

Using GIS to Examine the Health Status of Immigrant and Indigenous Groups in New South Wales, Australia

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1. Introduction

Despite Australia's presence as a sea-locked nation in the Indian and Pacific oceans, this country is home to a diverse collection of people whose original nationalities range from Indigenous Australian to Asian and European. Even with this wide array of demographics, answers regarding the health of particular segments of Australia's population are still lacking. This is a gap that must be filled in the interest of improving public health across demographic lines¹. In recent years, public health is increasingly being studied through the technology of Geographic Information Systems (GIS) which allows for analysis of health related concerns as correlated to location instead of typical tables, graphs and charts. This 'Spatial Medicine' offers a way to understand where disease has its greatest impact, thus providing a basis for focusing improved healthcare or policy making in certain areas.

2. Research Objectives

The main objective of the research is to identify and examine spatially the relationships between ethnic background, economic status, disease and geographic location for immigrant and indigenous populations of Australia using existing demographic data and Global Positioning Systems (GPS) field surveys. The research will be focused on identifying correlations and patterns between these areas as they exist and provide comparison of the health status between immigrant groups and Indigenous populations in urban areas. Given the constraint of acquiring nation-wide data, the state of New South Wales (NSW) is selected as a pilot study area.

3. GIS for Health

GIS provides a platform for public health researchers to take a simple map of an area and add layers of information regarding demographics, disease prevalence, and socio-economic status. When overlaying multiple types of data spatially, relationships and correlations can be discovered in a way a table or graph is unable to display. While

research has been conducted focusing on the status of indigenous (Aboriginal and Torres Strait Islanders) health, there is lack of published literature that has focused on detailed geographic analysis to correlate the availability of resources and compare to other demographic populations, hence this research is originated.

The following questions and relationship scenarios will be considered in this study:

- 1) Are particular diseases more likely to be found in certain communities?
- 2) How do the correlations regarding the health concerns and practices of immigrants compare or contrast to Indigenous populations?
- 3) Are Indigenous populations susceptible to diseases imported by immigrant populations?
- 4) What are the greatest health concerns for Indigenous and immigrant women of particular communities? Where are the heaviest areas of these concerns?
- 5) What are the relationships between rural health concerns and urban health concerns?
- 6) Can we create a model to assist Indigenous populations in decision making – deciding where to live to better suit their healthcare needs.

4. Data Sources

Health-related data is sought from multiple sources including census data from the Australian Bureau of Statistics (ABS), ethnically specific data from Australian Institute of Health and Welfare (AIHW) and data collected from the Australian Social Health Atlas and Center for Disease Control (CDC). Other sources considered including the Public Service Mapping Authority, CURF, UNSW School of Public Health, NSW Department of Health Notifiable Disease Database. Data must be able to be associated with at least postcode-level information in order to be spatially analysed.

Table 1. Expected Data

<ul style="list-style-type: none"> • Demographic data of NSW <ul style="list-style-type: none"> ○ Age ○ Gender ○ Household size • Aboriginal Status data of NSW • Aboriginal lands and communities data of NSW • Mortality and causes • Alcohol Consumption or alcoholics identified • Drug use (recreational and otherwise) • Smoking • Mental Health conditions <ul style="list-style-type: none"> ○ Depression • Suicide 	<ul style="list-style-type: none"> • Maternal mortality • Birth weight • Perinatal/infant mortality • Vaccinations • Diabetes • Cardiovascular diseases • Infectious diseases <ul style="list-style-type: none"> ○ TB, URTI, GI, Skin • Disability of any type • Body weight • Nutrition • Locations of Schools, Universities and Educational institutions • NSW transportation maps (train, bus routes, roads)
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5. Significance

Answering these questions as part of the research will provide updated information to Australian health institutions and policy makers about the health of a large segment of the population. About 23% of the population was born abroad and this segment of the population is continuing to influence the workforce in Australia². It is important to ensure that adequate healthcare is provided for this group. Data collected in 2000 highlights that Indigenous populations are twice as likely to be disabled or have a health condition³. The mortality rates are particularly high for this segment of Australian society. The results of this research will highlight geographic areas of concern and create a foundation for future study and health services accessibility planning.

6. Post-Research Outcomes

The electronic and printed form of all GIS maps and the corresponding datasets will be made available to any partner organizations. The original data map files will reside with the SSIS so that additional studies can be carried out.

7. Acknowledgements

This research project is possible with support from the Australian American Fulbright Commission through the U.S. Fulbright Exchange Program and Stanford University Medical School.

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