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Measuring Healthcare Accessibility for Elderly Patients

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Background - Why healthcare accessibility?

Percentage of population aged 65 years or over for the world, SDG regions, and selected groups of countries, 2022, 2030 and 2050, according to the medium scenario

Region	*2022*	*2030*	*2050*
World	**9.7**	**11.7**	**16.4**
Sub-Saharan Africa	3.0	3.3	4.7
Northern Africa and Western Asia	5.5	7.0	12.5
Central and Southern Asia	6.4	8.1	13.4
Eastern and South-Eastern Asia	12.7	16.3	25.7
Latin America and the Caribbean	9.1	11.5	18.8
Australia/New Zealand	16.6	19.4	23.7
Oceania*	3.9	5.1	8.2
Europe and Northern America	18.7	22.0	26.9
Least developed countries	3.6	4.1	6.1
Landlocked developing countries (LLDC)	3.6	4.1	5.8
Small island developing States (SIDS)	8.9	11.3	16.0

*excluding Australia and New Zealand

- The **aging population** is a global issue.
- **Healthcare accessibility** has received particular attention since older people have **higher and more frequent medical needs**.
- Access to healthcare depends not only on service availability, but also about whether people can physically reach them, which makes transport and mobility a key factor.

United Nations (2022); Cheng et al., (2020); (Zhang et al., 2022)

Background - Have access ≠ Accessible

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- Perceptions of accessibility often influence healthcare-seeking behaviour, particularly for the elderly, who may avoid healthcare services **if the journey feels inconvenient, stressful, or overly complex, even when facilities are objectively accessible.**

- **Physical challenges** (e.g., struggling to get on the bus), as well as **emotional concerns** (e.g., fear of not finding a seat or feeling unsafe) can discourage older adults from using transport systems.

Cheng et al., (2023)

Objective vs. Perceived accessibility

	Objective Accessibility	Perceived Accessibility
Core Concept	Based on measurable **spatial and temporal** indicators.	Reflects individuals' **perceived barriers or ease** of reaching opportunities.
Measures	Include **travel time/distance**, **cumulative opportunities**, **gravity-based**, **person-based**, and **utility-based** measures.	Primarily uses the **PAC** (Perceived Accessibility Scale) and its adaptations.
Data Sources	Relies on GIS, transport networks, and population data.	Utilises **surveys or interviews**, including large-scale national travel surveys.

(Handy & Niemeier, 1997; Kwan, 1998; Ben-Akiva & Lerman, 1979; Lättman et al. 2016)

Research Focus

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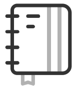
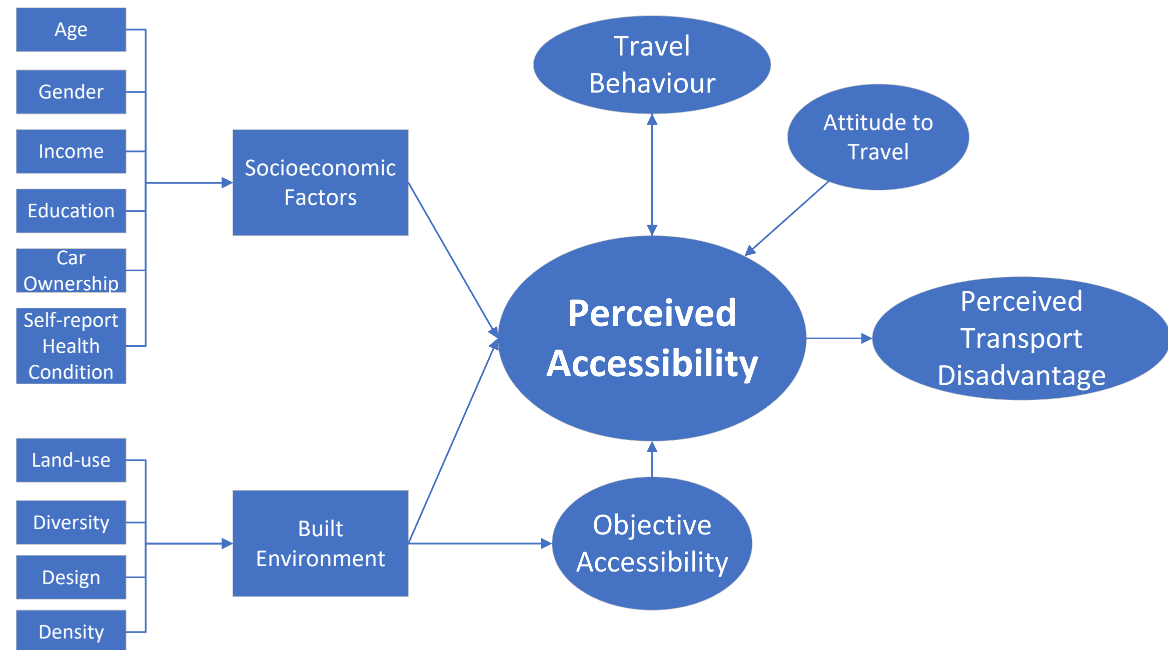
Quantify and compare the discrepancy between objective and perceived healthcare accessibility **across different urban contexts**.



