

GeoHealth Laboratory

Research & Applications

Te tai whenua o te hau ora

Research & Applications

June 2007



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This annual report outlines the work successfully undertaken during the *GeoHealth Laboratory's* second year of operation. We have achieved a great deal and clearly demonstrated the added value that the *GeoHealth Laboratory* brings to the health system.

This is the second annual report of the Laboratory. The report describes the infrastructure, workplan, milestones, achievements and key events in the second year of operation of the Laboratory; as well as setting out the aims and work plan in detail for year three.

Section 1 outlines the key funding stream of the Laboratory for its first three years of operation, together with details of the personnel, infrastructure, equipment, data and management of the Laboratory. Sections 2, 3 and 4 describe the workplan of the Laboratory broken down into its three constituent parts, research, scholarships and training. Section 5 covers the important publicity and promotional activities undertaken to increase awareness and publicise the Laboratory; whilst Section 6 outlines the immediate goals for year two and the strategic direction beyond.

Year two has been very good, so what of year three? Building on the success of the conference, our aim for year three is the continued promotion and raised awareness of the Laboratory across the health sector. In this respect I have five goals:

strengthen the Laboratory's geohealth research focus around 'risk

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Table 2. Current GeoHealth Research Laboratory Personnel

| Post | Location | Name |
|---|-------------------|--|
| Core funded Research Assistant | Laboratory | Peter Day |
| PHI seconded posts: Research Assistant level | Laboratory to PHI | Replacement for Irfon Jones sought |
| | PHI | Jinny Gunston Kylie Mason |
| Masters scholarships | Laboratory | Catherine Tisch: Finished Sept 06* Katrina McPherson: Finished Dec 06 Erin Holmes: Finished Mar 07 Esther Rhind: Finishing Jun 07 |
| PhD scholarships | Laboratory | Francis Ayuka Owuor: Mar 2010 |
| Board | Dept Geog | Prof. Eric Pawson (joint chair) |
| | UoC | Prof. Andrew Hornblow |
| | PHI | Dr. Barry Borman (joint chair) |
| | UK | Prof. Graham Moon |
| Management team | Australia | Assoc. Prof. Laurie Brown |
| | Dept Geog | Dr. Jamie Pearce |
| Dept Geog postgraduates and research assistants | PHI | Dr. Paul White |
| | Laboratory | Ionara Wilson Phil Bartie Katie McPherson |
| Dept Geog staff | Dept Geog | Prof. Ross Barnett Prof. Andrew Sturman Assoc. Prof. Simon Kingham Dr Peyman Zavar-Reza |
| Dept Geog technical support staff | Dept Geog | John Thyne Paul Bealing |
| PHI GeoHealth staff | PHI | Dyfed Thomas |
| PHI Staff | PHI | 20+ personnel |

*Catherine will be awarded the Jobberns Prize for best Masters dissertation at the graduation ceremony in April.

3. Facilities

The Laboratory is located in a dedicated room situated adjacent to the Department of Geography. The Laboratory room is fitted out with three partitioned workstations, bench space for a further five workstations and eight reading carrels. In addition there is a large table and white board. The laboratory is locked and has passcode protected entry. The Laboratory layout was carefully considered to provide a conducive working and research environment with extra capacity beyond initial requirements to allow for growth.



GeoHealth Laboratory team

4. Equipment

The GeoHealth Laboratory has been refurbished to provide deskpace and computer terminals for up to 13 people. At present there are nine networked PCs each with 19 inch screens. There is also a dedicated GeoHealth network drive for the storage of data files which are regularly backed up

Each PC has ArcGIS software, together with a number of statistics applications as well as standard PC text and numerical software tools. These applications are updated and maintained through UoC site licenses. Technical support is provided by Department of Geography GIS specialists and manager, and UoC central IT services.

5. Management

The Laboratory has a two tier management structure. The directorship and management of the Laboratory is undertaken jointly by Jamie Pearce of the Department of Geography and Paul White of PHI. Jamie and Paul are in weekly phone and email contact and meet regularly in Christchurch and Wellington.

The two directors are responsible for the work activities of the Laboratory and for generating the Laboratory workplan.

Oversight and governance are provided by the GeoHealth Laboratory Board. The Board alternates locations between Wellington and Christchurch, with the Chair rotating between Eric Pawson of the Dept of Geog and Barry Borman of PHI. Wider expertise is drawn from three further Board members; Andrew Hornblow from the Health Sciences Centre, UoC; Laurie Brown (National Centre for Social and Economic Modelling), University of Canberra; and Graham Moon (Health Services Research), University of Portsmouth. The two directors sit on, and report to, the Board.

The Board met twice in the 06/07 year.

In September 2006 Jamie and the two Laboratory based Research Assistants came up to Wellington to meet with the four PHI geohealth and spatial epidemiology group members, following the practice established a year earlier. Given the close working relationship of these two groups this meeting was a tremendous success for fostering closer working relations. It is hoped that this practice can continue with possibly the PHI team visiting the Laboratory.

