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Geographic proximity of pharmacies and supermarkets in Australia: a national spatial analysis

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Short Report

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Abstract

Introduction

A recent Australian health report proposed allowing pharmacies to operate within supermarkets to improve convenience, competition and medicine access. The existing geographic relationship between pharmacies and supermarkets has not been well characterised.

Aim

To quantify the geographic proximity of Australian pharmacies and supermarkets and examine variation by remoteness.

Method

Pharmacy locations were obtained from the National HealthDirect Health Facilities dataset and supermarket locations from OpenStreetMap. Straight-line distances were calculated from each pharmacy to the nearest supermarket and vice versa. Results were stratified by Modified Monash Model (MMM) 2023 category. We calculated the proportion of supermarkets with one, two or at least three pharmacies within 1 km. Sensitivity analysis used the nearest pharmacy identified in either dataset. Analyses were descriptive and not population weighted.

Results

The analysis included 5,526 pharmacies and 5,548 supermarkets. Across MM1-MM5 ((metropolitan areas, regional centres and rural towns), median distances in either direction ranged from 94 to 151 m

and 80.0% to 92.5% were within 1 km of the other business type. In MM6 (remote communities), median pharmacy-to-supermarket and supermarket-to-pharmacy distances were 102 m and 419 m, respectively; in MM7 (very remote communities) they were 175 m and 65.2 km. In MM7, 75.5% of pharmacies were within 1 km of a supermarket, compared with 36.1% of supermarkets within 1 km of a pharmacy. At least two pharmacies were located within 1 km of 63.4% of metropolitan (MMM1) supermarkets, 11.2% of MM6 supermarkets and 2.7% of MM7 supermarkets. In the sensitivity analysis, the median supermarket-to-pharmacy distance in MM7 was 20.2 km and 43.5% of supermarkets were within 1 km of a pharmacy.

Conclusion

Pharmacies and supermarkets were geographically close throughout metropolitan, regional and most rural Australia. Supermarket co-location is therefore unlikely to substantially improve medicine access in these areas. In very remote communities, many supermarkets were not close to a pharmacy, despite most pharmacies being near a supermarket. However, existing pharmacist workforce constraints may limit the feasibility of supermarket-based pharmacies, regardless of location.

Keywords

community pharmacy; supermarkets; geographic accessibility; rural health; spatial analysis; Modified Monash Model

Impact statement

- Pharmacies and supermarkets are typically located within a few hundred metres of each other across metropolitan, regional and most rural Australia.
- The spatial relationship was most divergent in very remote areas, where many supermarkets had no nearby pharmacy.
- Any geographic access benefit from supermarket-based pharmacy models would depend on whether additional pharmacies are established in communities that currently lack nearby pharmacy services.

Introduction

Australia's Pharmacy Location Rules set location-based criteria for establishing and relocating pharmacies approved to supply Pharmaceutical Benefits Scheme medicines[1]. A 2026 Grattan Institute report proposed removing these restrictions, including allowing pharmacies to operate within supermarkets, as part of a broader package intended to increase competition and consumer choice[2].

Supermarkets are already recognised within Australia's pharmacy location framework. Under specified circumstances, the current rules allow new pharmacies to be established closer to existing pharmacies when criteria involving supermarkets and medical practices are met[1]. Proposed reforms would go further by allowing pharmacies to operate within supermarkets[2].

Geographic accessibility is one component of access to medicines. International research indicates that pharmacy accessibility varies by population characteristics and rural or urban location, and pharmacy density is one indicator of geographic accessibility[3]. Recent Australian research has demonstrated substantial variation in community pharmacy density across metropolitan, regional, rural and remote areas[4].

The policy relevance of supermarket and pharmacy co-location depends in part on existing geography. If pharmacies and supermarkets are already close in metropolitan and regional areas, permitting in-supermarket pharmacies could affect convenience or business models without necessarily reducing geographic distance to pharmacy services. Conversely, supermarkets in areas without nearby pharmacies could highlight locations where a supermarket-based pharmacy model might alter geographic access. We therefore examined proximity in both directions and across the Modified Monash Model.

Aim

To quantify bidirectional geographic proximity between Australian pharmacies and supermarkets and examine variation according to remoteness.

