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Article

Fast food restaurant locations according to socioeconomic disadvantage, urban–regional locality, and schools within Victoria, Australia



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ABSTRACT

Features of the built environment provide opportunities to engage in both healthy and unhealthy behaviours. Access to a high number of fast food restaurants may encourage greater consumption of fast food products. The distribution of fast food restaurants at a state-level has not previously been reported in Australia. Using the location of 537 fast food restaurants from four major chains (McDonald's, KFC, Hungry Jacks, and Red Rooster), this study examined fast food restaurant locations across the state of Victoria relative to area-level disadvantage, urban–regional locality (classified as Major Cities, Inner Regional, or Outer Regional), and around schools. Findings revealed greater locational access to fast food restaurants in more socioeconomically disadvantaged areas (compared to areas with lower levels of disadvantage), nearby to secondary schools (compared to primary schools), and nearby to primary and secondary schools within the most disadvantaged areas of the major city region (compared to primary and secondary schools in areas with lower levels of disadvantage). Adjusted models showed no significant difference in location according to urban–regional locality. Knowledge of the distribution of fast food restaurants in Australia will assist local authorities to target potential policy mechanisms, such as planning regulations, where they are most needed.

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Background

In recent years, there has been growing attention paid by researchers, land-use planners and policymakers to the number and types of food stores within neighbourhoods (Caspi, Sorensen, Subramanian & Kawachi, 2012; Fraser, Edwards, Cade & Clarke, 2010; Kent & Thompson, 2014; Ni Mhurchu et al., 2013; Story, Kaphingst, Robinson-O'Brien & Glanz, 2008). Environmental justice theories posit that communities experiencing greater levels of disadvantage have a disproportionate distribution of “good” and “bad” environmental features (Schlosberg, 2007). To understand the impact of these contextual injustices, epidemiological studies have sought to understand how neighbourhood-level food access may contribute to individuals' diet and health (Caspi et al., 2012; Giskes, van Lenthe, Avendano-Pabon & Brug, 2011; Ni Mhurchu et al., 2013).

Two recent reviews point to a number of studies that have focused specifically on the location of fast food restaurants, and identified characteristics of areas with high exposure to the

expanding fast food industry (Fleischhacker, Evenson, Rodriguez & Ammerman, 2011; Fraser et al., 2010). Whilst definitions of a fast food restaurant have varied, with few exceptions, large-scale studies on fast food restaurant locations by socioeconomic characteristics have shown that these restaurants are more accessible in areas with greater socioeconomic disadvantage (Cummins, McKay & Macintyre, 2005; Macdonald, Cummins & Macintyre, 2007; Pearce, Blakely, Witten & Bartie, 2007; Powell, Chaloupka & Bao, 2007).

Only ten of the forty previously reviewed studies of fast food restaurant locations considered both urban and rural areas, again noting that the definition of what constitutes an urban or rural area varies (Fleischhacker et al., 2011). A nationwide study in the US found that compared to urban areas, fast food chains were more abundant in suburban areas but were less prevalent in rural regions (Powell et al., 2007). In New Zealand, meshblocks (small geographic unit with approximately 100 people) within the urban setting were located a median distance of 2 km from the nearest multinational fast food restaurant compared to a median distance of 31 km from meshblocks located in rural locations (Pearce et al., 2007).

Fast food restaurant access around schools has been examined in a number of studies, particularly in the US (Austin et al., 2005; Simon, Kwan, Angelescu, Shih & Fielding, 2008; Sturm, 2008;

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Walker, Block & Kawachi, 2014; Zenk & Powell, 2008). Secondary schools are generally reported to have greater access to fast food restaurants than schools with younger children attending (Simon et al., 2008; Sturm, 2008; Zenk & Powell, 2008). Similar to findings from studies focused on neighbourhood-level access, larger-scale studies have found fast food restaurants to be more accessible to schools located in lower income neighbourhoods and in urban areas, compared with higher income or rural neighbourhoods (Pearce et al., 2007; Zenk & Powell, 2008).

