



HHS Public Access

Author manuscript

Foodborne Pathog Dis. Author manuscript; available in PMC 2015 September 08.

Published in final edited form as:

Foodborne Pathog Dis. 2013 January ; 10(1): 97–98. doi:10.1089/fpd.2012.1412.

Case-Control Studies of Sporadic Enteric Infections Complement Information from Outbreak Investigations

Kathleen E. Fullerton and Barbara E. Mahon

Enteric Diseases Epidemiology Branch, Division of Foodborne, Waterborne, and Environmental Diseases, National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia

Dear Editor

In his Letter to the Editor, Craig Hedberg (Hedberg, 2012) correctly points out that case-control studies of risk factors for sporadic (not outbreak-associated) enteric disease are expensive, time-consuming, and logistically challenging. However, they can yield important information for enteric disease control that is not available from outbreak investigations.

For example, a case-control study of sporadic infections enabled an unprecedented response time during the large U.S. listeriosis outbreak in 2011. Data collected by the *Listeria* Initiative led to the identification of an association with cantaloupe within days rather than weeks or months (CDC, 2011a). We estimate that the commercial recall of the implicated cantaloupe just 12 days from outbreak detection prevented 20% of the cases and deaths that would otherwise have occurred (CDC, unpublished data, 2012). Cantaloupe is included in the *Listeria* initiative questionnaire as a direct result of a case-control study of sporadic listeriosis conducted in the Foodborne Diseases Active Surveillance Network (FoodNet) (Varma *et al.*, 2007).

Beyond facilitating outbreak investigation, data from case-control studies are central to efforts to make rational decisions about the use of resources to reduce food contamination. Outbreak-associated cases comprise only a small proportion of all cases; for example, more than 99% of *Campylobacter* infections are sporadic (CDC, 2011b). Case-control studies of sporadic *Campylobacter* infection have shown strong associations with poultry (Friedman, 2004; Stafford, 2007; Wingstrand, 2006); poultry, however, is rarely a vehicle in *Campylobacter* outbreaks (Taylor *et al.*, 2012). Current regulatory actions appropriately aim to decrease the contamination of poultry to better control *Campylobacter* infection (USDA-FSIS, 2011).

Case-control studies are an important tool in the enteric disease epidemiologist's toolbox and, like any tool, should be wielded properly to obtain useful results. Recognizing that case-control studies are resource-intensive and designing and deploying them thoughtfully can answer important questions that cannot be addressed otherwise.

Address correspondence to: Kathleen E. Fullerton, MPH, Enteric Diseases Epidemiology Branch, Division of Foodborne, Waterborne, and Environmental Diseases, National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention, 1600 Clifton Road NE, MS C-09, Atlanta, GA 30329, kfullerton@cdc.gov.

References

- [CDC] Centers for Disease Control and Prevention. Multi-state outbreak of listeriosis associated with Jensen Farms cantaloupe—United States, August–September 2011. *MMWR Morb Mortal Wkly Rep.* 2011a; 60:1357–1358. [PubMed: 21976119]
- [CDC] Centers for Disease Control and Prevention. Foodborne Diseases Active Surveillance Network (FoodNet): FoodNet Surveillance Report for 2010 (Final Report). Atlanta: CDC; 2011b. Available at: www.cdc.gov/foodnet/PDFs/2010_annual_report_508c.pdf [accessed October 5, 2012]
- [CDC] Centers for Disease Control and Prevention. Memorandum to the Record: Estimates of illnesses, hospitalizations, and deaths prevented by the response to the 2011 multistate outbreak of listeriosis infections associated with cantaloupes grown on a single farm. May 25, 2012
- Friedman CR, Hoekstra RM, Samuel M, Marcus R, Bender J, Shiferaw B, Reddy S, Ahuja SD, Helfrick DL, Hardnett F, Carter M, Anderson B, Tauxe RV. Emerging Infections Program FoodNet Working Group. Risk factors for sporadic *Campylobacter* infection in the United States: A case-control study in FoodNet sites. *Clin Infect Dis.* 2004; 38(Suppl 3):S285–S296. [PubMed: 15095201]
- Fullerton KE, Scallan E, Kirk MD, Mahon BE, Angulo FJ, de Valk H, van Pelt W, Gauci C, Hauri AM, Majowicz S, O'Brien SJ. International Collaboration Working Group. Case-control studies of sporadic enteric infections: A review and discussion of studies conducted internationally from 1990 to 2009. *Foodborne Pathog Dis.* 2012; 9:281–292. [PubMed: 22443481]
- Hedberg CW. Case-control studies of sporadic enteric infections have limited usefulness in evaluating key foodborne disease risk factors. *Foodborne Pathog Dis.* 2012; 9:868. [PubMed: 22871214]
- Stafford RJ, Schluter P, Kirk M, Wilson A, Unicomb L, Ashbolt R, Gregory J. OzFoodNet Working Group. A multi-centre prospective case-control study of *Campylobacter* infection in persons aged 5 years and older in Australia. *Epidemiol Infect.* 2007; 135:978–988. [PubMed: 17134530]
- Taylor EV, Herman KM, Ailes EC, Fitzgerald C, Yoder JS, Mahon BE, Tauxe RV. Common source outbreaks of *Campylobacter* infection in the USA, 1997–2008. *Epidemiol Infect.* 2012 Aug.15:1–10.
- [USDA-FSIS] U.S. Department of Agriculture, Food Safety Inspection Service. New performance standards for Salmonella and *Campylobacter* in young chicken and turkey slaughter establishments: Response to comments and announcement of implementation schedule. Docket no. FSIS-2010-0029. Federal Register. Mar 21.2011 76(54) Available at: www.fsis.usda.gov/OPPDE/rdad/FRPubs/2010-0029.htm.
- Varma JK, Samuel MC, Marcus R, Hoekstra RM, Medus C, Segler S, Anderson BJ, Jones TF, Shiferaw B, Haubert N, Megginson M, McCarthy PV, Graves L, Gilder TV, Angulo FJ. *Listeria monocytogenes* infection from foods prepared in a commercial establishment: A case-control study of potential sources of sporadic illness in the United States. *Clin Infect Dis.* 2007; 44:521–528. [PubMed: 17243054]
- Wingstrand A, Neimann J, Engberg J, Nielsen EM, Gerner-Smidt P, Wegener HC, Mølbak K. Fresh chicken as main risk factor for campylobacteriosis, Denmark. *Emerg Infect Dis.* 2006; 12:280–285. [PubMed: 16494755]