

BRIEF REPORT

Does fast-food outlet density differ by area-level disadvantage in metropolitan Perth, Western Australia?

Abstract

Issue addressed: Socio-economic spatial patterning of fast-food outlets can result in disparities in the availability and access of food across geographic areas, contributing to health inequalities. This study investigated whether area-level socio-economic disparities exist in fast-food availability across the Perth metropolitan region of Western Australia.

Methods: Fast-food outlet locations were sourced from Perth Local Governments in 2018/2019. All Perth suburbs ($n = 328$) were allocated a decile ranking based on the Australian Bureau of Statistics Socio-Economic Index for Areas with decile 1 indicating relatively greater disadvantage and decile 10 indicating a relative lack of disadvantage. Zero-inflated negative binomial regression models, adjusted for suburb area and population density, were used to investigate the association between area-level disadvantage decile and availability of fast-food outlets.

Results: A socio-economic gradient was identified; for every unit increase in disadvantage decile (ie a reduction in relative disadvantage), the count of fast-food outlets decreased by 6% ($P < .01$), and the count of the “top ranking” fast-food chains (ie McDonalds, KFC, Hungry Jacks and Red Rooster) decreased by 10% ($P < .001$).

Conclusions: Consistent with evidence internationally and from within Australia, socio-economic spatial patterning of fast-food outlet availability was shown to exist in Perth, with greater fast-food availability in areas with more relative socio-economic disadvantage.

So what?: To address health inequities associated with fast-food consumption, policy and practice changes are needed that manage fast-food outlet proliferation in areas of greater socio-economic disadvantage.

1 | INTRODUCTION

Fast-food outlets typically provide energy-dense and nutrient poor meals, high in added salt, sugar and saturated fat.^{1,2} From market research on the percent of Australian's visiting outlets within a 6 months period, the four leading fast-food chains are McDonalds (52.7%), KFC (40.8%), Hungry Jacks (29.0%) and Red Rooster (16.3%).³ In 2018, 30.5% of West Australian adults ate meals from fast-food outlets at least once per week.⁴ With consumption of fast-food linked to obesity and other nutritional related chronic disease,² there is growing concern that the increased availability of fast-food outlets may be contributing to the rising prevalence of obesity.

Studies examining trends in retail mix over-time suggest fast-food outlets are increasing in greater numbers compared to healthier food outlets, such as supermarkets and greengrocers.^{5,6} There is also evidence of increased availability of fast-food outlets compared to healthier food outlets. For example, in the Perth metropolitan region of Western Australia, the number of fast-food outlets per 1000 population outweighed the number of healthy food outlets by a ratio of 3-to-1 (ie 1.4 to 0.5 per 1000 population).⁷ Increased availability of fast-food outlets increases the opportunities to purchase and consume fast-food, which in turn contributes to poorer health outcomes.⁸ Indeed, Australians are spending an increasing proportion of their household income on fast-foods; in 1988-1989 25% of the weekly food and beverage budget was spent on fast-foods compared to 34% in 2015-2016.⁹

Evidence also suggests there is greater exposure to fast-food outlets in areas of lower socio-economic status (SES) within Australia¹⁰⁻¹³ and internationally.¹⁴⁻¹⁶ However, the Australian data are limited to Victoria, Brisbane and Sydney. Currently, there has been no comprehensive assessment of fast-food outlet availability in relation to area-level SES across the Perth metropolitan region. Therefore, this study aimed to determine whether area-level socio-economic disparities exist in fast-food availability across Perth. Contextually specific evidence on the spatial patterning of fast-food outlets will assist public health authorities and policy makers to target appropriate interventions, such as planning regulations, where they are needed most.

2 | METHODS

Data on the location of all fast-food outlets (ie where food is ordered at the counter, served immediately and can be eaten without cutlery [eg burger, ice-cream, donut and pizza shops]) were sourced from each Perth metropolitan Local Government (n = 38) in 2018/2019. All suburbs that fell within the Perth metropolitan region (n = 328) were allocated an area-level disadvantage decile ranking based on the Australian Bureau of Statistics (ABS) Socio-Economic Index for Areas (SEIFA) Index of Relative Socioeconomic Disadvantage (IRSD). Decile 1 indicates suburbs with relatively greater disadvantage (eg many people with no qualifications or low skilled occupations, less car ownership), whereas decile 10 indicates a relative lack of disadvantage (eg few people with no qualifications or low skilled occupations, greater car ownership). The area in square kilometres of each suburb and population density (per square kilometre computed as the total population/total suburb area) was also obtained from the 2016 ABS census.¹⁷

