



HAMILTON COUNTY
PUBLIC HEALTH

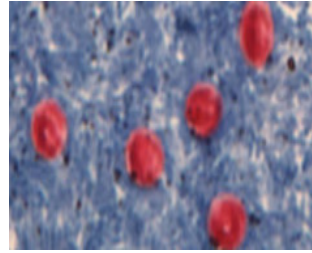
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Cryptosporidiosis and Recreational Water Facilities Issue Brief

Cryptosporidiosis and Recreational Water Facilities

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Cryptosporidiosis (Crypto) is a disease characterized by watery diarrhea, which usually lasts for one to two weeks. Other symptoms may include headache, severe abdominal cramping, nausea, and less commonly, vomiting.¹ The disease is caused by a microscopic parasite called *Cryptosporidium* that lives in the intestine of infected humans and animals.² The disease and parasite are often both referred to as “crypto.” Crypto can be found in water and other sources that have been contaminated with animal or human feces that contain the parasite. The crypto parasite has a protective, external



Source: <http://www.cdc.gov/parasites/crypto/>

layer that allows it to exist in the environment for extended periods of time and prevents it from being susceptible to the levels of chlorine typically used for disinfection at recreational water facilities (RWF) (e.g., swimming pools, water parks). Infection occurs when the parasite is ingested. Although the parasite can be spread from per-

son-to-person, animal-to-person, and via food, water is the most common mode of transmission.² Cases of the disease are most commonly reported in the summer months when participation in outdoor recreational activities is at its highest – particularly, those that involve water. Crypto has been associated with past waterborne outbreaks in the U.S. and Hamilton County and is one of the most frequent causes of waterborne illness in humans.^{3,4} It has been estimated that 748,000 cases occur each year in the U.S.³

Points of Interest:

- The most common symptom of crypto infection is watery diarrhea that lasts one to two weeks.
- Crypto infection is often associated with waterborne transmission, but may also occur via person-to-person, animal-to-person, and foodborne modes of transmission.
- Crypto resists chlorine disinfectant levels typically used to treat recreational water.
- Crypto is most commonly reported in the summer months, with the highest incidence normally occurring in August and September.
- An estimated 748,000 cases of crypto occur each year in the U.S.

Want to learn more about Crypto???

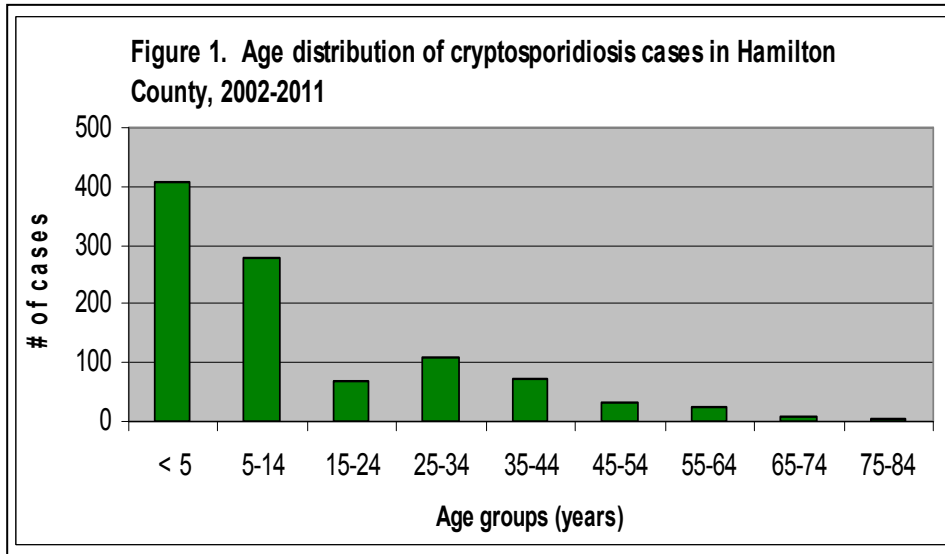
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Who is at Risk in Hamilton County?

