

# Five-Year Surveillance of Foodborne/Enteric Illnesses Jefferson County, CO 2005 to 2009

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# Foodborne/Enteric Disease Surveillance in U.S.

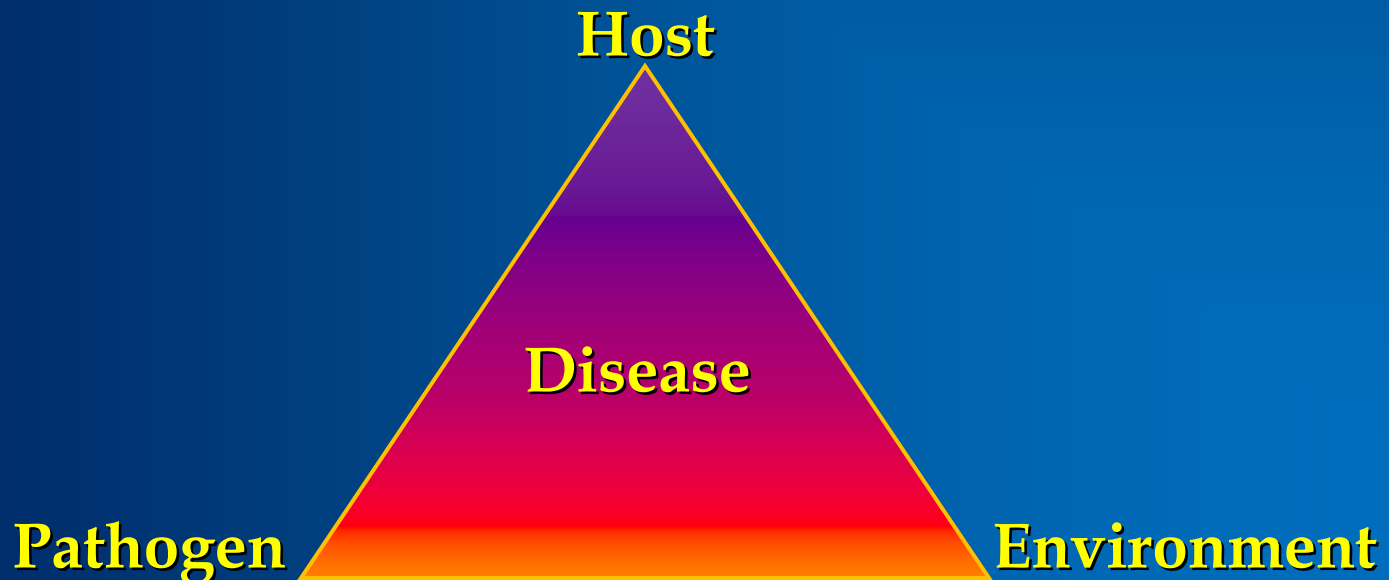
- **FoodNet** (Foodborne Disease Active Surveillance Network):
  - Principal component of the Centers for Disease Control & Prevention's (CDC) Emerging Infections Program
  - CDC grant-funded sites in 10 states, covering 15% of the US population, monitors diseases caused by specific bacteria and parasites commonly transmitted through food
- **Public Health Surveillance:** Systematic, ongoing assessment of the health of a community, based on the collection, interpretation and use of health data
- Surveillance provides information necessary for public health decision making and interventions

# Foodborne/Enteric Disease Surveillance in Jefferson County, CO

- Jefferson County is a selected CDC FoodNet site in Colorado
- Responsible for conducting ongoing active surveillance of residents infected with foodborne/enteric pathogens
- Pathogens contributing to most burden of illness are analyzed and findings submitted to Colorado Department of Public Health & Environment (CDPHE) and CDC
- Surveillance reports from county level ensure issues of public health importance are effectively monitored and emerging diseases are tracked

# Foodborne/Enteric Disease

- **Host:** A person or other living animal that affords subsistence or lodgment to an infectious agent under natural conditions
- **Pathogen:** A disease-causing agent
- **Environment:** Influences the circumstances and probability of contact between host and the pathogen/agent
- **Enteric Infections (Disease):** Enter the body through the mouth and intestinal tract and are usually spread through contaminated food and water or by contact with vomit or feces



