The application of spatial measures to analyse health service accessibility in Australia: a systematic review and recommendations for future practice

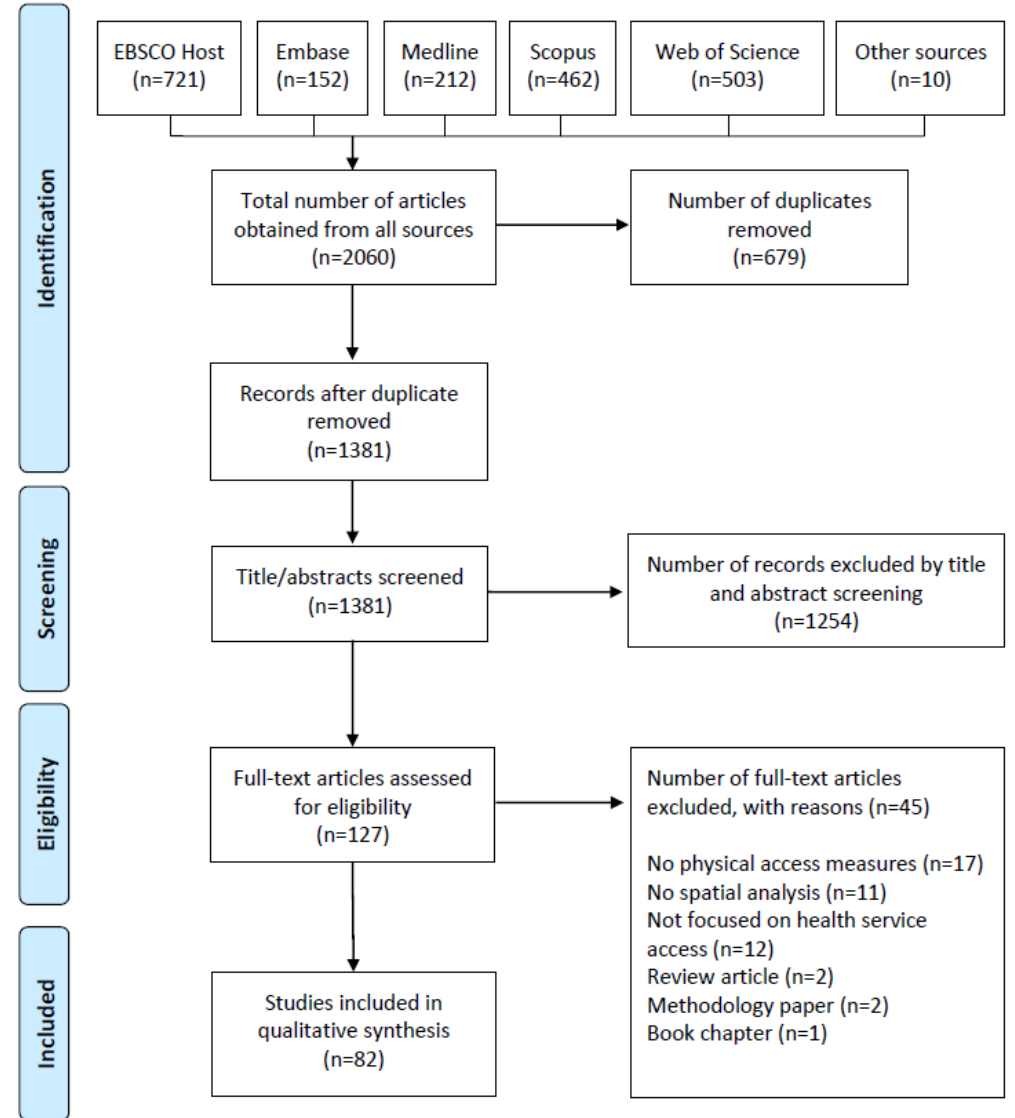Wood SM, Alston L, Beks H, Mc Namara K, Clark RA, Coffee NT, Wong Shee A, & Versace VL

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Aims & methods

To synthesise the available peer-reviewed literature that spatially analyses health service access in Australia.

P (Population)	• Study population living in Australia.
I (Intervention)	• Spatial access of health services, including primary healthcare, specialist care, hospital services, and health promotion and prevention.
C (Comparison)	None.
O (Outcomes)	**Primary Outcome Measure:** objective physical access measures. **Secondary Outcome Measure:** spatial analysis methods.
S (Study design)	• Epidemiological observational studies that include geographic or ecological-level data with spatial analysis.

