What the rural health indicators are indicating for New Zealand

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Executive summary

In 2010, the New Zealand Institute of Rural Health (NZIRH) commenced a three stage research project to develop a national collection of Rural Health Indicators related to the health status and health services for rural people compared to people who live in urban centres, the three broad headings of health status, determinants of health and health system performance were used.

Health status of rural people has been of interest in recent years to researchers, industry groups, health service providers, planners and funders. There have been many attempts to delineate rural health from urban and to drill down into further data for sub sets of rural communities. Specific dimensions of health status are health conditions, human functions, wellbeing and deaths.

The development of the Rural Health Indicator framework will enable high level measurement, assessment and comparison of the health status of urban and rural New Zealanders and the measurement of disease and health trends of rural communities. Specific dimensions of health status are health conditions, human functions, wellbeing and deaths. The AIHW rural health indicator framework provided a sound footing for developing a set of Rural Health Indicators for New Zealand.

The inter relationship between health status, determinants of health and health system performance is often questioned within and on behalf of rural communities; this piece of work offers a strong basis to compare relevant data and make National comparisons in this area.

It is worth noting that although important, indicators are simply that, they can be used to indicate changes or performance but provide only part of the picture. This paper gives a summary of the development of a set of national indicators for rural health and suggests areas that are worth more detailed inspection and application of this information over time.

Within the context of an ageing population, an ageing workforce and rural health workforce issues, it is interesting to note the opportunity that arises for DHBs, Ministry and others to work more closely and across sectors to compare progress against this data set.

Introduction

Health status of rural people has been of interest in recent years to researchers, industry groups, health planners, funders and service providers. There have been many attempts to delineate rural health from urban.

In 2010, the NZIRH commenced a three stage research project to develop a national collection of Rural Health Indicators to demonstrate and measure any difference in the health status and health service provision for rural people compared to those people who live in urban centres. ‘Indicators’, ranging from very specific to very broad, can be defined as statistical measures selected to describe a situation concisely; to track change, progress and performance; and guide decision making. The single largest challenge in developing a framework for Rural Health Indicators in a New Zealand context has been the lack of New Zealand material relating to this subject.

A Rural Health Indicator framework for New Zealand was developed in stage one of the project. The indicators selected include the incidence of cardiovascular disease, malignancy, renal disease and respiratory disease. The indicators have been applied to a comparison of rural populations in New Zealand and Australia followed by a more in depth study of some of those findings.

In stage two, the five DHBs of Northland, Waikato, Taranaki, Canterbury and Southern (Otago and Southland) were chosen for analysis due to their comparatively large and diverse rural areas. Interesting
results came to light principally in Independent Urban Areas (IUAs) as well as rural areas with low urban influence. These are areas with little or no connections to Main Urban Areas.

In the third stage, further analysis of these DHB areas continued with comparison of certain aspects of demographic and socio-economic data with the National Minimum Data Set (NMDS) discharge data between independent urban areas within the District Health Boards (DHBs) of Northland, Waikato and Southern, against entire DHB areas and between DHBs. Additional work and analysis took place to identify why IUAs populations have the highest incidence of cardiovascular disease, malignancy, renal and respiratory disease hospital discharges. All of the IUAs have high deprivation levels except for Matamata. In all areas Maori are more deprived than non-Maori.

The portion of the New Zealand population with the poorest outcomes from the health indicator analysis and the implications of those results were highlighted in this stage.

**Methodology**

Tatua Kahukura: the Maori Health Chart Book\(^1\) was used in the development of the indicator framework for stage one of the project and had a major influence on the evaluation, adoption and development of this New Zealand Rural Health Indicator Framework. The AIHW rural health indicator framework\(^2\) provided a sound base for developing a set of Rural Health Indicators for New Zealand.

The New Zealand framework contains 14 health performance dimensions overall, grouped under three broad headings:

- health status
- determinants of health
- health system performance.

In stage 2 of the project, the five DHBs of Northland, Waikato, Taranaki, Canterbury and Southern were chosen for analysis due to their comparatively large and diverse rural areas. Analysis was based on a prioritised list of Rural Health Indicators (see Appendix 1) taken from the comprehensive framework produced in stage one 1.

