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### **Chicago High-Rise Demolition Raises Health Concern for Asthmatics, Study Finds**

Demolition of high-rise public housing increases air pollution in Chicago neighborhoods where asthmatics live, according to a study conducted by University of Illinois at Chicago School of Public Health researchers.

Little is known about the impact of demolition on air quality. Yet thousands of public housing units in Chicago and across the United States are being torn down in minority, low-income communities, which often have higher prevalence rates of asthma.

"Chicago is the epicenter of the asthma epidemic. Nationally, asthma prevalence rates have been rising and are higher among African Americans than other groups. More dramatic are the disparities between African Americans and other groups in terms of rates of asthma death, asthma hospitalization, and emergency department use due to asthma," said Dr. Samuel Dorevitch, research assistant professor at the UIC School of Public Health and lead author of the study. "Since demolition is going on in the heart of high-risk communities, this is a vulnerable population. We want to identify reversible, treatable and preventable causes of asthma exacerbation."

In the study, air quality samples were obtained at three high-rise public housing sites -- Robert Taylor Homes, Stateway Gardens, and ABLA Homes -- prior to and during demolition. All three demolition sites were within 100 meters of occupied public housing structures and within 250 meters of a school or community building.

According to researchers, the demolition was associated with a 59 percent increase in outdoor particulate matter 100 meters downwind of a demolition site, with larger increases occurring closer to the site.

The high-rise demolitions took place over several weeks using heavy equipment such as the wrecking ball, pneumatic jack and excavator. This method, compared with near instantaneous implosion, resulted in elevated concentrations of particulate matter during a much longer period of time.

"With implosion, there's a sharp spike in particulate matter, but it passes quickly,"

Dorevitch said. "Using heavy equipment, there are not massive peaks in particulate count, but there's a relatively sustained increase that goes on over a period of weeks."

Although the particulate matter concentrations averaged over 24 hours did not exceed Environmental Protection Agency standards, previous studies have shown that adverse health effects and increased mortality may occur during relatively short-term increases of particulate matter.

"When we looked at very short-time intervals, we found extremely high levels downwind of the demolition sites. The health effects of short-term exposure have not been well described," said Dorevitch. "We know what an average 24-hour air pollution concentration can do to health, but we don't know what it means if somebody is exposed to a level 10 times the EPA standards over a very short time period. We did document that this occurs, and the height of these short-term peaks was dramatically higher than the 24-hour averages."

Particulate matter air pollution is linked to a variety of respiratory problems such as asthma, chronic bronchitis and emphysema. It also causes lung cancer and is associated with cardiac mortality, cardiac arrhythmias, heart attacks and abnormal birth outcomes, such as low birth weight babies.

According to the researchers, the potential for adverse health effects among residents living near the demolition sites, as well as demolition workers, is concerning.

Spraying water during and after demolition can reduce particulate matter generated by demolition. Other preventive methods for reducing dust particles include wind barriers, covering debris piles, and hauling rock and debris away to less populated areas.

"When conditions were visibly dusty, our measurements of dust levels were considerable higher," said Dorevitch. "This validates local community concerns about air quality issues and confirms that residents can take an active role in communicating their health concerns to the city, the Department of Environment, and other agencies that are involved in demolition."

"When residents see high levels of dust, whether it's at a demolition site or near the Dan Ryan construction project, it is affecting air quality. Even though that's intuitive, we've been able to put a number on it," according to Dorevitch.

The study is published in the July issue of the Journal of the Air & Waste Management Association.

Hakan Demirtas, Victoria Persky, Serap Erdal, Lorraine Conroy, Todd Schoonover and Peter Scheff of the UIC School of Public Health, are co-authors of the study, which was funded by the National Institute of Environmental Health Sciences, National Institutes of Health.

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