Results

Health service areas	Studies (n=82)
Primary health services	n=50 (61%)
Specialist care	n=17 (21%)
Hospital services	n=12 (15%)
Health promotion and prevention	n=3 (4%)

Identification

EBSCO Host (n=721) | Embase (n=152) | Medline (n=212) | Scopus (n=462) | Web of Science (n=503) | Other sources (n=10)

Total number of articles obtained from all sources (n=2060) → Number of duplicates removed (n=679)

Records after duplicate removed (n=1381)

Screening

Title/abstracts screened (n=1381) → Number of records excluded by title and abstract screening (n=1254)

Eligibility

Full-text articles assessed for eligibility (n=127) → Number of full-text articles excluded, with reasons (n=45)

No physical access measures (n=17)
No spatial analysis (n=11)
Not focused on health service access (n=12)
Review article (n=2)
Methodology paper (n=2)
Book chapter (n=1)

Included

Studies included in qualitative synthesis (n=82)
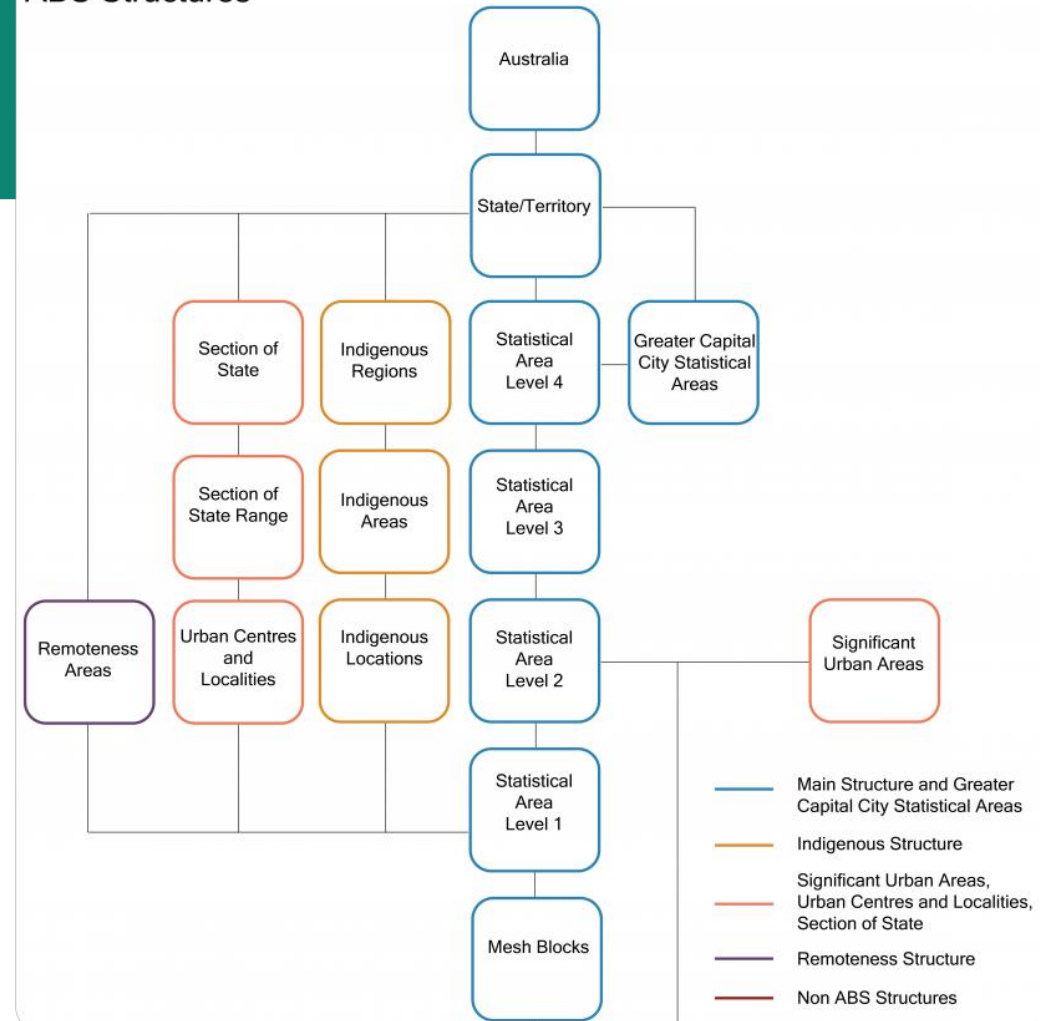
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Geographic scope
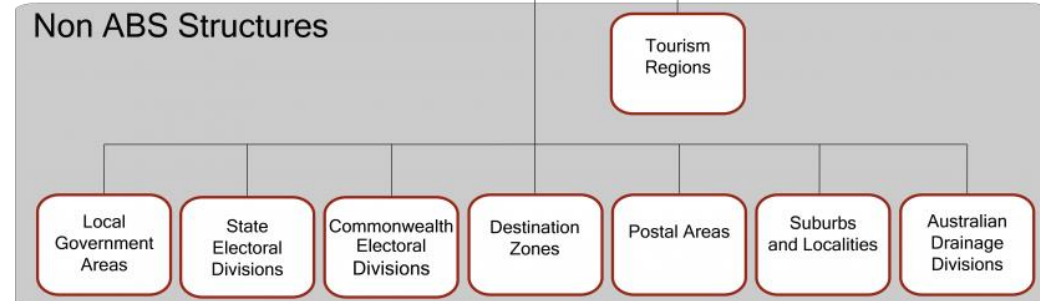
The geographic scope of the 82 articles included:

