‘Poorly defined’: unknown unknowns in New Zealand Rural Health

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ABSTRACT

There is a considerable mismatch between the population that accesses rural healthcare in New Zealand and the population defined as ‘rural’ using the current statistics New Zealand rural and urban categorisations. Statistics New Zealand definitions (based on population size or density) do not accurately identify the population of New Zealanders who actually access rural health services. In fact, around 40% of people who access rural health services are classified as ‘urban’ under the Statistics New Zealand definition, while a further 20% of people who are currently classified as ‘rural’ actually have ready access to urban health services. Although there is some recognition that current definitions are suboptimal, the extent of the uncertainty arising from these definitions is not widely appreciated. This mismatch is sufficient to potentially undermine the validity of both nationally-collated statistics and also any research undertaken using Statistics New Zealand data. Under these circumstances it is not surprising that the differences between rural and urban health care found in other countries with similar health services have been difficult to demonstrate in New Zealand. This article explains the extent of this mismatch and suggests how definitions of rural might be improved to allow a better understanding of New Zealand rural health.

A paradoxical finding in New Zealand rural health research is that the rural/urban inequalities often demonstrated in international data[1-6] do not seem to be a feature in nationally compiled New Zealand statistics. This seeming lack of evidence of rural/urban health differentials is something of a disincentive to further research in the area, but work addressing specific topics has shown evidence of disparity in rates of disease incidence,[7] access to services and outcomes.[8,9]

The apparent similarity in rural/urban health care outcomes is usually taken as reassuring evidence that any barriers to care in rural areas are generally overcome and the system provides equitable outcomes for all New Zealanders. However, it is also possible that the lack of evidence of rural health inequality is an artefact arising from the lack of a clear definition of ‘rural health care’, and that national statistics may thus be incapable of detecting true differences in health outcomes.

At the heart of the problem is the fact that researchers using census data typically use the Statistics NZ rural and urban categorisation, despite the fact that the definition of these categories does not take health service access in to account. This means the resultant rural/urban delineation does not accurately differentiate the population of New Zealanders who actually receive ‘rural health care’. Although it has been recognised that current definitions are inadequate,[10] the extent of the uncertainty resulting from the suboptimal definitions is not widely appreciated. As discussed below, currently large numbers of people who access rural health services are classified as ‘urban’ under the Statistics NZ definition, while a significant percentage of the people who are classified as ‘rural’ actually have ready access to urban health services. Under these circumstances, it is not surprising that it is difficult to demonstrate differences between rural and urban health care.

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Past, present and proposed definitions of 'rural'

Prior to 2003, Statistics NZ defined 'rural' as census area units with less than 1,000 people. Apart from the arbitrary nature of the definition (resulting in areas with close to 1,000 residents changing from rural to urban from census to census without any change in access to health services), significant numbers of people who access rural health services live in small rural centres with over 1,000 residents, and are thus classified as 'urban' under this definition. For example, Wanaka, which is 90km from the nearest rural hospital and 300km from the nearest base hospital, is classified as 'urban'. As this definition was widely used until the mid-2000s, most New Zealand research published before then is based on it.

Statistics NZ modified the rural/urban definition in 2003, and it now recognises three urban (major urban, satellite urban and independent urban areas) and four rural categories (highly rural/remote and rural areas with low/moderate/high urban influence).

This definition is actually less useful in defining populations receiving rural health care, as the 'independent urban' definition now includes some rural centres with less than 1,000 residents. Thus, places like Hanmer Springs are now grouped with slightly larger centres like Wanaka, Takaka, Twizel, Murupara, Wairoa, Ohakune and Dargaville, all of which are clearly rural in New Zealand health terms, but are included as 'urban' in nationally-collated health data.

Moreover, this definition highlights the significant percentage of people classified as 'rural' who live adjacent to large urban centres and generally access urban health services. Areas classified as 'Rural with high urban influence' comprise around 22% of the rural population. These are small (relatively affluent) census area units adjacent to large urban centres and 'a significant proportion' of residents work and access services in the adjacent urban area. Therefore, including these people as 'rural' has the potential to further confound attempts to study the health effects of true rurality.

Overall, we estimate that it is likely that around 340,000 people who actually receive rural health care are included in the urban definition, while up to 124,000 of those defined as rural may actually receive urban health care. These rather imperfect definitions underlie most data published by the Ministry of Health (MoH) and other national bodies, so even fundamental statistics such as mortality rates, life expectancy and cancer survival rates need to be interpreted with this caveat in mind. More detailed studies such as the *Urban–Rural Health Comparisons: Key results of the 2002/03 New Zealand Health Survey* report published in 2007 are also dependent on these definitions,[11] and this may explain the lack of significant findings in this work, which is probably the largest single piece of work looking at rural/urban differentials in New Zealand to date. Only a very small number of published New Zealand studies have used alternative or multiple definitions of rurality in an attempt to better define the issues in question.[12]

The National Health Committee *Rural Health, challenges of distance, opportunities for innovation* report (2010) recognised the inherent problems in trying to study rural health using current Statistics NZ definitions,[10] and have proposed an alternative definition, whereby Independent Urban areas are classified as rural, and rural areas with high urban influence are classified as urban. The National Health Committee (NHC) study used their proposed new definition to re- analyse some of the MOH Rural/Urban comparison data on incidence of heart disease and stroke in rural and urban areas (previously analysed with the pre 2003 Statistics NZ definition (Table 1).

