Relevant research article summaries

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1. Valero, N. et al., 2017. *Street Cleaning Trucks as Potential Sources of Legionella pneumophila*, Emerging Infectious Disease, 23(11): 1880–1882.

A case of Legionnaires' disease was diagnosed in a street-cleaning worker in Spain in 2015. *Legionella pneumophila* serogroup 1 was found in the water and in internal foam from the tanks of two trucks used by the worker during the incubation period.

2. Black, E.P. et al., 2018. *Fruit Flies as Potential Vectors of Foodborne Illness*, Journal of Food Protection, 81(3): 509–514.

Laboratory experiments were conducted to assess the bacterial transfer capability of fruit flies. Data showed fruit flies were able to accumulate approximately 2.9×10^3 log CFU of *E. coli* per fly within 2 hours of exposure to a contaminated food source. The levels of bacteria did not decrease over an observation period of 48 hours. The flies also demonstrated the ability to transfer *E. coli* O157:H7, *Salmonella* Saint Paul, and *Listeria innocua* from an inoculated food source to noncontaminated products, showing fly-mediated cross-contamination of ready-to-eat food.

3. Rodriguez-Villamizar, L.A. et al., 2017. *Proximity to Two Main Sources of Industrial Outdoor Air Pollution and Emergency Department Visits for Childhood Asthma in Edmonton, Canada*, Canadian Journal of Public Health, 108(5–6): e523–e529.

The relative risk of emergency department (ED) visits for asthma, calculated using a spatial scan test for events, was 10.4 within a power plant area when compared with the outside area. In addition, there was an inverse association of the distance to the power plant with asthma visits when multivariable models were used. No asthma clusters were identified around a petrochemical industrial area.

4. DeFlorio-Baker, S. et al., 2018. *Estimate of Incidence and Cost of Recreational Waterborne Illness on United States Surface Water*, Environmental Health, 17: 3.

Researchers estimated that there are 4 billion surface water recreation events occurring annually, resulting in an estimated 90 million illnesses nationwide and costs of \$2.2 to \$3.7 billion annually. Illnesses of moderate severity (visit to a health care provider or ED) were responsible for over 65% of the economic burden; severe illnesses (hospitalization or death) were responsible for approximately 8% of the total economic burden.

5. Noonan, C.W. et al., 2017. *Randomized Trial of Interventions to Improve Childhood Asthma in Homes with Wood-Burning Stoves*, Environmental Health Perspectives, 125(9): 097010.

Among children with asthma and chronic exposure to wood smoke, an air-filter intervention that improved indoor air quality did not affect quality-of-life measures.

6. Becher, R. et al., 2018. *Do Carpets Impair Indoor Air Quality and Cause Adverse Health Outcomes: A Review*, International Journal of Environmental Research and Public Health, 15: 184.

Several studies have shown the presence of more dust and allergens in carpets compared with noncarpeted floors. More recently, carpet producers have argued that former assessments were obsolete and that modern rugs are unproblematic, even for those with asthma and allergies. The authors did a thorough review of the research and did not find any updated peer-reviewed evidence that carpeted floor is unproblematic for the indoor environment. There are actually more recent data supporting that fact that carpets may act as a repository for pollutants that may become suspended upon activity in the carpeted area.

7. Wu, T. et al., 2018. *Infant and Adult Inhalation Exposure to Resuspended Biological Particulate Matter*, Environmental Science & Technology 52: 237–247.

Researchers evaluated infant and adult inhalation exposures and respiratory tract deposited dose rates of resuspended bioPM from carpets. The study found crawling and walking delivered a significant number of resuspended aerosol particles to the breathing zone, with concentrations ranging from 0.5 cm^{-3} to 2 cm^{-3} . Infants and adults were primarily exposed to particles with a size distribution between $2 \mu\text{m}$ and $6 \mu\text{m}$, with infants receiving greater exposures to $10 \mu\text{m}$. Based on body mass, an infant will receive a nearly four times greater respiratory tract deposited dose of resuspended biological aerosol particles compared with an adult.

8. Fjendbo, L. et al., 2017. *Benefits of Green Roofs: A Systematic Review of the Evidence for Three Ecosystem Services*, Urban Forestry & Urban Greening, 28: 167–176.

A systematic review was used to evaluate the documentation relating to three selected green roof ecosystem services: reduction of the urban heat island effect, reduction of urban air pollution, and reduction of building energy consumption.

Although results varied, in general, studies reported cooling at street level ranged between 0.03°C and 3°C and pollution (PM₁₀) removal at roof level ranged between 0.42 g/m² and 9.1 g/m² per year. Reports on energy consumption ranged between an increase of 7% to a decrease of 90%.

9. Simmering, J.E. et al., 2017. *Weather-Dependent Risk for Legionnaires' Disease, United States, Emerging Infectious Diseases*, 23(11): 1843–1851.