- National (n=33; 40%)

- State (n=27; 33%)

- Metropolitan areas (n=18; 22%)

- Specified regional/rural/remote areas (n=4; 5%)

Geographic classifications

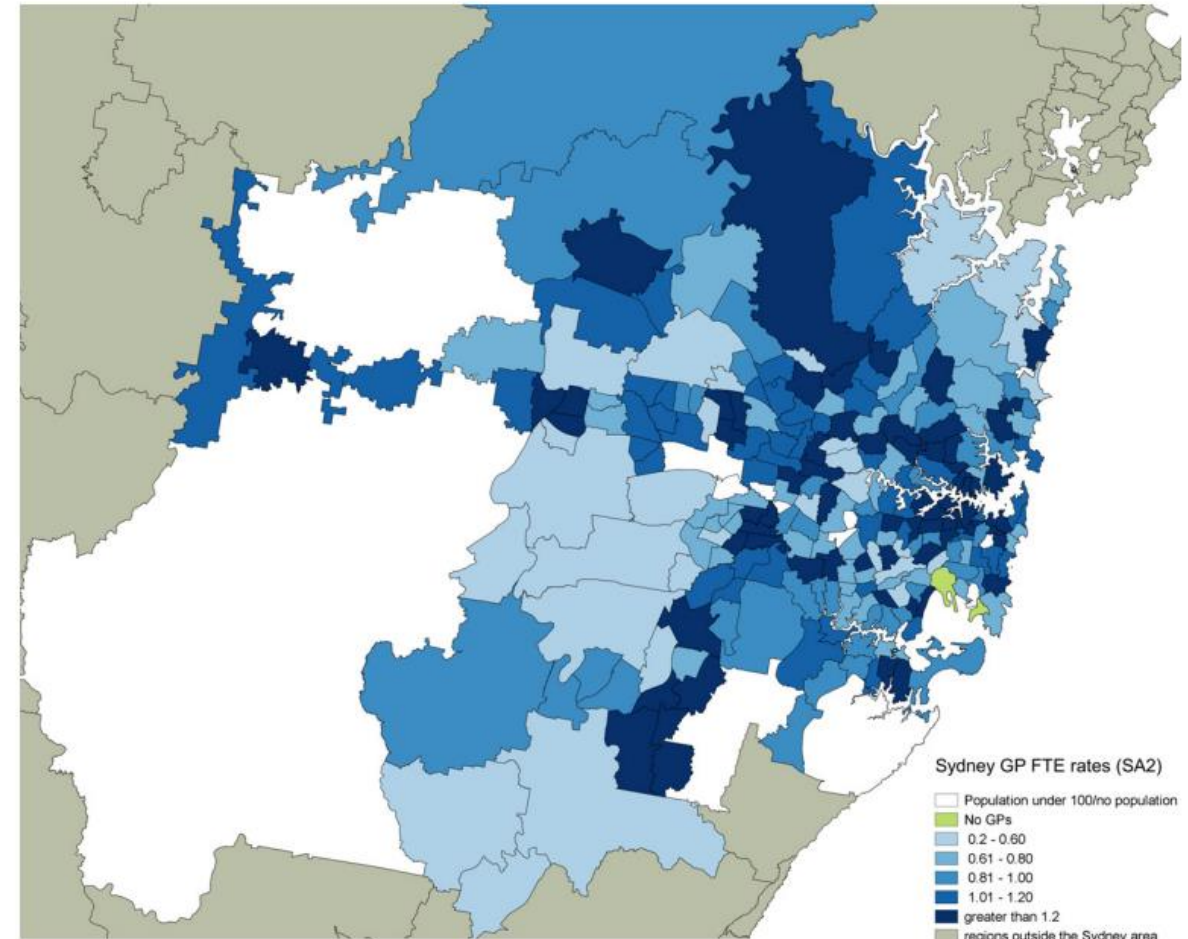| Geographic classification	Studies (n=82)
ABS structure	n=56 (68%)
Non ABS Structure	n=23 (28%)
Unclear	n=3 (4%)

