

# GIARDIASIS IN NEVADA, 2003-2012

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Edition 1.0

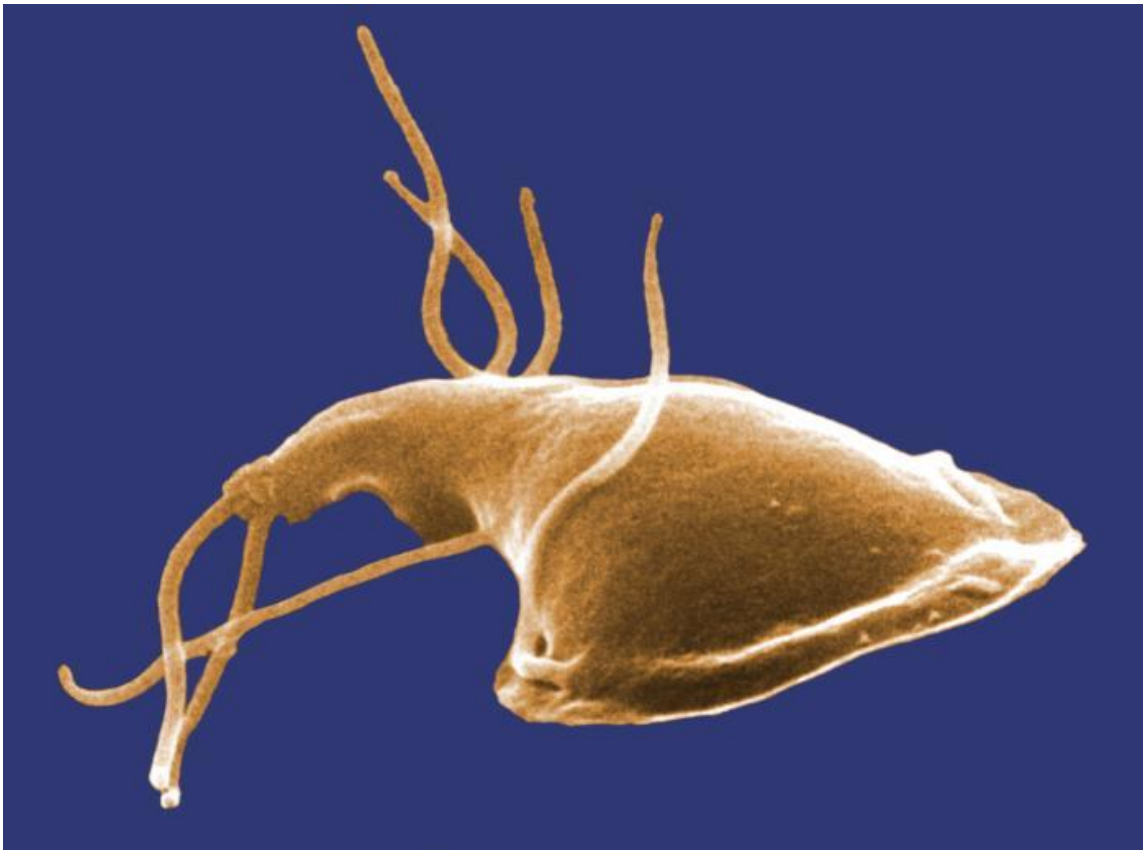


Photo: Centers for Disease Control and Prevention/ Dr. Stan Erlandsen; Dr. Dennis Feely



**DEPARTMENT OF HEALTH AND HUMAN SERVICES**  
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Office of Public Health Informatics and Epidemiology

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## Purpose

The purpose of this report is to provide a general overview of the incidence and trends of giardiasis among Nevada residents. The report also includes Nevada data collected from cases of giardiasis from 2003 to 2012. Giardiasis is listed as one of Nevada's reportable diseases pursuant to [NRS 441A](#) (1). Giardiasis reporting is further regulated by [NAC 441A.535](#) (2).

## Giardiasis

Giardiasis is a diarrheal illness caused by *Giardia*, a microscopic parasite. *Giardia* exists as cysts or trophozoites. Cysts are protected by a hard outer shell, allowing them to survive for weeks or months outside of the body and also makes them tolerant to chlorine disinfection. *Giardia* can be found in every region of the United States and around the world. It infects nearly 2% of adults and 6 to 8% of children in developed countries worldwide. Nearly 33% of people in developing countries have had giardiasis. Giardiasis is the most common intestinal parasitic disease affecting humans in the United States (3).

A person can become infected when they swallow a *Giardia* cyst; it is not possible to become infected through contact with blood. Once a person or an animal becomes infected, the parasite lives in the intestines and is passed in feces. Anything that comes into contact with the feces of an infected human or animal can be contaminated. An infected person may shed 1 to 10 billion cysts daily in their feces; as few as 10 cysts are sufficient to cause someone to become ill. *Giardia* is most commonly water-borne and transmitted via drinking water and recreational waters, especially untreated or improperly treated water from lakes, streams, or wells. Other sources of *Giardia* include surfaces that are contaminated with stool from an infected person, such as bathroom handles, changing tables, or diaper pails as well as uncooked or undercooked food contaminated with *Giardia* cysts (3).