**Diagram 1** National Health Committee Urban Rural Profile

During this stage, the focus was on identifying and comparing the findings using an adaption of the Statistics New Zealand Experimental Urban/Rural profile\(^3\) as used by the National Health Committee

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\(^2\) Australian Institute of Health and Welfare (2008) Rural, regional and remote health Indicators of health status and determinants of health, Rural Health Series Number 9, March 2008, AIHW

\(^3\) Ibid Statistics New Zealand (undated) Urban/Rural Profile
in the document—Rural Health—Challenges of Distance and Opportunities for Innovation⁴ and the National Minimum Data Set (NMDS)⁵ from 2005–2009 to analyse:

- **incidence of disease**—cardiovascular disease, malignancy, renal and respiratory disease
- **mortalities**—potentially avoidable mortalities (PAMs) and non potentially avoidable mortalities (Non PAMs)
- **secondary care activity levels**—discharges, inpatient and day patient, length of stay (LOS) and case weighted discharges (CWD).

Stage 3 identified and compared the findings using the same methodology and criteria as stage 2. As a consequence of the data analysis from the five DHBs chosen in stage 2 there was a strong focus on IUAs as well as rural areas with low urban influence.

### Independent Urban Areas selected for review

<table>
<thead>
<tr>
<th>Northland DHB</th>
<th>Waikato DHB</th>
<th>Southern DHB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dargaville</td>
<td>Matamata</td>
<td>Alexandra</td>
</tr>
<tr>
<td>Kaikohe</td>
<td>Te Kuiti</td>
<td>Cromwell</td>
</tr>
<tr>
<td>Kaitaia</td>
<td>Tokoroa</td>
<td>Gore</td>
</tr>
<tr>
<td>Kerikeri</td>
<td>Waihi</td>
<td>Te Anau</td>
</tr>
</tbody>
</table>

### Results

The development of the Rural Health indicator framework enables high level measurement, assessment and comparison of the health status of urban and rural New Zealanders. It has been used in this report to compare certain aspects of demographic and socio-economic data with the NMDS discharge data between independent urban areas within selected DHBs. The indicators are useful in monitoring the gains and in highlighting areas where improvements can be achieved especially:

- measuring disease and health trends of rural communities
- identifying high prevalence disease conditions that warrant particular attention and focus
- assessing the performance of the national health system in relation to rural needs
- providing a data resource in support of other health research activities.

Using the six point methodology, comparison of the prevalence of disease across the DHBs and the IUAs selected has demonstrated the similarities with obvious issues for some disease processes within certain age groups, gender, ethnicity and high social deprivation.

Analysis of the data from the five DHBs chosen in stage 2 indicated the highest incidences of secondary care activity in health—cardiovascular, malignancy, renal and respiratory disease plus potentially avoidable mortalities, occurred principally in IUAs as well as rural areas with low urban influence. These are areas with little or no connections to Main Urban Areas. IUAs are often or have been service centres for the surrounding rural communities and have an interdependent relationship with them. Since 2010 they have been classed as “rural” by the National Health Committee.

Additional work and analysis has taken place in order to explore why IUAs populations have the highest incidence of cardiovascular disease, malignancy, renal and respiratory disease hospital discharges. Stage

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⁴ Ibid National Health Committee (2010) Rural Health: Challenges of Distance; Opportunities for Innovation
⁵ Ibid See Glossary of Terms
3 compared certain aspects of demographic and socio-economic data with the NMDS discharge data between independent urban areas within selected DHBs—Northland, Waikato and Southern, against entire DHB areas and between DHBs.

Demographic data shows that:

The gender split is evenly spread between males and females (49% and 51% respectively). Most of the IUAs have high deprivation levels with Southern being the only DHB with relatively low deprivation. The comparison of disease prevalence across DHBs and IUAs has confirmed that age, gender, ethnicity and life style behaviours common to your social and physical environment as well as some hereditary pre curators all lead to determining health status. IUAs with high socio-economic deprivation and Maori ethnicity biases demonstrate higher hospital discharge rates. Generally, the incidence of infant mortality follows the deprivation score, which is influenced by Maori ethnicity also.

Selected for analysis from the fourteen health performance dimensions were the health status categories of:

1. Health conditions
2. Deaths
3. Health System Performance
4. Efficiency and Sustainability

The comparison across DHBs and IUAs has confirmed the outcomes of age, gender, ethnicity and life style behaviours common to social and physical environment as well as some hereditary pre curators all lead to determining health status.

Each Independent Urban Area reviewed has duplicated the relevant DHB disease status for all its IUAs particularly related to those IUAs with high socio-economic deprivation and higher Maori ethnicity bias.

