Relevant research article summaries

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1. Garrison, L.E. et al., 2016. *Vital signs: deficiencies in environmental control identified in outbreaks of legionnaires' disease- North America, 2000–2014*, MMWR, 65.

The number of reported cases of Legionnaires' disease has risen from 0.42 to 1.62 per 100,000 during 2000 to 2014. A CDC investigation found 65% of outbreaks were linked to process failures, 52% to human errors, 35% to equipment failures, and 35% to unmanaged external changes (48% of total outbreaks had more than two deficiencies). In the majority of outbreaks, inadequate water disinfectant levels and temperatures in the optimal range for *Legionella* growth were observed. Implementing a functional water management program could address these deficiencies. Deficiencies related to equipment failures and unmanaged external changes were less common but are also remediable through preventive measures such as flushing after main breaks. The most frequent outbreak settings were hotels and resorts, long-term care facilities, and hospitals.

2. McCarty, C.L. et al., 2016. *Community needs assessment after microcystin toxin contamination of a municipal water supply – Lucas County, Ohio, Sep 2014*, MMWR, 65(35).

A no-water advisory was issued for 3 days after microcystin toxin levels reached 3.19 µg/L, exceeding the EPA threshold of 1.0 µg/L (note: new thresholds value are 0.3 µg/L for special populations and children aged <6 years and 1.6 µg/L for adults and children aged >6 years). After the advisory was lifted, a survey was conducted to assess community needs. Most households (88.1%) reported hearing the advisory the morning it was issued, but 11% reported drinking and 21% reported brushing teeth with municipal water during the advisory.

3. Basler, C. et al., 2016. *Outbreaks of human Salmonella infections associated with live poultry, US 1990–2014*, Emerging Infectious Diseases, 22(10): 1705–1711.

Backyard poultry flocks have increased in popularity concurrent with an increase in live poultry-associated salmonellosis (LPAS) outbreaks. During 1990–2014, a total of 53 LPAS outbreaks were documented, involving 2,630 illnesses, 387 hospitalizations, and 5 deaths. Median patient age was 9 years. Chick and duckling exposure were reported by 85% and 38% of case patients, respectively. High-risk practices included keeping poultry inside households (46%) and kissing birds (13%). To prevent future outbreaks, the general public needs to be better educated about the risk for LPAS.

4. Reid, C.E. et al., 2016, *Critical review of health impacts of wildfire smoke exposure*, En. Health Perspectives, 1124(9): 1334–1342.

Wildfire activity is predicted to increase in many parts of the world due to changes in temperature and precipitation patterns from global climate changes. There was consistent evidence from a large number of studies indicating that wildfire smoke exposure is associated with respiratory morbidity with growing evidence supporting an association with all-cause mortality.

5. Chen, L.-Y. and Ho, C., 2016. *Incense burning during pregnancy and birth weight and head circumference among term births: The Taiwan birth cohort study*, En. Health Perspectives, 1124(9): 1487–1492.

Incense burning for rituals or religious purposes is an important tradition in many countries. However, incense smoke contains particulate matter and gas products such as carbon monoxide, sulfur, and nitrogen dioxide. This study found prenatal incense burning was associated with lower birth weight for boys and smaller head circumference for boys and girls. The associations were more pronounced among the lower quantiles of birth outcomes.

6. Wang, C. et al., 2016. *Bed bugs: prevalence in low-income communities, resident's reactions, and implementation of a low-cost inspection protocol*, Journal of Medical Entomology. Doi: 10.1093/jme/tjw018 2016.

Researchers examined bed bug prevalence in 2,372 low-income apartments within 43 buildings in four New Jersey cities. Infestation rates ranged from 3.8% to 29.5% among the buildings, with an overall infestation rate of 12.3%. Within each apartment, the bed area trapped significantly more bed bugs per trap than the sofa area. African American residents had a proportionally higher number of bed bug infestations than white residents. Only 68% of residents who experienced bed bug infestations reported symptoms after being bitten. Fifty nine percent of the residents who experienced infestations applied insecticides to control bed bugs. Only two out of 291 infestations were not detected by brief visual inspection or interceptors.