The risk of developing the disease varies depending on each person's level of immune response. In particular, the very

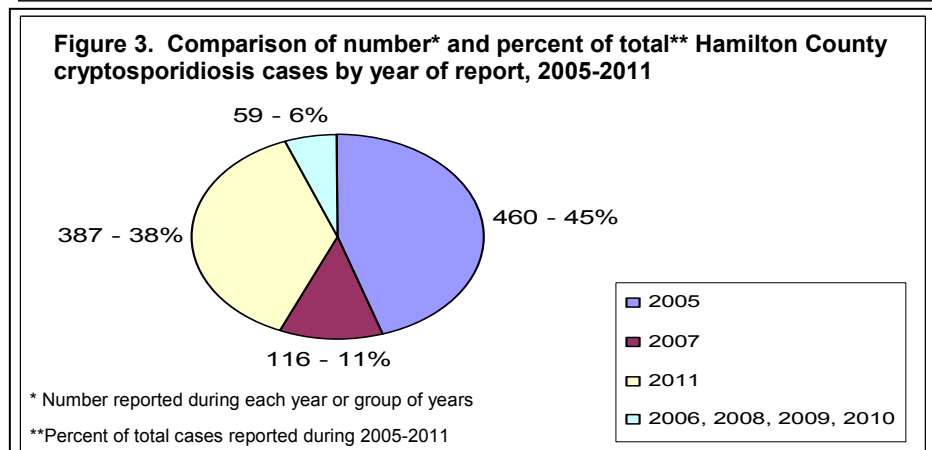
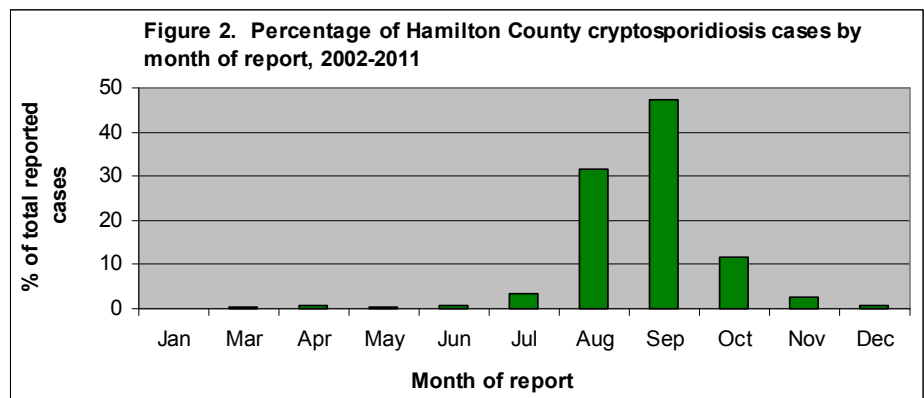
young and old and those with compromised or weakened immune systems are most at risk for developing a severe form

of the disease that may result in hospitalization and/or prolonged or fatal illness. Over the last 10 years (2002-2011), those most impacted in Hamilton County were children and teenagers; with children under 5 years of age accounting for 41 percent (n=409) of all cases for which age was reported (Figure 1). The odds of developing the disease increased among daycare attendees toward the end of 2005 and during October-November of 2011 when severe outbreaks occurred. During 2002-2011, white residents in Hamilton County comprised the majority of cases for which race was reported at 55 percent (n=474) followed by black residents (n=191, 22 percent) and all other races (n=190, 22 percent). The distribution of cases by sex was similar with females accounting for 51 percent (n=525) and males for 49 percent



Are there Seasonal Fluctuations in Disease Risk?

