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As an early career researcher Vincent Learnihan’s expertise lies in understanding the influence of the urban environment on human health. He has worked internationally both in technical and consulting capacities applying Geographic Information Systems (GIS) to urban planning, transportation and public health data. Learnihan has experience in the preparation and development of a range of spatial data for statistical modelling including parcel level land use data, transportation networks and physical activity data. He has worked on a range of large scale research projects involving academic, private and government stakeholders and contributed to peer-reviewed publications, research tools and surveys. Learnihan holds both Bachelor’s and Master’s degrees from the University of Western Australia and is currently employed at the University of Canberra at the Centre for Research and Action in Public Health.

Local Neighborhood Influences of Health: Building a more Integrated GIS

This discussion paper highlights a major challenge for spatial scientists concerned with developing methods to increase our understanding of the relationship between health and place. That is, the need for data on health behaviors and outcomes to be integrated into Geographic Information Systems (GIS) together with broader social determinants of health and inequality.

The Challenge
The classic public health triad composed of man, agent and environment emphasizes the importance of geographic location (environment or space where we live) in health and disease. Where people reside affects the way they live their lives and this in turn impacts on their health. GIS are increasingly being used to examine the relationships between place, health-related behaviors and health outcomes. However, data required to examine these potential pathways and mechanisms for public health action is often limited, not easily accessible, and mostly collected in silos outside of the health sector (e.g., urban planning and design, environment, property rights and taxation and transportation etc.). At present the lack of integrated health-related GIS limits our ability to use spatial-epidemiological approaches in the prevention of Non-Communicable Disease (NCD). There is a need to compile spatially derived datasets of health outcomes and behaviors that seamlessly integrate with data on the broader environmental and social determinants of health and inequality.

Why Tackle This Challenge?
The Global Burden of Disease 2010[1] study and the Australia profile derived from this have demonstrated unequivocally the dominance of NCDs in the burden of overall disease in
Australia (and other OECD countries). In 2010, nine of the top 10 risk factors for NCD’s, accounting for almost 50% of the total disease burden (in disability-adjusted life years), were lifestyle-related and many of these NCDs can be prevented.

Building the Evidence Base
A recent review article by Auchincloss and colleagues [2] called for the adoption of spatial methods as “. . . They are likely to improve specificity of exposure and disease relationships, reduce measurement error, and deepen our understanding of the relationship between place and health.” Developing the evidence base for local neighborhood influences of health, as well as elucidation of the causal mechanisms through which they are mediated will help drive public policy. However, better integrated systems are required to allow further development of spatial methods to understand the local neighborhood influences of health. Geographic Information Systems have a key role to play in public health surveillance and in finding solutions to the future “grand challenges” in public health.

References