Methods

Pharmacy locations were obtained from the 2025 National Healthdirect Health Facilities (NHDHF) dataset[5]. Records were restricted to active facilities classified as 'Pharmacy service', yielding 5,526 pharmacies with valid coordinates. NHDHF was used as the primary pharmacy source because it provided better national coverage than the OpenStreetMap pharmacy dataset (5,526 vs 3,313 pharmacies). Supermarket locations were obtained from the OpenStreetMap dataset as this is the only publicly available data source for supermarket location[6]. Records tagged shop=supermarket were cleaned to remove duplicate and ineligible records before analysis. The analysis was restricted to the Australian Capital Territory, New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria and Western Australia. Records classified by the Australian Bureau of Statistics in the Australian Statistical Geography Standard as Other Territories were excluded because these areas were not coded consistently across the source datasets.

All locations were transformed to the GDA2020 / Australian Albers (EPSG:9473) coordinate system. For each pharmacy point, we calculated the minimum straight-line distance to the nearest supermarket and repeated the calculation from each supermarket to the nearest pharmacy point. Distances therefore represent geographic proximity rather than road travel distance or travel time. Locations were assigned to Modified Monash Model 2023 categories (MM1 metropolitan to MM7 very remote) by spatial intersection[7].

We summarised median distance and interquartile range, the proportion within 1 km in each direction, and the proportion of supermarkets with at least one, two or three pharmacies within 1 km. Cumulative distance distributions were also examined. Analyses were descriptive and were not population weighted. Because some pharmacies identified in the reviewed OpenStreetMap dataset were not present in Healthdirect, supermarket-to-pharmacy distances were recalculated in a sensitivity analysis using the shorter distance to the nearest pharmacy identified in either dataset.

Ethics approval

Ethics approval was not required because the study used publicly available facility-location data and did not involve human or animal participants.

Results

The primary analysis included 5,526 Healthdirect pharmacies and 5,548 reviewed OpenStreetMap supermarkets. Figure 1 maps supermarkets according to straight-line distance to the nearest Healthdirect pharmacy.