7. Picard-Masson, M. et al., 2016. *Two related occupational cases of Legionella longbeachae infection, Quebec, Canada*, Emerging Infectious Diseases, 22(7): 1289–1291.

Two patients with no exposure to gardening compost had related *Legionella longbeachae* infections in Quebec. An investigation

linked this to the patients' workplace, a metal recycling plant, as the likely source of infection, indicating a need to suspect occupational exposure.

8. Shibata, T. et al., 2016. *Risk assessment of arsenic in rice cereal and other dietary sources for infants and Toddlers in the US*, International Journal of Environmental Research, 13: 361.

Currently, there are no set standards or quantitative guidelines in the United States for arsenic levels in rice cereal. Risk assessment showed the largest source of inorganic arsenic for infants and toddlers between 4 and 24 months old was rice cereal (55%), followed by other infant solid food (19%), and drinking water (18%). Maximum contaminant level for inorganic arsenic in rice cereal ranged from 0.0 (chronic) to 0.4 mg/kg (acute exposures).

9. Falk, L.E. et al. 2016. *Comparing listeriosis risks in at-risk populations using a user-friendly quantitative microbial risk assessment tool and epidemiological data*, Epidemiology and Infection, 1: 1–16.

The QMRA model showed the majority (80%) of listeriosis cases were predicted in at-risk subpopulations comprising only 20% of the total Canadian population, with the greatest number of predicted cases in the subpopulation with dialysis and (or) liver disease. Use of growth inhibitors in ready-to-eat meat led to a 110-fold reduction in the median number of listeriosis cases for turkey delicatessen meat, followed by ham, beef, and hotdogs with 78-fold, 56-fold, and 49-fold reductions, respectively.

10. Bari, M. and Kindzierski, W.B., 2016. *Evaluation of air quality indicators in Alberta, Canada – an international perspective*, Environment International, 92–93: 119–129.

With an increase in oil sands development in northern Alberta and an overall increase in economic activity in the province, an evaluation of the state of air quality was conducted in four locations—the urban centers of Calgary and Edmonton and the smaller communities of Fort McKay and Fort McMurray. Data showed consistent decreasing trends for NO₂ and

SO₂ (<1 ppb per year), and CO (<0.1 ppm per year) at all stations. There was decreasing total hydrocarbon (<0.1 ppm per year) and increasing O₃ (<0.52 ppb per year) at most stations, and it was unchanged for PM_{2.5} at all stations in Edmonton and Calgary over a 17-year period. Other than for PM_{2.5}, Calgary and Edmonton tended to have median and annual concentrations comparable to and (or) below that of larger populated Canadian and US cities.

11. Tabe, N.N. et al., 2016. *Prevalence of E. coli and Salmonella in runoff of two cattle feedlots in North Dakota*, Food Protection Trends, 36(1): 33–42.

Of the 136 samples collected from two feedlots, 78% tested positive for at least one of the *E. coli* serotypes, and 40% were positive for *Salmonella*.

12. Matheus, A. et al., 2016. *A historical look at the prevalence of foodborne disease outbreaks associated with Asian foods in the US*, Food Protection Trends, 36(2): 108–115.

From 1990 to 2008, 8.7% of foodborne disease outbreaks in the United States were associated with three popular ethnic foods (Italian, Mexican, and Asian). Asian foods represented approximately 20.6% of outbreaks and 9.6% of the total cases associated with ethnic foods. Sixty percent of the outbreaks originated in restaurants. Asian foods most frequently associated with illness were Asian-style cooked and fried rice (40%) and sushi (15%).

13. Allen, J.G. et al., 2016. *Associations of cognitive function scores with carbon dioxide, ventilation, and volatile organic compound exposures in office workers: a controlled exposure study of green and conventional office environments*, Environmental Health Perspectives, 124(6): 805–812.

Researchers simulated indoor environmental quality conditions in “Green” and “Conventional” buildings and evaluated the impacts on human performance. The study found that on average, cognitive scores were 61% higher on the Green building day and 101% higher on the Green+ building days than on the Conventional building day. VOCs and CO₂ were independently associated with cognitive scores.