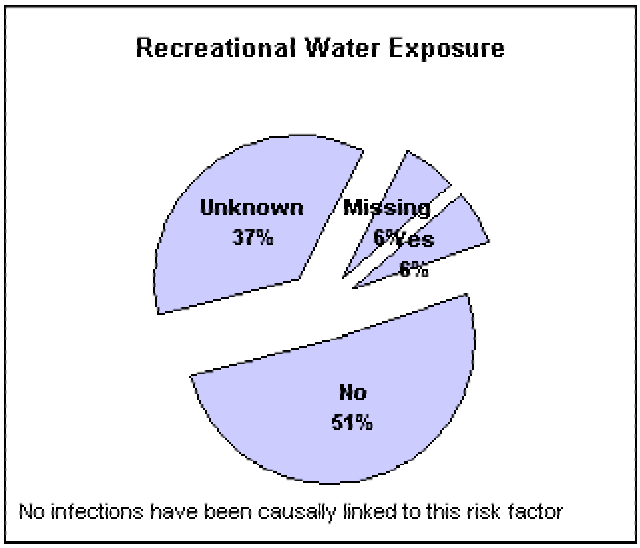




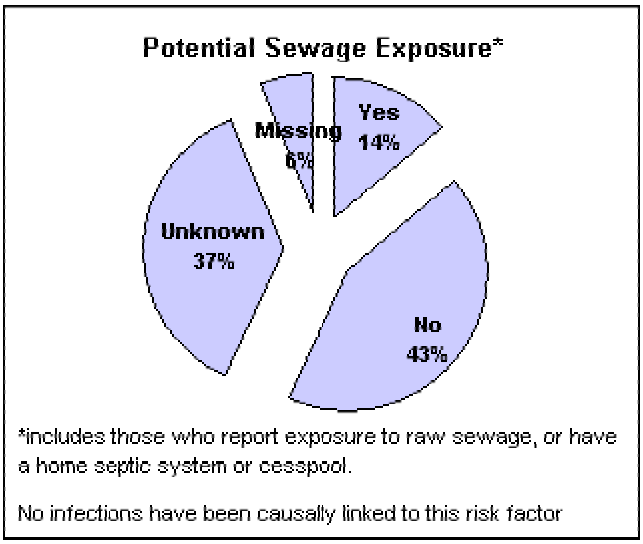




No infections have been causally linked to this risk factor



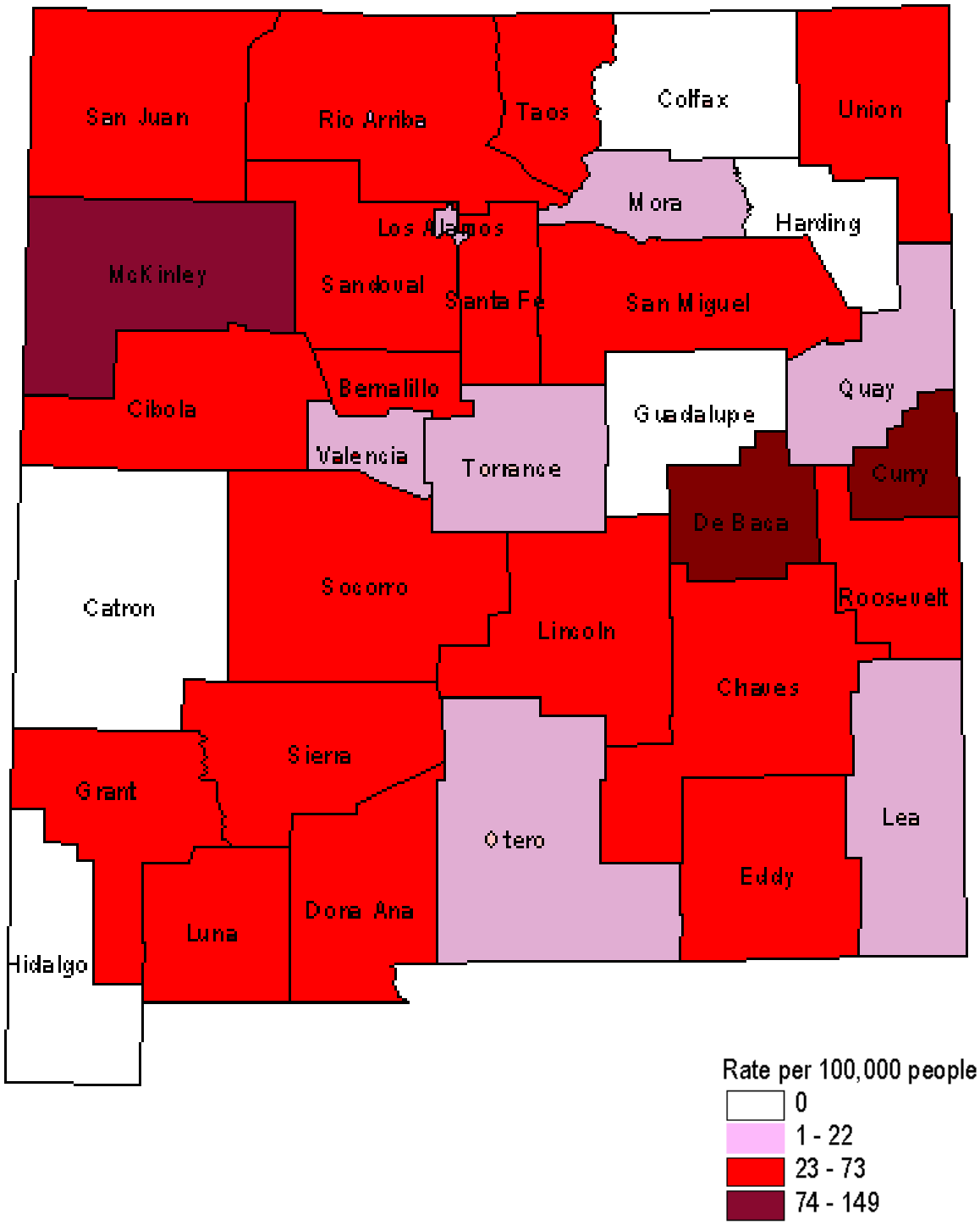
No infections have been causally linked to this risk factor



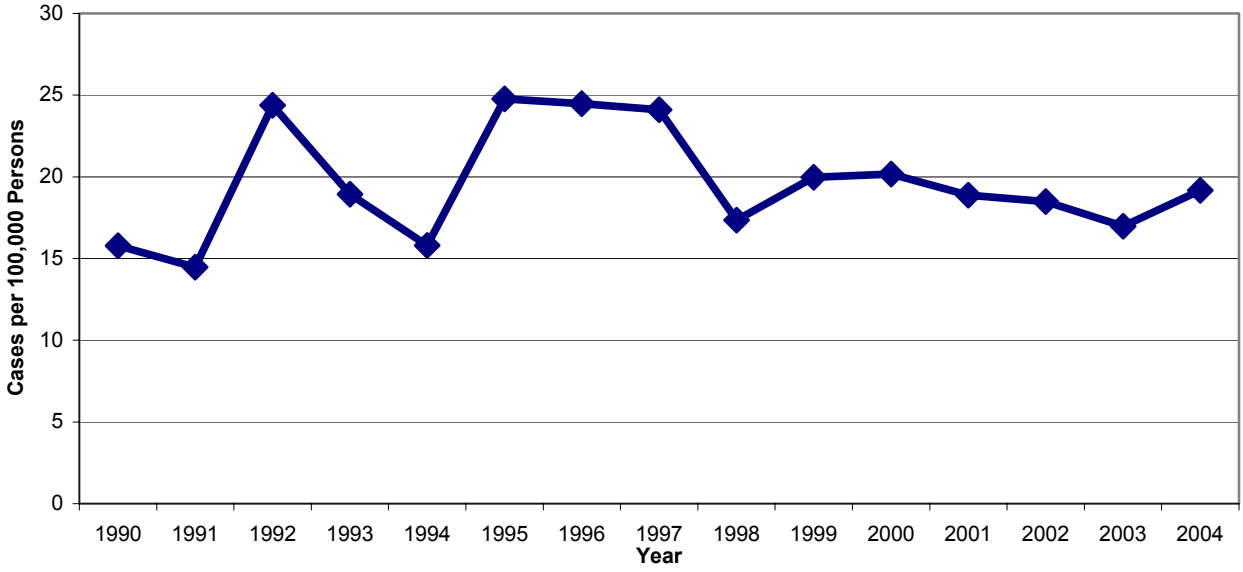
*includes those who report exposure to raw sewage, or have a home septic system or cesspool.

No infections have been causally linked to this risk factor

All Reported Potential Waterborne Diseases
County Rate per 100,00 People
New Mexico, 2004



Campylobacteriosis in New Mexico, 2004
Total reported cases: 365

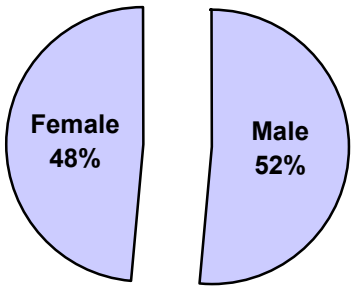


Special points of interest:

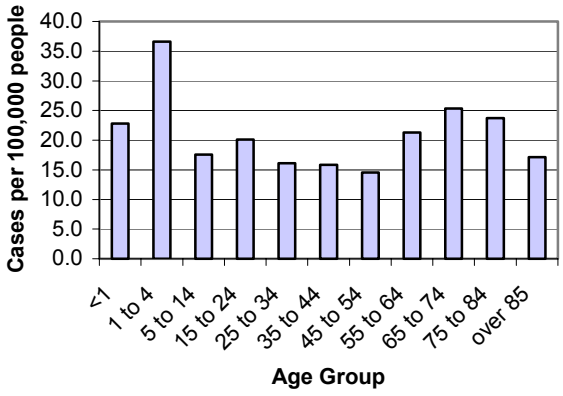
- Summer was the most frequent season of onset for this disease
- McKinley & Roosevelt Counties had the highest rates during 2000-2004; however, this may be due to greater reporting numbers than actual occurrences.
- It's more commonly reported for Children than Adults
- Almost all cases are sporadic events.
- In the U.S., there are about 15 cases per 100,000 annually
- Virtually all persons infected with *Campylobacter* will recover without any specific treatment.

