The Problem of Indoor Environmental Health Hazards

Approximately 1.2 million children residing in Cook County are at risk of developing immediate and long-term health effects due to numerous indoor environmental hazards.1 These hazards come in the form of dust (lead, particulate matter, mold, pet and pest allergens, insect), gas (smoking, radon, CO) and water (moisture and polluted sources). Given the different pathways of exposure, children are at heightened risk because of their underdeveloped nervous systems, immune systems and overall body. Also, their proximity to the ground and general curiosity make them more prone to lengthy exposure to some hazards. This risk is exacerbated based on the income level of the family and the age, value and conditions of the home—factors that are highly correlated.

Children constitute about 27% of individuals in Cook County who are living in poverty—242,609 children, to be exact. It is this subgroup that will be most at risk. Hundreds of thousands of children will be negatively affected by exposures that will place them at a heightened risk of suffering from chronic diseases, impaired cognitive functions, and societal retardation.

Lead poisoning has been labeled as the greatest in-home risk to children and also as the easiest to remediate. The latest Lead Surveillance Report shows that 5,185 children in Cook County (not including Chicago) and 22,493 children in Chicago, under the age of 6, had blood lead levels of 5-9mcg/dL. This is enough to impair their growth, behavior, cognitive functioning, IQ and endocrine system; as well as build up in tissue resulting in later problems like osteoporosis, anemia and various nutrient deficiencies due to the nature of lead storage in the body. As a child is continuously exposed to lead it will accumulate in the bone tissue which results in lower bone density; if a child is undergoing malnutrition (a likely scenario in areas where lead poisoning is constantly high) then the child’s body will break down necessary minerals to supplement itself thereby releasing more lead into the bloodstream. This one hazard is directly linked to the age of homes. In Cook County one-third of the homes (a staggering 1.8 million residences) were built during, or prior to, 1979.

88,378 children under the age of 18 have asthma in Cook County; a disease that is linked to a number of in-home factors including dust and smoke. This disease is responsible for a national cost per asthmatic of $3,300 in medication, hospitalization, missed school and work days; another example of the lifelong toll an indoor hazard can have. Failure to mitigate the risks of unhealthy homes owing to these environmental toxins may have long-term effects. Long-term exposure to dust and smoke, and severe asthma, can lead to chronic obstructive pulmonary diseases (COPD), which are the third leading cause of death in the U.S., and affects over 237,430 adults nationwide. Moreover, COPD is irreversible.

1 This document was created for the Healthy Homes Healthy Communities Initiative by law, medical and public health students enrolled in the Health Justice Project at Loyola University Chicago School of Law during spring 2014, including Emily Coffey, Ali Gross, Carlos Minaya, and Paige Steffen, under the supervision of Professor Emily Benfer, Professor Dhrubajyoti Bhattacharya, and Allyson Gold.
An estimated 112,283 cases of gastrointestinal illnesses in Cook County, primarily due to food and water borne pathogens, have been documented. Although this number counts the population as a whole; poor housing structure that incorporates little to no insulation, rusted/rotting pipes, leaky roofs and weakening foundations are the most susceptible during rains and floods. At times of heavy rains and subsequent flooding from combined sewer overflows and oversaturation of groundwater these homes are prone to floods and physical exposure to waterborne pathogens that lead to GI illnesses. Yet, even without actual flooding the structural conditions of older homes, in particular the age of pipes, have been shown to transmit GI illnesses through drinking water during times of severe rains.²

Lung cancer, which is popularly associated with smoking, may also result from exposure to radon gas and lesser known indoor environmental toxins. For example, in February 2014, a Cook County resident filed a lawsuit alleging that asbestos exposure during his work as a laborer caused his lung cancer. (Cook County Court Case No. 2014L001863 filed February 25, 2014). In Cook County, from 2006-2010, approximately 8,744 men and 8,489 females were diagnosed with lung cancer, which claims an estimated 20,000 lives in the U.S., annually. Radon gas, the second leading cause of lung cancer in America, is slightly below the threshold limit of 4.0 pCi/L. The last readings by the IEMA (Illinois Emergency Management Agency) showed levels of 3.2 pCi/L in Cook County. Radon gas can easily seep through any home due to the nature of the gas. Radon is found in the soil and passes through the soil rising up in tandem with warm air. Regardless of the age or structure of the home, radon can seep through foundations and cracks. Once inside, it is trapped within a home; old windows trap it in the glass, decayed radon progeny can be found in dust, and it can settle in groundwater.

Smoking indoors has only been documented at the state level and is an example of a behavioral factor that leads to harmful health effects. Roughly 60% of middle and high school students who are current smokers also live with smokers; this number drops to about 30% if the students are non-smokers. This doesn’t mean that smoking is always allowed indoors; only about 12% of parents 45+ allow indoor smoking. In combination with radon exposure the EPA has reported that about 20 smokers living in areas of 1.3 pCi/L will develop lung cancer;³ about 3 non-smokers living in the same radon exposed area will develop lung cancer. Smoking has also been shown to be compound the effects of asthma.⁴ This comparison is ideal for policy and behavioral change.

Indoor health hazards are pervasive across Cook County, disproportionately affecting low-income populations, and warrant a closer examination of policies that ought to be amended, or enacted, to address these harms.

³ http://www.epa.gov/radon/pubs/citguide.html#risk