Developing an Integrated GIS Approach to Health and Human Services

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Introduction

- Population ageing, health and human services
- Community infrastructure ageing (PwC Report)
- Information silos and data management issues
- Modelling population effects and demand for services
- GIS as an inventory and intelligence tool
- Examples
- Future service role of GIS applications
- Conclusion
Population Change

• Population ageing as a new event
• Regional variations in aged population and community infrastructure
• Sea change/tree change phenomenon and local government capacity
• Immigration, emigration and competition for skill sets
• Systemic capacity, funding and thinking
Ageing populations
Ages 65+ in OECD countries, 2005, 2050

Source: OECD Health Working Paper No. 26
Growth of Australia’s Population 85+ to 2050
NSW Population Aged 85+ 2031
Complexity of Health and Human Services Infrastructure

- Health care sector – Federal, state, private, NGO, religious
- Information silos
- Limited public access
- Staff turnover issues
- Public communication issues
Health System Architecture

- Administrative boundaries
- Facilities and infrastructure
- Workforce distribution
- Patient distribution
- Disease distribution patterns
- Costs and expenditures
- Treatment modalities, frequencies eg. pharmaceutical prescribing
SLA’s
Statistical Divisions
ACAT Regions
Public Hospitals
Building an Inventory of Services

- General Practitioners and medical centres
- Pharmacists
- Diagnostic services
- Public and private hospitals
- Residential care facilities
- HACC funded services eg. MoW
- Religious, NGO, NFP
- Options – alternative providers, allied services, nominated facilities etc
Mapping Patterns of Disease and Service Demand

• Alzheimer’s current and projected prevalence
• Incidence data where/when available
• Patient treatment and support
• Carer support and respite care
• Etc etc
Projected Alzheimer’s Disease Prevalence in 2031
Projected Day Care Attendance 2006
Total Numbers
Projected Day Care Attendance 2031
Total Numbers
Combining Information into an Analytical System

• Take administrative geographies, service locations, population data etc and develop an improved understanding of our complex system eg.
  – Proximity to services
  – Distance to travel for frail/disabled etc
  – Actual service distribution against desired
  – Areas for improvement or opportunities for development
Distribution of Pharmacies in NSW
Distance to Nearest Pharmacy
Distance to Nearest Pharmacy x Population in NSW

![Graph showing the relationship between distance to the nearest pharmacy and population in NSW. The x-axis represents distance to the nearest pharmacy in kilometers, with categories 0<.44, .44<.75, .75<1.24, 1.24<3.15, and 3.15Plus. The y-axis represents population in millions, ranging from 0 to 1.6.]
Population per Pharmacy
Pharmacies in Sydney
Pharmacy Density

Pharmacies within 5kms
- Less than 23
- 23.00 to 36.00
- 36.00 to 51.00
- 51.00 to 83.00
- 83.00 Plus
Population per Pharmacy - Sydney detail

[Map showing population density per pharmacy in Sydney with various color-coded areas indicating different population ranges.]
Future Applications

- Inter-sectoral cooperative activities eg. linking health and social services, public and NFP etc
- Public participation GIS (PPGIS) capacity for community and advocacy groups
- Service capacity estimation in low service areas
- Future population demand/service gap identification
- Planning and implementation support
- Community based advocacy
- Service recipient support eg. service redirection
- Targeted fund raising and/or volunteering
Conclusion

• Complex inter-sectorial systems require linking architectures and data sharing protocols that work
• Open systems need accessible information portals for both service providers and users
• Changing communities need timely and relevant information at the local level
• Services need to be accessible to multiple client types eg. users, carers, referrals
• Service providers need to be planning at a local community level and not just at an industry level
• These technologies have the capacity to support planned, effective and relevant change at a community level