Future Directions in Spatial Demography

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I see a strong need to develop spatial demography as a tool to advance health research in the areas of chronic disease prevention, health promotion, and more sophisticated causal analysis related to energy balance—diet, physical activity, weight, and their consequences. Such developments could build on the prominent role achieved by spatial demography in the analysis of infectious disease. Achieving this goal requires at least three things. a) Developing and disseminating visions concerning how spatial demography can contribute to chronic disease research and control. b) Identifying and describing compelling examples of existing contributions by spy spatial demography. c) Achieving a greater presence at NIH both among staff and in study sections.

I do not have an overarching position concerning the scientific contents of spatial demography per se. Instead, I have an intense interest in several research topics that involve spatial demography. My desire to learn more about the discipline and my belief that it is worth developing have arisen organically from projects that began in behavior and population studies related to health behaviors and chronic disease.

Identifying consistent measures of the environment
How can we harmonize and standardize environmental variables related to physical activity? I have developed datasets concerning street connectivity and neighborhood walkability (e.g., Huang et al. 2009; Berrigan et al. 2010; Hoehner et al. in press). In each of these collaborations, we extracted multiple variables (e.g. nine measures of street connectivity, 15 + census data elements) and then used principal components analysis to reduce the number of variables. This seems like an imperfect method. At the workshop I would like to discuss and learn about how to conceptualize and measure key spatial influences on physical activity, diet, and obesity. Some of my future programmatic and research activities will focus on supporting efforts to harmonize and/or standardize measures of these key influences.

Analyzing interactions between contextual variables and behavior change
Much of the analytical work concerning context and energy balance has involved cross sectional analyses of behaviors. A few studies have examined longitudinal data, and some of these suggest that environmental effects may not be as important as hitherto thought (e.g., Ewing et al.
I like to participate in discussions focusing on creative new ways to tease apart contributions of self-selection and environment on health behaviors, especially physical activity.

**Better integration of spatial thinking into chronic disease research?**
Geospatial analyses for health have a long tradition of focusing on infectious disease. More recently, a significant body of work has developed that explores the geography of chronic disease and its behavioral and environmental correlates. In 2011, an American Association of Geographers/NIH joint workshop emphasized the need to extend NIH’s efforts in this area ([http://www.aag.org/cs/projects_and_programs](http://www.aag.org/cs/projects_and_programs)). I believe that additional thinking and discussion are needed to develop a clearer vision concerning the potential contributions of geospatial demography to chronic disease prevention and control and to research concerning the promotion of healthy behavior. One area of special interest arising from my work on built environment and walking concerns the use of detailed spatial and behavioral data from devices such as GPS units and accelerometers. Such data are becoming more and more prevalent, both from stand-alone devices and from units embedded in phones, pads, computers and other tools. Creative plans, analyses and study designs are needed to obtain these data and use them to advance behavior and health research.

**Immigration and acculturation**
I am very interested in health and health trajectories of immigrant populations (Willis et al. 2010; Oh et al. 2011; Berrigan et al. 2006; 2010). Immigrants come from specific contexts and the process of acculturation occurs in a complex social and spatial setting. Better data and specific examples of how understanding dynamic effects of context on health behaviors and health outcomes can improve immigrant health could help make a strong case for further investment in geospatial research for health.

**Conclusions**
Geospatial demography seems to have the potential to make significant contributions to public health in part via improved understanding of relationships between environment and behavior. I hope that this workshop can help clarify a research agenda