Deprived yet healthy: Neighbourhood-level resilience in New Zealand

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ABSTRACT

Geographical inequalities in health are omnipresent with health and related behaviours typically worse in socioeconomically deprived places. However, this is not always true. Deprived places with unexpectedly good health outcomes, or what might be considered 'resilient' places, have been noted. Few studies have quantitatively examined resilience in neighbourhoods or investigated potential explanations for this resilience. This paper examines the paradox of low mortality despite high social deprivation in New Zealand neighbourhoods and considers possible neighbourhood characteristics that contribute to unanticipated positive health outcomes. Using area-level mortality (2005–2007) and socioeconomic data, we developed the Resilience Index New Zealand to quantify neighbourhood levels of resilience across the country. We then examined relationships between this measure and a suite of built, physical and social characteristics. We found that resilient places tended to be densely populated, urban areas. We observed gradients and increases/decreases in the most resilient groups in access to or levels of physical environment factors (environmental deprivation, safe drinking water, air quality) and unhealthy living infrastructure (alcohol and gambling outlets). Since these factors are amenable to change, these findings are the strongest evidence that such improvements may lower mortality in similarly deprived places. The social environment of resilient areas was characterised by high levels of incoming residents. We also found some surprising associations and observed U-shaped relationships for a number of the neighbourhood factors. Such findings suggest the need to develop a better proxy of community cohesion and a better understanding of the interactions between people and their neighbourhoods, rather than simply the presence of certain factors. We argue that this study has identified amenable neighbourhood characteristics and highlighted the importance of 'place-specific' resilience factors that may be effective in reducing mortality in some neighbourhoods, but be less effective in others.

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Introduction

Geographical and social inequalities in health have been identified in many countries, including New Zealand (Pearce, Witten, & Bartie, 2006). Socioeconomically deprived places tend to have less favourable health outcomes and health-related behaviours (Chan et al., 2008; Haynes, Pearce, & Barnett, 2008; Richardson, Blakely, Young, Graham, & Tobias, 2009; Tobias & Cheung, 2003). Evidence also suggests that the gradient in health is growing (Pearce & Dorling, 2009; Wilkinson, 2005). It is argued that much of the socio-spatial distribution to health inequalities relates to rising social and economic inequalities within neoliberal economics which not only directly affect population health, but have also resulted in rising social segregation, decreased social capital, and the increasingly uneven distribution of environmental goods and bads (Wilkinson & Pickett, 2009).

Despite rising inequalities, it has been posited that there are neighbourhoods with unexpectedly good health outcomes regardless of their disadvantageous settings, or what might be considered 'resilient' neighbourhoods. Although sometimes a nebulous concept, resilience has been defined as the internal ability or coping capacity to recover from or adapt to harmful stressors to a system (Kasperson, Turner, Schiller, & Hsieh, 2002). Resilience entails both a level of adversity and an unanticipated, positive result. Psychology has long employed the concept of resilience and studies have argued that resilience at individual and group levels can be a key factor in managing significant stressors (Hegney et al., 2007), including deprivation. In this way, deprivation acts as a source of adversity to overcome. Research has identified characteristics that make individuals more likely to be healthy, despite living in deprived areas, including cognitive skills (Garmezy, 1991), family and community support, self-esteem

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(Canvin, Marttila, Burstromb, & Whitehead, 2009), and optimism (Connor & Davidson, 2003). In addition, researchers are beginning to explore the neighbourhood characteristics that influence area-level resilience. Theoretically, one might be resilient through two pathways: 1) the neomaterial; and 2) the psychosocial. Through the neomaterial perspective, even very deprived areas may be rich in access to amenities, social capital, and environmental resources which lead to health benefits. Through the psychosocial perspective, some deprived groups may avoid comparison with more advantaged groups in society, and thereby sidestep associated poor health such as depression and chronic stress (Sweet, 2011). These pathways are not mutually exclusive. Drawing on an 'assets-based' model of health, it is feasible that some socially deprived neighbourhoods may, despite their otherwise poor social circumstances, provide a 'healthy' environment such as better access to health care facilities, healthy food options, an urban infrastructure that is supportive for physical activity, cohesion and integration, and high levels of voting or volunteering. Neighbourhoods with a particular combination of population groups may also provide a positive social context, in that they lack segregation or fragmentation. We theorise that these neighbourhood characteristics may strengthen resilience.