Crypto is most commonly reported in the summer months. The highest incidence in Hamilton County over the last 10 years has occurred in August and September (Figure 2). Community-wide crypto outbreaks occurred in Hamilton County in the summers of 2005 and 2011. Elevated incidence was also observed in the summer of 2007. There were over 450 cases of crypto reported in 2005, over 110 reported in 2007, and nearly 400 reported in 2011. Figure 3 shows the proportion of cases reported during each of these years compared with the total cases reported during all other years between 2005 and 2011 (n=1,022). The incidence of crypto during July-November 2005 was 55.4 per 100,000 residents. By comparison, it was only 0.5 per 100,000 residents during the same period in 2004. During July-November 2007, the incidence was 14.1 per 100,000 residents and was only 2.7 per 100,000 residents during July-November 2006. In 2011, the July-November incidence was 44.4 per 100,000 residents and in 2010 it was 1.4 per 100,000 residents.



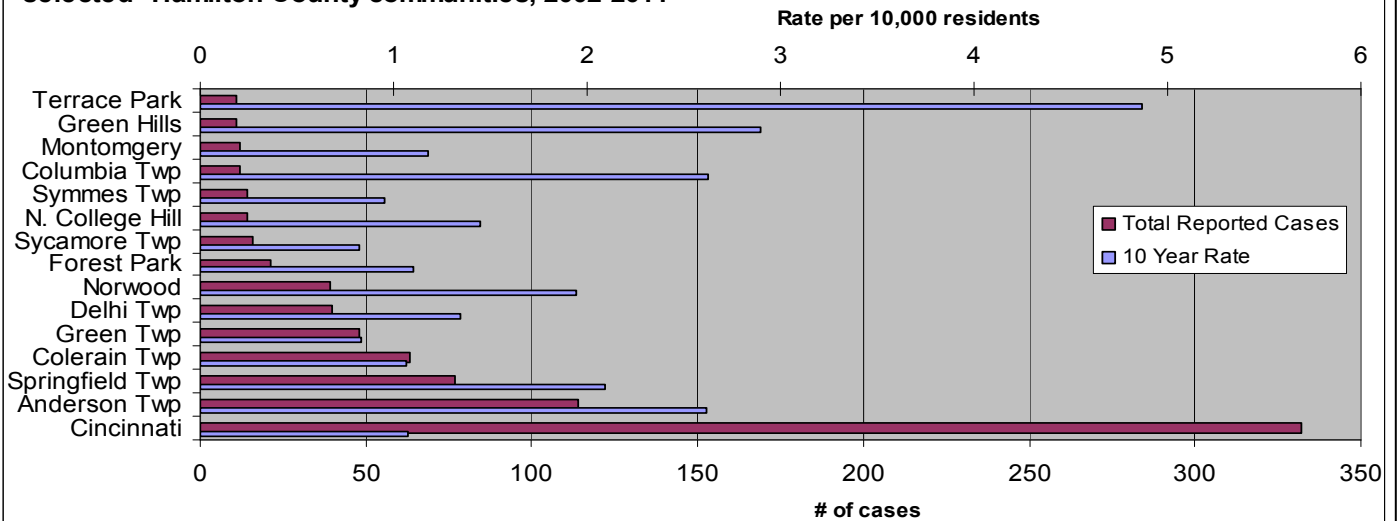
Which Communities are Affected?

All communities in Hamilton County had at least one case of crypto reported among their residents during 2002-2011. Higher total incidences have burdened the communities of Cincinnati, Anderson Town-

ship, Springfield Township, Colerain Township and Green Township (Figure 4). Higher rates of disease were often seen among residents of smaller communities such as Terrace Park, Green Hills and Co-

lumbia Township. However, some of the more heavily populated areas such as Anderson Township, Springfield Township and Norwood were also among the communities with the highest rates.

Figure 4. Comparison of total reported cryptosporidiosis cases and 10-year rates for selected* Hamilton County communities, 2002-2011



* Communities shown represent those with the 15 highest total incidences of reported cases among all Hamilton County communities during 2002-2011

How Does Public Health Respond?