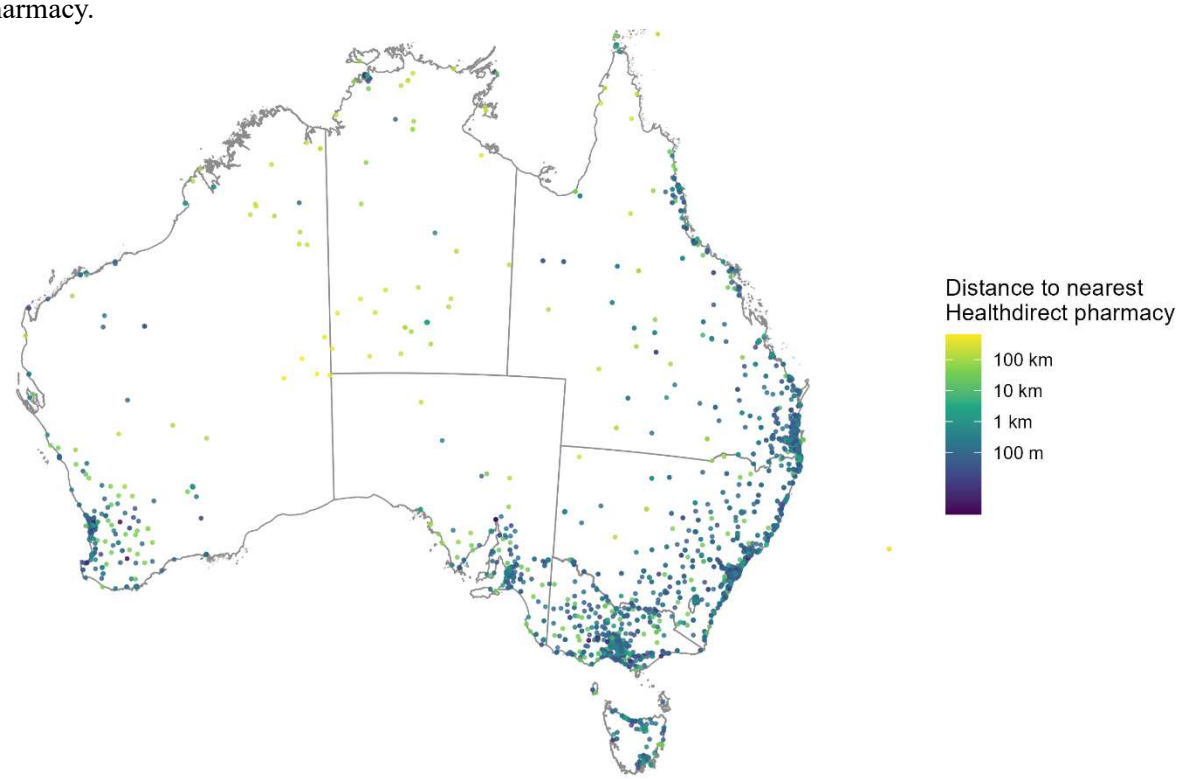


Figure 1: Each point represents a mapped supermarket; colour indicates straight-line distance to the nearest Healthdirect pharmacy

Nationally, the cumulative distance distributions in the two directions were similar through most of their range, with separation concentrated in the long-distance tail (Figure 2).

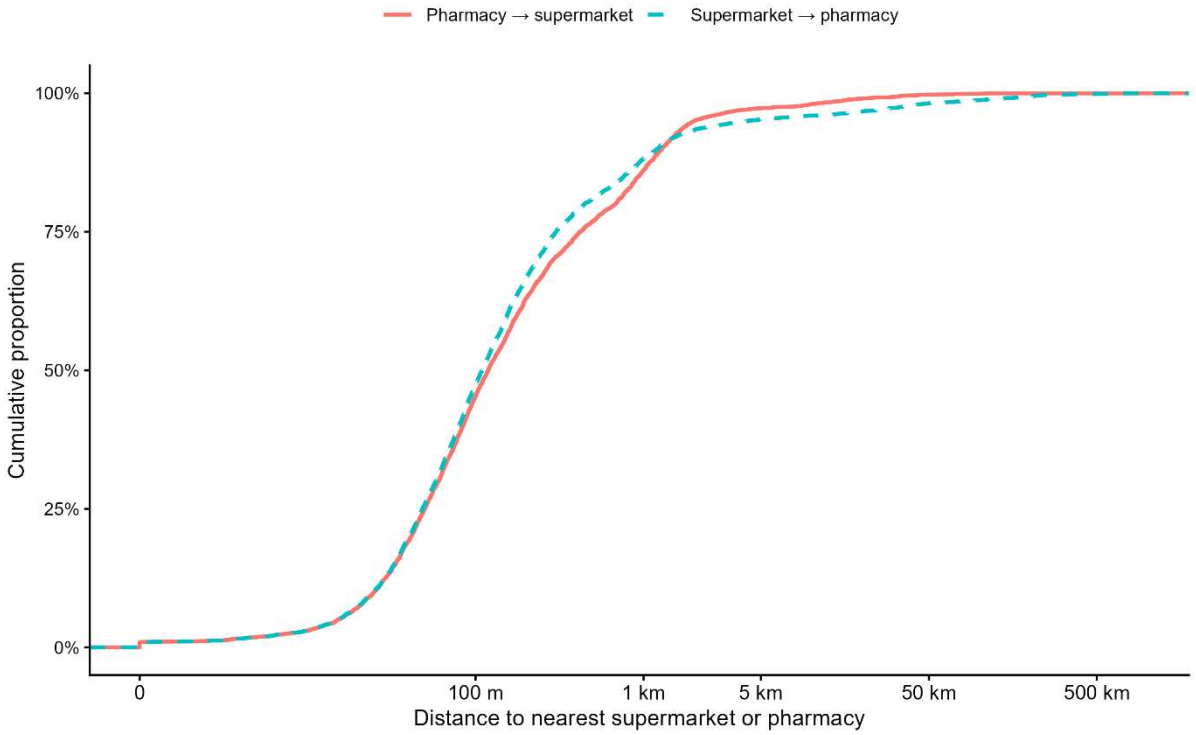


Figure 2: Cumulative proximity between pharmacies and supermarkets in both directions.