Researchers identified a dose–response relationship between relative humidity and the odds for Legionnaires' disease (LD). When the mean temperature was 60°F – 80°F with high humidity (>80%), the odds for community-acquired pneumonia being diagnosed with LD were 3.1 times higher than with lower levels of humidity (<50%).

10. Marder, E.P. et al., 2018. *Preliminary Incidence and Trends of Infections with Pathogens Transmitted Commonly Through Food-Foodborne Diseases Active Surveillance Network, 10 US Sites, 2006–2017*, MMWR, 67(11): 324–328.

In 2017, FoodNet reported 24,484 infections, 5677 hospitalizations, and 122 deaths linked to nine pathogens transmitted commonly through food. Compared with 2014–2016, the incidence of infections with *Campylobacter*, *Listeria*, non-O157 Shiga toxin-producing *E. coli* (STEC), *Yersinia*, *Vibrio*, and *Cyclospora* increased. Compared with 2006–2008, in 2017 the incidence of infections with *Salmonella* serotypes Typhimurium and Heidelberg decreased, and the incidence of serotypes Javiana, Infantis, and Thompson increased by 50%. Like most serotypes, these have been linked to both food and other exposures, including animal contact. Thus, some of these infections are likely attributable to nonfood exposures.

11. Kerins, J.L. et al., 2018. *Outbreaks of Seoul Virus among Rats and Rat Owners—US and Canada, 2017*, MMWR, 67(4): 131–134.

In 2016, Wisconsin Department of Health Services notified CDC of a patient hospitalized with fever, leukopenia, and proteinuria. The patient owned and operated an in-home rattery, or rat-breeding facility, with approximately 100 Norway rats primarily bred as pets. A family member developed similar symptoms 4 weeks later. CDC confirmed acute Seoul virus infection in both patients. The investigation identified 31 facilities in 11 states with human and/or rat Seoul virus infections. Six facilities also reported exchanging rats with Canadian ratteries. Testing of serum samples from 183 persons in the US and Canada identified 13.1% with Seoul virus antibodies, 12.5% were hospitalized, and no deaths occurred. This is the first known transmission of Seoul virus from pet rats to humans in the US and Canada. Pet rat owners should practice safe rodent handling to prevent infection.

12. Hunter, C.M. et al., 2017. *Reducing Legionnaires' Disease in Public Spas*, ASHRAE Journal.

CDC's Network for Aquatic Facility Inspection Surveillance (NAFIS) data showed that the most frequent hot tub/spa violations from inspections were problems with disinfectant concentration (19.2%), pH (27.5%), pool chemical safety (9.9%), and excess water temperature (7.5%). In 2016, CDC reported that hot tubs, when improperly maintained, were the third most common water source implicated among Legionnaires' disease outbreaks investigated by CDC. Human errors were implicated in at least half of all investigated outbreaks, including improper filter maintenance, deficient disinfection levels, inadequate monitoring, and poor temperature control and ventilation.

13. Whitworth, K.W. et al., 2018. *Drilling and Production Activity Related to Unconventional Gas Development and Severity of Preterm Birth*, Environmental Health Perspectives, 126(3): 037006.

Researchers examined phase- and trimester-specific associations between unconventional gas development (UGD) activity and preterm birth (PTB). Data showed increased odds of PTB in the third tertile of the UGD drilling (OR = 1.20) and production (OR = 1.15). Among women in the third tertile of UGD-production, associations were strongest in trimesters one and two.

14. Soda, E.A. et al., 2017. *Vital Signs: Health Care-Associated Legionnaires' Disease Surveillance Data from 20 States and a Large Metropolitan Area—US, 2015*, MMWR, 66(22): 584–589.

National surveillance data identified 2809 confirmed Legionnaires' disease (LD) cases from 21 jurisdictions. Seventy-six per cent reported 1–21 definite health care-associated (HCA) cases per jurisdiction. Among definite HCA cases, 88% occurred in persons aged >60 years and exposures occurred at 72 facilities. The case fatality rate was 25% for definite and 10% for possible HCA LD.

15. Svanes, O. et al., 2018. *Cleaning at Home and at Work in Relation to Lung Function Decline and Airway Obstruction*, American Journal of Respiratory and Critical Care Medicine. doi: 10.1164/rccm.201706-1311OC

Cleaning tasks may imply exposure to chemical agents with potential harmful effects to the respiratory system. Researchers investigated long-term effects of occupational cleaning and cleaning at home on lung function. When compared with women not engaged in cleaning, FEV1 (maximum amount of air one can forcefully blow out of lungs in 1 second) declined more rapidly in women responsible for cleaning at home and occupational cleaners. Both cleaning sprays and other cleaning agents were associated with accelerated FEV1 decline.