Symptoms of giardiasis usually appear within 1 to 3 weeks of exposure to the parasite and last 2 to 6 weeks depending on the health of the infected person. Patients may exhibit diarrhea, gas, greasy stool (that may float), stomach or abdominal cramps, upset stomach, and dehydration. Giardiasis may cause weight loss and failure to absorb fat, lactose, and vitamins A and B12, and severe giardiasis in children can delay physical and mental growth, slow development, and cause malnutrition. Giardiasis is diagnosed by collecting multiple stool samples for laboratory testing. Prescription drugs are used to treat the infection. Patients, especially infants and pregnant women, can experience dehydration from the diarrhea, so it is important to drink plenty of fluids while ill (3).

Those at the greatest risk of contracting giardiasis are children in child care settings, those who are in close contact with an infected person or animal, people (especially backpackers and hikers) who drink water or use ice made from places where *Giardia* is endemic, international travelers, and people exposed to human feces through sexual contact. Centers for Disease Control and Prevention (CDC) recommends practicing good hygiene is the most effective way to prevent giardiasis. Proper hand-washing technique is crucial: before, during, and after preparing food; before and after caring for someone who is sick; after using the toilet; after changing diapers or cleaning up a child who has used the toilet; and after touching an animal or animal waste. Giardiasis transmission can also be prevented by avoiding swallowing water while swimming in any body of water, especially ponds, streams, and lakes. It is recommended to never drink untreated water, and if the safety of water is questionable, bottled water should be consumed or tap water should be disinfected by heating it to a rolling boil for 1 minute. Eating contaminated foods should be avoided as should contact and contamination with feces during sex (3).

## Summary

From 2003 to 2012, the annual number of reported giardiasis cases in Nevada ranged from a low of 79 cases in 2011 to a high of 146 cases in 2007. Over the ten years, a total of 1,148 cases were reported. Overall, Nevada's crude incidence rate of giardiasis has slowly declined, with the annual rates for 2011 and 2012 statistically significantly lower than those for 2003 and 2004. The annual crude incidence rate ranged from a low of 2.9 cases per 100,000 population in 2011 to a high of 6.3 cases per 100,000 population in 2003, and this difference was statistically significant. The crude incidence rate from 2003 to 2012 was 4.5 cases per 100,000 population. There are no Healthy People 2010 or Healthy People 2020 objectives for giardiasis.

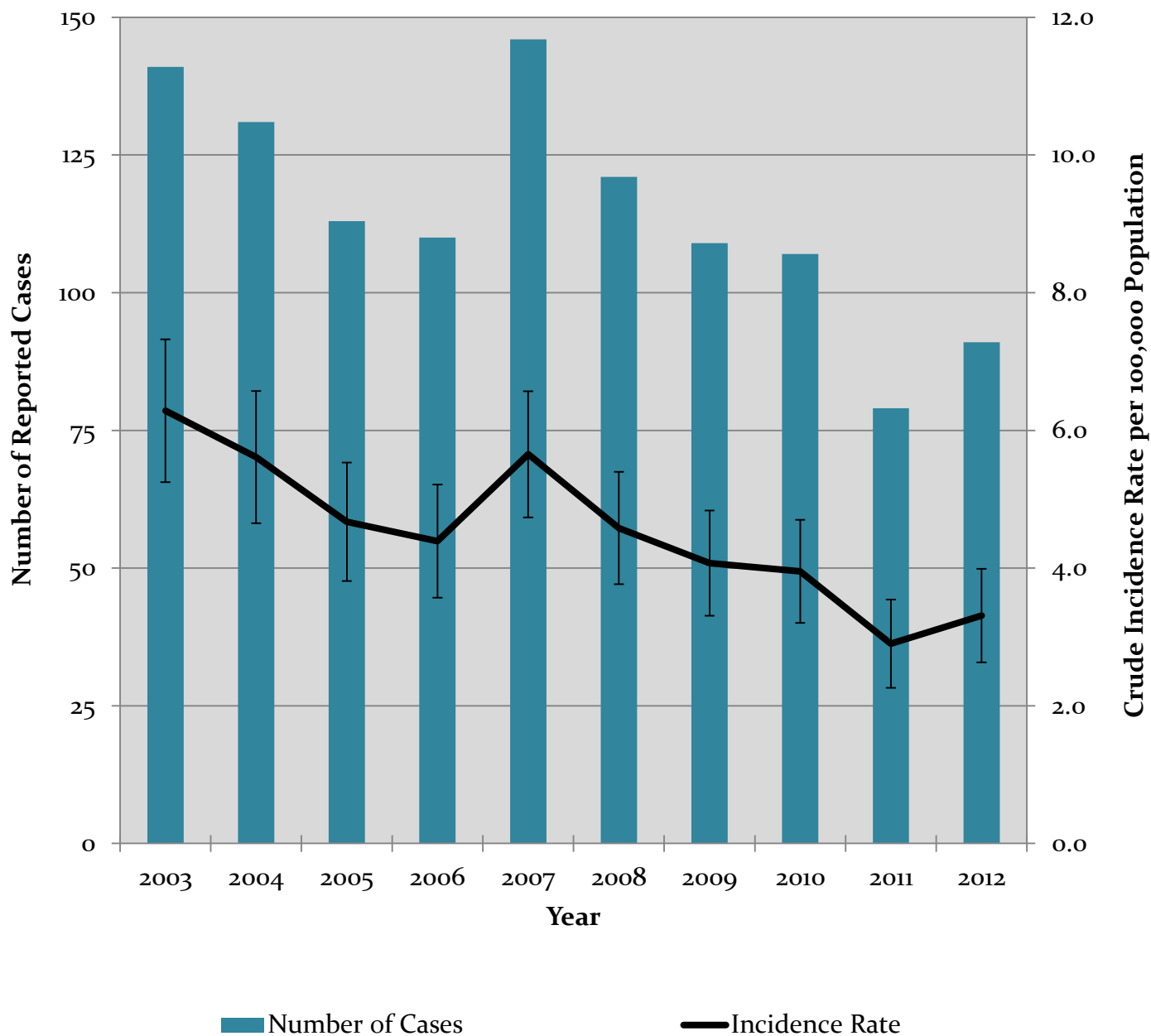
Washoe County Health District had a spike in age-adjusted incidence rate in 2004 (13.2 cases per 100,000 population), which was significantly higher than age-adjusted incidence rates for the entire state and the other health districts. From 2003 to 2012, Washoe County also had a significantly higher age-adjusted incidence rate compared to the state rate and the rates of the other health districts (7.0 cases per 100,000 population). There were no other significant differences between the other health districts.