Snapshot of indicators relating to Independent Urban Areas (IUAs)

Cardiovascular disease (CVD) is the leading cause of death in all DHBs and the leading cause of potential years of life lost by people dying early. All DHBs exhibit high levels of Cardiovascular Disease most notably in IUAs and Satellite Urban Areas.

Renal Disease analysis per 100,000 population for Waikato DHB demonstrates that IUAs are again strongly represented with renal disease

Analysis of Respiratory Disease per 100,000 population reports that Main Urban, Satellite Urban and IUAs are strongly represented by significant numbers. This may be able to be explained with further research into the deprivation deciles and socio economic factors for known areas of poor housing, poor nutrition or other factors.

Mortality is a key indicator of whole of system performance for health. In 2007 there were 28,601 deaths registered in New Zealand representing a 4.2 per cent increase in the number of deaths. The mortality rate per 100,000 people, when adjusted for age, shows a strong downward trend. However, if mortalities are analysed by DHB population, all mortalities when expressed as a crude total percentage for each DHB population are over represented within the IUAs and sometimes even higher than the Main Urban Centres.

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6 In Taranaki “Years of Life Lost” before 75 years per 10,000 population appear to be increasing since 1997, particularly for males, whereas NZ overall has seen a reduction.
Review of the five DHBs demonstrates that non-potentially avoidable mortalities per 100,000 population are over represented once again within the IUAs sometimes even higher than the Main Urban Centres other than for the Southern DHB.

Secondary care activity has been measured to review and compare the efficiency and sustainability of services within the five DHBs in relation to the urban/rural profile. It is interesting to note that IUAs have more inpatient discharges than the Main Urban Centres in most DHBs. There could be various reasons for this including a motivation to meet elective waiting times as per the Minister of Health’s health targets.\(^8\) Four of the DHBs may be using more inpatient services, rather than day patient services to meet what would be a relatively uncomplicated casemix.

Population adjusted Length of Stay is again strongly represented in the IUAs of all five DHBs. Average Length of Stay, is quite high averaging between four to six days for most DHBs. Apart from Canterbury DHB there is no significant difference between Independent Urban Areas and Main Urban Areas.

This project developed a preliminary framework with an initial set of New Zealand Rural Health Indicators that can be used at a national level. The health status of rural and urban New Zealanders can be assessed and measured for specific indicators at a very high level. A methodology has been created that allows regular reporting of the information measured to date.

The indicators presented here can help in monitoring the gains and in highlighting areas where improvements can be achieved especially:

- measuring disease and health trends of rural communities
- identifying high prevalence disease conditions that warrant particular attention and focus
- assessing the performance of the national health system in relation to rural needs
- providing a data resource in support of other health research activities.

The findings in relation to the IUAs lead to a number of possible contributing factors:

- the downsizing of the rural hospitals in some of the IUAs
- the socio-economic environments within these towns where people have moved in from more isolated rural areas but are limited to these areas due to the lack of affordability of living within the urban environments
- a lack of hospital visits from visiting specialists to outlying areas
  - potentially resulting in people with chronic disease having delayed assessment
  - an increase in the rate of admission to hospital with a more advanced state of disease leading to increased morbidity/mortality
- problems in maintaining an adequate primary health workforce in these towns
- hubs for farming communities
- where farmers retire.

Additional work and analysis would be necessary to confirm or otherwise the impact of the factors listed above.

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Discussion

The difference in geographical diversity, the variation in definitions and the lack of homogeneity in rural dwellers make national and international comparisons of health somewhat difficult. However, it would appear that health outcomes are generally poorer in rural areas. It is also known that specific predictive factors for health outcome in rural persons are difficult to attain. Anecdotally, rural populations are disadvantaged in terms of health service delivery although in New Zealand there is a lack of empirical evidence to support this.

Social and economic factors have been shown to have the greatest influence on health especially income and poverty, employment and occupation, education, housing, and ethnicity. The relationship between socio-economic deprivation and health outcomes demonstrates increasing levels of deprivation are associated with higher mortality rates, and higher rates of many diseases.

Research has shown that a number of demographic and socio-economic factors may impact a person’s health. DHBs can work collaboratively with other government and local body organisations to address these difficulties.

The way people live their lives and the behaviours they exhibit influence health status. There are a wide range of influences of which smoking, diet, alcohol and other drugs, and physical activity are key.

People who live in deprived areas suffer from greater health problems, it is not always clear whether those areas are the cause of the problems or if ill health has caused the fall of some into poverty.