Campylobacteriosis, New Mexico, 2004
General Case Characteristics & Possible Water Exposures
Total reported cases: 365

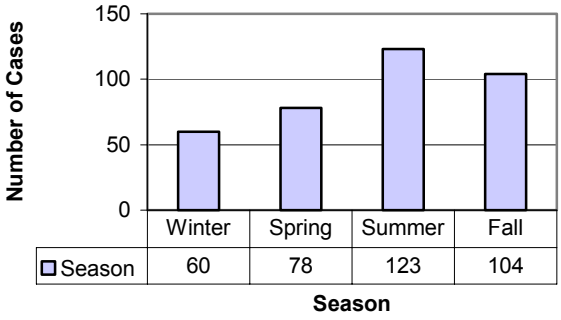
Reported Cases by Gender



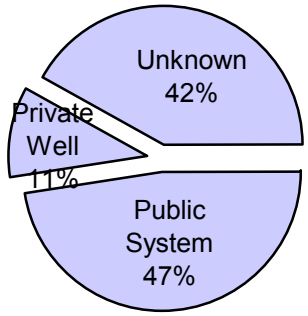
Reported Rates by Agegroup



Season of Onset

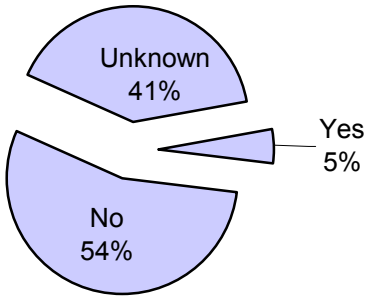


Residential Water Source



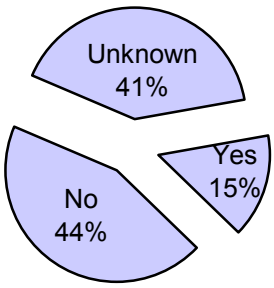
No infections have been causally linked to this risk factor

Recreational Water Exposure



No infections have been causally linked to this risk factor

Potential Sewage Exposure*

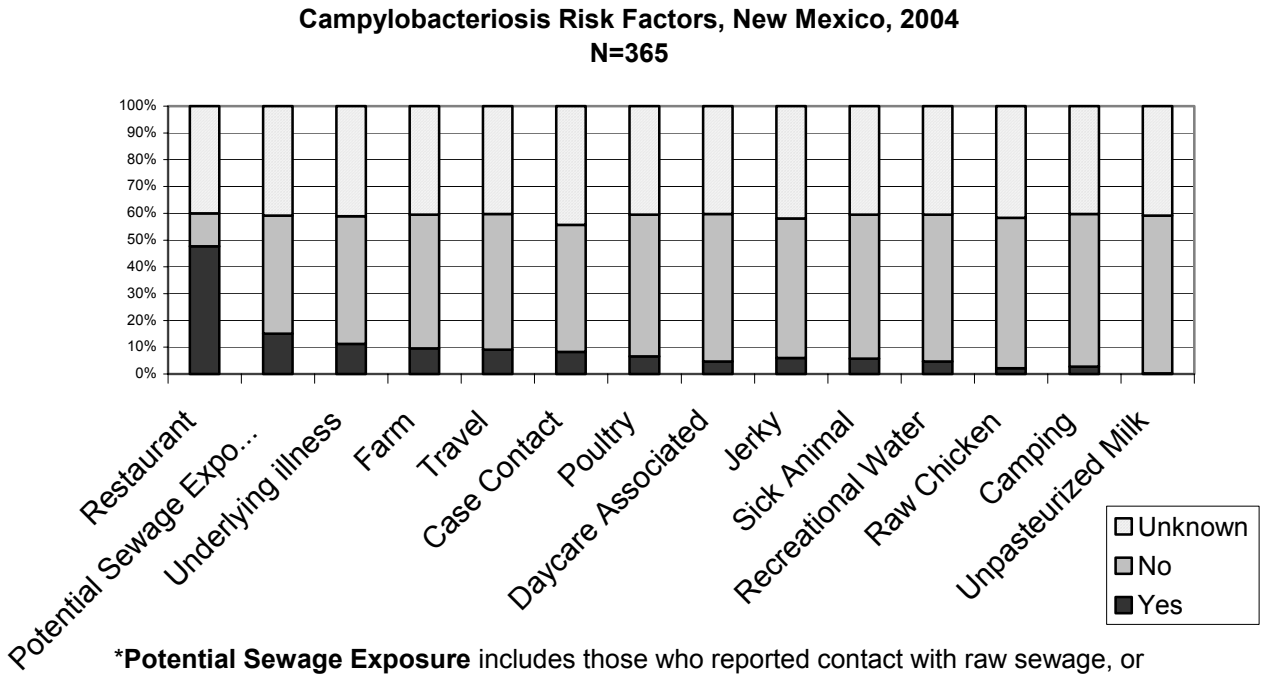


*includes those who report exposure to raw sewage, or have a home septic system or cesspool.

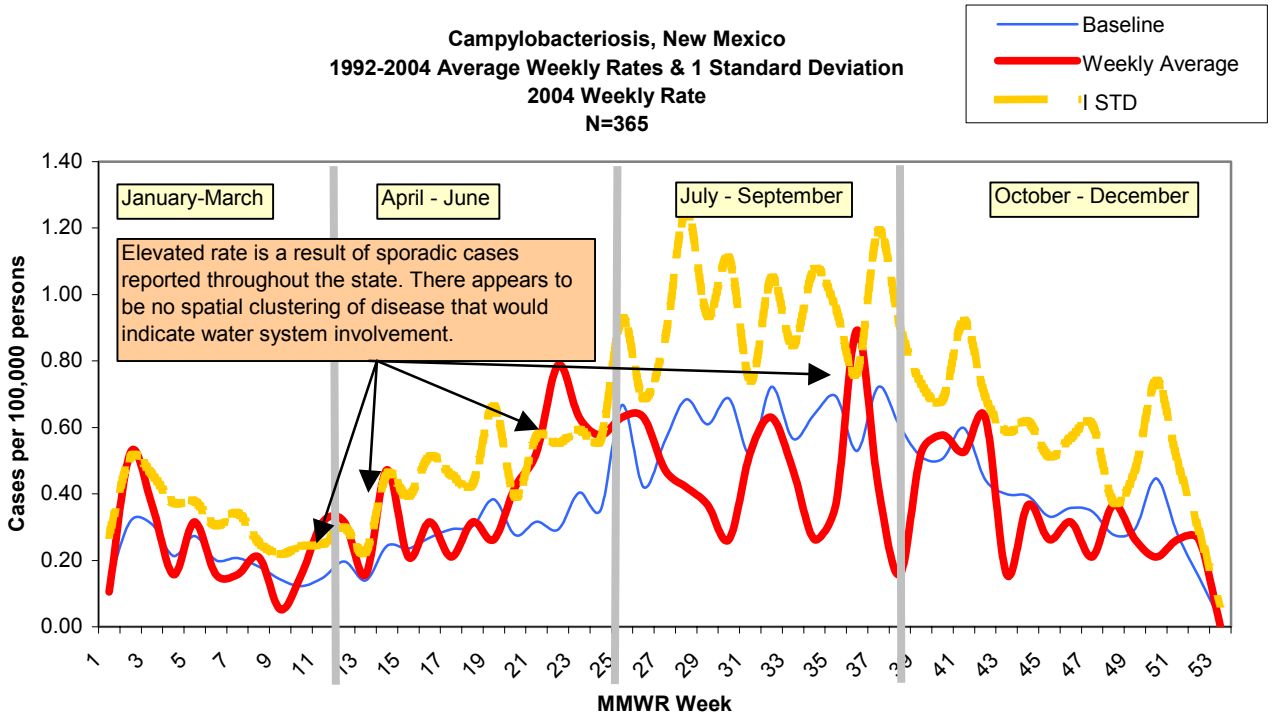
No infections have been causally linked to this risk factor

Campylobacteriosis, New Mexico, 2004
Weekly Surveillance and Risk Factor Information

Total reported cases: 365

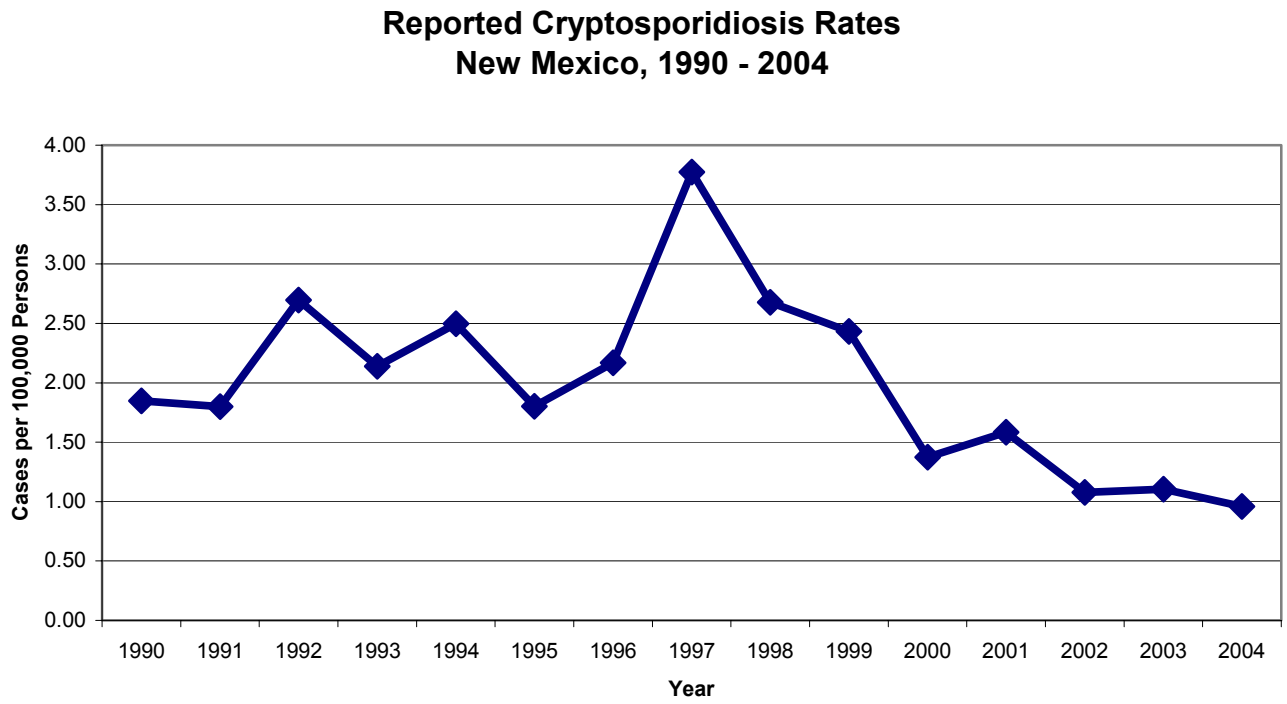


*__Potential Sewage Exposure__ includes those who reported contact with raw sewage, or have a home septic system or cesspool.