Giardiasis infections typically increase during summer and decline in fall and winter. Between 2008 and 2012 (years for which monthly data is available), giardiasis infections in Nevada followed this pattern. The number of reported giardiasis cases was highest during August and September with a large increase in August 2010 (35 total cases). Except for January 2008 and February 2011, December, January, and February had the lowest numbers of giardiasis infections in Nevada. The number of reported cases ranged between 2 and 35 cases per month, depending on the year.

From 2003 to 2012, a significantly higher age-adjusted incidence rate was observed among Whites and residents of Hispanic origin (both 4.5 cases per 100,000 population) compared to Asian/Pacific Islanders (2.9 cases per 100,000 population). There were no other significant differences between other racial/ethnic groups.

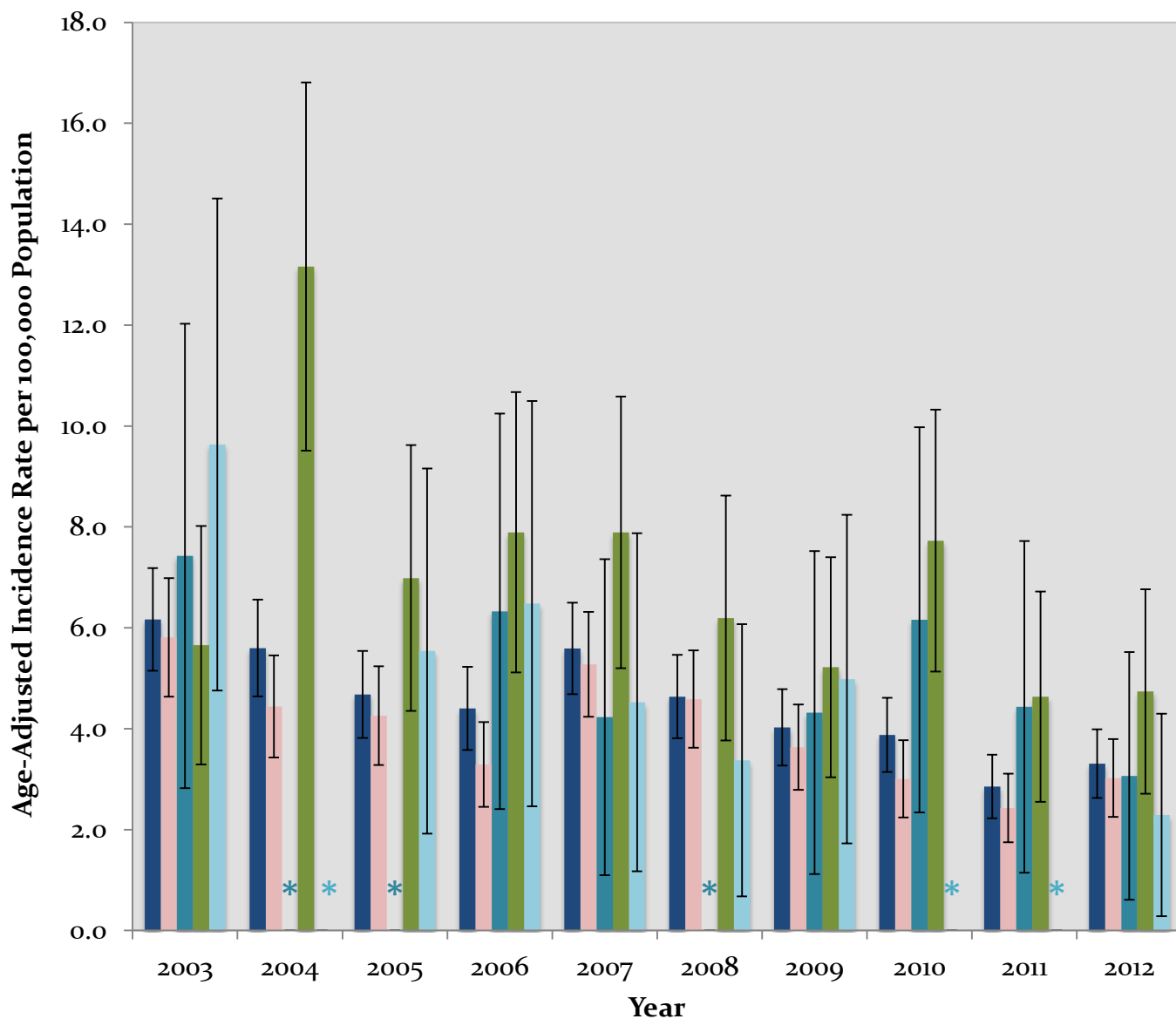
From 2003 to 2012, the highest case count of giardiasis in Nevada was in persons 40-64 years of age, with 2007 having the largest number of cases, 47. Nevertheless, during the 10-year time period, children 1-4 years of age had a significantly higher incidence rate (11.7 cases per 100,000 population) compared to all other age groups. Children in child care settings are known to be at greater risk of contracting giardiasis (3). Persons 5-14 years of age, 25-39 years of age, and 40-64 years of age also had significantly higher incidence rates (4.9, 4.8, and 4.4 cases per 100,000 population, respectively) compared to persons 15-24 years of age and older than 65 years (2.7 and 2.4 cases per 100,000 population, respectively). Children 1-4 years of age experienced a steady decline in incidence rates over the 10 years, with 2011 and 2012 having significantly lower rates than 2003, 2004, and 2005 (low of 3.3 cases per 100,000 population in 2011 and high of 24.9 cases per 100,000 population in 2003). Nevertheless, giardiasis incidence rates for the other age groups did not change significantly over the 10-year time period.