Neighbourhood resilience research represents a small proportion of the broader neighbourhoods and health literature and work to date has been restricted to the United Kingdom (UK). These studies define resilience or 'overachieving' in terms of better mental health, lower mortality or better life expectancy than estimated given the level of deprivation. One study identified significantly lower age-specific mortality rates in places with persistent economic disadvantage, relative to places with similarly deprived histories (Tunstall, Mitchell, Gibbs, Platt, & Dorling, 2007). Other studies have identified associated characteristics of resilient neighbourhoods such as low percentages of non-western immigrants, low percentages of elderly people (van Hooijonk, Droomers, van Loon, van der Lucht, & Kunst, 2007), low community turnover, low percentages of single-parent households (Wandersman & Nation, 1998), attracting new residents (Mitchell, Gibbs, Tunstall, Platt, & Dorling, 2009) and not being located in major urban fringe (Doran, Drever, & Whitehead, 2006). A weakness of these studies was the large population size of the area units investigated, with one study having as many as one million people per unit and others having an average of 90,000 people. While this scale may be suitable for assessing population health impacts of policy, this level of aggregation discounts smaller-scale characteristics of the built, physical or social environments, thus missing more localised processes of resilience. Our study fills an important gap by evaluating resilience at a finer geographic scale, where processes and practices that are rooted in neighbourhoods may be more pertinent in explaining resilience.

Research on the health-promoting or health-hindering aspects of areas of residence has expanded dramatically over the last decade. Aspects of the neighbourhood which may impact the ability of residents to live healthy lives have been conceptualized as 'opportunity structures' (Macintyre & Ellaway, 2000). The geographical locations of such public goods are often determined by local planning and policy. Implicit in the provision of such public goods is a belief that they are beneficial to residents' well-being (Witten, Exeter, & Field, 2003). Thus, modifications to these neighbourhood characteristics are often seen as a way to reduce poor health outcomes and health inequalities, particularly in poor areas.

A wide range of neighbourhood characteristics have been identified which affect individual or community health, although not consistently. There are three broad (and overlapping) areas of investigation, the built, physical and social environments. These features may directly impact health via harmful exposures or by influencing health-related behaviours. Often degraded or harmful environments within these three realms coincide with deprived areas. For example, deprived groups are exposed to higher levels of air pollutants (Næss, Piro, Nafstad, Smith, & Leyland, 2008), contaminated waste sites (Salmond, Howden-Chapman, Woodward, & Salmond, 1999), and poorer drinking water quality (Hales, Black, Skelly, Salmond, & Weinstein, 2003), which are associated with poor health. While this may be true in a number of deprived neighbourhoods, the question is whether some features of the built, physical and social environment have the potential to bolster health despite high levels of deprivation. For example, social conditions of neighbourhoods may be beneficial, especially in poor areas, to respond to or sidestep some of the negative effects of deprivation including access to social support systems and social contexts which nurture healthy behaviours and prevent psychosocial stress (Congdon, 1996; Everson-Rose et al., 2011). Thus, using the neomaterial perspective, features of neighbourhood built, physical and social environments may be positive influences on, or create opportunities for, health even in very deprived places.

Our research examines the apparent paradox of low mortality despite high deprivation in neighbourhoods in New Zealand and considers associated neighbourhood characteristics. First, we identified areas with better or worse health than expected, to create a Resilience Index New Zealand (RINZ) that quantifies levels of resilience for each neighbourhood. Then, we used the RINZ to examine relationships with neighbourhood characteristics of the built, physical and social environments.

Data and methods

This study evaluated resilience in small areas in New Zealand, utilising 2006 census area units (CAUs), which are suitable approximates of a neighbourhood (n = 1919; mean population c.2000), and the spatial unit for which health data are routinely released. To quantify a Resilience Index New Zealand (RINZ), we identified CAUs which have unexpectedly high to low mortality, given levels of deprivation, percentage Māori and the number of aged care facilities. We fitted regression models and detected areas of model under- and over-prediction. Then, we used the RINZ to examine relationships with neighbourhood characteristics.

Deprivation data

Our area-level indicator of deprivation was the New Zealand Deprivation Index (NZDep) which comprised nine variables (e.g. employment, home and car ownership, and uptake of government assistance programs) taken from the 2006 census (Crampton, Salmond, & Kirkpatrick, 2004). NZDep has been associated with a number of health outcomes including cardiovascular disease (Chan et al., 2008), lower life expectancy (Tobias & Cheung, 2003), increased cervical cancer (McFadden, McConnell, Salmond, Crampton, & Fraser, 2004), and diabetes in New Zealand Europeans (Joshy et al., 2009). The NZDep scores were ranked to create deciles (1 = least deprived 10% of CAUs).

Health, population and confounder data

To generate mortality rates, we compiled 2006 census data for the usually resident population and all-cause mortality counts (smoothed by averaging 2005–2007) by six age-sex groups (males and females aged 0–4, 5–24, 25–44, 45–64, 65–84, and 85 years and over). As these data are publicly available, anonymised records, no ethical approval was required. In addition, we obtained CAU census-based percentage Māori and address locations for all aged care facilities from the Ministry of Health. Addresses were