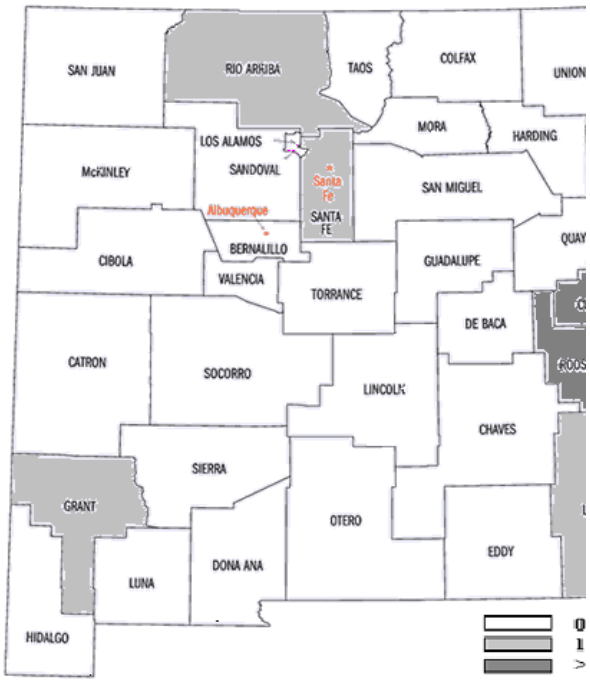


The weekly baseline rate was calculated from the 12 year average rate for each week.

Cryptosporidiosis, New Mexico, 2004
Total reported cases: 21



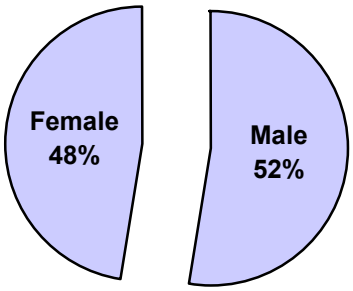
Reported Cryptosporidiosis Count Rate per 100,00 Persons New Mexico, 2004 N=21



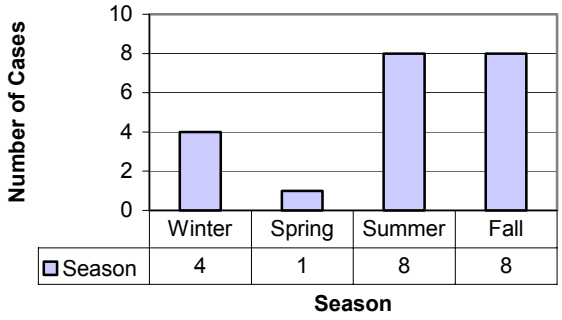
Special points of interest:

- Cryptosporidiosis has shown a decreasing trend, with the exception of a large increase in 1997
- Curry County had the highest rate in 2004 with 13 (62%) cases, but was randomly distributed throughout the year
- Cryptosporidiosis is a low incidence disease in NM; most counties reported no cases in 2004
- Cryptosporidiosis occurs worldwide

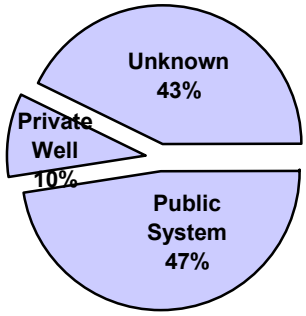
Reported Cases by Gender



Season of Onset

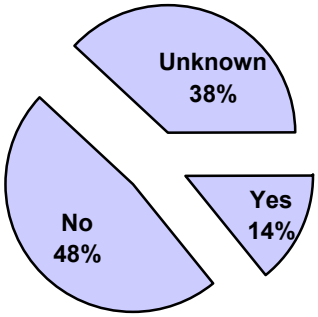


Residential Water Source



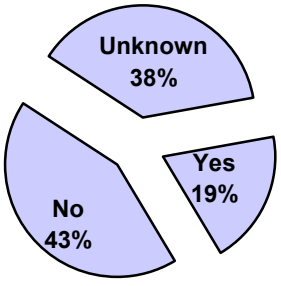
No infections have been causally linked to this risk factor

Recreational Water Exposure



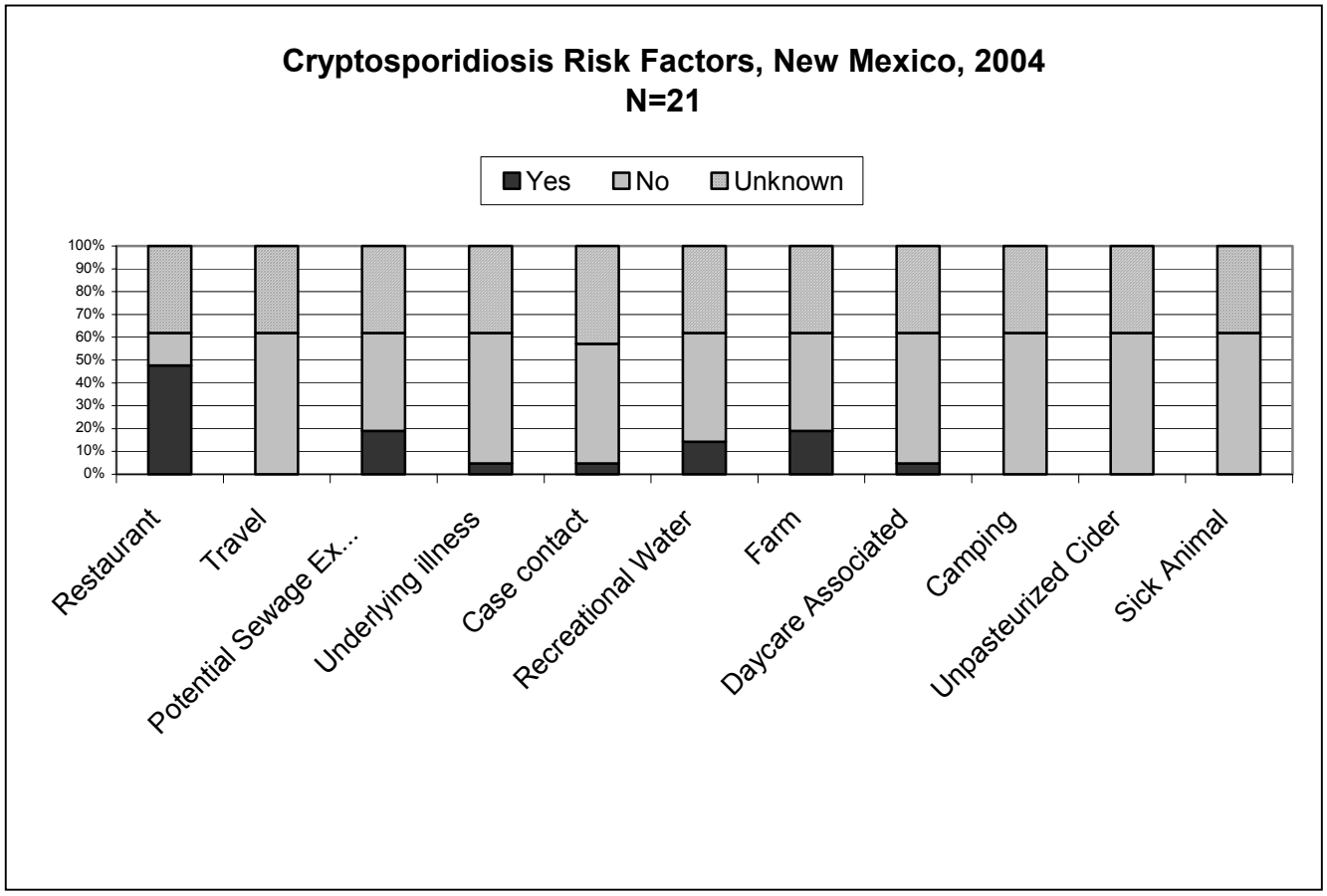
No infections have been causally linked to this risk factor

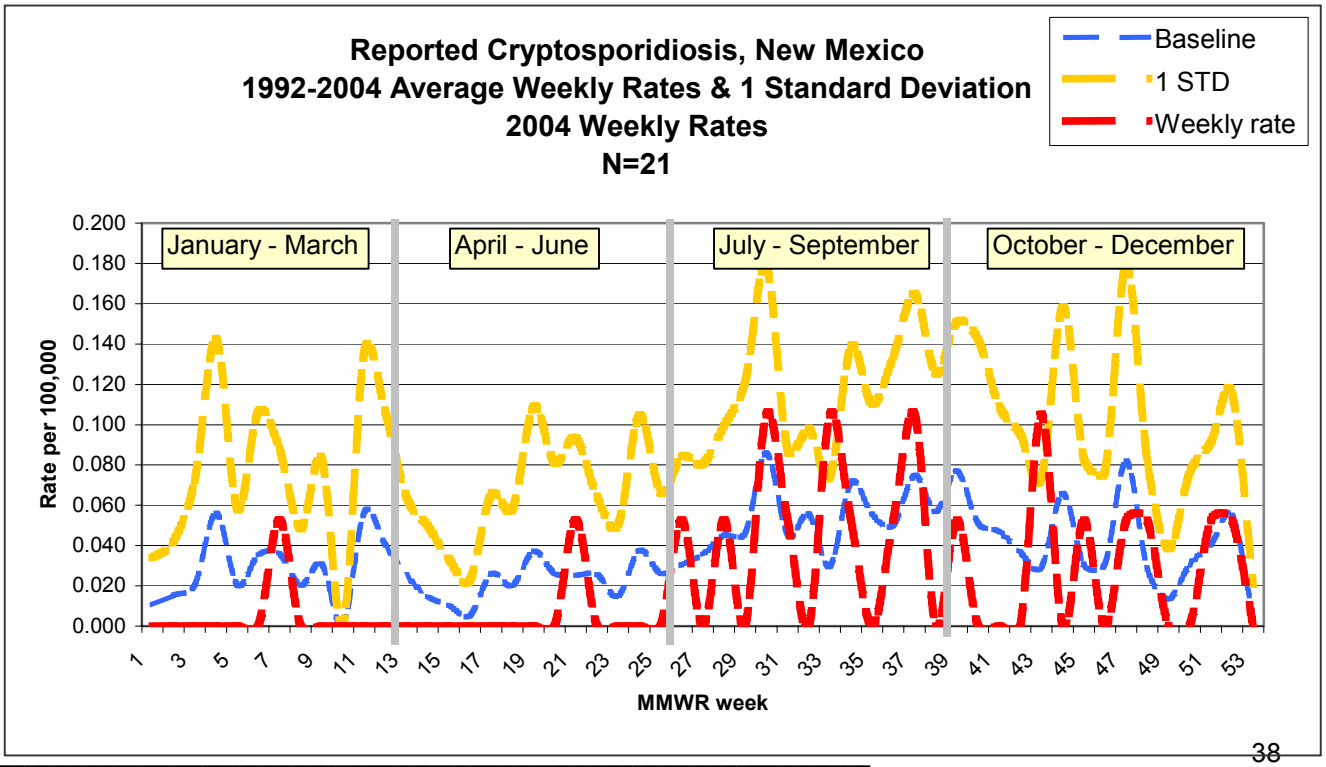
Potential Sewage Exposure*



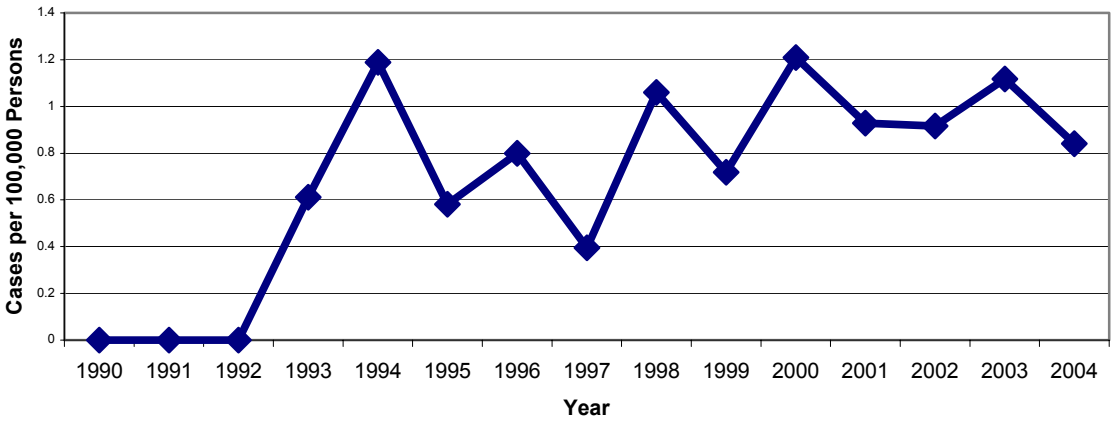
*includes those who report exposure to raw sewage, or have a home septic system or cesspool.