# Figure 1. Number of Reported Cases and Crude Incidence Rates of Giardiasis in Nevada: 2003-2012



The crude incidence rate in Nevada from 2003 to 2012 was 4.5 cases per 100,000 population.

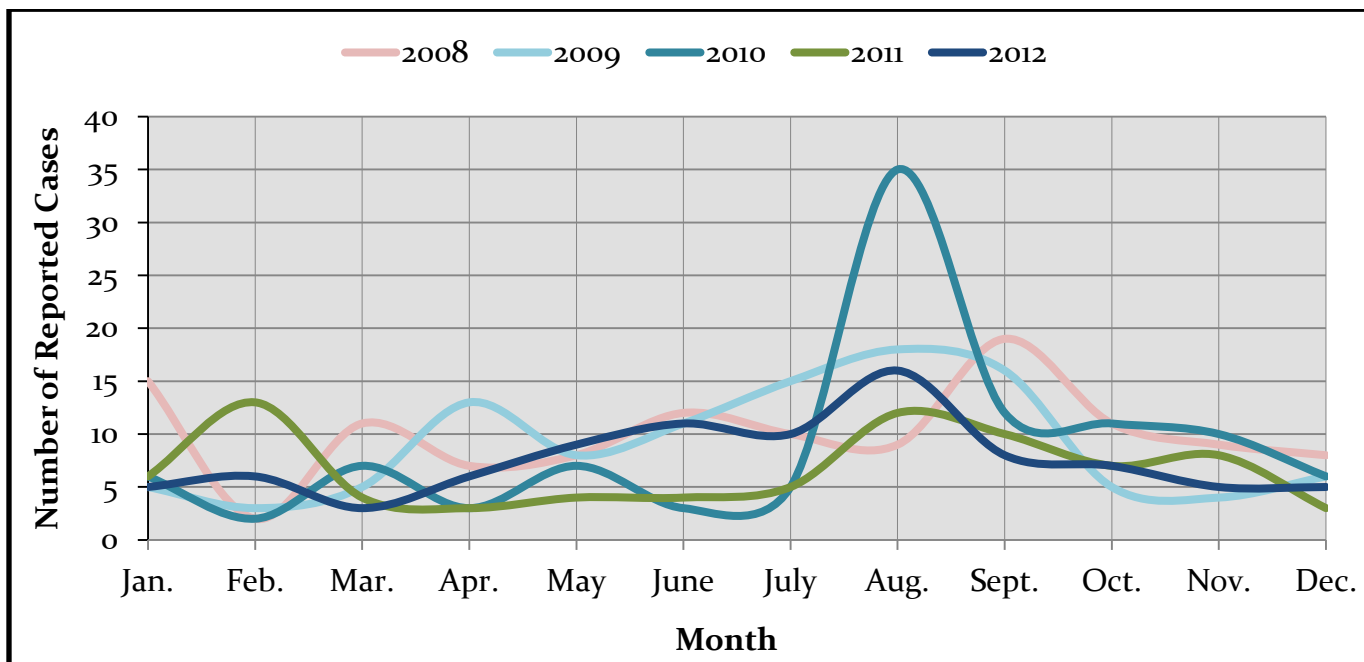
## Figure 2. Age-Adjusted Incidence Rates of Giardiasis in Nevada and Nevada Health Districts: 2003-2012