The NHC definition of 'rural' produces a marked difference in the results, with an almost 100% variance in the relative incidence of heart disease and stroke in rural areas. The figures suggest that it is difficult to have a high degree of confidence in any statistics using current urban/rural definitions. Although the NHC report did not directly comment on these results, it did suggest there is a significant burden of ill health in small rural centres, and other recent work by the New Zealand Institute of Rural Health (NZIRH) supports this finding.[13]

While the NHC definition is an improvement in correctly identifying

Table 1: Relative reported incidence of rural heart disease and stroke (urban incidence = 1.0).

Study	Heart disease	Stroke
NZ Health Survey	0.62	0.88
NHC	1.66	1.71

(Figures from page 10 of the New Zealand health survey and page 68 of the NHC report have been standardised such that urban incidence = 1.0 to enable comparison)

populations using rural health services, larger 'independent urban centres' including Timaru, Greymouth, Blenhiem, Masterton and Whakatāne, all have DHB base hospitals, but are classified as 'rural' under the proposed NHC schema; therefore over 100,000 people with 'urban' access to DHB level 'base hospital' services will be analysed as having 'rural' health care, adding significant potential for obscuring true rural/urban differences. Excluding these larger independent urban centres with urban health services from the 'rural' definition will significantly improve the 'accuracy' of the NHC definition of the population that receives rural health services.

As small regional/rural centres and rural areas with low/moderate urban influence typically have the highest average levels of deprivation and unemployment,[10] a more accurate rural definition will also imply a higher level of rural deprivation than is currently recognised. This is important as the combination of rurality and deprivation has been shown to adversely affect health outcomes in overseas studies.[14]

While we have working definitions of what constitutes a rural general practice or a rural hospital,[15,16] we cannot accurately identify the populations served by these entities using current definitions (see Table 2). Health service rurality is a continuum and is not readily classified with a simple formula. There is no clear, internationally recognised definition of 'rural' for health purposes, and the default position of defining rural as 'not urban' or 'not metropolitan' is commonly used. In the New Zealand context, professional groups such as the Rural Hospital Doctors Working Party have had to define 'rural' to define their scope of practice, and distance from base hospital (specialist) services has emerged as a key component of the definition.[16] Like many things in rural health, some local knowledge of the available services and their context is useful and this level of knowledge has been used to produce a more nuanced definition of the rural parts of the Midland region DHBs.[17] While similar techniques may prove useful in the future, a simple and relatively robust rural/urban definition can be achieved with minor modification of the NHC definition, as outlined above and in Table 2.

It may seem somewhat late in the day to be pointing out that national health statistics on rural health may not be fit for purpose, but this is symptomatic of the rather "undeveloped" state of rural health research in New Zealand.[18] The widespread adoption of a consensus definition of rural is a necessary step toward any meaningful analysis of rural/urban health differentials in New Zealand. The NHC report called for a new rural/urban definition in 2010, but as yet their call has achieved little traction. Therefore, it is vital that any new definition is recognised and 'advertised' by Statistics NZ, so that future research can be based on a functional and consistent definition. Until this can be achieved, we will remain in an era of not knowing exactly what we don't know about rural health in New Zealand.

Table 2: Comparison of the rural population as defined by Statistics New Zealand and the population actually accessing rural health care.

	Statistics NZ (current)	**Approximation of actual population accessing rural healthcare**
URBAN	Major Urban 2,892,810(72%)	Major Urban 2,892,810(72%)
	Satellite Urban 128,094 (3.2%)	Satellite Urban 128,094 (3.2%)
	Independent Urban 440,000 (10.9%)	Independent Urban with DHB 'base' hospital ≈100,000 (2.4%)
		Rural with high urban influence 124,251 (3.1%)
	sub-total 86%	**sub-total 81%**
RURAL	Rural with high urban influence* 124,251 (3.1%)	Independent Urban without DHB 'base' hospital* ≈340,000 (8.5%)
	Rural with moderate urban influence 154,968 (3.8%)	Rural with moderate urban influence 154,968 (3.8%)
	Rural with low urban influence 220,470 (5.5%)	Rural with low urban influence 220,470 (5.5%)
	Highly Rural/Remote 64,182 (1.6%)	Highly Rural/Remote 64,182 (1.6%)
	sub-total 14%	**sub-total 19%**
	**Up to 22% (124,251/563,871) of people currently described as rural probably usually receive urban health services*	**Over 43% (340,000/779,620) people who actually use rural health services are classified as urban under the current definition*

Figures represent 2006 population numbers (percentage of total New Zealand population). Corresponding numbers from 2013 census not yet available on SNZ website. Sub-totals are rounded.

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Nil.

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