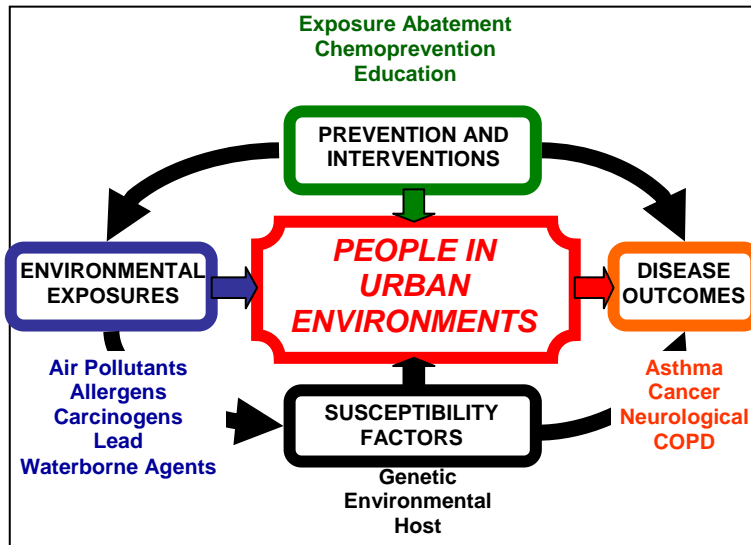


## CENTER GOAL AND OVERALL OBJECTIVE OF THE PILOT PROJECT PROGRAM

In spite of major gains in environmental quality, the health of people living in inner cities remains poorer than for the nation as a whole. Environmental factors continue to contribute to this poor health, but fortunately there are fewer widespread exposures with high risk, such as past lead and air pollution situations. Today, a vast majority of people in this country live in cities and by 2050 over 75% of the world's population will be urban dwellers (1). To reduce the environmental burden of disease, researchers now face the challenge of characterizing exposures and doses to multiple agents and identifying genes that modulate their effects. The special vulnerability of segments of urban populations also needs to be taken into account. Indeed, in Maryland life expectancy in Baltimore City is 68.3 years and this is 13 years less than one of our more affluent county's, Montgomery County, that has an average life expectancy of 81.4 years (2). This problem also extends to the economically developing world where most of the mega cities, such as Mexico City, New Dehli and Bangkok exist. Thus, the public health challenge facing us is how we can improve the health of individuals who now and in the future will live in urban environments. As a **theme** for our Center, we propose that multidisciplinary research on the urban environment will lead to continued opportunities for prevention. The long-term goals emanating from this **theme** are to identify environmental exposures, their biological consequences and underlying susceptibility factors, the nexus of gene-environment interactions, that alone or together increase health risk for people living in urban environments, such as Baltimore, and then to use these findings to develop prevention and intervention strategies to improve urban environmental health both locally and globally. To succeed in accomplishing the long-term goals of this Center, leadership has made the decision to involve a broad multi-disciplinary team of faculty from across Johns Hopkins University whose specialties include epidemiology, toxicology, physiology, pathology, biochemistry, medicine, virology, immunology, behavioral sciences, biostatistics and environmental engineering. In total, our Center promotes basic, population and clinical research in environmental health at Johns Hopkins and proactively works to provide an infrastructure to translate scientific findings for the design and implementation of prevention measures and policy changes. Thus, the **public health goal** of the Johns Hopkins Center in Urban Environmental Health is to contribute scientific knowledge that can be used to reduce morbidity and mortality caused by environmental agents in people residing in cities.

The underlying theme that guides our Center in Urban Environmental Health is the study of the acute and chronic exposures to toxic, chemical, physical and biological agents that impact the residents of urban environments and significantly contribute to higher incidence of human diseases in both children and adults. Epidemiologic studies have shown that people living in or in close proximity to inner-city areas are at elevated risk for developing a variety of chronic diseases, including asthma, cancer, COPD and neurologic deficits (4). These health effects are caused or exacerbated by the complex chemical matrix of the urban environment. For example, collaborative studies by our Center members have shown the insidious relation between particulate matter air pollution and increased cardiovascular deaths among the elderly (5). These problems are unfortunately exemplified by the Baltimore City community where this Center is located. Further, although there has been significant improvement in the past 10 years, the State of Maryland through the 1990's had the dubious distinction of having one of the highest cancer death rates of all fifty states. Some of the clusters of highest cancer incidence within this state are in the zip codes surrounding this Center (6). In addition to high cancer rates, our communities are also burdened by problems including, lead poisoning, asthma and high air pollutant levels.



The framework of interaction of our Center is outlined in the model shown in Figure 1 above. In this model, risk of the individual or a population for disease result from interactions between multiple environmental exposures and susceptibility factors. An understanding of these interactions can lead to a translation to preventive and policy interventions. The disease burden in a community will be the outcome of the interaction between exposure, susceptibility and the availability and efficacy of these prevention measures. The rationale for use of this paradigm has framed our strategies over the past 10 years, and will continue for the next funding period. As shown in the structure of the Center for 2008-2013 in the following diagram, the pilot project program is an important component of both the Center's structure and in allowing the Center to address its research directions.