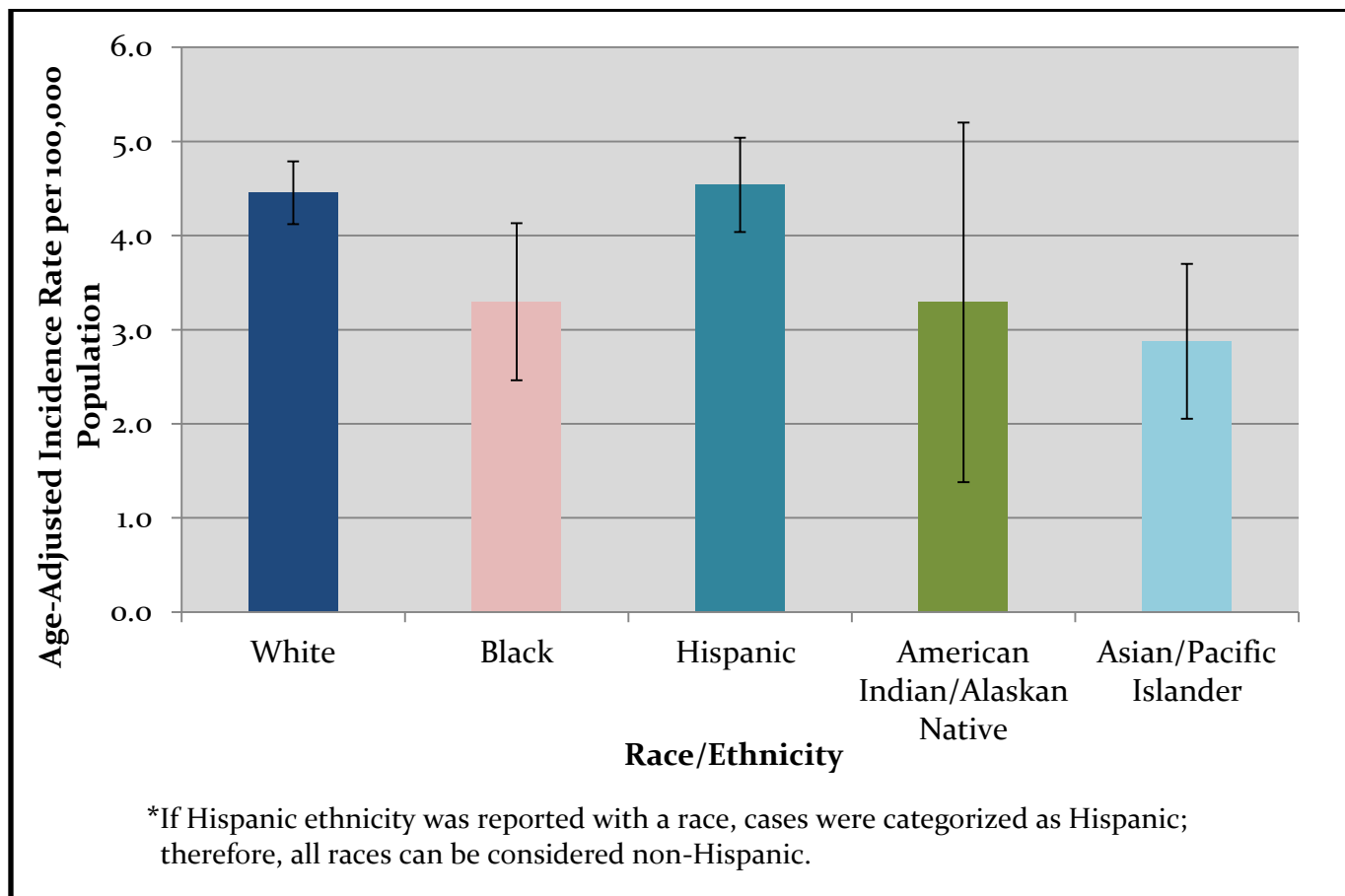
- Nevada
- Southern Nevada Health District (Clark County)
- Carson City Health and Human Services (Carson City, Douglas, and Lyon Counties)
- Washoe County Health District (Washoe County)
- Community Health Nursing (Rural and Frontier Counties)

\* Data not presented due to low case counts.