# Pathogens attributed to greatest burden of foodborne/enteric illnesses in Jefferson County:

<b>Pathogen</b>	<b>Organism</b>	<b>Mode of Transmission</b>	<b>Symptoms/ Illness</b>
<i>Campylobacter</i>	Bacteria	Ingestion of undercooked meat (poultry), contaminated food & water, raw milk, contact with infected pets	Diarrhea (bloody stools), abdominal pain, malaise, fever, nausea and/or vomiting
<i>Cryptosporidium</i>	Parasite	Fecal-oral; person-to-person, animal-to-person, contaminated food and/or water	Diarrhea (watery/profuse), anorexia, vomiting, cramping abdominal pain, malaise, fever, nausea and/or vomiting
<i>Giardia</i>	Parasite	Fecal-oral; person-to-person transfer of cysts from feces (child-care centers), anal intercourse, contaminated water and/or food	Often asymptomatic, diarrhea (acute &/or chronic), steatorrhea, abdominal cramps, bloating, frequent loose and pale greasy stools, fatigue, malabsorption and weight loss

<b>Pathogen</b>	<b>Organism</b>	<b>Mode of Transmission</b>	<b>Symptoms/ Illness</b>
<i>Salmonella</i>	Bacteria	Ingestion of contaminated food (feces from infected animal or person), raw eggs, raw milk, meat, produce contaminated water, contact with infected animals and/or environments	Sudden onset of headache, abdominal pain, diarrhea, nausea, sometimes vomiting, dehydration, fever, anorexia
<i>Shigella</i>	Bacteria	Fecal-oral (direct or indirect), ingestion of contaminated food and/or water, person-to-person	Loose bloody/mucus stools of small volume, fever, nausea, sometimes toxemia, vomiting, cramps, tenesmus
<i>Shiga toxin-producing E. coli (STEC)</i>	Bacteria	Ingestion of contaminated food (beef, produce, unpasteurized cow's milk), direct contact with infected animals or environment	Diarrhea (often bloody), hemolytic uremic syndrome (HUS), neurologic abnormalities, fever

# Foodborne/Enteric Disease Surveillance

Project Objectives: Assess foodborne/enteric illness in Jefferson County, CO from 2005 to 2009 for required FoodNet grant-deliverable five-year report

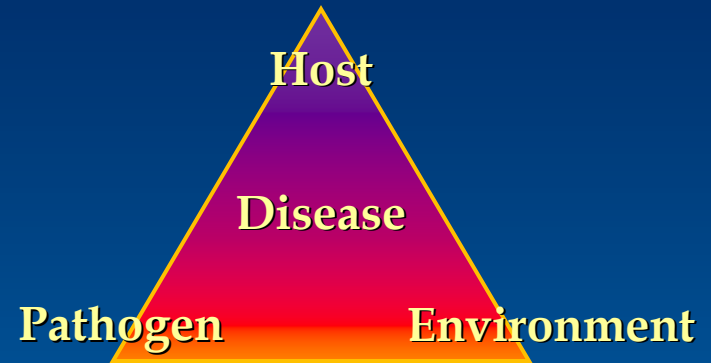
- Determine the burden of foodborne illness attributed to certain pathogens
- Identify any trends or emerging patterns
- Summarize findings and provide to the Colorado Department of Public Health & Environment for distribution to CDC's FoodNet

# Methods

## Analyze foodborne/enteric illnesses in Jefferson County, CO for trends and emerging patterns

Time	2005 - 2009 (Grant-deliverable five-year analysis)
Population	Residents of Jefferson County, CO; reported probable or confirmed cases (Colorado Electronic Disease Reporting System[CEDRS])
Pathogens	Campylobacter, Cryptosporidium, Giardia, Salmonella, Shigella, STEC
Cross-sectional & Temporal	Pathogens, Age, Seasonality, Outbreak vs. Sporadic, Time