Studies previously conducted in Australia have also demonstrated greater access to fast food restaurants in more disadvantaged areas (Burns & Inglis, 2007; Reidpath, Burns, Garrard, Mahoney & Townsend, 2002). Reidpath and colleagues undertook the first study that investigated fast food restaurant locations within an Australian context, exploring the distribution across Melbourne (Australia's second largest city) (Reidpath et al., 2002). Data were collected at the postcode level on the number of fast food franchises from Australia's five largest chains (McDonald's, Pizza Hut, Kentucky Fried Chicken, Red Rooster, and Hungry Jack's). Results showed that the lowest income postcodes had 2.5 times more fast food restaurants per person compared to the highest income postcodes (Reidpath et al., 2002). In another study undertaken in the outer fringe of Melbourne, Burns and Inglis (2007) reported shorter travel times to the nearest fast food restaurant for those living in the most disadvantaged areas; however this study was limited to a single Local Government Area (LGA) and edge effects (i.e. stores outside of the LGA boundary) were not considered. Another Victorian study found a greater number of fast food restaurants in urban compared to rural areas (Thornton et al., 2012a), but that study focused only on areas with higher levels of socioeconomic disadvantage. Elsewhere in Australia, Turrell and Giskes (2008) found that residents of the most disadvantaged neighbourhoods tend to live more proximally to major fast food chains, but the number of stores per population did not differ by area-level disadvantage. To our knowledge, fast food restaurant location around schools has yet to be investigated in Australia.

Greater access to fast food chains translates into an environment with increased opportunities to purchase and consume such items (Brug, 2008; Thornton, Bentley & Kavanagh, 2009). As governments at the Federal, state, and local levels strive to find new ways to improve population health outcomes, a growing amount of attention has been directed towards potential environmental-level factors that may contribute to detrimental health. Whilst a number of other countries have produced large scale investigations on fast food restaurant distribution (Cummins et al., 2005; Macdonald et al., 2007; Maddock, 2004; Mehta & Chang, 2008; Pearce et al., 2007; Pearce, Hiscock, Blakely & Witten, 2009; Powell

et al., 2007; Zenk & Powell, 2008), Australia to date has not. Given the current interest among researchers and policy makers in aspects of the built environment that potentially contribute to obesity, it is timely to update prior findings that have thus far been limited in scope. The present study includes a comprehensive assessment of the location of four of Australia's largest fast food chains across the whole state of Victoria, Australia. Fast food restaurant locations are considered at two geographic levels and assessed in relation to area-level disadvantage, urban/regional location, and around schools. This study concludes by offering insights into planning and policy mechanisms that may help control the proliferation of fast food restaurants within vulnerable communities.

Methods

Study area and geographic units

This study was conducted within the state of Victoria, Australia, the second most populous state (5,841,700 people as of June 2014; ~25% of the total Australian population (Australian Bureau of Statistics, 2014a)). Two geographic units were considered in this study: (1) Statistical Area Level 2 (SA2); and (2) Local Government Area (LGA). SA2s correspond to a boundary for which census data is released and therefore can be used to guide the provision of community services. LGAs relate to geographic areas that have the regulatory authority over local planning decisions. Population and geographic descriptors related to these two administrative units are presented in Table 1.

Fast food restaurant locations

Based on market research (Franchise Business, 2014), four leading fast food chains were chosen for this study: (1) McDonald's (ranked 1st for popularity; average of 2.7 visits per customer over 4 weeks; over 900 Australian stores); (2) KFC (ranked 2nd; average 1.9 visits; over 600 Australian stores); (3) Hungry Jacks (ranked 4th; average 2.2 visits; over 340 Australia stores); and (4) Red Rooster (ranked 6th; average 1.8 visits; over 360 Australian stores).

Reidpath et al. (2002) previously investigated these same four chains within Melbourne in addition to Pizza Hut. In the present study, Pizza Hut (ranked seventh) and Domino's Pizza (ranked fifth) were excluded since there are many other competing pizza outlets (chain and non-chain) in Victoria and as these stores often offer home delivery, location is of less relevance than for stores that can only be accessed by visiting. A further point of difference

Table 1
Description of study areas.

	Statistical Area Level 2 (SA2) <i>n</i> = 422 ^a				Local Government Area (LGA) <i>n</i> = 79			
	Percentage of areas with FF restaurant present	Mean (s.d.)	Median (IQR)	Min–max	Percentage of areas with FF restaurant present	Mean (s.d.)	Median (IQR)	Min–max
Fast food (FF) restaurants	52.1	1.2 (1.6)	1 (0–7)	0–9	77.2	6.8 (7.6)	4 (0–26)	0–33
Population size		12,620 (6716)	11,466 (7201–17,248)	77–38,328		67,660 (60,410)	41,842 (15,953–111,312)	2995–252,347
Geographic area (km ²)		525.6 (1709.9)	18.3 (6.3–153.9)	1.3–21,570		2876 (3963)	1533 (114–4047)	8.6–22,083
Proportion of the population aged < 25 years		31.5 (4.7)	31 (29–35)	15–51		30.7 (3.7)	31 (28–34)	21–38

^a *n* based on areas without missing IRSD values and excluding Melbourne CBD and Melbourne Airport.

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