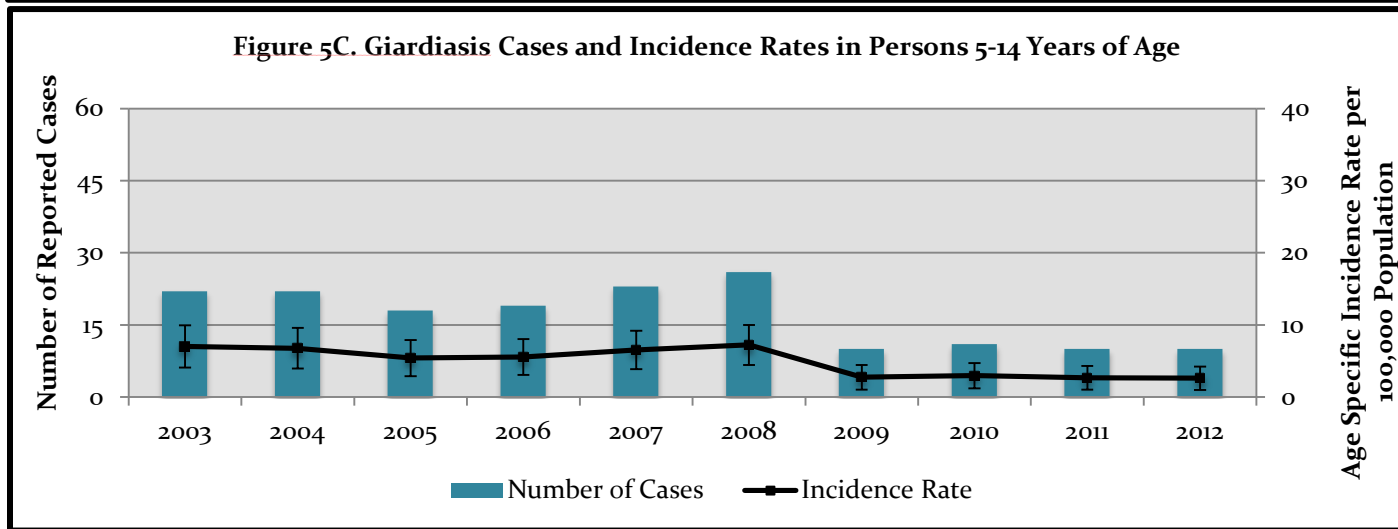
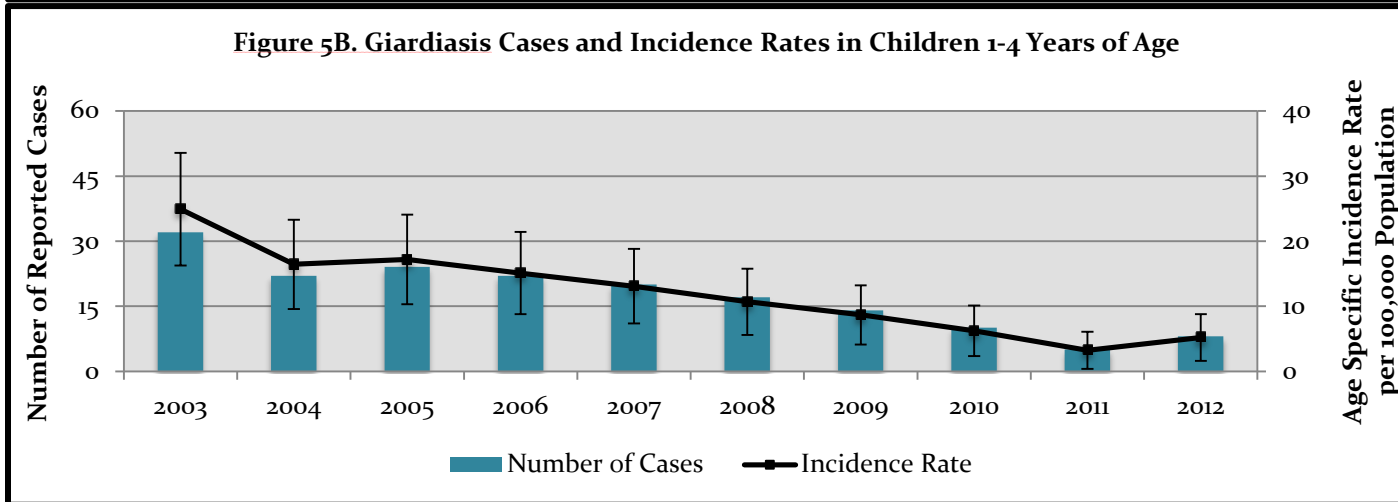
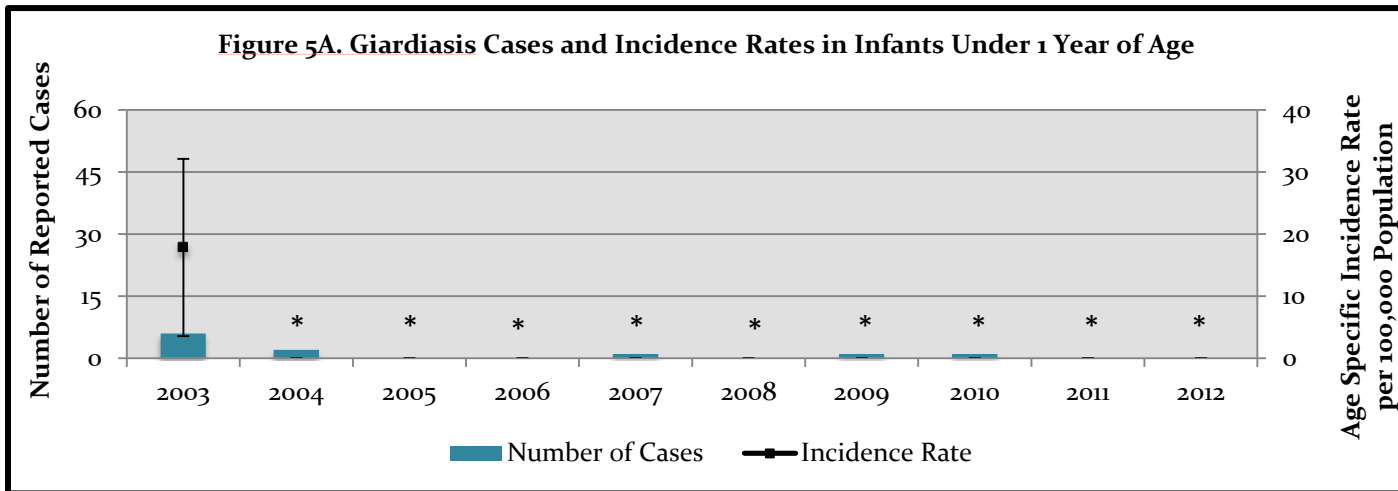
### Figure 3. Number of Giardiasis Cases Reported in Nevada by Month: 2008-2012



### Figure 4. Age-Adjusted Incidence Rates of Giardiasis in Nevada by Race/Ethnicity\*: 2003-2012



# Figures 5A-G. Number of Reported Cases and Crude Incidence Rates of Giardiasis in Nevada by Age Group: 2003-2012



\* Data not presented due to low case counts.