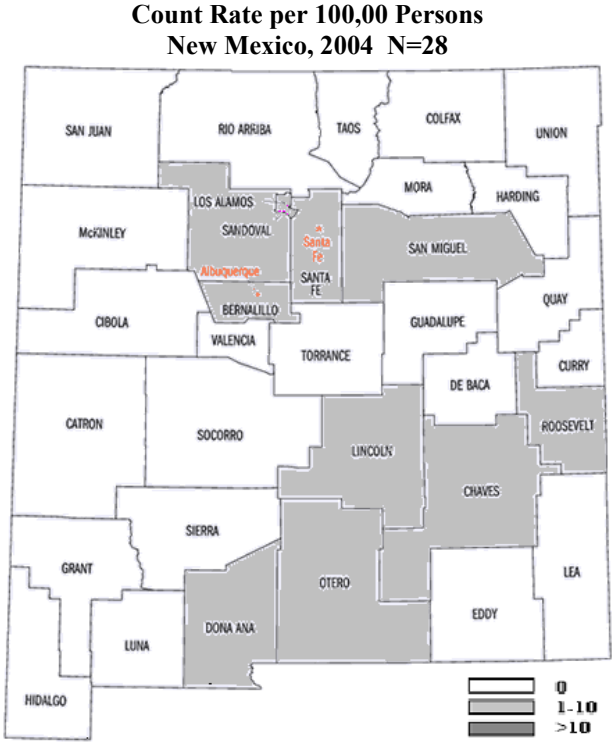
No infections have been causally linked to this risk factor


Cryptosporidiosis Risk Factors, New Mexico, 2004
N=21
Yes
No
Unknown
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Restaurant
Travel
Potential Sewage Ex...
Underlying illness
Case contact
Recreational Water
Farm
Daycare Associated
Camping
Unpasteurized Cider
Sick Animal


Reported Cryptosporidiosis, New Mexico
1992-2004 Average Weekly Rates & 1 Standard Deviation
2004 Weekly Rates
N=21
Baseline
1 STD
Weekly rate
January - March
April - June
July - September
October - December
Rate per 100,000
0.200
0.180
0.160
0.140
0.120
0.100
0.080
0.060
0.040
0.020
0.000
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41
43
45
47
49
51
53
MMWR week

Enterohemorrhagic E. coli (EHEC) in New Mexico, 2004
Total reported cases: 28



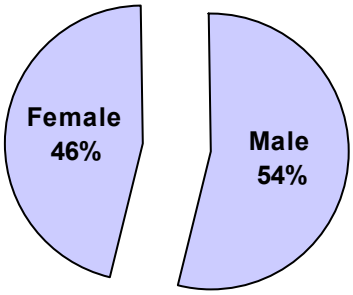


Special points of interest:

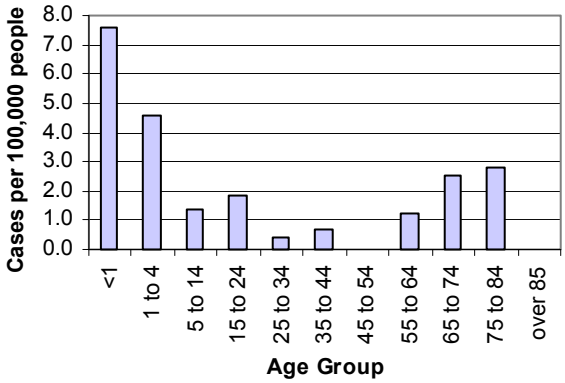
- This disease became reportable in 1993.
- Undercooked meat did not seem to be a significant risk factor.
- Due to the small number of cases in NM the rates in some county may only represent 1 case.

Enterohemorrhagic E. coli infection, New Mexico, 2004
General Case Characteristics & Possible Water Exposures
Total reported cases: 28

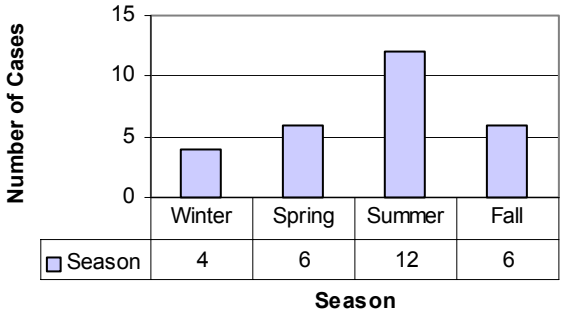
Reported Cases by Gender



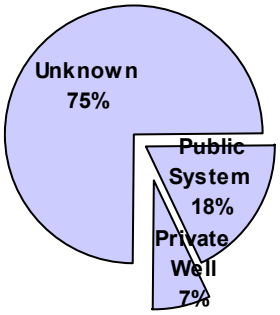
Reported Rates by Agegroup



Season of Onset

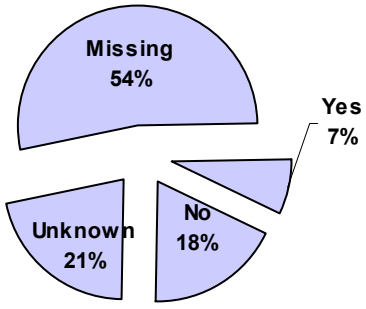


Residential Water Source



No infections have been causally linked to this risk factor

Recreational Water Exposure



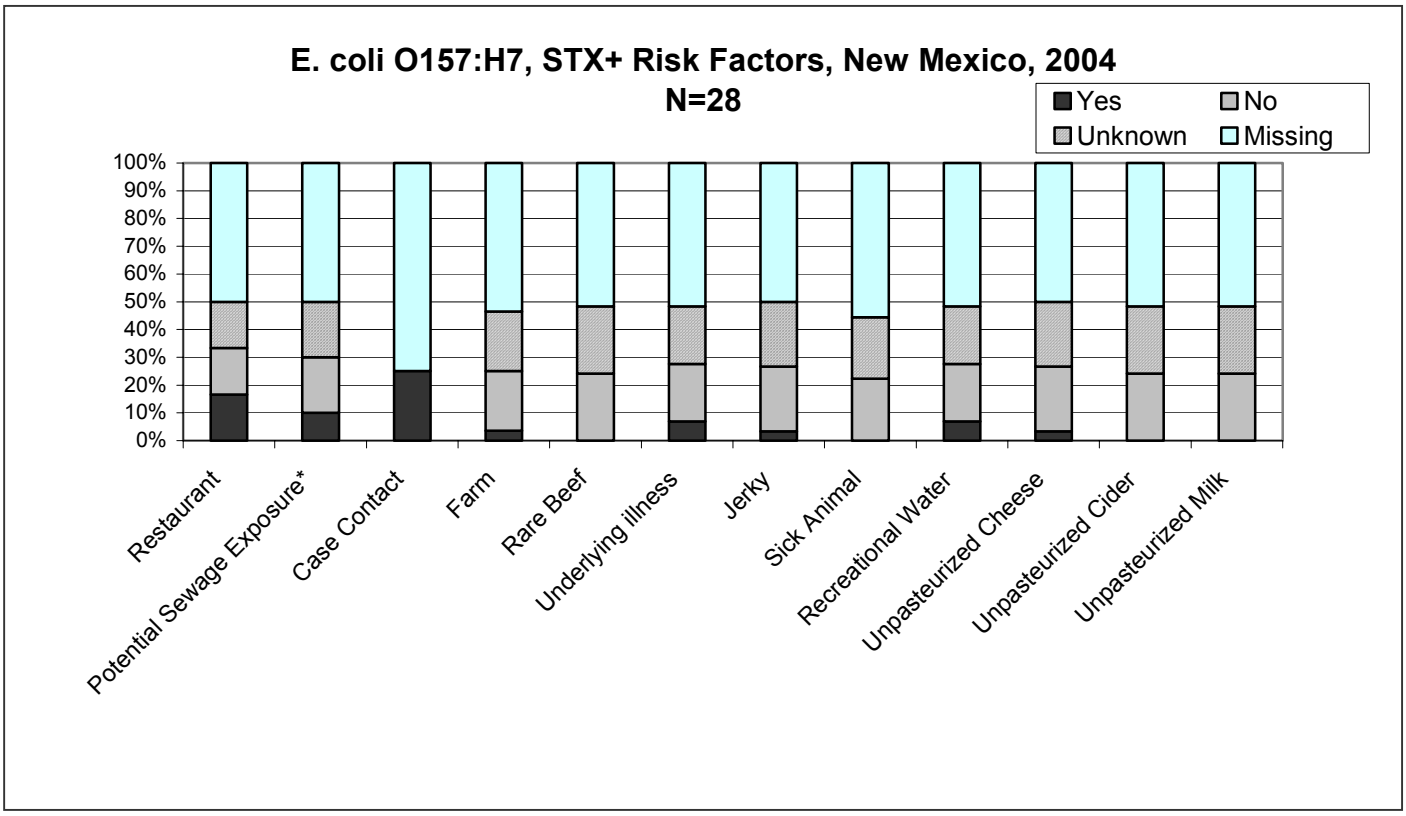
No infections have been causally linked to this risk factor