2.1 | Statistical analyses

The total number of all fast-food outlets combined as well as the total count of the top-ranking fast-food chains (ie McDonalds, KFC, Hungry Jacks and Red Rooster)³ were identified. The mean and standard deviations were computed by area-level disadvantage decile. A zero-inflated negative binomial regression model examined whether area-level disadvantage decile was associated with the count of all fast-food outlets/top-ranking fast-food chains within suburbs. Analyses were adjusted for population density and suburb area (km²).

3 | RESULTS

Table 1 shows the distribution of all suburbs across the Perth metropolitan region (n = 328) from each area-level disadvantage decile with the mean count of all fast-food outlets and top-ranking fast-food chains within suburbs by area-level disadvantage decile.

There was a negative association between area-level disadvantage decile and count of fast-food outlets (incident rate ratio: 0.94 (0.89-0.98); P-value: .0085; odds: 0.18) and count of top-ranking fast-food chains (incident rate ratio: 0.90 (0.85-0.95); P-value: .0002; odds: 0.11). Specifically, for every unit increase in disadvantage decile (ie a reduction in relative disadvantage), the count of fast-food outlets decreased by 6% (P < .01), and the count of the “top ranking” fast-food chains (ie McDonalds, KFC, Hungry Jacks and Red Rooster) decreased by 10% (P < .001).

4 | DISCUSSION

This study found the availability of fast-food outlets within the Perth metropolitan region to be greater in areas with relatively greater disadvantage. These findings are consistent with other Australian¹⁰⁻¹³ and international¹⁴⁻¹⁶ literature which suggests a “concentration effect” whereby there are more fast-food outlets in areas experiencing greater disadvantage.

Living in more disadvantaged areas, with greater exposure to fast-food, may lead to increased acceptance of fast-food and the normalising of fast-food intake among residents. Furthermore, individuals with lower levels of income, education and employment are more likely to frequently purchase fast-foods.¹⁸ This may be compounded by the fact that area-level disadvantage is also associated with lower levels of car ownership,¹⁹ which facilitates a greater reliance on the immediate neighbourhood facilities. Indeed, households experiencing financial and physical barriers were found to more frequently purchase fast-food²⁰ and this may be due to its convenience and affordability. Moreover, the combination of low socio-economic status, and high fast-food outlet exposure has been shown to amplify the odds of obesity. For example, one study found that greater fast-food consumption, body mass index, and odds of obesity were associated with greater fast-food outlet exposure and a lower educational level in UK adults.²¹ Thus, increased densities of fast-food outlets in areas of disadvantage could further aggravate health inequalities.

SEIFA decile	Number of suburbs	Mean (SD) count of fast-food outlets	Mean (SD) count of top-ranking fast-food chains
1 (most disadvantaged)	27	10.81 (14.58)	1.15 (1.63)
2	26	8.00 (11.59)	0.96 (1.64)
3	32	5.69 (5.81)	0.50 (0.98)
4	31	7.77 (8.68)	1.19 (1.62)
5	15	8.93 (17.94)	0.27 (0.46)
6	35	6.57 (11.89)	0.77 (1.24)
7	27	10.74 (25.25)	0.89 (1.80)
8	41	7.07 (10.80)	0.46 (0.90)
9	34	5.44 (5.90)	0.32 (0.59)
10 (least disadvantaged)	60	4.38 (7.56)	0.43 (0.83)

TABLE 1 Mean (SD) count of fast-food outlets and top-ranking fast-food chains in the Perth metropolitan region by area-level disadvantage decile

Reasons behind the greater availability of fast-food outlets in disadvantaged areas in Perth may be related to economic drivers and planning and zoning practices. For example, lower land values and rents in disadvantaged areas make them appealing to businesses, particularly if they are proximate to higher demand populations.²² Indeed, fast-food businesses are likely to strategically target areas where fast-food consumption is higher. There are also no current planning and zoning policies regulating fast-food outlets in disadvantaged areas in Perth.²³ Internationally, efforts have been made to limit fast-food exposure through urban planning measures. For example, in 2008 the Los Angeles City Council approved a 1-year moratorium on the opening of new fast-food establishments in low-income neighbourhoods with an already high fast-food density and in 2011 extended the moratorium indefinitely.²⁴ Future research should evaluate the use of planning and zoning policies in reducing the observed inequalities in fast-food access and the public health benefits of these regulatory measures.

