Relevant research article summaries

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1. Rahim, T. et al., 2017. *Public Health Considerations Associated with the Location and Operation of Off-Leash Dog Parks*, Journal of Community Health. doi: 10.1007/s10900-017-0428-2

This Calgary, Alberta study found parasite prevalence among canine fecal samples to be 50%, with *Giardia* (25%) and *Cryptosporidium* (15%) being the most common. Another study in Saskatoon, Saskatchewan, demonstrated a variety of potential pathogens including roundworm species (2%), hookworm species (0.4%), and whipworm species (0.7%) in fecal samples. While studies have documented shedding of zoonotic agents in dog parks, the risk of transmission to humans was relatively low.

2. Schwartz, A.M. et al., 2017. *Surveillance for Lyme Diseases—US 2008–2015*, MMWR, 66(22): 1–12.

During 2008–2015, the total number of reported cases of Lyme disease remained above 30,000 each year, making Lyme disease the most commonly reported vector-borne disease in the US. Overall, regions with highest risk for Lyme disease and populations in which most cases occurred remain similar to those previously reported. Fourteen states, all located in the Northeast, mid-Atlantic, and upper Midwest regions, accounted for 95.2% of all reported cases. Expansion of Lyme disease into neighboring states was also found.

3. Barton, M. et al., 2017. *Legionellosis Following Water Birth in a Hot Tub in a Canadian Neonate*, CMAJ, 189(42): E1311–E1313.

Legionellosis in an 8-day-old full-term girl was traced to water birth. Factors such as prefilling the tank days ahead of delivery, inadequately disinfecting the birthing tank, using a contaminated water source, using jetted tubs, and heating water all increased the bacterial load of the birthing water. Although disinfection is recommended, there are safety concerns with the use of disinfectants, given the lack of data on the impact of potential aspiration or exposure of the neonate's skin and mucous membranes to chemicals.

4. Webb, E. et al., 2017. *Neurodevelopmental and Neurological Effects of Chemicals Associated with Unconventional Oil and Natural Gas Operations and their Potential Effects on Infants and Children*, Review on Environmental Health. doi: 10.1515/43f3h-2017-0008

Researchers focused on five pollutant categories that are associated with increased neurological and neurodevelopmental

problems in developing children: heavy metals (arsenic and manganese), PM, BTEX, PAHs, and EDCs. These chemicals are widely used in, or become by-products of, unconventional oil and natural gas development and operations. Researchers concluded that the present set-back distance of 100–1,000 feet from well-bore to sensitive receptors such as schools and other occupied dwellings may not be adequate to protect the public. A minimum of 1.6 km setbacks, preferably greater, is recommended to be established between drilling facility lines and the property lines of occupied dwellings such as schools, hospitals, and other spaces where infants and children might spend a substantial amount of time.

5. Huang, P.-C. et al., 2018. *Characterization of Phthalates Exposure and Risk for Cosmetics and Perfume Sales Clerks*, Environmental Pollution, 233: 577–587.

Phthalates are additives used in plastics for softness and flexibility, in cosmetics as a vehicle for fragrances, and as an additive in many other daily products. Considerable amounts of phthalates (up to 5%) are added to a wide range of cosmetics and personal care products. Researchers concluded that cosmetics and perfume sales clerks had higher levels of urinary MEP, MP, and MEHP than clothing clerks in the department store. Higher levels of air DEP and DEHP were measured in cosmetics and perfume sales regions. Findings indicated an increased risk of DBP, DEP, and DEHP exposure in cosmetic and perfume workers. Seventy percent of cosmetic and perfume sales clerks had exceeded cumulative risk of phthalate exposure for anti-androgenic effect. Inhalation and dermal exposure were important routes of phthalate exposure for cosmetics and perfume workers. Since most of the cosmetics and perfume sales clerks who participated in the study were of childbearing age and may continue working while pregnant, researchers suggested that cosmetics-related sales clerks, especially those who are pregnant, should work in other departments without phthalate exposure to minimize their risk of reproductive hazards.

6. Jagai, J.S. et al., 2017. *Sanitary Sewer Overflows and Emergency Room Visits for Gastrointestinal Illness: Analysis of Massachusetts Data, 2006–2007*, Environmental Health Perspectives, 125(12): 129003–129003. doi: 10.1289/EHP2048

Sanitary sewer overflows occur when untreated sewage is discharged into water sources before reaching the treatment facility, potentially contaminating the water source with gastrointestinal pathogens. Using a case-crossover study design, the results

demonstrated an association between sanitary sewer overflows events and ER visits for GI illness.