Examine how **socioeconomic characteristics**, **built environment**, and **objective accessibility** shape perceived accessibility among older adults.

Explore the complex links between perceived accessibility, **travel behaviour**, **attitude to travel**, and **perceived transport disadvantage**.



Study areas – Shanghai and Perth

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247 Primary
86 Secondary
51 Tertiary

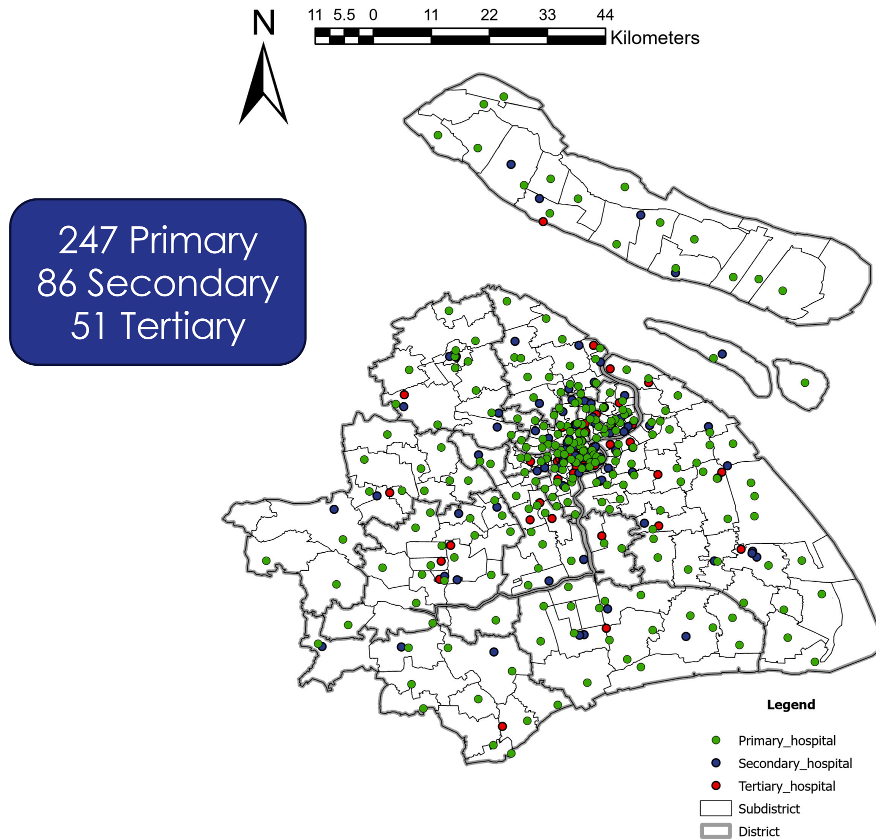

Figure1. The health services distribution in Shanghai

549 GPs
29 Hospitals

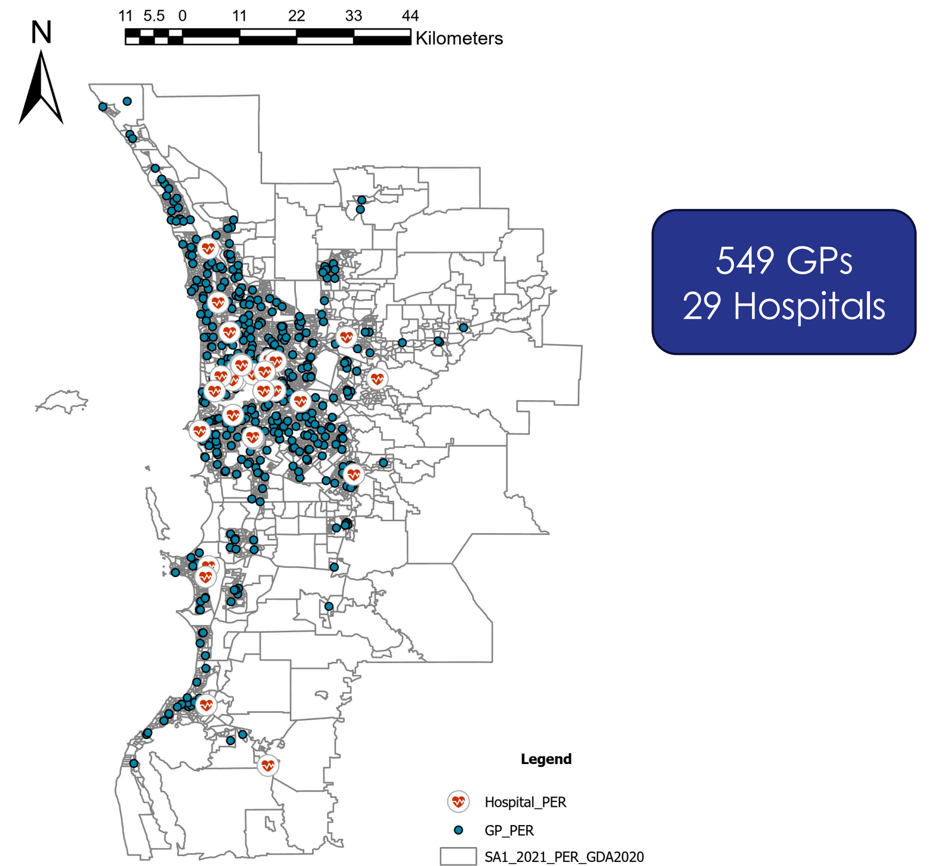

Figure2. The health services distribution in Perth

Data

Secondary data (open-source)

- **Population data:**

Density of residents aged 60+
(Shanghai Statistical Yearbook ; Australian Bureau of Statistics)

- **Health Facilities:**

Locations and types of GPs and hospitals
(Healthdirect; Shanghai Health Commission)

- **Transport Infrastructure:**

Road networks (OpenStreetMap) and
Public Transit schedules (GTFS from Mobility Database)

Primary data (online survey)

- **Socio-demographics**: Age, gender, income, education level, car ownership, self-report health
- **Travel behaviour**: Travel frequency and main transport mode
- **Perceptions and attitudes**:
  - perceived accessibility to health services (adapted PAC)
  - Travel attitude and satisfaction
  - Perceived transport disadvantage