# Foodborne/Enteric Disease in Jefferson County



## Pathogen:

Incidence of illness differed by pathogen

## Seasonality:

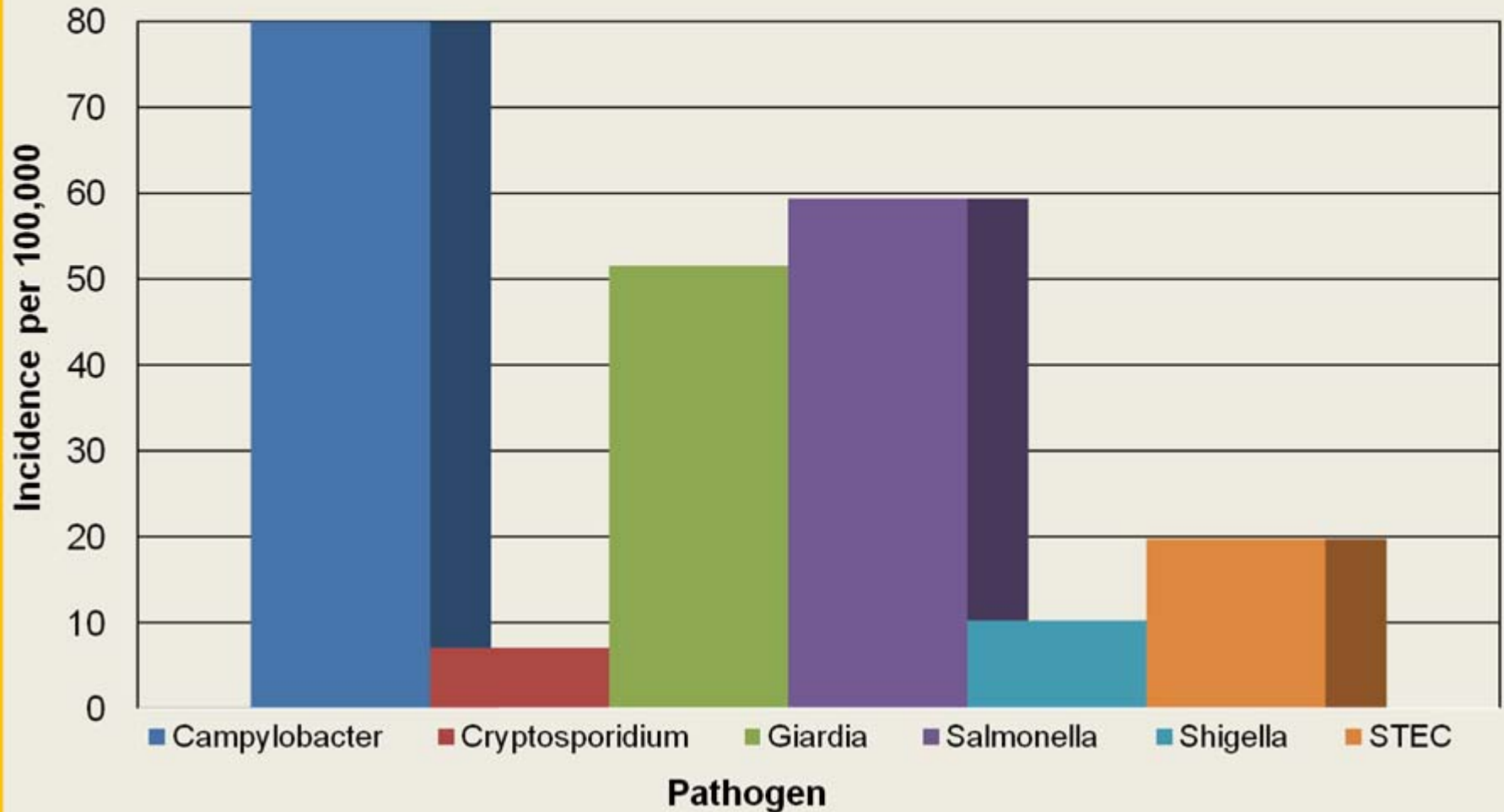
The number of reported infections varied by month