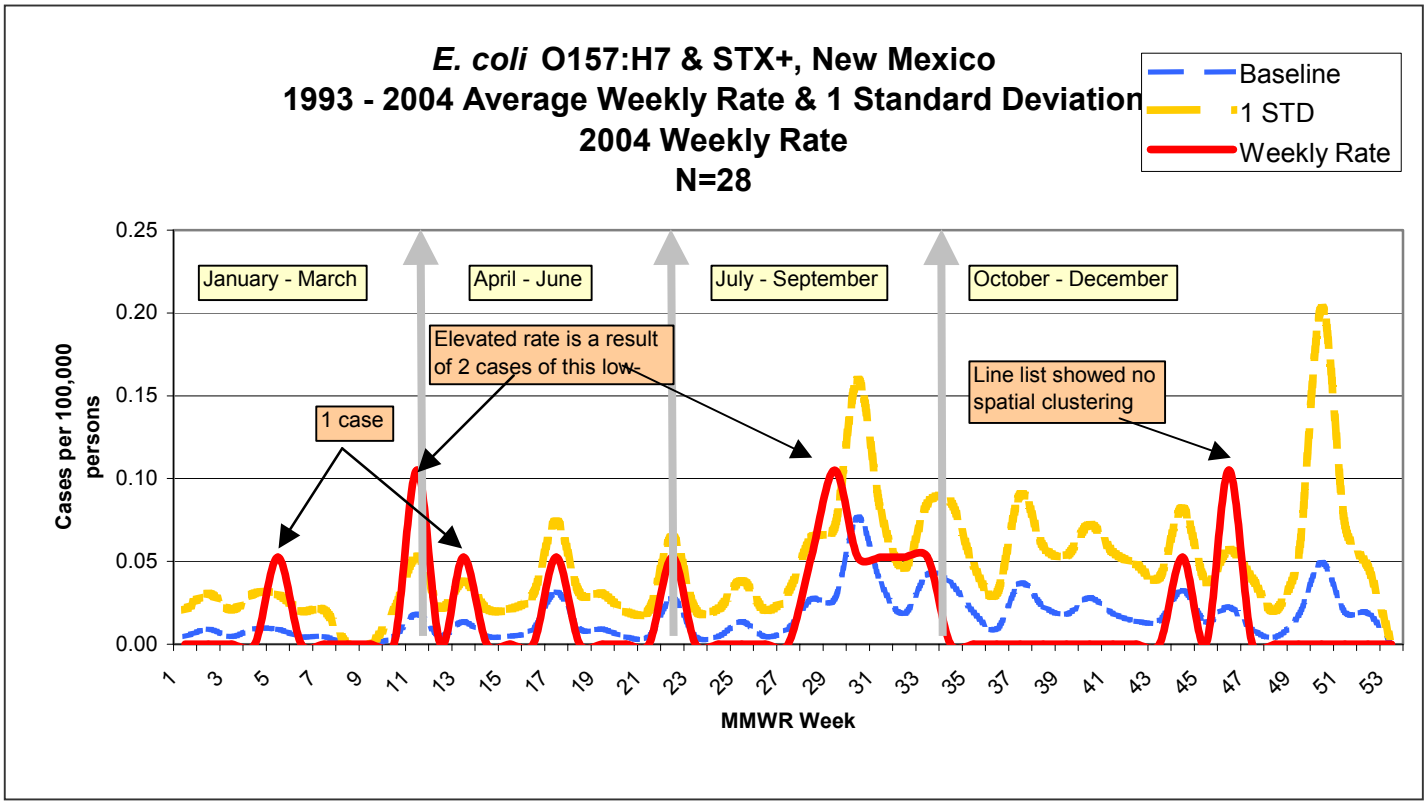
Potential Sewage Exposure*

*includes those who report exposure to raw sewage, or have a home septic system or cesspool.

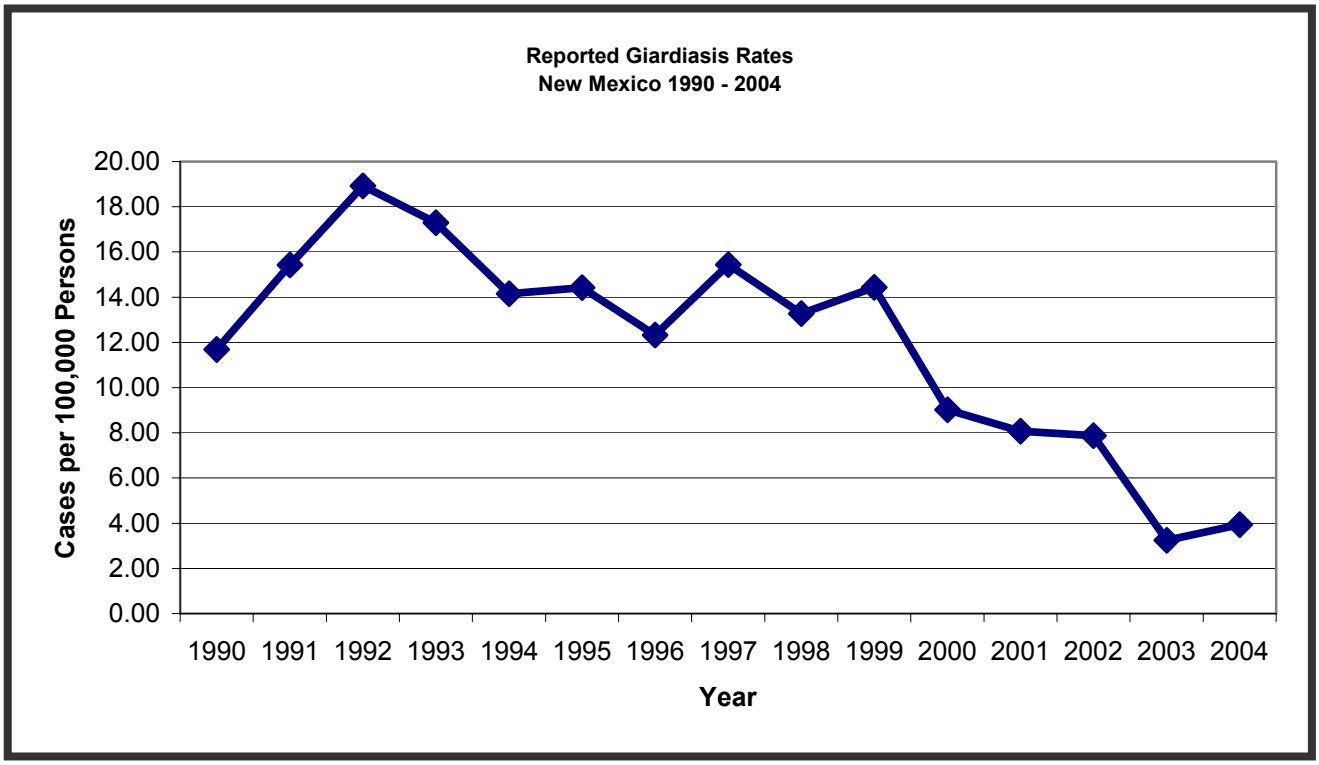
No infections have been causally linked to this risk factor

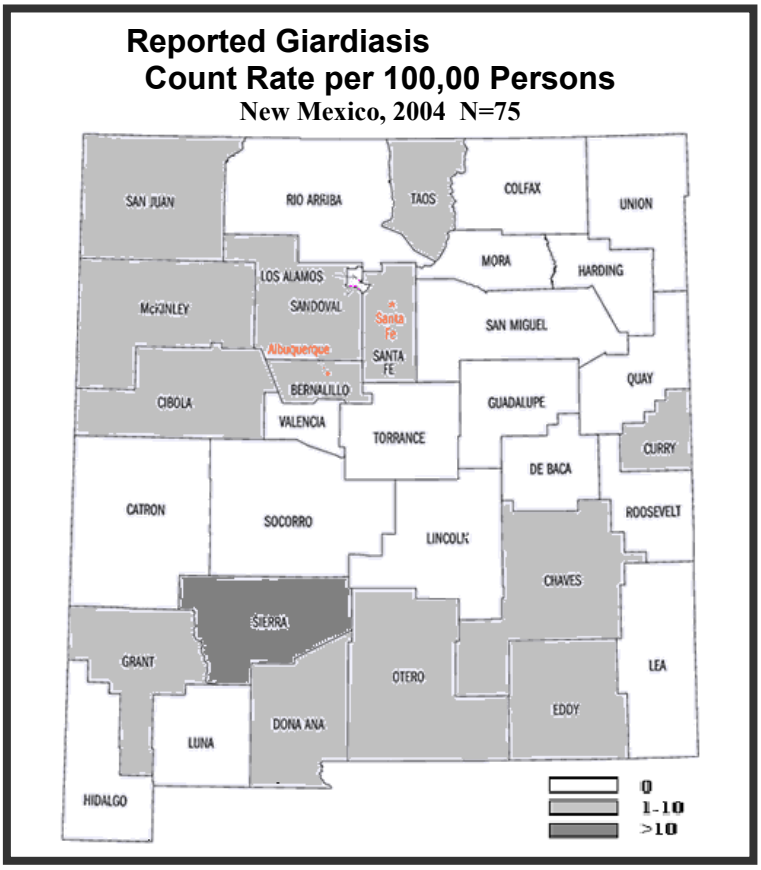
Enterohemorrhagic E. coli, New Mexico, 2004
Weekly Surveillance and Risk Factor Information
Total reported cases: 21





Giardiasis, New Mexico, 2004
Total reported cases: 75



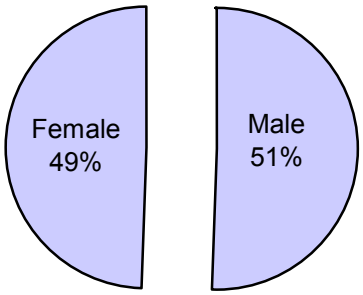


Special points of interest:

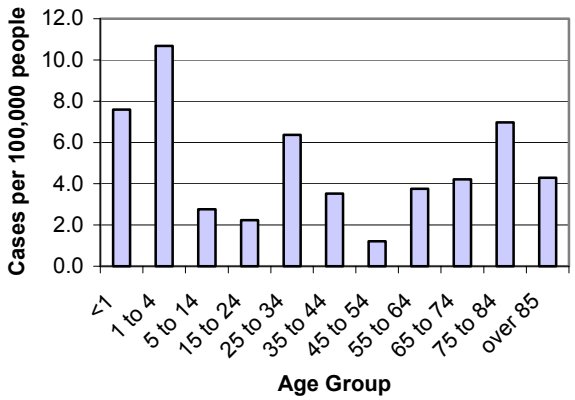
- Reported giardiasis has decreased slightly since 1990
- The rate of Giardiasis in NM is 4 per 100,000 persons
- National estimates based on state surveillance data indicate that as many as 2.5 million cases of giardiasis occur annually in the United States
- Spring & summer were the highest reported onset seasons

Giardiasis, New Mexico, 2004
General Case Characteristics & Possible Water Exposures
Total reported cases: 75