Strengths of this study include use of food outlet location data sourced from local governments, which has been shown to be more reliable than other secondary sources such as online commercial databases and business directories.²⁵ It is limited by its focus on Perth as opposed to areas outside of the metropolitan region. Nevertheless, this study has provided important evidence which could be used to inform future land use policies aimed at influencing the location of new fast-food outlets in Perth.

KEYWORDS

Australia, fast-food, food environment, health, socio-economic disadvantage

ACKNOWLEDGMENTS

We would like to acknowledge Healthway and Cancer Council Western Australia for funding this research.

CONFLICT OF INTEREST

The authors declare they have no conflicts of interest.

ETHICS APPROVAL

This study did not involve research on humans, thus human research ethics approval was not necessary for this research. The University of Western Australia Human Research Ethics Committee (HREC) deemed this study as exempt from HREC review (reference number: 2019/RA/4/1/6524).

FUNDING INFORMATION

This study was funded by a Healthway Research Exploratory Grant (#32981) and Cancer Council Western Australia as part of its Rapid Obesity Policy Translation Program. Dr Trapp is supported by an Australian Research Council DECRA Fellowship (DE210101791). Dr Hooper is supported by a Healthway Research Fellowship (32892).

Gina S. A. Trapp^{1,2} 

Paula Hooper³ 

Lukar Thornton⁴

Kelly Kennington⁵

Ainslie Sartori⁵

Wesley Billingham¹

Alexia Bivoltsis¹ 

¹Telethon Kids Institute, Perth Children's Hospital, Nedlands, Western Australia, Australia

²School of Population and Global Health, The University of Western Australia, Nedlands, Western Australia, Australia

³The Australian Urban Design Research Centre (AUDRC), School of Design, The University of Western Australia, Nedlands, Western Australia, Australia

⁴Department of Marketing, Faculty of Business and Economics, University of Antwerp, Antwerp, Belgium

⁵Cancer Council Western Australia, Subiaco, Western Australia, Australia

Handling editor: Jonathan Hallett

Correspondence

Gina S. A. Trapp, Telethon Kids Institute, The University of Western Australia, PO Box 855, West Perth, Western Australia 6872, Australia.

Email: gina.trapp@telethonkids.org.au

ORCID

Gina S. A. Trapp  <https://orcid.org/0000-0001-8529-4260>

Paula Hooper  <https://orcid.org/0000-0003-4459-2901>

Alexia Bivoltsis  <https://orcid.org/0000-0001-9895-3624>

REFERENCES

- Wellard-Cole L, Hooper A, Watson WL, Hughes C. Nutrient composition of Australian fast-food and fast-casual children's meals available in 2016 and changes in fast-food meals between 2010 and 2016. *Public Health Nutr.* 2019;22(16):2981–8.
- Jaworowska A, Blackham T, Davies IG, Stevenson L. Nutritional challenges and health implications of takeaway and fast food. *Nutr Rev.* 2013;71(5):310–818.
- Roy Morgan. Australia. 2018 May 29 [cited 2021 March 9]. McDonald's, KFC & Subway most visited Aussie restaurants. Available from: <http://www.roymorgan.com/findings/7599-australian-eating-habits-eating-in-out-march-2018-201805290253>
- Radomiljac A, Davies C, Landrigan T. Health and Wellbeing of Adults in Western Australia 2018, Overview and Trends. Australia: Department of Health; 2019. Available from: https://ww2.health.wa.gov.au/-/media/Files/Corporate/Reports-and-publications/Population-surveys/The-Health-and-Wellbeing-of-Adults-in-WA_2018.pdf
- James P, Seward MW, O'Malley AJ, Subramanian SV, Block JP. Changes in the food environment over time: examining 40 years of data in the Framingham Heart Study. *Int J Behav Nutr Phys Act.* 2017;14(1):1–9.

