Cryptosporidiosis is a disease caused by parasites of the genus Cryptosporidium. Both the disease and the parasite are commonly known as “crypto.” Crypto is one of the most common causes of waterborne disease. The parasite may be found in drinking water and recreational water. Outbreaks have been associated with water parks, community swimming pools, and day care centers. The parasite’s protective outer shell allows it to survive outside the body and makes it very resistant to disinfectants, including chlorine.

The most common symptom of cryptosporidiosis is watery diarrhea. Other symptoms may include dehydration, weight loss, stomach cramps or pain, fever, nausea, and vomiting. Symptoms generally begin 2 to 10 days after becoming infected. Symptoms usually last about 1 to 2 weeks. Some people with cryptosporidiosis will have no symptoms at all. In persons with AIDS and in others whose immune system is weakened, cryptosporidiosis can be serious, long-lasting, and sometimes fatal.

**Cryptosporidiosis Incidence**

Incidence is the number of new cases of a disease that arise during a specific period of time. Williamson County is one of thirty counties in the Texas Department of State Health Services (DSHS) Health Services Region 7 (HSR 7). HSR 7 is one the eight health service regions of DSHS. Incidence of cryptosporidiosis in Williamson County was not calculated for 2003 and 2004 because <5 cases were reported for those years (see section entitled “Incidence” at the end of this report). Incidence of cryptosporidiosis increased dramatically in 2006 in Williamson and Travis Counties due to an outbreak (see “Response and Prevention” section).
Cryptosporidiosis Surveillance Data

Williamson County and Cities Health District (WCCHD) nurses, public health technicians, and epidemiologists work together to conduct public health surveillance. Public health surveillance for cryptosporidiosis has clear objectives and provides and interprets data to facilitate the prevention and control of disease by:

- Identifying cases and outbreaks and responding appropriately;
- Confirming the agent causing illness and conducting further laboratory studies if necessary to ensure control measures and treatment recommendations are optimal;
- Raising awareness of disease in the medical community and the general public.

To achieve these objectives, disease reporting systems must be timely, provide an accurate picture in time of the disease, be sensitive enough to identify persons with disease, and be specific enough to exclude persons not having disease. The ultimate goal is to reduce the morbidity and mortality associated with cryptosporidiosis.

Case Definitions and Laboratory Confirmation

Cryptosporidiosis is an illness characterized by diarrhea, abdominal cramps, loss of appetite, low-grade fever, nausea, and vomiting. Asymptomatic infections may occur. Laboratory confirmed cryptosporidiosis is defined as the detection of crypto using one or more laboratory techniques or testing methods.

Cases are classified as “confirmed, symptomatic” with one of the symptoms listed above or “confirmed, asymptomatic” with none of the symptoms listed above. When investigating cryptosporidiosis outbreaks, WCCHD also classifies unconfirmed symptomatic cases that are epidemiologically linked to a laboratory confirmed case as “probable”. However, these probable cases may not be “officially” counted as cases by DSHS or the Centers for Disease Control and Prevention.

To be consistent with state and national statistics, only confirmed cases were used to calculate incidence rates and compare case counts by age. Probable cases are only included in this report for total case counts by year and area.

Williamson County accounted for 40% (44/109) of laboratory confirmed cases reported in HSR 7 for 2006. The rise in reported cases was due in part to increased awareness of the disease. Surveillance data and incidence figures for cryptosporidiosis within Texas and the United States should be compared with caution because local surveillance systems have varying capabilities to detect cases and reporting may vary.
The patterns for cryptosporidiosis by age group for Williamson County closely parallel patterns observed for national data which indicate the highest number of reported cases for 2003 – 2005 was among children aged 1 to 9 years and adults 30 – 39 years.
### Williamson County Cryptosporidiosis Confirmed and Probable Cases by Area

<table>
<thead>
<tr>
<th>Area*</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round Rock</td>
<td>3</td>
<td>29</td>
<td>2</td>
</tr>
<tr>
<td>Cedar Park</td>
<td>3</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Georgetown</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Taylor</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Hutto</td>
<td>1</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Leander</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Austin (Williamson County)</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Bartlett</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Coupland</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Florence</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Granger</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Jarrell</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Liberty Hill</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Thrall</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Weir</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

*Areas defined by one or more zip code boundaries. Parts of zip codes located outside of county are excluded.
Cryptosporidiosis follows a seasonal pattern in Williamson County, with cases being reported primarily in the summer and early fall. The number of cases reported increases during the recreational water season. During outbreaks and perhaps during summer months, health care providers’ heightened suspicion for crypto may lead them to request crypto diagnostic laboratory tests, greatly increasing the likelihood that cryptosporidiosis is reported to the health department. Cryptosporidiosis outbreaks can be difficult to stop, especially if the source of infection is not known. The disease can be spread for weeks after symptoms have stopped. Some infected persons may not experience symptoms but are still able to spread the disease.

Cryptosporidiosis in Williamson County by Onset Month

**Response and Prevention**

**Recent Outbreaks**

Health care providers and other reporters are required to report cryptosporidiosis to assist public health investigators in detecting and responding to possible outbreaks.

WCCHD requests official outbreak names from DSHS for cryptosporidiosis outbreaks (outbreaks associated with water systems, water parks, large family gatherings etc.). The number of named cryptosporidiosis outbreaks for 2005, 2006, and 2007 was 0, 1, and 0 respectively.