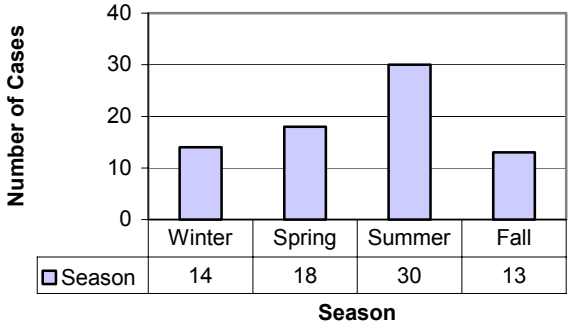
Reported Cases by Gender



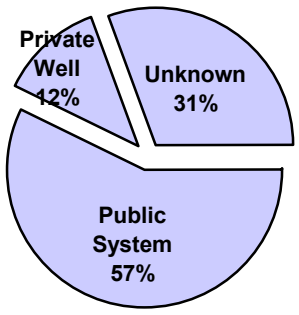
Reported Rates by Agegroup



Season of Onset

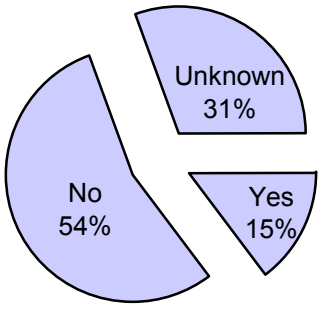


Residential Water Source



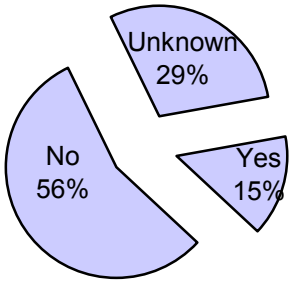
No infections have been causally linked to this risk factor

Recreational Water Exposure



No infections have been causally linked to this risk factor

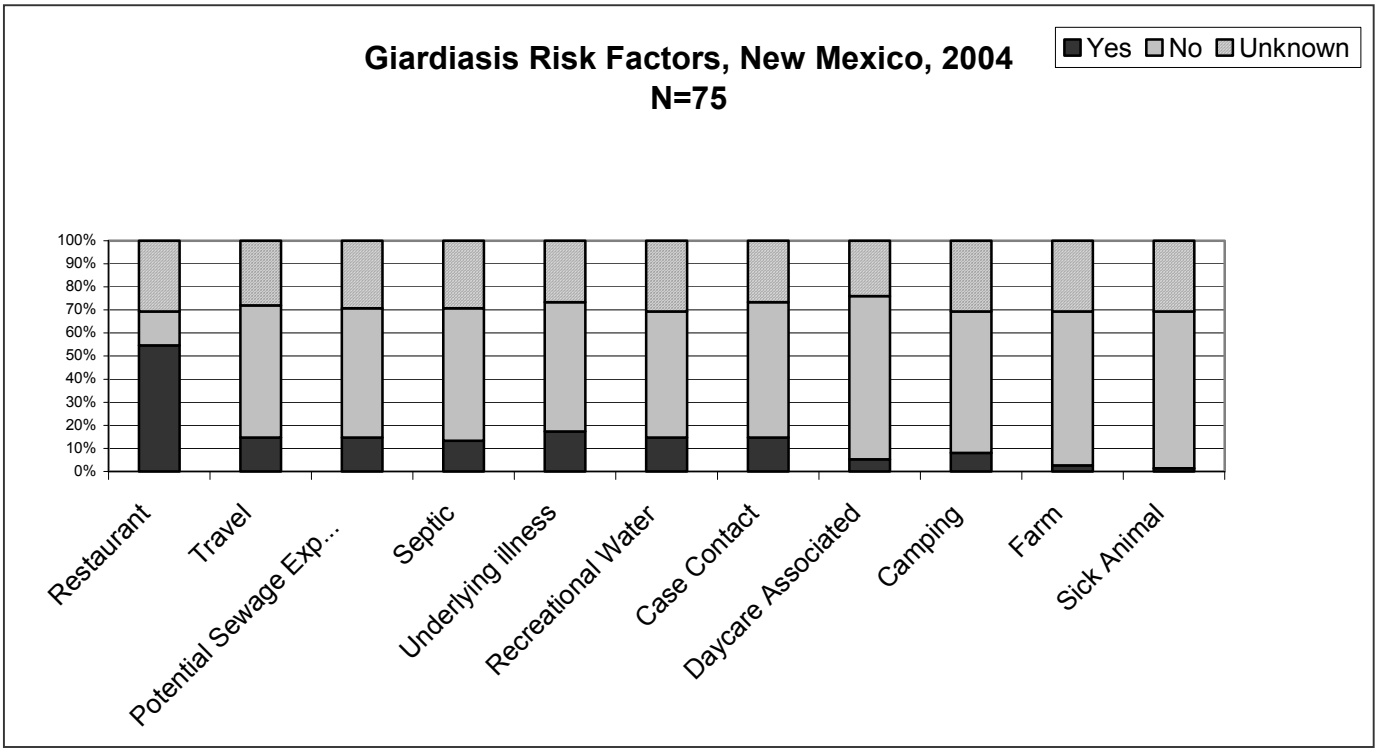
Potential Sewage Exposure*

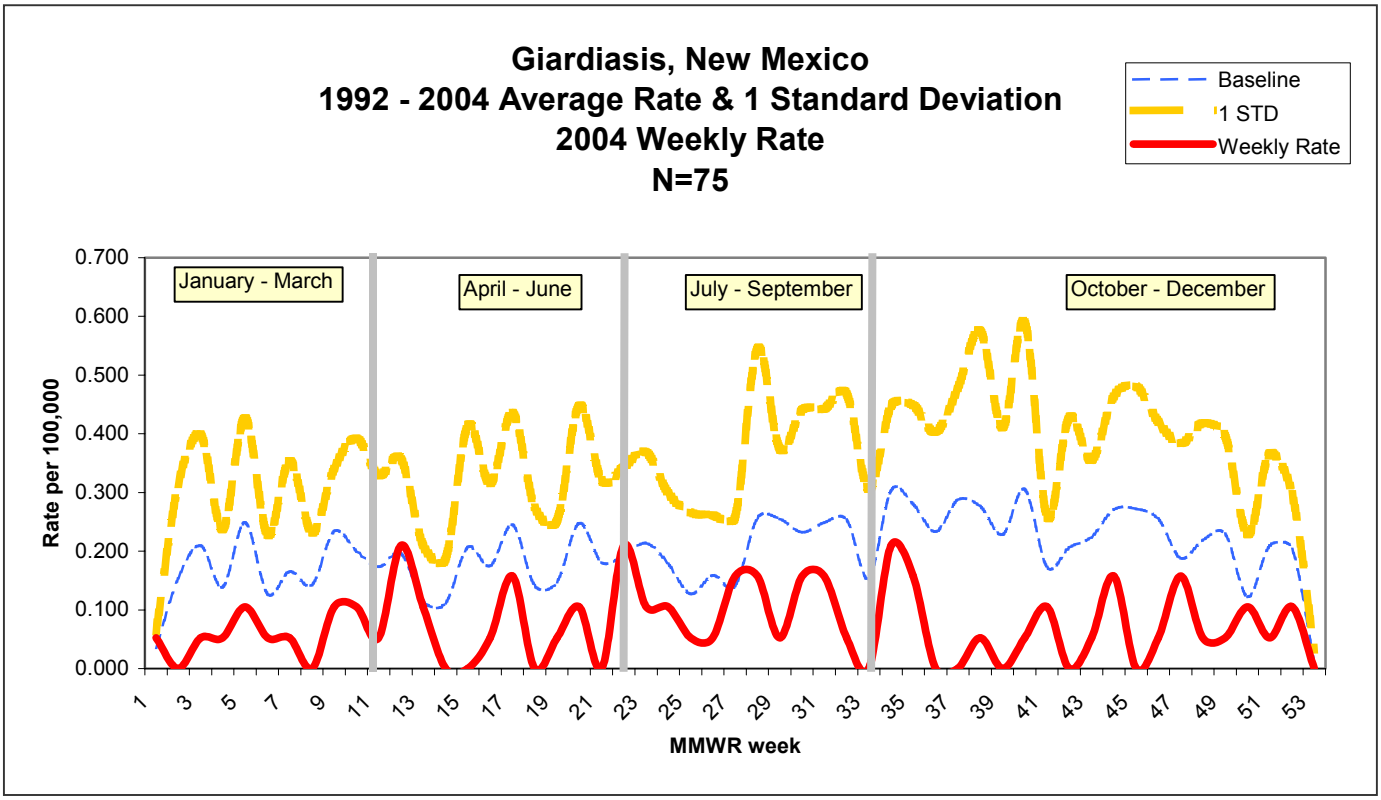


*includes those who report exposure to raw sewage, or have a home septic system or cesspool.

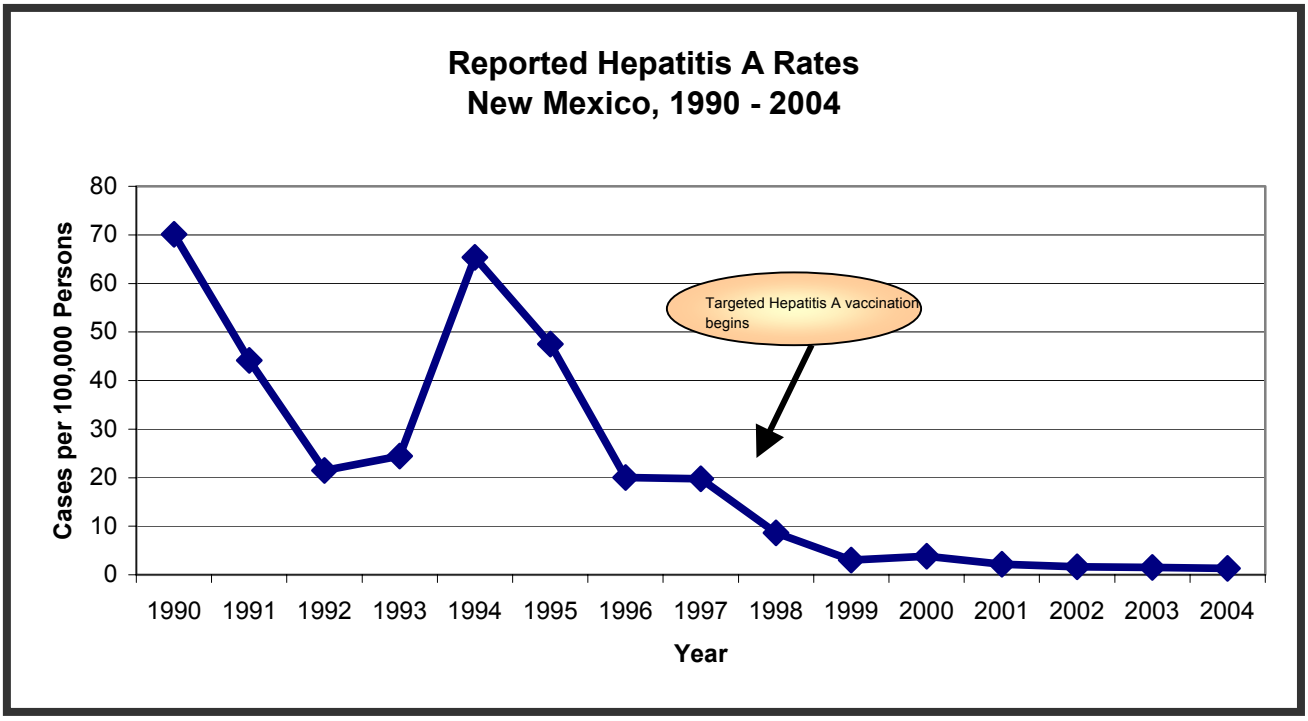
No infections have been causally linked to this risk factor