## Individual Characteristics:

Incidence of infection varied by age group

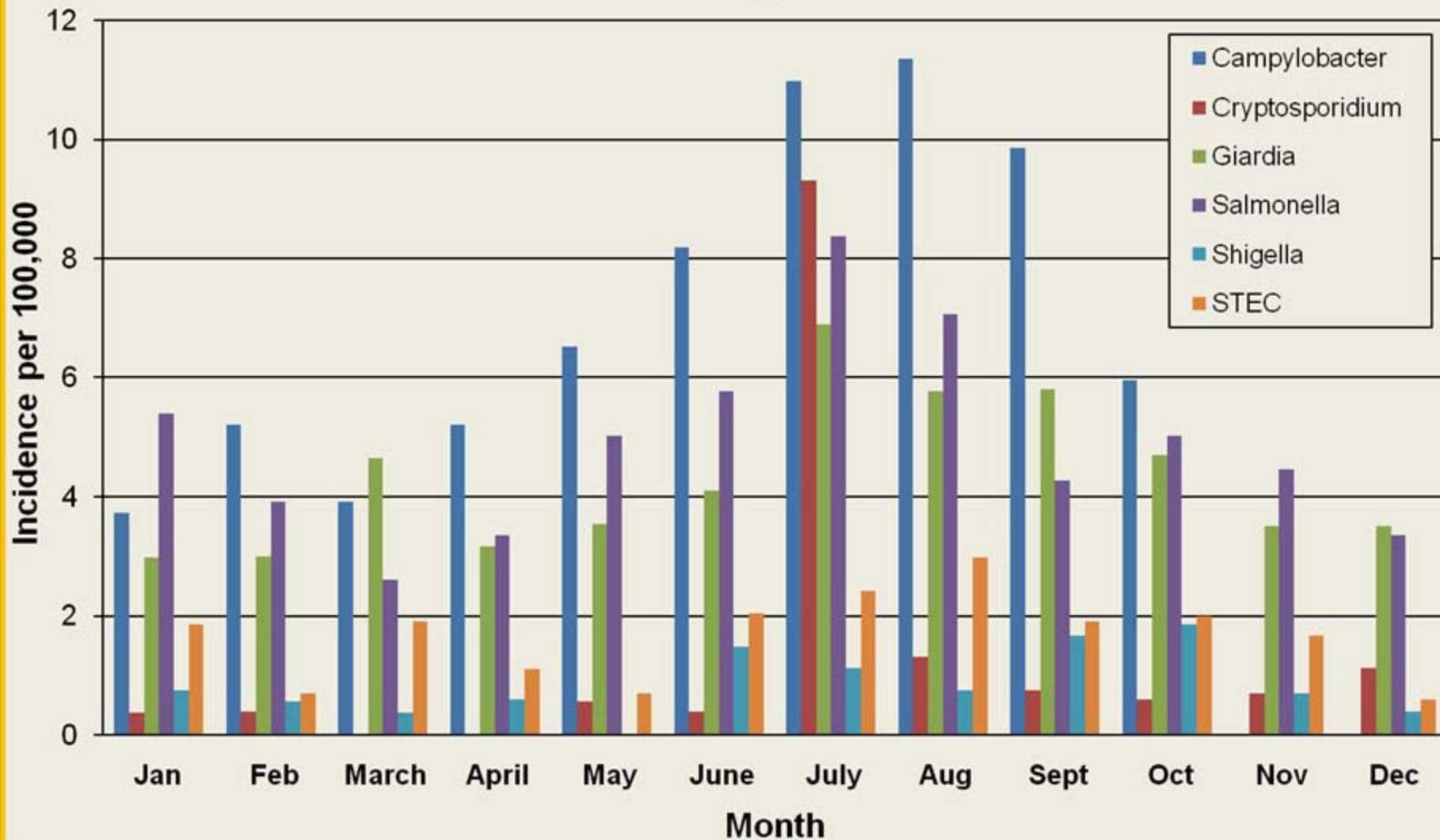
# Pathogens

Incidence Rate by Pathogen  
Jefferson County, CO 2005 - 2009



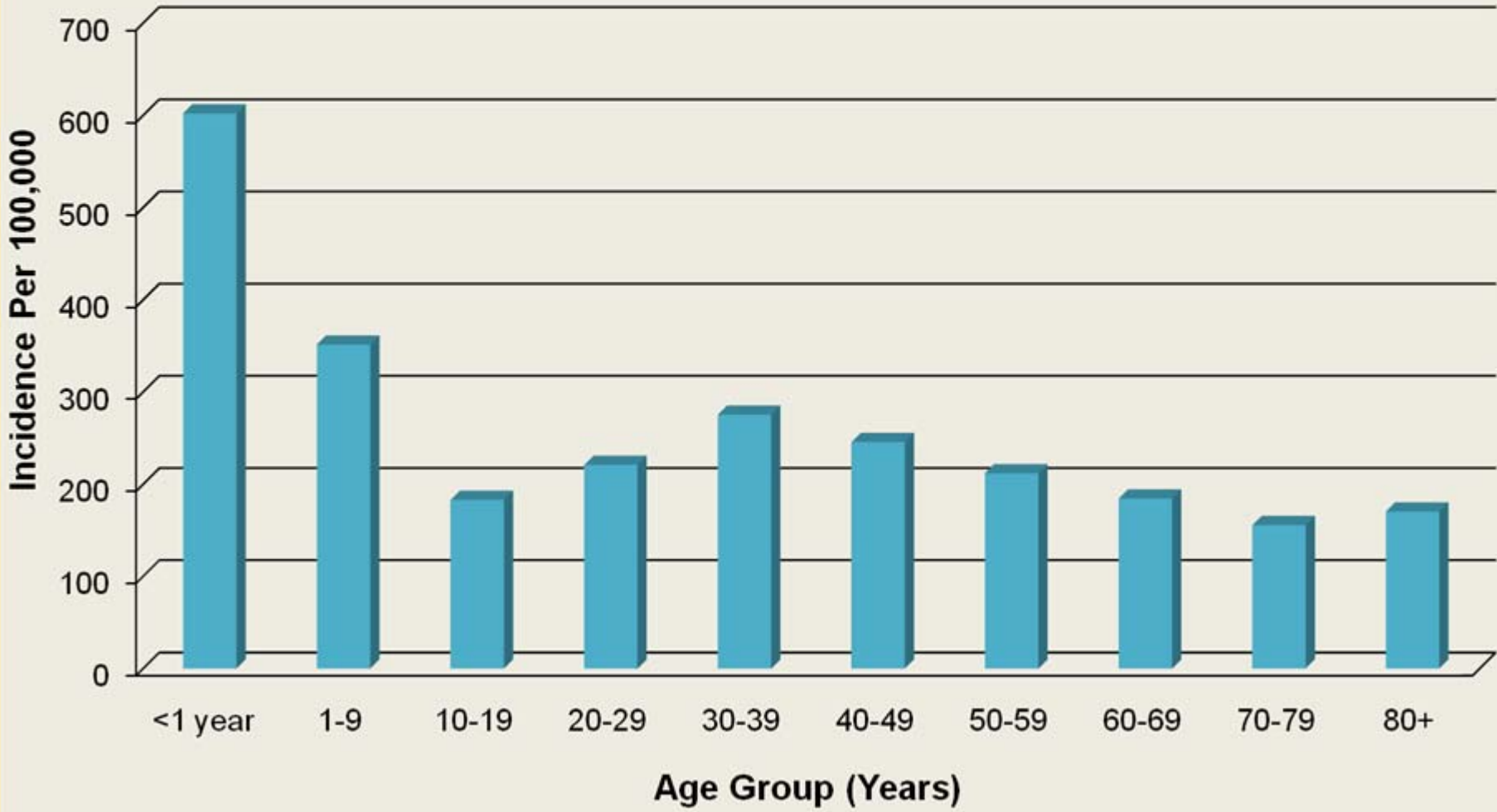
