



## PREVENTION OPPORTUNITIES UNDER THE BIG SKY

### Twenty-five Years of Bacterial Enteric Illness Surveillance in Montana, 1987 to 2011

Each year in the U.S., domestically-acquired infections caused by *Campylobacter* spp., *Escherichia coli*, *Listeria monocytogenes*, *Salmonella* spp., *Shigella* spp., and *Yersinia enterocolitica* result in an estimated 2,300,000 cases of human illness, 34,000 hospitalizations, and 768 deaths.<sup>1</sup> Healthcare professionals and laboratories are required to report enteric illnesses caused by each of these organisms to the Montana Department of Public Health and Human Services (DPHHS).<sup>2</sup> This issue of *Montana Public Health* describes a 25-year review of public health surveillance in Montana for campylobacteriosis, *E. coli* enteritis, listeriosis, salmonellosis, shigellosis, and yersiniosis.

#### Campylobacteriosis

Campylobacteriosis was the most commonly reported bacterial enteric illness in Montana (Figure 1) and also resulted in the majority of hospitalizations from bacterial enteric illnesses (Figure 2). The average annual incidence rate for frontier counties was 12.7 cases per 100,000 population/year compared with 11.8 and 9.9 for rural and urban counties, respectively. Since 2005, the incidence rate and illness-related hospitalizations have increased; the contribution of newer antigen-detection methods to these increases is unknown.

#### *E. coli* enteritis (Shiga toxin-producing *E. coli* [STEC])

Typically, fewer than five cases per 100,000 population/year were reported in Montana (Figure 1). Unlike other enteric illnesses, incidence rates of *E. coli* enteritis were less variable. The highest incidence rates occurred in 1994 and 1995 and were associated with outbreaks in Lewis and Clark, and Missoula Counties, respectively. Thirty *E. coli*-related hospitalizations occurred during 2006 to 2011 compared with 38 during 2000 to 2005 (Figure 2).

#### Listeriosis

Listeriosis was reported rarely; only 21 cases in 13 health jurisdictions were reported during 1987 to 2011.

#### Salmonellosis

The number of salmonellosis cases reported per year was variable (Figure 1). The highest rate occurred in 2004 when over 20 cases per 100,000 population were reported. Average annual incidence rates varied significantly by county from 1.9 cases (Phillips County) to 34.2 cases (Wibaux County) per 100,000 population/year (Figure 3). Illness-related hospitalizations were not common (Figure 2).

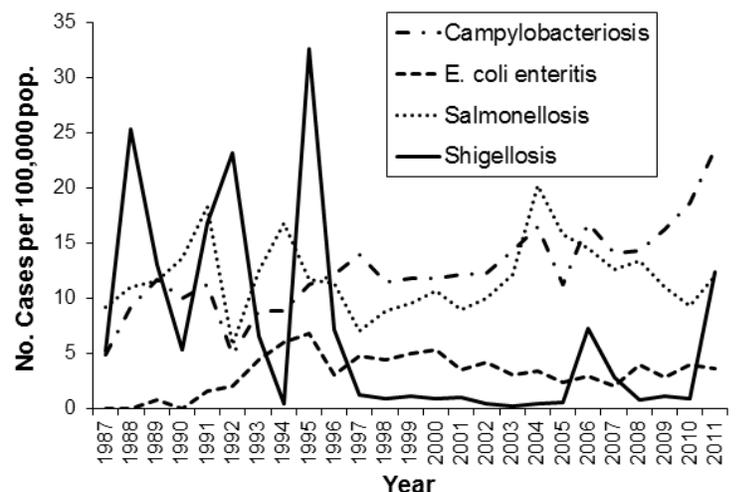
#### Shigellosis

The annual incidence rate (Figure 1) and the average annual incidence rate (Figure 3) varied dramatically by year and county, respectively, likely because of localized outbreaks. The average annual incidence rate for Montana was 6.7 cases per 100,000 population/year. The highest incidence rates were in Big Horn, Blaine, Glacier, Hill, Park, Rosebud, and Roosevelt counties (range: 21.1 to 66.8 cases per 100,000 population/year).

#### Yersiniosis

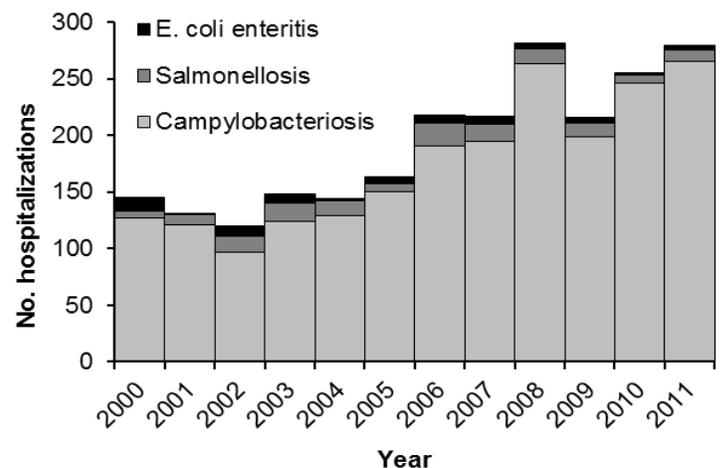
Yersiniosis was reported infrequently. Zero to four cases were reported each year. Only 10 counties reported cases. Yersiniosis is no longer a reportable condition in Montana.