Physical access measures

Area-based measures

- Provider-to-population ratio (n=16; 20%)

- Number of services (n=10; 12%)

- Number of practices (n=8; 10%).

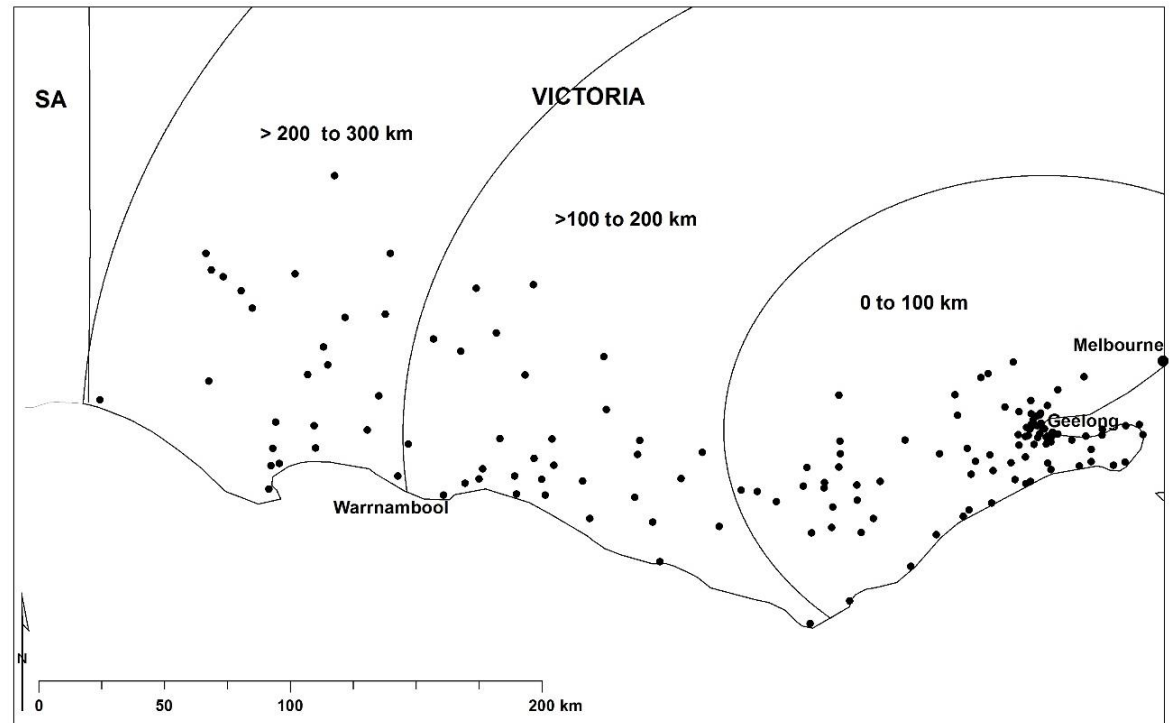Sydney GP FTE rates (SA2)

- Population under 100/no population
- No GPs
- 0.2 - 0.60
- 0.61 - 0.80
- 0.81 - 1.00
- 1.01 - 1.20
- greater than 1.2
- regions outside the Sydney area

Source: NHWDS 2013.

