New study to use smart phones to track air pollution exposure

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University at Buffalo researchers are creating a new and unusual "app" for the smart phone: tracking air pollution.

Carole Rudra, PhD, UB assistant professor of social and preventive medicine, has received a grant to assess a person's exposure over time to pollutants in an urban area -- in this case, the City of Buffalo.

The study is funded by a two-year $440,247 grant from the National Institutes of Health (NIH).

A city's air pollution varies from downtown to playground to kitchen table, making it essential to be able to track study participants' location and collect data throughout the day. Smart phones equipped with GPS can do this very well.

"There are many ways to estimate air pollution exposures among humans," says Rudra. "Many current methods are based on participants' home addresses. These methods don't take into account the fact that people don't spend all day inside their homes. In an urban area, exposure changes significantly as people go about their daily activities.

"To overcome this limitation in a way that is convenient for study participants and feasible for future large studies, we will use smart phones to track study participants' locations over 24 hours. Their location registers automatically, so they don't have to call in or do anything else."

The 40 participants in the two-year study will use their own GPS-equipped smart phones, such as iPhones or Androids, which will record their location several times a day during a three-month study period. Volunteers from Buffalo and surrounding areas will be recruited in two waves -- summer 2011 and winter 2011-12.

Location will be defined by geographical coordinates, a system that enables every location on earth to be specified by a set of numbers. The researchers will check air pollution monitoring sites in various locations to determine participants' exposure to a number of pollutants.

"Air pollution is associated with a variety of health problems, such as asthma, heart disease, lung cancer, COPD and other conditions," notes Rudra.

An earlier study conducted by Rudra around Seattle, Wash., on the health risks of air pollution in pregnancy found that it does not increase the risk of preeclampsia or early delivery.

"This project will develop a method that will improve our ability to estimate human exposures to air pollutants, and will improve public health by allowing researchers to more accurately measure human exposures and relate these exposures to health outcomes."

Provided by University at Buffalo