The next two decades will bring growing numbers of older people in both rural and urban communities. Independent Urban Areas are projected to be home to an even larger proportion of people aged 70 years and over (21 per cent) than Highly Rural/Remote Areas and Rural Areas with Low Urban Influence (15 per cent). Age-related projections differ dramatically by ethnicity. The European population is facing a much greater increase in proportions of older people than are the Maori and Pacific populations which will continue to have larger proportions of children. New Zealand is experiencing the unpredictable effects of a worldwide economic recession. This has affected, among other things, the country’s gross domestic product and levels of unemployment which have the ability to influence the health status of New Zealanders.

It is important to remember that although indicators can track change, progress and performance; and guide decision making they are indicators and not designed to give the whole picture.
Table 1  The Rural Health Indicator Framework Domains and Dimensions

<table>
<thead>
<tr>
<th>Domain</th>
<th>Dimension</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Status</td>
<td>Health conditions</td>
<td>• Incidence of heart attacks&lt;br&gt;• Incidence of selected Cancers&lt;br&gt;• Incidence of sexually transmissible infections and blood borne viruses&lt;br&gt;• Incidence of end-stage kidney disease (ESKD)&lt;br&gt;• Hospitalisations for injury and poisoning</td>
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<td></td>
<td>Human function</td>
<td>• Severe or profound core&lt;br&gt;• activity limitation</td>
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<td></td>
<td>Wellbeing</td>
<td>• Self-assessed health status&lt;br&gt;• Psychological distress</td>
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<tr>
<td></td>
<td>Deaths</td>
<td>• Infant/young child mortality rate&lt;br&gt;• Life expectancy</td>
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<tr>
<td>Determinants of Health</td>
<td>Environmental factors</td>
<td>• Water quality</td>
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<tr>
<td></td>
<td>Community and socio-economic</td>
<td>• People with low income&lt;br&gt;• Proportion of babies born with low birth weight&lt;br&gt;• Health literacy&lt;br&gt;• Education</td>
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<tr>
<td></td>
<td>Health behaviours</td>
<td>• Summarised using 5 indicators that relate to the risk for many chronic diseases. (Obesity is included as a ‘behaviour’ because it relates to behaviours such as diet and physical activity.)</td>
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<tr>
<td></td>
<td>Biomedical factors</td>
<td>• Are determinants that represent bodily states that are risk factors for other conditions, for example high blood pressure or high blood cholesterol. It is hoped in time that ways of collecting this data may become available.</td>
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<tr>
<td>Health System Performance</td>
<td>Effectiveness</td>
<td>• Unsafe sharing of needles&lt;br&gt;• Immunisation rates for vaccines in the national schedule&lt;br&gt;• Selected potentially preventable hospitalisations&lt;br&gt;• Survival following heart attack&lt;br&gt;• Survival of people diagnosed with cancer&lt;br&gt;• Potentially avoidable deaths</td>
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<td></td>
<td>Safety</td>
<td>• Adverse events treated in hospitals&lt;br&gt;• Falls resulting in patient harm in hospitals</td>
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<td></td>
<td>Responsiveness</td>
<td>• Proportion of people with diabetes with a GP annual Get Checked plan&lt;br&gt;• Proportion of people with asthma who have a written asthma plan&lt;br&gt;• Proportion of people with mental illness who have a GP care plan</td>
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<td></td>
<td>Continuity of care</td>
<td>• Measured by three indicators that relate to the management of three common chronic diseases in the New Zealand population</td>
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<tr>
<td>Domain</td>
<td>Dimension</td>
<td>Indicators</td>
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<tr>
<td>Accessibility</td>
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<td>• Potentially avoidable GP-type presentations to emergency departments</td>
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<td>• Waiting times for elective surgery</td>
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<td>• Waiting times for emergency department care</td>
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<td></td>
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<td>• Cancer screening rates Proportion of pregnancies with an antenatal visit in</td>
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<td></td>
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<td>the first trimester</td>
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<td></td>
<td></td>
<td>• Differential access to hospital procedures</td>
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<tr>
<td>Efficiency and Sustainability</td>
<td></td>
<td>• Net growth in health workforce</td>
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<tr>
<td></td>
<td></td>
<td>• Cost per casemix-adjusted separation for acute care episodes</td>
</tr>
</tbody>
</table>

**References**


7. New Zealand Institute of Rural Health 2011. *Annexe 1 Rural Health Indicators Comparison of Five District Health Boards Incidence of Disease, Mortality and Secondary Care Activity*.