When results were stratified by Modified Monash Model category, pharmacy-supermarket proximity was similar in MM1-MM5, where median distances in either direction ranged from 94 to 151 m and 80.0% to 92.5% were within 1 km of the other feature type (Table 1). The relationship became more asymmetric in remote settings. In MM6, median pharmacy-to-supermarket and supermarket-to-pharmacy distances were 102 m and 419 m, respectively and in MM7 they were 175 m and 65.2 km. In MM7, 75.5% of pharmacies were within 1 km of a supermarket, compared with 36.1% of supermarkets within 1 km of a pharmacy. The number of supermarkets per pharmacy increased from approximately one in MM1-MM3 to 2.77 in MM7.

Table 1: Pharmacy and supermarket proximity by Modified Monash Model category.

MMM	Modified Monash category	Pharmacy → supermarket distance (n= 5526 pharmacies)			Supermarket → pharmacy distance (n = 5548 supermarkets)			Supermarkets/pharmacy ratio
		n	Median (IQR), m	Within 1 km, %	n	Median (IQR), m	Within 1 km, %	
1	Metropolitan areas	3,799	114 (47-432)	86.8	3,610	94 (44-241)	92.5	0.95
2	Regional centres	496	150 (54-545)	84.7	464	134 (50-436)	86.0	0.94
3	Large rural towns	380	127 (52-424)	86.6	364	121 (50-302)	91.2	0.96
4	Medium rural towns	241	105 (61-209)	92.5	283	123 (64-272)	92.2	1.17
5	Small rural towns	480	125 (58-365)	80.4	546	151 (62-387)	80.0	1.14
6	Remote communities	77	102 (51-274)	80.5	134	419 (92-39,887)	53.7	1.74
7	Very remote communities	53	175 (112-682)	75.5	147	65,176 (263-180,297)	36.1	2.77

Note: Pharmacies were active Healthdirect records classified as ‘Pharmacy service’. Supermarkets are from OpenStreetMap records. Distances are straight-line distances between the Healthdirect pharmacy point and the nearest supermarket geometry or vice versa. IQR = interquartile range; MMM = Modified Monash Model 2023.

The availability of multiple pharmacies near supermarkets also varied by Modified Monash Model category (Table 2). In metropolitan areas, 63.4% of supermarkets had at least two pharmacies within 1 km and 44.4% had at least three. The corresponding proportions were 11.2% and 5.2% in MM6 and 2.7% and 0% in MM7. MM4 had the highest proportion of supermarkets with at least two nearby pharmacies (70.0%).

166 *Table 2: Supermarkets with nearby pharmacies by Modified Monash Model (MMM)*

MMM	Modified Monash category	Supermarkets	At least 1 pharmacy within 1 km, %	At least 2 pharmacies within 1 km, %	At least 3 pharmacies within 1 km, %
MM1	Metropolitan areas	3,610	92.5	63.4	44.4
MM2	Regional centres	464	86.0	44.2	25.6
MM3	Large rural towns	364	91.2	58.2	40.9
MM4	Medium rural towns	283	92.2	70.0	25.8
MM5	Small rural towns	546	80.0	17.9	2.0
MM6	Remote communities	134	53.7	11.2	5.2
MM7	Very remote communities	147	36.1	2.7	0.0
Percentages are calculated among mapped supermarkets in each Modified Monash category.					

167

In the sensitivity analysis, median supermarket-to-pharmacy distances remained between 69 and 110 m across MM1-MM5. In MM6, the median decreased from 419 m to 166 m and the proportion of supermarkets within 1 km of a pharmacy increased from 53.7% to 64.2%. In MM7, the median decreased from 65.2 km to 20.2 km and the proportion within 1 km increased from 36.1% to 43.5%. The sensitivity results are presented in Supplementary Table 1.

Discussion

The principal finding was that pharmacies and supermarkets were closely located across MM1 (metropolitan areas) -MM5 (small rural towns), but the relationship differed in very remote Australia. In MM7 (very remote communities), the median distance from a pharmacy to the nearest supermarket was 175 m, whereas the median distance from a supermarket to the nearest pharmacy was 65.2 km. Three quarters of pharmacies in very remote communities were within 1 km of a supermarket, but only 36.1% of supermarkets were within 1 km of a pharmacy. This means that when pharmacies were available in very remote areas they were usually located near supermarkets; however, there were many supermarkets in very remote areas that were not located near a pharmacy.