6. Bivoltsis A, Trapp G, Knuiman M, Hooper P, Ambrosini GL. The evolution of local food environments within established neighbourhoods and new developments in Perth, Western Australia. *Health Place*. 2019;57:204–17.
7. Miller LJ, Joyce S, Carter S, Yun G. Associations between childhood obesity and the availability of food outlets in the local environment: a retrospective cross-sectional study. *Am J Health Promot*. 2014;28(6):e137–e145.
8. Fraser LK, Edwards KL, Cade J, Clarke GP. The geography of fast food outlets: a review. *Int J Environ Res Public Health*. 2010;7(5):2290–308.
9. Australian Bureau of Statistics (ABS). 6530.0 – Household Expenditure Survey, Australia: Summary of Results, 2015–2016. Canberra: ABS; 2017. Available from: <http://www.abs.gov.au/ausstat/bs@ns/ooku/530.0main+features12015-16>
10. Burns CM, Inglis AD. Measuring food access in Melbourne: access to healthy and fast foods by car, bus and foot in an urban municipality in Melbourne. *Health Place*. 2007;13(4):877–85.
11. Reidpath DD, Burns C, Garrard J, Mahoney M, Townsend M. An ecological study of the relationship between social and environmental determinants of obesity. *Health Place*. 2002;8(2):141–5.
12. Astell-Burt T, Feng X. Geographic inequity in healthy food environment and type 2 diabetes: can we please turn off the tap? *Med J Aust*. 2015;203(6):246–8.
13. Thornton LE, Lamb KE, Ball K. Fast food restaurant locations according to socioeconomic disadvantage, urban–regional locality, and schools within Victoria, Australia. *SSM-Popul Health*. 2016;2:1–9.
14. Maguire ER, Burgoine T, Monsivais P. Area deprivation and the food environment over time: a repeated cross-sectional study on takeaway outlet density and supermarket presence in Norfolk, UK, 1990–2008. *Health Place*. 2015;33:142–7.
15. Pearce J, Blakely T, Witten K, Bartie P. Neighborhood deprivation and access to fast-food retailing: a national study. *Am J Prev Med*. 2007;32(5):375–82.
16. Powell LM, Chaloupka FJ, Bao Y. The availability of fast-food and full-service restaurants in the United States: associations with neighborhood characteristics. *Am J Prev Med*. 2007;33(4):S240–5.
17. Australian Bureau of Statistics (ABS). 2016 Census QuickStats. Available from: <https://quickstats.censusdata.abs.gov.au>
18. Thornton LE, Bentley RJ, Kavanagh AM. Individual and area-level socioeconomic associations with fast food purchasing. *J Epidemiol Community Health*. 2011;65(10):873–80.
19. Johnson V, Currie G, Stanley J. Measures of disadvantage: is car ownership a good indicator? *Soc Indic Res*. 2010;97(3):439–50.
20. Burns C, Bentley R, Thornton L, Kavanagh A. Associations between the purchase of healthy and fast foods and restrictions to food access: a cross-sectional study in Melbourne, Australia. *Public Health Nutr*. 2015;18(1):143–50.
21. Burgoine T, Forouhi NG, Griffin SJ, Brage S, Wareham NJ, Monsivais P. Does neighborhood fast-food outlet exposure amplify inequalities in diet and obesity? A cross-sectional study. *Am J Clin Nutr*. 2016;103(6):1540–7.
22. Yang Y, Roehl WS, Huang JH. Understanding and projecting the restaurantscape: the influence of neighborhood sociodemographic characteristics on restaurant location. *Int J Hosp Manag*. 2017;67:33–45.
23. Sacks G, Robinson E; for the Food-EPI Australia project team. Policies for tackling obesity and creating healthier food environments: 2019 progress update. Melbourne: Deakin University; 2019.
24. Sturm R, Hattori A. Diet and obesity in Los Angeles County 2007–2012: Is there a measurable effect of the 2008 “Fast-Food Ban”? *Soc Sci Med*. 2015;133:205–11.
25. Fleischhacker SE, Evenson KR, Sharkey J, Pitts SB, Rodriguez DA. Validity of secondary retail food outlet data: a systematic review. *Am J Prev Med*. 2013;45(4):462–73.

How to cite this article: Trapp GSA, Hooper P, Thornton L, Kennington K, Sartori A, Billingham W, et al. Does fast-food outlet density differ by area-level disadvantage in metropolitan Perth, Western Australia? *Health Promot J Austral*. 2022;00:1–4. <https://doi.org/10.1002/hpja.597>