Cases associated with an outbreak of cryptosporidiosis in 2006 were first reported in early August. Within Williamson County, the outbreak had the greatest impact in the Round Rock area. Cases associated with the outbreak were also reported in Travis County. The outbreak peaked in mid August with 10 cases for Williamson County the week of 8/16/2006. Joint investigation by public health departments from Williamson and Travis counties found exposure to recreational water (including several water parks) to be the likely cause of the outbreak. The lack of adequate fencing around some water parks may have allowed deer and other wild animals carrying crypto to enter the parks at night. The source of contamination could also have been one or more park patrons infected with crypto. Other possible sources for crypto include swimming pools and the numerous streams and lakes used frequently for recreation in Williamson County.
**What is an “Epi Curve”?** The epidemiologic curve, also known as an epi curve, is a visual display of an outbreak’s magnitude and time trend. The x-axis is the date or time of onset of illness among cases and the y-axis is the number of cases. If an onset date or week is not known, the diagnosis date or the date the case was reported to the health department is used in place of onset date.
**Historical Perspective – 1998 Brushy Creek Outbreak**

*Excerpts from “Cryptosporidiosis at Brushy Creek”, Epidemiology in Texas 1998 Annual Report, Texas Department of Health*

On July 13, 1998, a lightning strike during a thunderstorm incapacitated the controls at a wastewater lift station located upstream from the Brushy Creek Municipal Utility District’s (MUD) five drinking water wells. This power outage caused 167,000 gallons of raw sewage to flow into Brushy Creek. Brushy Creek MUD serves a number of neighborhoods in the Brushy Creek-Cat Hollow area adjacent to Round Rock near the Williamson County-Travis County line.

Beginning on July 24, 1998, the Texas Department of Health Infectious Disease Epidemiology and Surveillance Division (IDEAS) and WCCHD began receiving calls from Brushy Creek residents complaining of nausea, diarrhea, and abdominal cramps. It was later determined that residents of Brushy Creek were suffering from cryptosporidiosis. It is estimated that 60 percent of Brushy Creek’s population of 10,000 were exposed to the parasite and approximately 1,440 residents contracted cryptosporidiosis. There were 89 laboratory confirmed cases. Based on a survey of residents, the mean duration of the illness was seven days (range 1- 45 days).

The only exposure that was significantly associated with illness was consumption of drinking water from the contaminated MUD wells. It was reported that MUD customers whose water came from the contaminated wells were five times more likely to be ill than MUD customers whose water came from treated surface water. Tests performed for fecal coliforms on raw water samples taken from the five wells after the sewage leak showed high levels of *Escherichia coli* and helped to confirm that the wells had been contaminated (four of the five wells were positive).

**Limitations of Disease Surveillance Data**

Incomplete reporting of diseases may impact the quality and limit the usefulness of disease statistics. Even though disease reporting is mandated by law, the completeness of reporting for different diseases varies greatly. Disease trends over time based on surveillance data should be interpreted with caution. Changes in laboratory technology may lead to new Centers for Disease Control and Prevention (CDC) case definitions and classifications, thereby increasing or decreasing the number of cases reported. Finally, as more is learned about a disease, the clinical case definition may be updated. Whenever possible such changes should be noted when analyzing or displaying disease trends. Case counts and incidence rates within Texas should be interpreted with caution because different surveillance systems have varying capabilities to detect cases, and reporting might vary.

**Use of Geographical Information Systems (GIS) to Estimate Disease Burden**

Disease surveillance in Williamson County is performed by two health departments, the Austin Travis County Health and Human Services Department (ATCHHSD) and WCCHD. ATCHHSD investigates suspect cases that lie within Austin’s city limits and Williamson County. WCCHD investigates all other suspect cases in the county. WCCHD also investigates suspect cases that are outside Williamson County but lie within the city limits of Round Rock, Cedar Park, and Leander. To estimate the true disease burden for the county, disease reports from both ATCHHSD and WCCHD must be combined. If the home address of a case is known, the “home county” is determined using Geographical Information Systems (GIS) techniques. Limitations of GIS include the inability to precisely match and map all addresses (P.O. Boxes, private roads, incorrectly entered address data).
Incidence

Incidence is the number of new cases of a disease that arise during a specific period of time. In this report it is expressed as:

\[
\text{Incidence} = \left( \frac{\# \text{ cases of a disease or condition reported for a year/population at risk}}{100,000} \right) \times 100,000 = \text{reported cases per 100,000 population}
\]

Disease incidence is only calculated if there were more than five cases reported. The reliability of incidence based on a low number of reported cases should be questioned. WCCHD utilizes the mid-year population estimates produced by the Texas State Data Center and Office of the State Demographer to calculate incidence. Surveillance data is usually available before official population estimates are published; therefore, this report may contain surveillance data for the most recent year, but not incidence.

For questions contact:
David G. Bastis, MPH, Epidemiologist, 512-248-3257 (dbastis@wcchd.org) or the WCCHD Communicable Disease Management Team, 512-943-3660
Visit the WCCHD webpage for current year statistics: http://www.wcchd.org

Cryptosporidiosis Online Resources & References

Centers for Disease Control and Prevention (CDC) general information on cryptosporidium (includes information on choosing safe bottled water): http://www.cdc.gov/Ncidod/dpd/parasites/cryptosporidiosis/default.htm

CDC guidance for persons with HIV/AIDS who are concerned about Cryptosporidiosis: http://www.cdc.gov/hiv/pubs/brochure/oi_cryp.htm

CDC healthy swimming site; includes information about recreational water illnesses (RWI): http://www.cdc.gov/healthyswimming/index.htm

CDC information on cryptosporidium and drinking water from private wells: http://www.cdc.gov/ncidod/dpd/healthywater/factsheets/crypto.htm


U.S. Environmental Protection Agency information on drinking water contaminants: http://www.epa.gov/safewater/contaminants/index.html