Objective accessibility: cumulative opportunities by mode

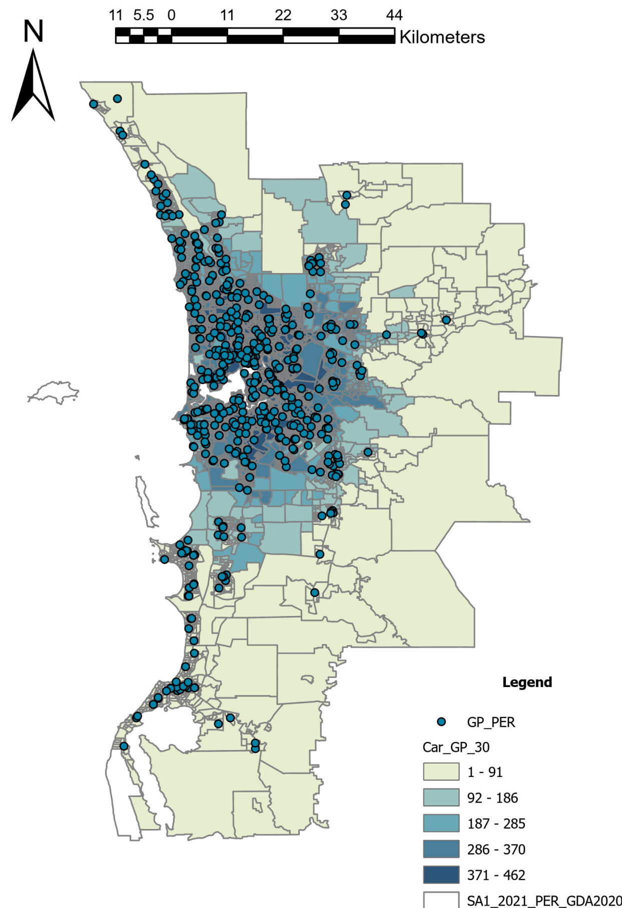

Figure3. Cumulative opportunities to health services by car (30 min)

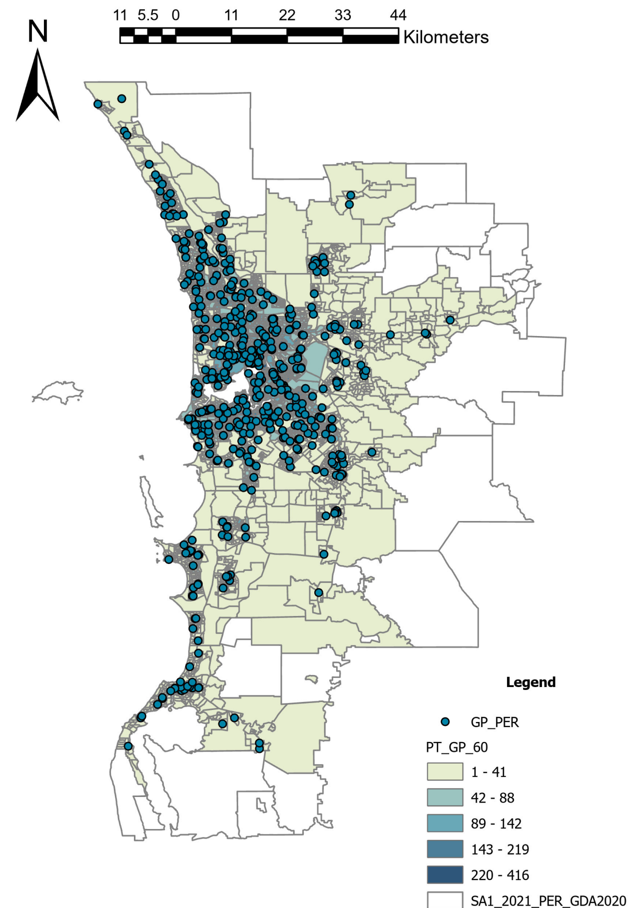

Figure4. Cumulative opportunities to health services by public transport (60 min)

Observation1:
Car accessibility is widespread, while PT access is highly concentrated in the central corridor.

Observation2:
Despite a longer travel threshold, PT accessibility remains significantly lower than car in most suburbs.

*Different time thresholds are applied to reflect realistic travel conditions across modes.

Conclusion

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Expected Outcomes:

•**Bridge the gap**: This study provides empirical evidence on the mismatch between "where services are" (objective) and "how they are felt" (perceived)

•**Cross-Context insights**: Comparing Shanghai and Perth reveals how urban density and transport systems influence elderly mobility differently.

•**Transport policy**: To support better mobility, well-being, and quality of life for older adults, contributing to more age-friendly and sustainable cities.

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Thank you!!!

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