These findings qualify, rather than resolve, arguments about supermarket-based pharmacies. In MM1-MM5, where the two facility types were usually within a few hundred metres of each other, locating a pharmacy inside a supermarket would not greatly reduce geographic distance to a pharmacy, although convenience, opening hours, prices or service models could differ. In MM6 (remote) and especially MM7 (very remote communities), some supermarkets were far from the nearest pharmacy, so a supermarket-based pharmacy could reduce geographic distance if it represented an additional pharmacy in one of those locations. Whether this would occur in practice cannot be determined from these data and many other factors, including pharmacist availability, would need to be considered. Prior studies have shown that there are fewer pharmacists overall[8] and per capita[9] in remote and very remote areas compared to metropolitan areas, and that workforce issues like frequent staff turnover, professional isolation and chronic understaffing persist[10]. This indicates that simply allowing co-location of pharmacies and supermarkets in remote and very remote communities is unlikely to improve pharmacy accessibility if the pharmacy workforce issues that persist in these remote locations are not also addressed.

Healthdirect provided substantially more pharmacy records than OpenStreetMap and was therefore used for the primary analysis. Some pharmacies identified in the reviewed OpenStreetMap dataset were not present in Healthdirect. When supermarket-to-pharmacy distance was recalculated using the nearer pharmacy identified in either source, the median fell from 419 m to 166 m in MM6 and from 65.2 km to 20.2 km in MM7; the proportion within 1 km increased from 53.7% to 64.2% and from 36.1% to 43.5%, respectively. Healthdirect therefore overestimated some remote supermarket-to-pharmacy distances, but the marked MM7 asymmetry remained.

Neither source is a statutory census of pharmacy premises, and both contain omissions and/or positional errors. Straight-line distance does not capture road networks, travel time, public transport or pedestrian access. We did not account for population distribution, pharmacy capacity, opening hours or ownership or banner affiliation. The results therefore describe the spatial relationship between pharmacy and supermarket locations rather than population access or the effect of a policy change. Recent Australian research has identified areas of low pharmacy density in both metropolitan and non-metropolitan Australia[4]. Further research that combines pharmacy and supermarket locations with population

distribution, travel time and socioeconomic characteristics could identify where geographic gaps are greatest and whether new pharmacy models could materially change access.

For metropolitan, regional and most rural Australia Pharmacies and supermarkets were closely located and for this reason co-locating pharmacies within supermarkets is likely to be of limited benefit to improving access. In very remote communities, pharmacies were usually close to supermarkets, but many supermarkets were not close to a pharmacy. In these communities, pharmacist availability is likely to constrain the establishment and ongoing operation of a pharmacy, irrespective of whether it is located within a supermarket or as a standalone premises

Declarations

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Data availability: The National HealthDirect Health Facilities and Modified Monash Model source data are publicly available from Australian Government sources and OpenStreetMap data are publicly available from OpenStreetMap. The analysis code is available from the corresponding author on reasonable request.

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Supplementary Table 1: Supermarket-to-pharmacy proximity in the primary and sensitivity analyses

MMM	Modified Monash category	Supermarkets, n	Primary analysis Median (IQR), m	Primary analysis Within 1 km, %	Sensitivity analysis Median (IQR), m	Sensitivity analysis Within 1 km, %
MM1	Metropolitan areas	3,610	94 (44-241)	92.5	69 (34-174)	94.7
MM2	Regional centres	464	134 (50-436)	86.0	88 (40-298)	89.9
MM3	Large rural towns	364	121 (50-302)	91.2	93 (40-246)	93.1
MM4	Medium rural towns	283	123 (64-272)	92.2	110 (54-241)	92.9
MM5	Small rural towns	546	151 (62-387)	80.0	110 (44-255)	86.3
MM6	Remote communities	134	419 (92-39,887)	53.7	166 (78-23,533)	64.2
MM7	Very remote communities	147	65,176 (263-180,297)	36.1	20,192 (162-160,936)	43.5

269