Figure A2: GP FTE rates for Sydney, calculated at the SA2 level

Physical access measures

Distance-based measures

- Travel time (n=30; 37%)

- Travel distance (n=21; 26%)

- Euclidean distance (n=24; 29%)

Recommendations for future practice
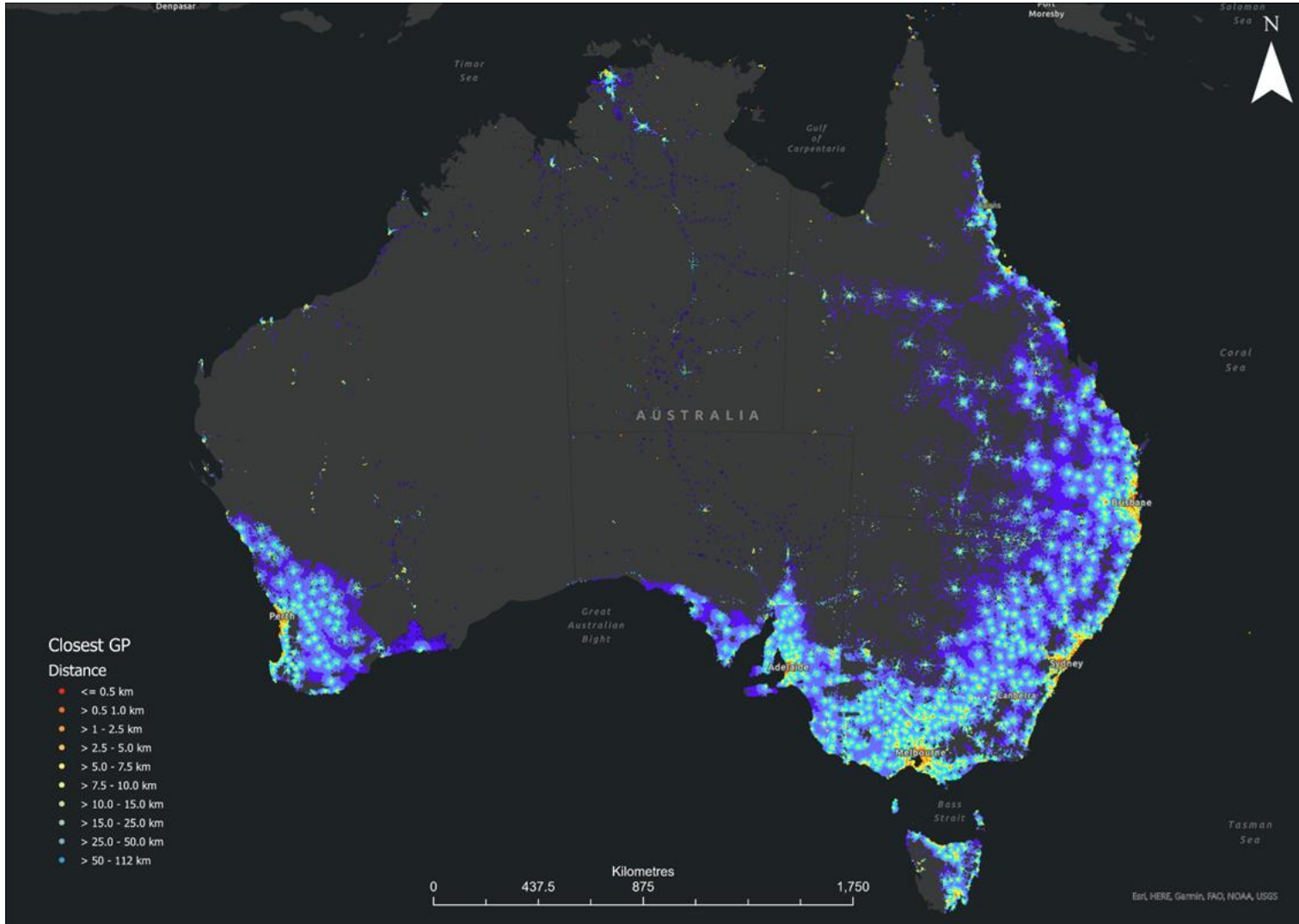
Future research should consider using:

- Standardised, nationally consistent measures

- Address-based spatial units

- Road networks and modelled distance/ time calculations