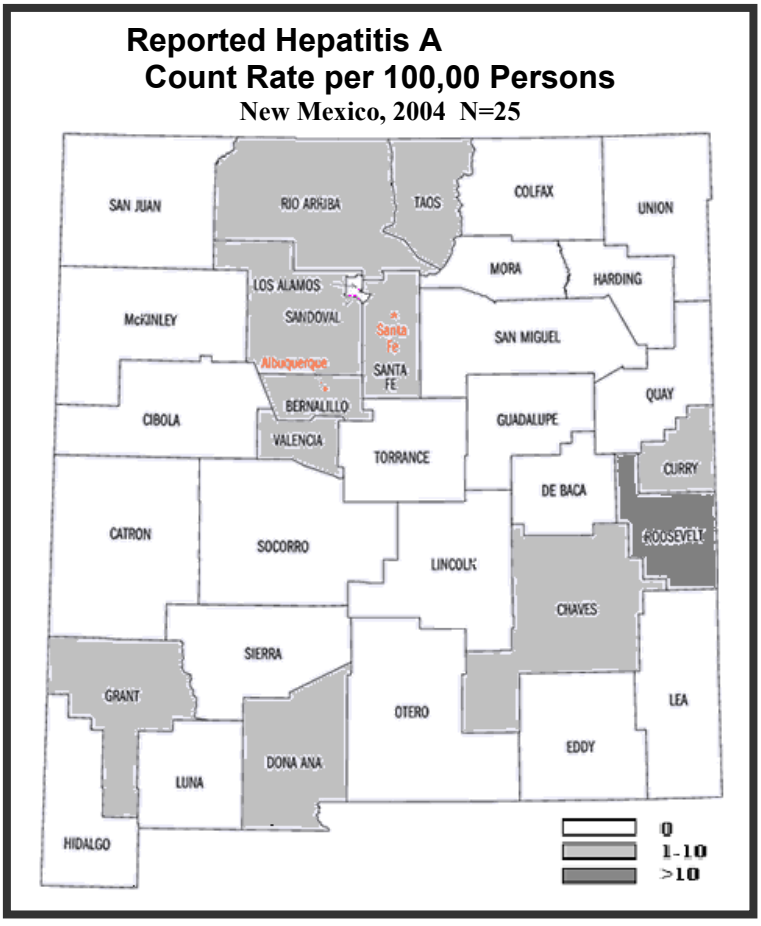
Giardiasis, New Mexico, 2004
Weekly Surveillance and Risk Factor Information
Total reported cases: 75





Hepatitis A infection in New Mexico, 2004
Total reported cases: 25



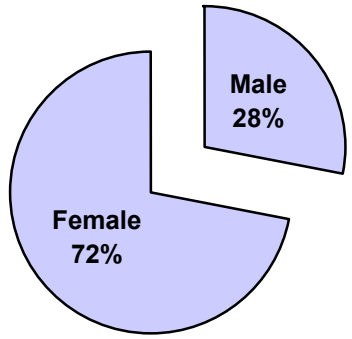


Special points of interest:

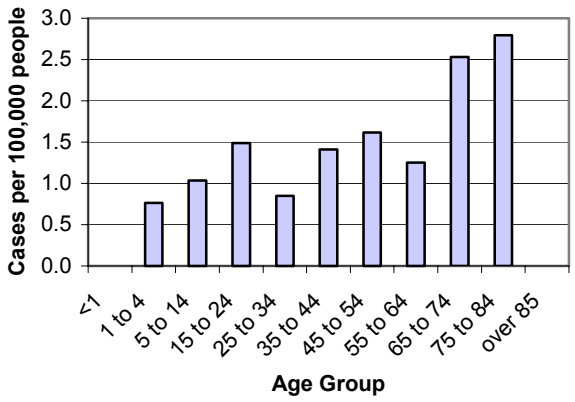
- The NM rate was well above the national rate until 1996, when targeted immunization strategies decreased rates statewide
- Most counties reported no cases in 2002 & 2004
- Approximately 45% reported international travel

Hepatitis A infection, New Mexico, 2004
General Case Characteristics & Possible Water Exposures
Total reported cases: 25

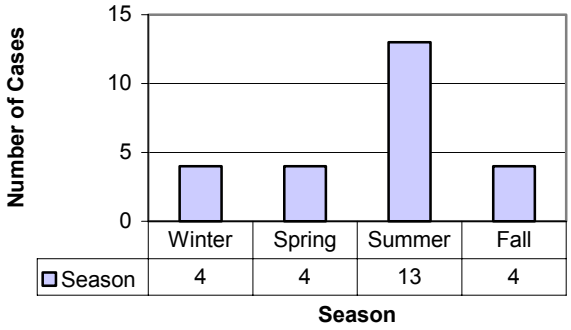
Reported Cases by Gender



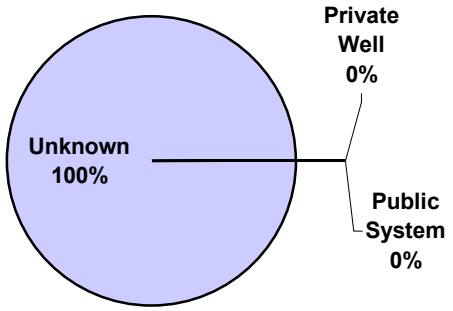
Reported Rates by Agegroup



Season of Onset

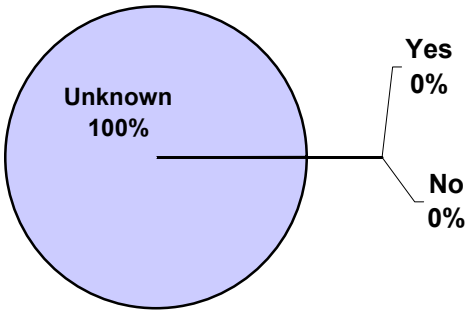


Residential Water Source



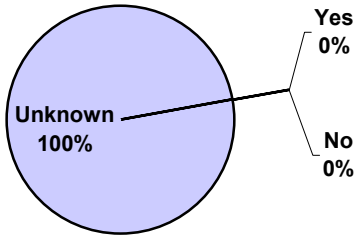
No infections have been causally linked to this risk factor

