Background

*Giardia intestinalis* is the most commonly reported enteric parasite in the United States (US), causing an estimated 2 million infections, 5,000 hospitalizations, and 10 deaths each year¹. Leading sources of *Giardia* infection include direct contact with an infected person (especially children in day care settings and among men who have sex with men) and ingestion of water contaminated by human or animal feces. Contaminated food is a less frequent source of infection. In the US, *Giardia* is an important cause of diarrheal illness outbreaks associated with recreational and drinking water, in part, because of its low infectious dose and moderate chlorine resistance. While animal contamination of drinking water has occurred, zoonotic transmission of giardiasis is not known to be a major source of human infection. There is no national *Healthy People 2010* target objective for giardiasis.

Acute illness, usually gastroenteritis, occurs after an incubation period of 3 to 25 days and can be associated with protracted symptoms and communicability. Occasionally, chronic intestinal symptoms develop and although extraintestinal invasion is rare, reactive arthritis can occur. *Giardia* is moderately resistant to chlorine and can survive for weeks in cold water.

We describe here the epidemiology of giardiasis in California from 2001 through 2008. Data for 2008 are provisional and may differ from data in future publications. For a complete discussion of the definitions, methods, and limitations associated with this report, please refer to Technical Notes².

### California reporting requirements and surveillance case definitions

California Code of Regulations, Title 17, requires health care providers to report suspected cases of giardiasis to their local health department within seven working days of identification or immediately by telephone if an outbreak is suspected. Giardiasis is not included in state regulations requiring notification by laboratories to local health officials.

Local health officers are required by regulation to report to CDPH cases of giardiasis. CDPH officially counted cases that satisfied the Centers for Disease Control and Prevention (CDC) surveillance case definition, including confirmed and probable classifications. During the surveillance period, CDC defined a confirmed case as one with detection of...
Giardia intestinalis cysts in stool specimens by microscopic examination using staining methods or direct fluorescent antibody assays; or detection, by the same assays, of trophozoites in stool specimens, duodenal fluid, or small-bowel tissue; or detection of antigens in stool specimens by immunodiagnostic testing including asymptomatic infections. A probable case was one with clinically-compatible illness and an established epidemiologic link to a laboratory-confirmed case.

**Epidemiology of giardiasis in California**

CDPH received reports of 18,993 cases of giardiasis with estimated symptom onset dates from 2001 through 2008. This corresponds to an average incidence rate of 6.5 cases per 100,000 Californians. Giardiasis incidence rates decreased by 42.0 percent from 2001 (8.8 per 100,000 population) to 2008 (5.1 per 100,000) (p < 0.001) although most of that decline occurred from 2001 to 2003 [Figure 1]. During the surveillance period, 35 (0.2 percent) cases were reported to have died with giardiasis during the surveillance period.

The average giardiasis incidence rates for the surveillance period were higher among children 1 to 4 years of age (18.4 per 100,000) and 5 to 14 years of age (7.3 per 100,000) and among adults 35 to 44 years of age (7.4 per 100,000) [Figure 2]. The ratio of male to female cases was 1.2:1.0. Incidence rates by race/ethnicity were not calculated due to the substantial portion of missing data (39.3 percent). However, giardiasis cases with complete data reported White non-Hispanic race/ethnicity more frequently than would be expected based on the overall demographic profile of California [Figure 3].

Average incidence rates for the surveillance period were 2.1 times higher in Northern California (9.3 per 100,000) than in Southern California (4.4 per 100,000). In Northern California, the average rate decreased by 43.2 percent from the combined years of 2001 and 2002 (11.8 per 100,000) to the combined years of 2007 and 2008 (6.7 per 100,000) [Figure 4]. In Northern California, the San Francisco Bay Area, Far North, and Sierras regions had the highest average incidence rates during the surveillance period. In Southern California, the average rate decreased by 7.8 percent from the combined years of 2001 and 2002 (5.1 per 100,000) to the combined years of 2007 and 2008 (4.7 per 100,000).
From 2001 through 2008, 6 outbreaks of suspected waterborne or foodborne giardiasis were reported to CDPH. Four suspected waterborne outbreaks involved 85 cases. Two of these 4 were suspected to be associated with a water filtration system at a Boy Scout camp and a water dispenser at a commercial gym. Two foodborne outbreaks of giardiasis involving a total of 80 cases were also reported; neither had a vehicle identified.

Comment
During the surveillance period, the highest annual number of giardiasis cases (3,049) was reported in 2001. California has experienced a significant decline in giardiasis incidence from 2001 to 2008. Reasons for this decrease are unknown, but declines might be associated with changes in laboratory testing and disease reporting practices, or changes in actual disease incidence. Continued monitoring of annual rates is needed.

Reducing giardiasis in California will require continued coordination between public health and drinking and recreational water quality control enforcement agencies. Educating the public about risk reduction measures, including safe hygiene practices for child care settings, recreational water settings, and for drinking water may provide the best opportunities for reducing giardiasis. Hand and personal hygiene practices in all settings, and safe sexual practices are also important for preventing and controlling this disease.

References and resources

Last update 8/17/2009

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