Public health agencies responsible for different communities and staff from different disciplines within the agencies all work together as a team to respond to and mitigate the spread of crypto at RWFs. Public health nurses, epidemiologists and environmental health (EH) staff work to determine the source of outbreaks and implement interventions by obtaining and reviewing individual and community level data from crypto cases and the RWFs they may have visited. Public health epidemiologists collect, monitor and analyze the data looking for unusual trends in the frequency of reported cases, the occurrence of cases in geographical clusters and/or among specific groups of people (e.g. children) to determine if higher than expected numbers might indicate that an outbreak of disease is occurring. Public health nurses investigate and interview individual cases

of crypto reported to public health (as required by law) from healthcare providers and laboratories. During case interviews, nurses collect information about how the individual may have become sick (i.e. exposures to the disease), when they became sick, what their symptoms are, and other people they know or have been in contact with that may also be sick with similar symptoms and/or exposures. EH staff routinely inspect all public RWFs several times a year in an effort to ensure they are maintained and operated in a safe and healthy manner and according to public health regulations. Inspections include standard tests of water chemistry for hygiene and quality, reviews of the RWF's mechanical and safety systems and, when possible and/or appropriate, operator education. When an RWF has been identified as a potential source of crypto exposure,

they respond quickly by conducting an inspection and working with the operator to implement recommended and/or required interventions that may include hyperchlorination of the water to concentrations capable of killing crypto and detailed operator, staff, or patron education. EH staff may also assist with inspections of and consultations with affected child care facilities when crypto cases have been identified in a facility. Through the efforts of these public health professionals, the outbreaks of 2005, 2007 and 2011 were controlled through enhanced communication with the local healthcare community and educational efforts directed at the general public, recreational water facilities and daycare centers.

What can the Public do to Prevent this Disease from Spreading?

According to the Centers for Disease Control and Prevention,² populations, such as the following, are at increased risk of acquiring cryptosporidiosis:

- Daycare center attendees – including diaper-aged children
- Child care workers
- Parents of infected children
- Caregivers for people infected with cryptosporidiosis
- International travelers
- Backpackers, hikers and campers who drink unfiltered, untreated water
- People who drink from untreated, shallow and/or unprotected wells
- People, including swimmers, who swallow water from contaminated sources
- People who handle infected cattle
- People exposed to human feces through sexual contact

Good hygiene practices that include the following are very important for crypto prevention and control:

- Thorough handwashing before preparing or eating food, after using the bathroom, after changing diapers or cleaning a child after he or she used the bathroom, before and after caring for someone with diarrhea and after handling animals or their waste
- Excluding children with diarrhea from child care environments
- Not swimming if you have diarrhea or have been diagnosed with crypto
- Showering before entering recreational water
- Washing children before they enter recreational water and after bathroom use of soiling their diapers
- Ensuring children take frequent bathroom breaks while swimming
- Checking and changing diapers often and always in the bathroom, away from recreational water
- Minimizing contact with animal feces and wearing disposable gloves when necessary to do so
- Washing hands after contact with animals or the environments in which they live

For More Information on Cryptosporidiosis Please Visit:

CDC Parasitic Diseases Division - Cryptosporidium Resource Page

- <http://www.cdc.gov/parasites/crypto/index.html>

Hamilton County Communicable Disease Report 2004 - 2008

- http://www.hamiltoncountyhealth.org/en/resource_library/reports.html

References

¹The Ohio Department of Health. *Infectious Disease Control Manual*. [11/10/2011]. Available from <http://www.odh.ohio.gov/healthResources/infectiousDiseaseManual.aspx>

²Centers for Disease Control and Prevention. Division of Parasitic Diseases. *Cryptosporidium* resources page. Atlanta, Georgia: Centers for Disease Control and Prevention website; [12/27/201]. Available from: <http://www.cdc.gov/parasites/crypto/>

³Scallan E, Hoekstra RM, Angulo FJ, Tauxe RV, Widdowson MA, Roy SL, Jones JL, and Griffin PM. [Foodborne illness acquired in the United States--major pathogens](#). *Emerg Infect Dis*. 2011;17(1):7-15.

⁴Centers for Disease Control and Prevention. Division of Parasitic Diseases. *Cryptosporidium* Infection (Cryptosporidiosis): *MMWR: Outbreaks of Cryptosporidiosis*. [8/10/2006]. Available from http://www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/moreinfo_crypto_outbreaks.htm