Recreational Water Exposure



No infections have been causally linked to this risk factor

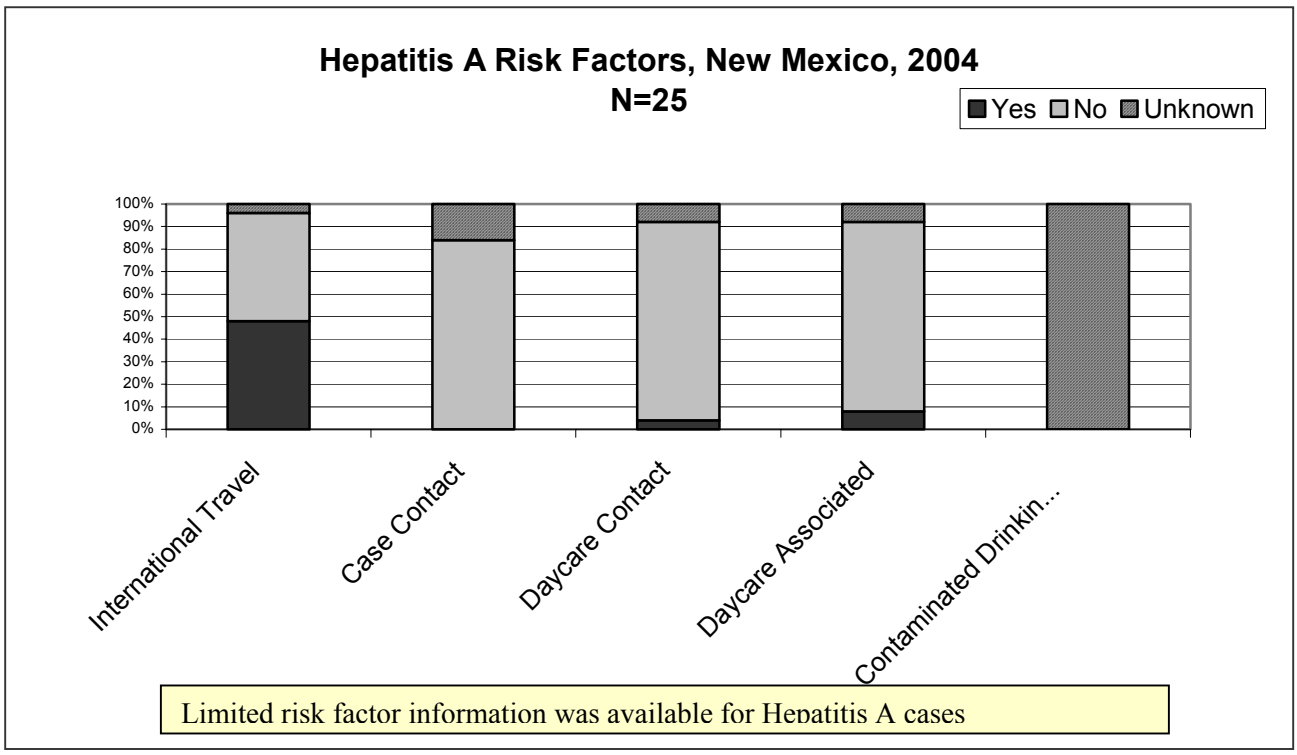
Potential Sewage Exposure*

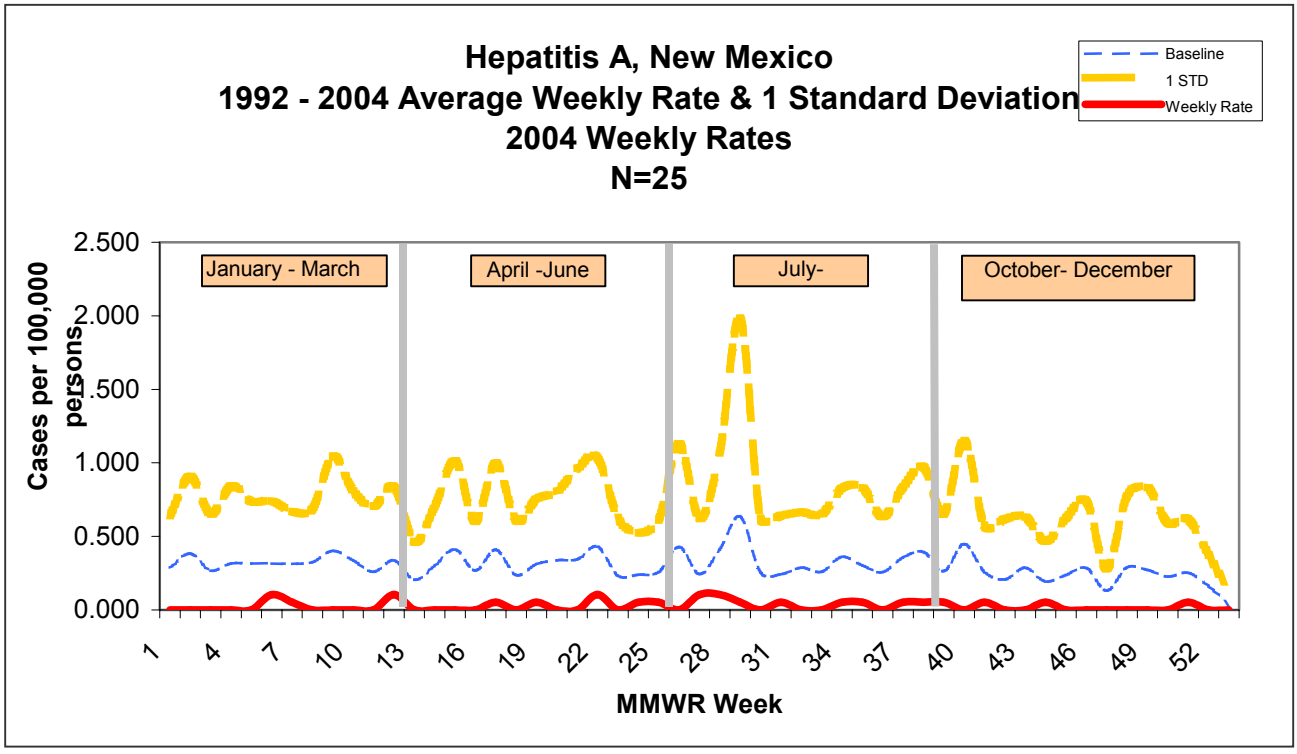


*includes those who report exposure to raw sewage, or have a home septic system or cesspool.

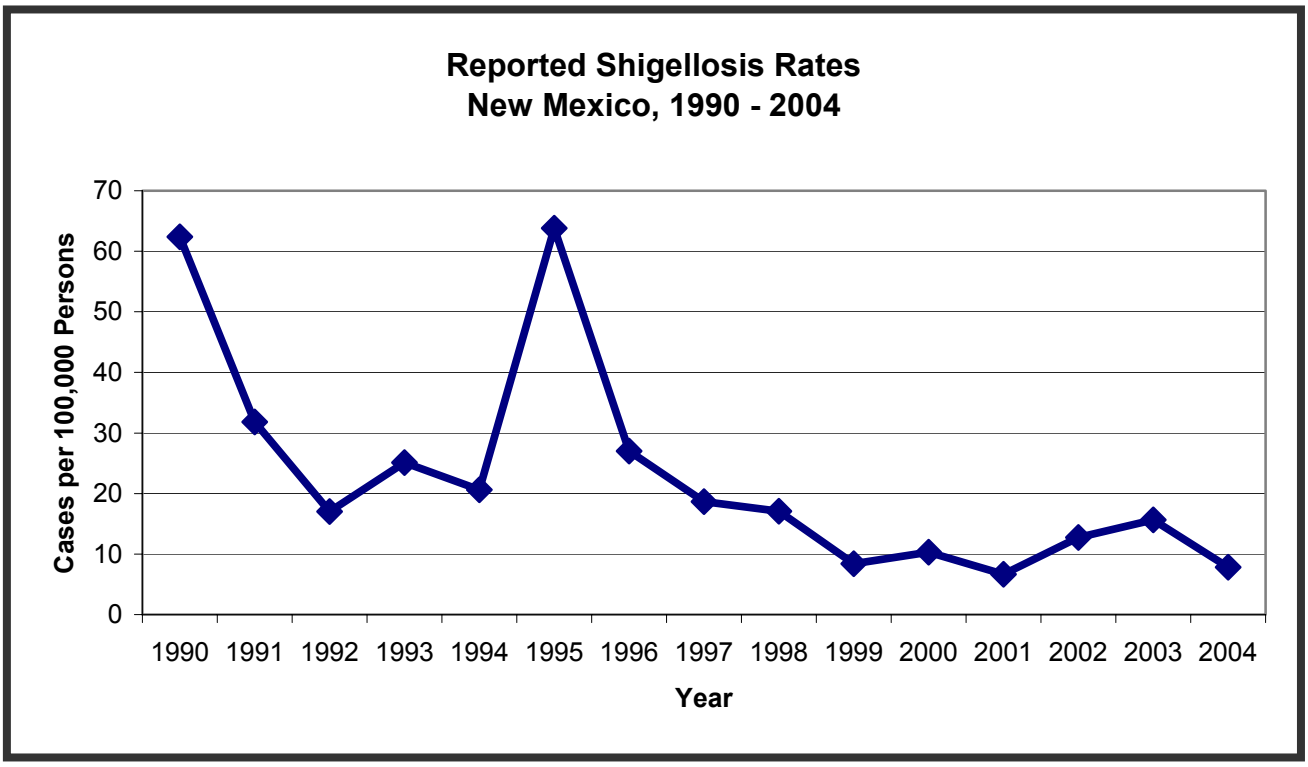
No infections have been causally linked to this risk factor

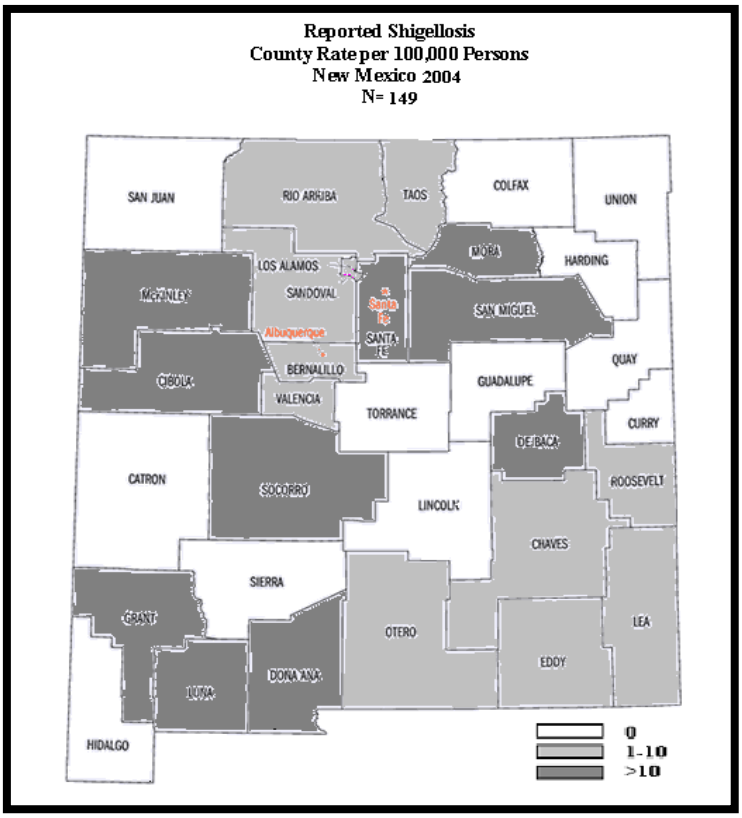
Hepatitis A infection, New Mexico, 2004
Weekly Surveillance and Risk Factor Information
Total reported cases: 25





Shigellosis, New Mexico, 2004
Total reported cases: 149



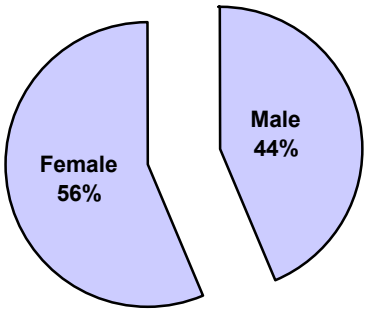


Special points of interest:

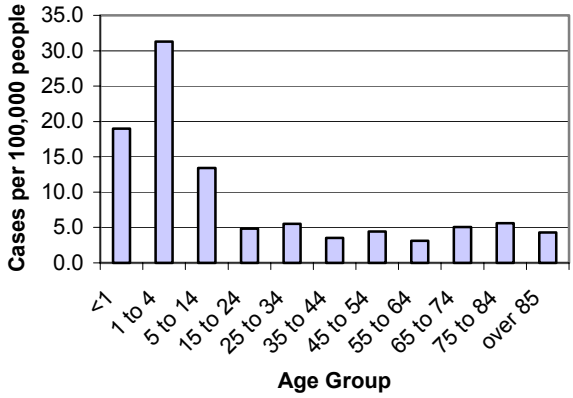
- The reported Shigellosis trend is relatively stable with the exception of an extreme rate in 1995
- McKinley County seems to be disproportionately affected by shigellosis
- Most infections occurred in fall months
- Children 1-5 have the most reported cases

Shigellosis, New Mexico, 2004
General Case Characteristics & Possible Water Exposures
Total reported cases: 149

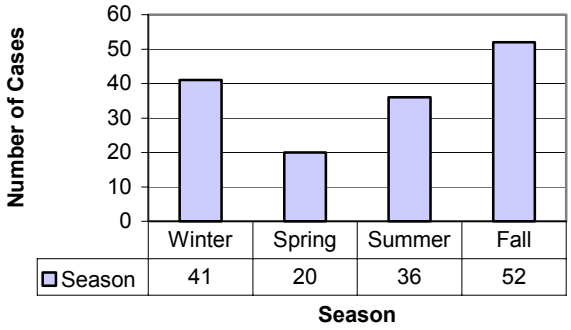
Reported Cases by Gender



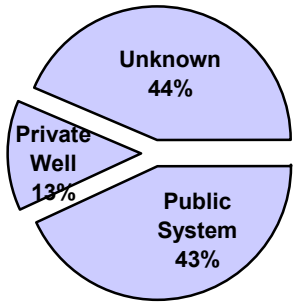
Reported Rates by Agegroup



Season of Onset

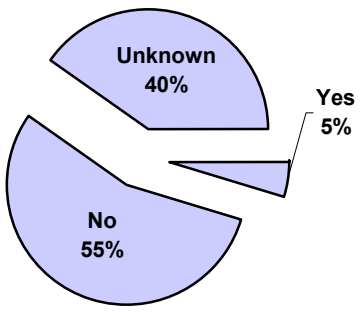


Residential Water Source



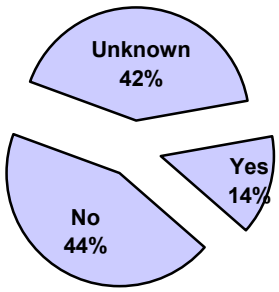
No infections have been causally linked to this risk factor

Recreational Water Exposure



No infections have been causally linked to this risk factor

Potential Sewage Exposure*



*includes those who report exposure to raw sewage, or have a home septic system or cesspool.

No infections have been causally linked to this risk factor

Shigellosis, New Mexico, 2004
Weekly Surveillance and Risk Factor Information
Total reported cases: 149