# Seasonality

Incidence Rate by Month and Pathogen  
Jefferson County, CO 2005 - 2009



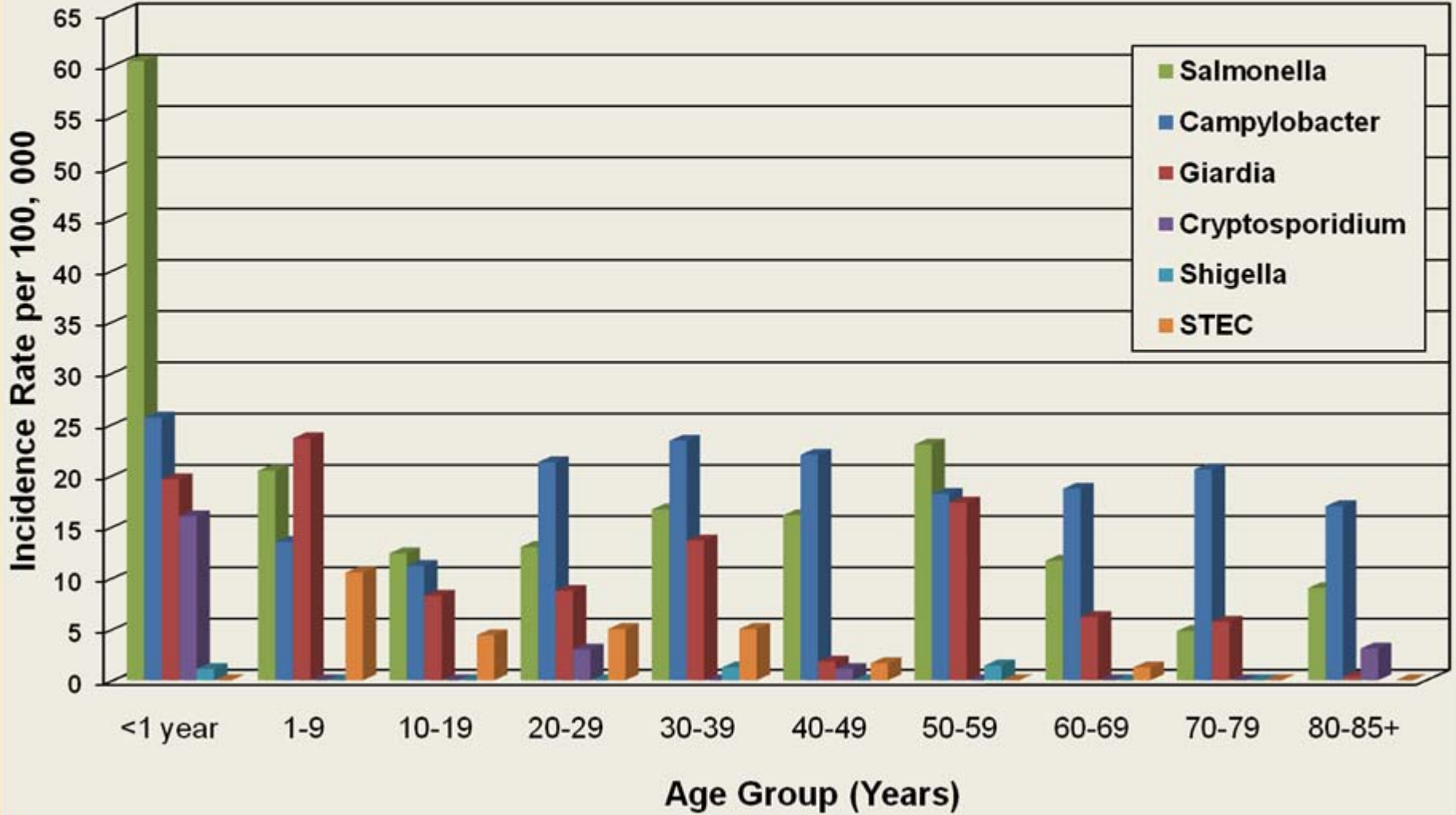
# Age Group

**Age-Adjusted Incidence Foodborne/Enteric Illnesses,  
Jefferson County, CO 2005 - 2009**