**Figure 1.** Annual incidence rate<sup>†</sup> of reportable bacterial enteric illnesses<sup>§</sup>, Montana, 1987 to 2011



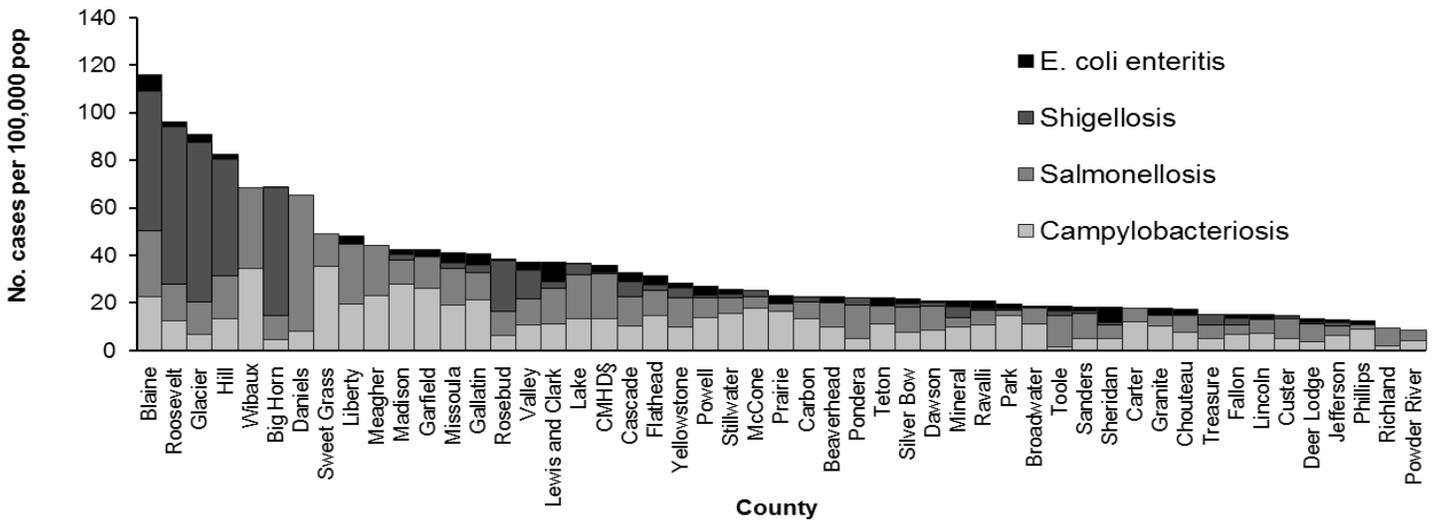
<sup>†</sup>County-specific population estimates were only available for 1990 to 2011; therefore, 1990 population estimates were used to calculate incidence rates for each year during 1987 to 1989.  
<sup>§</sup>Range of incidence rates for both listeriosis and yersiniosis during 1987 to 2011 was 0 to 2.1 cases per 100,000 population (not shown in figure).

**Figure 2.** Number of hospitalizations<sup>†</sup> for selected bacterial enteric illnesses<sup>§</sup> by year, Montana, 2000 to 2011



<sup>†</sup>Data provided courtesy of Montana Hospital Association. Hospital discharge data limited to reporting hospitals in Montana, and are only available since 2000.  
<sup>§</sup>Listeriosis, shigellosis, and yersiniosis each resulted in  $\leq 2$  hospitalizations per year; these hospitalizations are not shown.

**Figure 3.** Average annual incidence rates<sup>†</sup> of reportable bacterial illnesses<sup>‡</sup> by county, Montana, 1987 to 2011



<sup>†</sup>County-specific population estimates were only available for 1990 to 2011; therefore, 1990 population estimates were used to calculate incidence rates for each year during 1987 to 1989.

<sup>‡</sup>Because of the limited number of case reports, listeriosis and yersiniosis are not included in the figure.

<sup>§</sup>Central Montana Health District; includes Fergus, Golden Valley, Judith Basin, Musselshell, Petroleum, and Wheatland Counties.

### Recommendations to healthcare providers when evaluating patients with enteric illnesses

- Maintain a high index of suspicion for bacterial enteric illnesses in patients presenting with acute diarrhea
- For patients presenting with acute diarrhea, perform a thorough clinical and epidemiological evaluation (e.g., stool characteristics, travel history, ingestion of raw or undercooked meat, exposure to recreational water, etc.) per guidelines published by the Infectious Disease Society of America (IDSA) (<http://www.idsociety.org>)
- Use stool cultures and tests per the guidelines published by IDSA (<http://www.idsociety.org>)
- Initiate rehydration (oral is preferred when possible) in all patients with acute diarrhea
- For patients suspected of having a bacterial enteric illness, the choice of antimicrobial agents should be based on stool culture results
- Report any suspected or confirmed cases of campylobacteriosis, *E. coli* enteritis (STEC), listeriosis, salmonellosis, and shigellosis immediately to the local public health department (Administrative Rule Montana [ARM] Rule: 37.114.203)
- Report any suspected enteric illness outbreaks immediately to the local public health department (ARM: 37.114.203)

For more information contact the state communicable disease epidemiology program, 406-444-0273.

#### References:

1. Scallan E, Hoekstra RM, Angulo FJ, et al. Foodborne illness acquired in the United States—major pathogens. *Emerg Infect Dis.* 2011;17(1):7–15.
2. Heyman DL, ed. *Control of Communicable Diseases Manual*, 19<sup>th</sup> edition. Washington D.C.: American Public Health Association, 2008.
3. Guerrant RL, Van Gilder T, Steiner TS, et al. Practice guidelines for the management of infectious diarrhea. *Clin Infect Dis.* 2001;32:331–51.

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1400 Broadway  
Helena, MT 59620-2951

Richard Opper, Director, DPHHS  
Steven Helgerson, MD, MPH, State Med. Officer  
Jane Smilie, MPH, Administrator, PHSD