7. Sinharay, R. et al., 2017. *Respiratory and Cardiovascular Responses to Walking Down a Traffic-Polluted Road Compared with Walking in a Traffic-Free Area in Participants Aged 60 Years and Older with Chronic Lung or Heart Disease and Age-Matched Healthy Controls: A Randomised, Crossover Study*, *The Lancet*. doi: 10.1016/S0140-6736(17)33078-7

Researchers screened 135 participants, of whom 40 were healthy volunteers and 40 with COPD, and 39 with ischaemic heart disease. Concentrations of black carbon, NO₂, PM₁₀, PM_{2.5}, and ultrafine particles were higher on Oxford Street in London than in Hyde Park. After walking down Oxford Street, participants with COPD reported more cough, sputum, shortness of breath, and wheeze as compared with Hyde Park. For all participants, irrespective of their disease status, walking in Hyde Park led to an increase in lung function and forced vital capacity and a decrease in pulse wave velocity. By contrast, these beneficial responses were attenuated after walking on Oxford Street. The study showed short-term exposure to traffic pollution prevents the beneficial cardiopulmonary effects of walking in people with COPD, ischaemic heart disease, and those free from chronic cardiopulmonary diseases.

8. Barberio, A.M. et al., 2017. *Fluoride Exposure and Reported Learning Disability Diagnosis among Canadian Children: Implications for Community Water Fluoridation*, *Canadian Journal of Public Health*, 108(3): e229–e238.

Researchers examined the association between fluoride exposure and reported diagnosis of learning disability among a population-based sample of Canadian children aged 3–12 years. The data did not show a robust association between fluoride exposure and parental- or self-reported diagnosis of learning disability.

9. Yang, T. et al., 2017. *Effectiveness of Commercial and Homemade Washing Agents in Removing Pesticide Residues on and in Apples*, *Journal of Agricultural and Food Chemistry*, 65(44): 9744–9752.

This study investigated the effectiveness of commercial and homemade washing agents in the removal of surface and internalized pesticide residues from apples. Surface pesticide residues were most effectively removed by a sodium bicarbonate (baking soda, NaHCO₃) solution when compared with either tap water or Clorox bleach. Using a 10 mg/mL NaHCO₃ washing solution, it took 12 and 15 minutes to completely remove thiabendazole or phosmet surface residues, respectively, following a 24-h exposure to these pesticides. However, 20% of applied thiabendazole had penetrated the apples following the 24-h exposure and could not be washed away using the bicarbonate solution. The study showed the standard postharvest washing method using Clorox bleach solution for 2 minutes is not an effective means to completely remove pesticide residues on the surface of apples. Peeling is more effective to remove the penetrated pesticides, but bioactive compounds in the peels will become lost too.

10. Benefict, K.M. et al., 2018. *Surveillance for Waterborne Disease Outbreaks Associated with Drinking Water—US, 2013–2014*, *MMWR*, 66(44): 1216–1221.

Forty-two drinking water associated outbreaks were reported in 2013–2014, accounting for at least 1,006 cases of illness, 124 hospitalizations, and 13 deaths. *Legionella* was associated with 57% of these outbreaks and all of the deaths. All of the outbreak-associated deaths were in hospital/health care settings. Sixty nine percent of reported illnesses occurred in four outbreaks in which the etiology was determined to be either a chemical or toxin or the parasite *Cryptosporidium*.

11. Burch, T.R. et al., 2017. *Quantitative Microbial Risk Assessment for Spray Irrigation of Dairy Manure Based on an Empirical Fate and Transport Model*, *Environmental Health Perspectives*. doi: 10.1289/EHP283

Spray irrigation for land-applying livestock manure is increasing in the US as farms become larger and economies of scale make manure irrigation affordable. Modelling airborne microbe concentrations were negatively associated with distance and positively associated with wind speed. The data suggested that reducing pathogen prevalence and concentration in source manure would reduce the risk of AGI from exposure to manure irrigation and that increasing the setback distance and limiting irrigation to times of low wind speed may also reduce risk.

12. Czolowski, E.D. et al., 2017. *Toward Consistent Methodology to Quantify Populations in Proximity to Oil and Gas Development: A National Spatial Analysis and Review*, *Environmental Health Perspectives*. doi: 10/1289/EHP1535

Researchers estimated that 17.6 million people live within 1,600 m (approx. 1 mile) of at least one active oil and/or gas well in the US.

13. Fisk, W.J. and Chan, W.R., 2017. *Health Benefits and Cost of Filtration Interventions that Reduce Indoor Exposure to PM_{2.5} during Wildfires*, *Indoor Air*, 27: 191–204.

Researchers compared baseline (baseline (1) intermittently operating central forced air heating with a typical low-efficiency particle filter and baseline (2) home with no central forced air) with interventions ((1) forced air heating and air conditioning fan is operated continuously with no change in filter, (2) filter is upgraded to a high-efficiency filter, (3) filter is upgraded but forced-air system operates in its normal intermittent mode, (4) portable air cleaner with fan and particle filter is operated in the home with no upgrade in forced-air filter, (5) portable fan filter unit is operated in the home with upgraded forced-air filter, and (6) portable fan filter used in home with no forced-air system with filtration) during a 10-day period of wildfire smoke exposure in Southern California. The six interventions implemented in all affected houses were projected to prevent 11%–63% of the hospital admissions and 7%–39% of the deaths attributable to wildfire particles. Researchers recommend operating existing home air filtration systems continuously during periods of wildfire smoke exposure.