# Age Group/Pathogen

## Incidence of Campylobacter, Giardia & Salmonella by Age Group, Jefferson County, CO 2005 - 2009

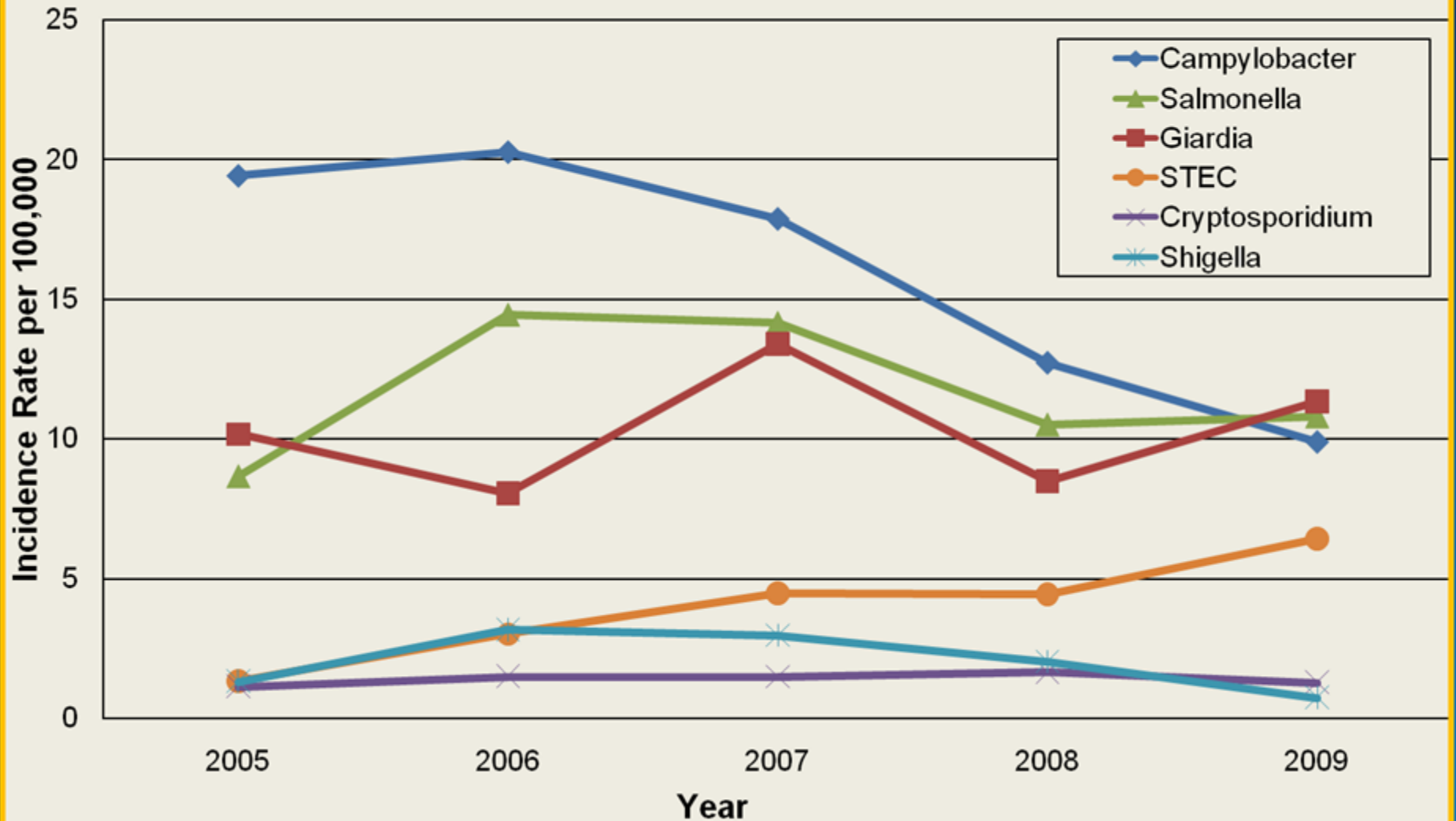


# Frequency Outbreak-Related vs. Sporadic Illnesses

Pathogen	# Outbreak Related Cases	% Outbreak Related Cases	# Sporadic Cases	% Sporadic Cases
<i>Campylobacter</i>	0	0%	430	100%
<i>Cryptosporidium</i>	0	0%	38	100%
<i>Giardia</i>	0	0%	277	100%
<i>Salmonella</i>	5	2%	310	98%
<i>Shigella</i>	3	6%	51	94%
STEC	46	43%	60	57%
<b>Total</b>	<b>54</b>	<b>5%</b>	<b>1166</b>	<b>95%</b>