Figure 5D. Giardiasis Cases and Incidence Rates in Persons 15-24 Years of Age

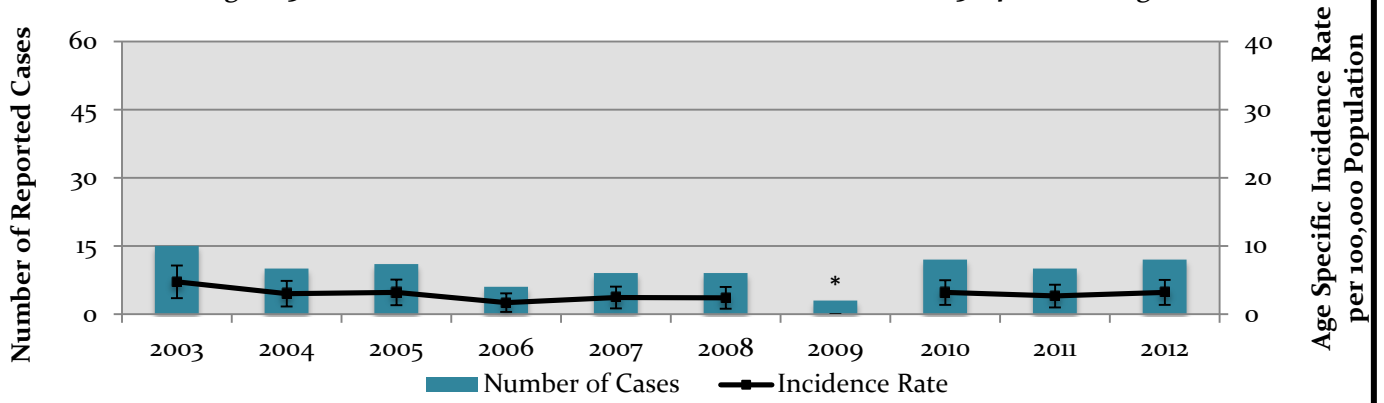


Figure 5E. Giardiasis Cases and Incidence Rates in Persons 25-39 Years of Age

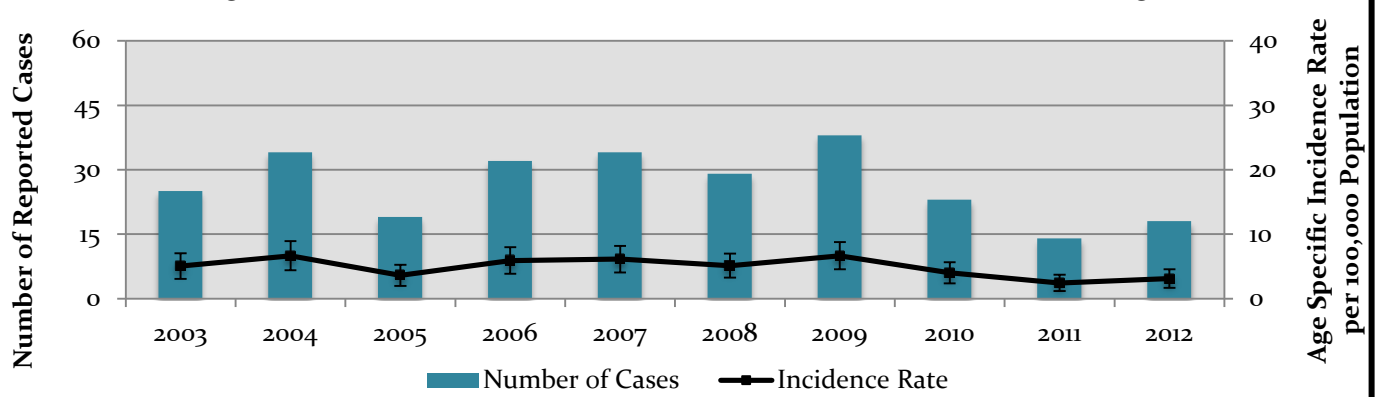


Figure 5F. Giardiasis Cases and Incidence Rates in Persons 40-64 Years of Age

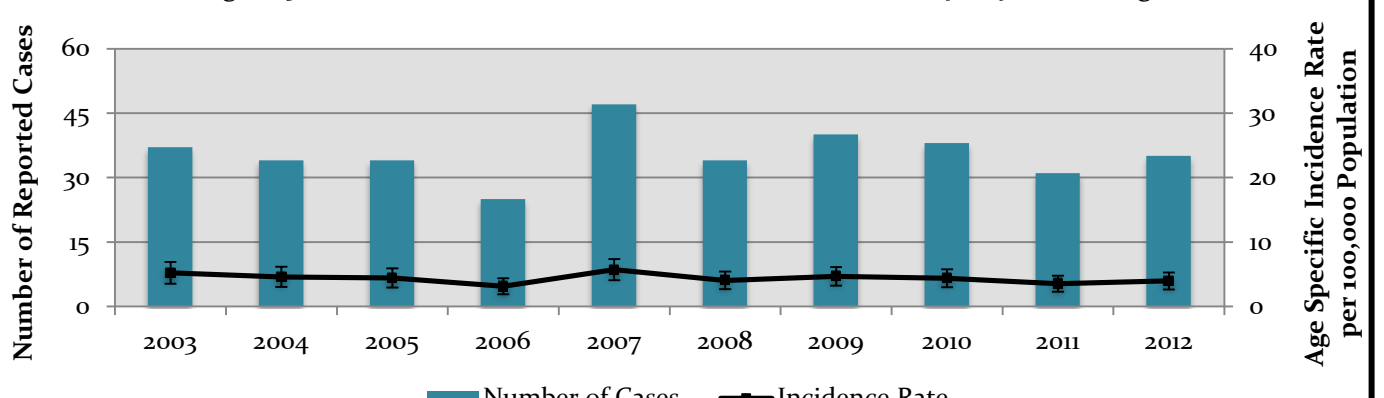
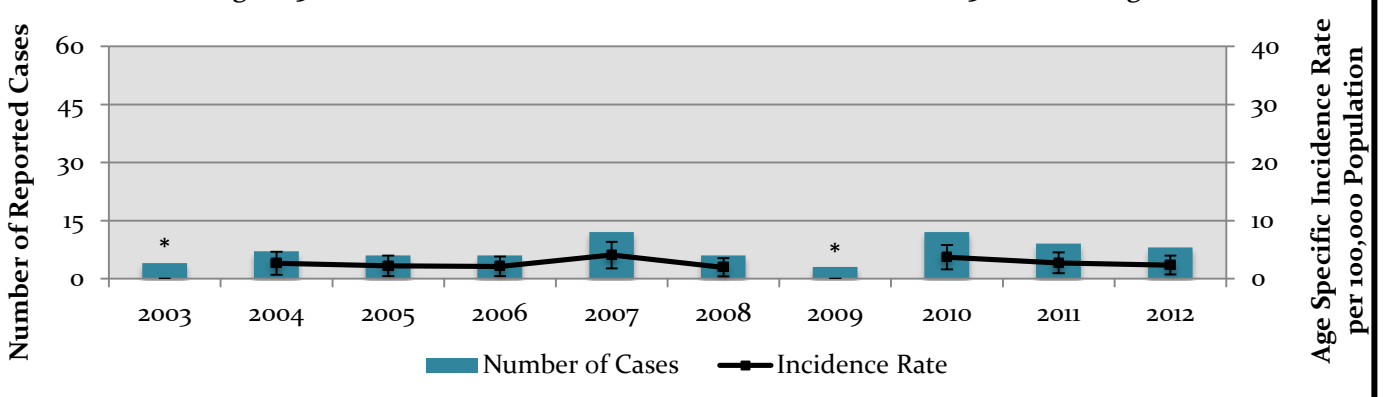


Figure 5G. Giardiasis Cases and Incidence Rates in Persons 65+ Years of Age



\* Data not presented due to low case counts.



## Technical Notes

All Nevada data from 2003 to 2012 came from reported cases of giardiasis infection among Nevada residents (4, 5). The CDC and Council of State and Territorial Epidemiologists case definition of giardiasis encompasses all cases classified as probable and confirmed; all cases of giardiasis used for this report follow this definition (6). Population estimates were obtained from Nevada State Demographer's Office (7). Age-adjusted rates per 100,000 population were calculated using the 2000 U.S. standard population. Cases with unknown ages were excluded from the age-adjusted rate calculations; one such case had to be excluded. Cases with unknown race/ethnicity (181 cases) were imputed among racial/ethnic groups based upon the distribution of each racial/ethnic group within the general population. Cases with race and ethnicity listed as "other" or those with multiple races were excluded from Figure 4; 34 such cases were excluded. When used for rates, error bars represent 95% confidence intervals. The Keyfitz method was used to calculate confidence intervals of age-adjusted rates (8). Due to their inherent unreliability, rates were not calculated for case counts lower than five.

## Sources

1. Nevada Revised Statute (NRS) 441A. <https://leg.state.nv.us/NRS/NRS-441A.html>
2. Nevada Administrative Code (NAC) 441A.535. <http://www.leg.state.nv.us/nac/NAC-441A.html#NAC441ASec535>
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4. NBS. NEDSS. All counties except Clark. 2005 to 2012.
5. NETSS. All counties from 2000 to 2004 and Clark. 2005 to 2012.
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7. Nevada State Demographer's Office. 2003-2012 ASRHO Estimates and Projections. Division of Public and Behavioral Health edition. Vintage 2012.
8. Keyfitz, Nathan. Human Biology. *Sampling variance of standardized mortality rates*. September 1966. 38(3): 309-17.

## Recommended Citation

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