Relevant research article summaries

Nelson Fok

Adjunct Professor, Concordia University of Edmonton, Edmonton, AB, Canada

1. Montgomery, M. P. et al., 2018. *Multidrug-Resistant Campylobacter jejuni Outbreak Linked to Puppy Exposure – US, 2017–2018*, MMWR, 67(37): 1032–1035.

In August 2017, the Florida Department of Health notified the CDC of six *Campylobacter jejuni* infections linked to a national pet store chain based in Ohio. The CDC examined whole-genome sequencing data and identified six isolates from the pet store puppies in Florida that were highly related to an isolate from a customer in Ohio. The information prompted a multi-state investigation and found 118 persons, including 29 pet store employees, in 18 states to have illness onset during 5 January 2016 to 4 February 2018. Outbreak isolates were resistant by antibiotic susceptibility testing to all antibiotics commonly used to treat *Campylobacter* infections. Store records showed that 95% of puppies received one or more courses of antibiotics, raising concern that antibiotic use might have led to development of resistance.

2. Dewey-Nattua, D. et al., 2018. *Surveillance for Foodborne Disease Outbreaks – US, 2009–2015*, MMWR Surveillance Summaries, 67(10): 1–11.

During 2009–2015, the Foodborne Disease Outbreak Surveillance System received reports of 5760 outbreaks that resulted in 100,939 illnesses, 5699 hospitalizations, and 145 deaths. Among 2953 outbreaks with a single confirmed etiology, norovirus was the most common cause of outbreaks (38%) and outbreak-associated illnesses (41%), followed by *Salmonella* (30% and 35%, respectively). Outbreaks caused by *Listeria*, *Salmonella*, and Shiga toxin-producing *E. coli* (STEC) were responsible for 82% of all hospitalizations and 82% of deaths reported. Among 1281 outbreaks in which the food reported could be classified into a single food category, fish was the most commonly implicated category (17%), followed by dairy (11%) and chicken (10%).

3. Fisk, W. J., 2018. *How Home Ventilation Rates Affect Health: A Literature Review*, Indoor Air, 28: 473–487.

The author reviewed studies of the relationships between ventilation rates (VRs) in homes and occupant health. Just over half of the studies reported one or more statistically significant (SS) health benefits of increased VRs. Wheeze was most clearly associated with VR. Overall, the number of SS improvements in health with increased VRs exceeded the anticipated chance improvements by approximately a factor of seven. Although available research indicated a tendency for improvements in respiratory health with increased home VRs, the health benefits

do not occur consistently and other exposure control measures should be used together with ventilation.

4. Casillas, S. M. et al., 2018. *Multiple Cyclosporiasis Outbreaks-US, 2018*, MMWR, 67(39), 1101–1102.

Two multistate cyclosporiasis outbreaks occurred in 2018 resulting in 761 laboratory-confirmed illnesses. The first outbreak was associated with prepackaged vegetable trays sold at a convenience store chain in the Midwest and the second outbreak was associated with salads sold at a fast food chain. There were also other outbreaks during the year, including two basil-associated clusters (eight confirmed cases each) and three clusters associated with Mexican-style restaurants with 53 confirmed cases. The consumption of cilantro was found to be significantly associated with illness. In total, 2299 domestically acquired laboratory-confirmed cases were reported during May to August 2018, markedly higher than the numbers reported in 2016 (174) and 2017 (623). To reduce risk from most causes of foodborne illness, CDC recommends washing fresh fruits and vegetables with clean running water, but noted that washing and the use of routine chemical disinfection or sanitizing methods is unlikely to kill *C. cayetanensis*.

5. Janicki, R. et al., 2018. *Drinking and Recreational Water Exposures Among Canadians: Foodbook Study 2014–2015*, Journal of Water and Health, 16: 197–211.

A population-based telephone survey of 10,942 Canadians was conducted to assess Canadians' drinking water sources and recreational water exposures. Store-bought bottled water was reported to be the primary drinking water source of nearly 20% of Foodbook survey respondents. This study found bottled water consumption was associated with education level; bottled water consumption was least likely among respondents reporting the highest level of education. The proportion of respondents reporting a private well as their primary drinking water source was significantly higher among the Maritime Provinces. While the Canadian average was nearly 11%, 55.7% of Prince Edward Island respondents, 46.3% of New Brunswick respondents, and 40.2% of Nova Scotia respondents reported this exposure.

6. Jackson, D. A. et al., 2018. *Lead Exposures Among Employees at a Bullet Manufacturing Company – Missouri, 2017*, MMWR, 67(39): 1103.

A bullet manufacturing company that melts lead ingots and casts them into bullets asked CDC's National Institute for Occupational Safety and Health to conduct a health hazard

evaluation. Among 10 tested employees, the median Blood Lead Level (BLL) was 8.5 $\mu\text{g}/\text{dL}$ (range 4 to 35 $\mu\text{g}/\text{dL}$), with elevated BLL defined as $>5 \mu\text{g}/\text{dL}$. Of these employees, nine had an elevated BLL, including packaging and shipping employees. The three employees with the highest BLLs worked in the casting and coating areas. All lead air concentrations were below OSHA permissible exposure limit of 50 $\mu\text{g}/\text{m}^3$ of air. All employees had lead on their hands after washing them. Interviews revealed inconsistent glove use and handwashing with lead removal soap and lack of clothes or shoes dedicated only to use at the worksite, as well as reports of dry sweeping the floors. Food and beverages were observed in work areas. Skin lesions were observed on the arms of casting area employees, who reported that these lesions were caused by molten lead.

7. June, S. G. and Dziewulski, D. M., 2018. *Copper and Silver Biocidal Mechanisms, Resistance Strategies, and Efficacy for Legionella Control*, Journal AWWA, doi: 10.1002/awwa/1144 Oct 19 2018.

Researchers reviewed current knowledge on the biocidal mechanisms of copper and silver ions against *Legionella* spp. and their survival responses and resistance mechanisms. There have been reports of *Legionella* developing resistance to copper and silver ion treatments. Researchers concluded that elevated dissolved oxygen, sodium content of the water, combined disinfectants, and higher temperature may provide conditions under which *Legionella* spp. may be more susceptible to metal ion disinfection.