# Five Years

Incidence Rate of Foodborne/Enteric Pathogens  
Jefferson County, CO 2005 - 2009



# Conclusions

- Increased incidence of *Giardia*, *Salmonella* and *STEC* from 2005 to 2009
- Incidence of *Campylobacter* and *Shigella* decreased
- Age-adjusted incidence was greatest among children less than 1 year of age
- *Campylobacter*, *Salmonella* and *Giardia* contributed to the most burden of disease regardless of age
- Most of the foodborne/enteric illnesses were sporadic (not outbreak-related)

# Public Health Recommendations

- Identify risks for exposures to foodborne/enteric pathogens
- Investigate potential factors responsible for higher incidence of *Campylobacter*, *Giardia* and *Salmonella*
- Study possible reasons for the increase in *STEC*, *Giardia* and *Salmonella*
- Identify causes of sporadic foodborne/enteric illnesses, create targeted prevention programs
- Design age and pathogen-specific interventions

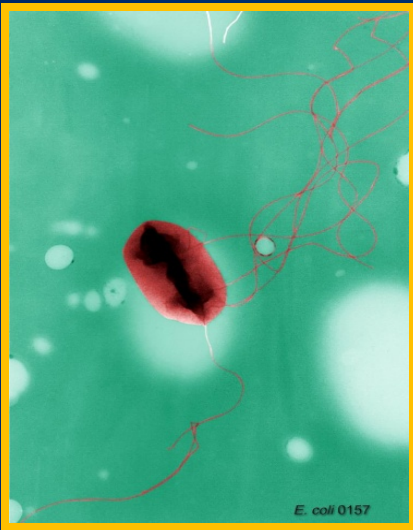
# References

- 1 Centers for Disease Control & Prevention. FoodNet. July 2011. July 2011 <<http://www.cdc.gov/foodnet/>>.
- 2 Centers for Disease Control and Prevention . Foodborne Outbreaks. 2010. December 2010 <<http://wwwn.cdc.gov/foodborneoutbreaks/>>.
- 3 Colorado Department of Public Health & Environment. Colorado Reportable Disease Statistics. 2006-2009. December 2010 <<http://www.cdphe.state.co.us/hs/communicabledata/communicabledata.html>>.
- 4 David L. Heymann, MD. "Control of Communicable Diseases Manual." Ed. MD David L. Heymann. American Public Health Association , 2008.
- 5 Jefferson County Public Health Department. Jefferson County Population Summary. Golden: Demography Section of the Colorado Department of Local Affairs, 2011.
- 6 National Center for Health Statistics. "Healthy People 2010 Objectives: 10 Food Safety." 2007. CDC Wonder Data 2010, The Healthy People 2010 Database. July 2011 <<http://wonder.cdc.gov/data2010/focusod.htm>; FTP directory /pub/Health Statistics/NCHS/Datasets/DATA2010/Focusarea10at ftp.cdc.gov>.
- 7 "Rules & Regulations Pertaining to Epidemic and Communicable Disease Control; 6CCR 1009-1." Colorado Department of Public Health & Environment, 2010.

## Photos:

- 8 Centers for Disease Control & Prevention/ Elizabeth H. White, M.S. "E.coli 0157, ID#9995." CDC Public Health Image Library (PHIL). Comp. Hayes, Peggy S CDC. 1995.
- 9 Centers for Disease Control & Prevention/ Dr. Stan Erlandsen. "Giardia lamblia parasite, ID# 11652." CDC Public Health Image Library (PHIL). Comp. Dr. Stan Erlandsen. 1999.
- 10 Centers for Disease Control & Prevention/ Bette Jensen. "Salmonella typhimurium bacteria ID# 10973." CDC Public Health Image Library (PHIL). Comp. Janice Haney Carr. 2009.

# Thank You



## Questions?