3. Spatial inequalities in suicide in New Zealand, 1980-2001

This research evaluates whether urban/rural inequalities in suicide have grown for males and females during the 1980s and 1990s, a period of rapid social and economic change to New Zealand society. Using consistent geographical areas, we calculate age standardised suicide rates for urban and rural areas. To assess whether socioeconomic factors underlie any urban/rural inequality in suicide, we investigate whether urban/rural status had an effect upon rates of suicide independently of socioeconomic deprivation for the time periods 1990-92 and 1999-2001.

Publications

Ministry of Health. 2006. New Zealand Suicide Trends: Mortality 1921–2003, hospitalisations for intentional self-harm 1978–2004. Monitoring Report No 10. Wellington: Ministry of Health.

Pearce J, Barnett R, Collings S, Jones I, 2007. Did geographical inequalities in suicide among males aged 15 to 44 in New Zealand increase during the period 1981-2001? *Australian and New Zealand Journal of Psychiatry* 41, 359-365.

Pearce J, Barnett R, Jones I, 2007. Yet more inequality? Have socio-economic and urban/rural inequalities in suicide in New Zealand grown during the period 1980-2001? *Social Science and Medicine*. Under Review.

4. Project Title: Monitoring geographical inequalities in health in New Zealand, 1980–2001

Recent studies have noted widening health inequalities between rich and poor areas in a number of OECD countries. These papers examine whether health in New Zealand has become more geographically polarized during the period 1980–2001, a time of rapid social and economic changes in New Zealand society. Mortality records for each year between 1980 and 2001 were extracted for consistent geographical areas: the 21 District Health Boards operating in New Zealand in 2001 and used to calculate male and female life expectancies for each area. The geographical inequalities in life expectancy were measured for each year between 1980 and 2001. Although overall life expectancy has increased during the period of study, New Zealand has experienced increased spatial polarization in health, with a particularly sharp rise in inequality during the late 1980s and early 1990s. Since the mid-1990s regional inequality has remained at stable but high levels. The polarization in mortality was mirrored by a growth in income inequality during the 1980s and 1990s. Health inequalities as expressed geographically in New Zealand have reached historically high levels and show little sign of abating.

16. Targeting Small Area Health Needs: integrating multilevel synthetic estimation and geographical data

Identifying the extent to which health needs vary across small areas has long been a concern of public health and health promotion. Centrally the focus has been on uncovering highly localised manifestations of health inequality within larger communities, thus enabling resources to be targeted more subtly. Methodological approaches to this task have ranged considerably in their level of sophistication. Some assume national inequalities are replicated uniformly at a local level; others place great emphasis on proxy measures. Most are highly data dependent, being constrained by the quality and availability of appropriate data and the spatial units for which it is produced.

This project aims to use the multilevel synthetic estimation methodology developed by Graham Moon. This focus in the first instance on small-area needs in relation to chronic respiratory illness using data from the 2002/03 NZ Health Survey and 2001 census, followed by the 2006 Tobacco Use Survey and the 2006 census. The outcome is a development of a very large spatial interaction model enabling health needs estimates to be linked to all NZ general practices.

17. Creating robust small area estimates of malignant melanoma for targeted health promotion

Malignant Melanoma is one of the leading cancers in New Zealand, and the most common cancer in adolescence (Sneyd & Cox, 2006). It is also one of the easiest to prevent as the aetiology (exposure to ultra-violet radiation) is well understood. However, current health protection messages such as 'slip, slop, slap' are not having the desired effect of reducing incidence. Driven by key health policy objectives this research seeks to assess the usefulness of routine data sources to create robust small area estimates that will allow health promoters to more accurately target local communities with tailored sun-smart campaigns.

The most robust quality data is found post introduction of the cancer registry in 1995. Therefore we have analysed 10 years of data. There has been a reduction in registrations in those under 20 years of age, despite an overall increase in incidence. The sun-smart campaigns began in the mid 1980's, therefore it is only this younger age category who reveal the potential effectiveness of health promotion messages. Anyone over the age of 25 could have received higher doses of UV radiation before this date and therefore still register with melanoma despite taking heed of the warnings. There is a variation in age/gender profiles, with high numbers of older males registering. It is surmised that melanoma incidence is dependent on a number of key spatially variable factors such as increased disposable income leading

Introduction

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The third core work activity of the Laboratory is specialised capacity building for the New Zealand Health sector. As the use of GIS based tools increases beyond academic sectors and across into the practical health settings it is important that appropriate support is available to encourage use and exploit advances and current best practice. This is inline with one of PHIs primary drivers of its sector engagement strategy, to increase specialised analytically capability to help deliver better GIS based analytical solutions directed towards meeting the District Health Board (DHB) and Public Health Service policy targets.

