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Walk how far to see *lokun**
in Singapore?

Final Project Proposal
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* Lokun (Singapore Hokkien slang) : Doctor from Chinese "老君" (wise man) or Malay *"Dukun"* (shaman)

Why?

Inequities in transportation-related factors to healthcare are concerning for disadvantaged population groups, e.g. seniors

Half of seniors ≥65 years old in Singapore are expected to be severely disabled at some point in their lifetime (MOH, 2018)

Having accessibility to transport nodes is insufficient

An inclusive healthcare system should also consider the factors that influence seniors' last-mile travel to healthcare services, such as their travel mode
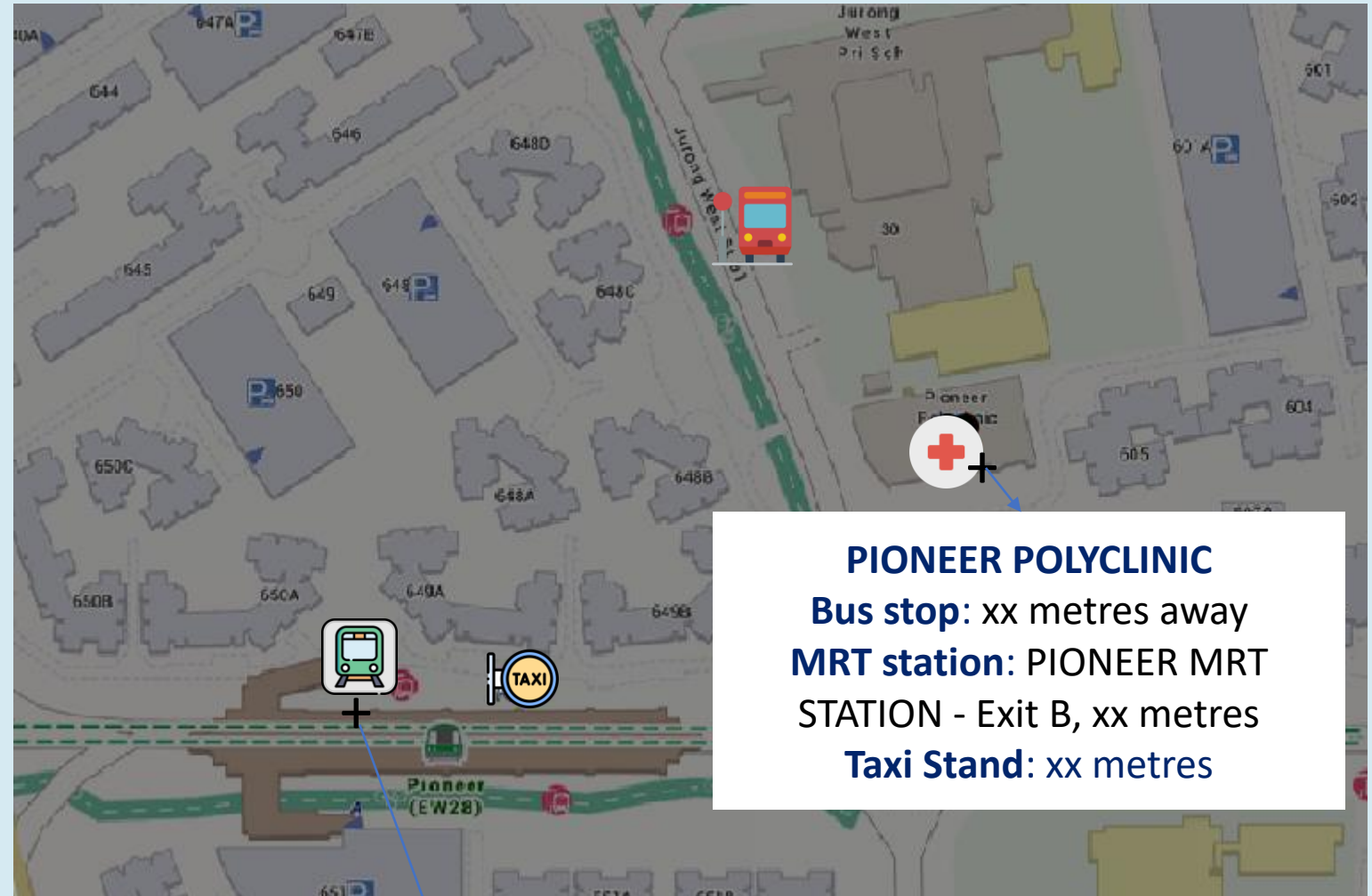
What data?

Data	Type of data	Data processing with open-source tools
1. Names and coordinates of polyclinics in Singapore	• Nominal • Geospatial	• Scrape polyclinics' names and addresses from HCI Directory with Python • Geocode polyclinics' postal codes to obtain coordinates with OneMap API
2. Coordinates of each polyclinic's nearest bus stop, mrt station exit and taxi stand	• Nominal • Geospatial	• Merge shapefiles of bus stops, mrt stations and taxi stands from LTA DataMall • Match each polyclinic to the nearest bus stop / mrt station exit / taxi stand with QGIS software
3. Walking distance between each polyclinic and nearest travel node	• Ratio	• Calculate walking distance between each polyclinic and nearest travel node using Google Distance Matrix API
4. Walking duration for each travel node	• Ratio	• Divide walking distance by an average Singaporean ≥65 years old 's gait speed (Lau et al., 2020)

1. Where are the polyclinics and their nearest bus stop, MRT exit and taxi stand?

2. What is the last-mile walking distance between each polyclinic and the nearest bus stop / MRT exit / taxi stand?

- Interactive map with **markers** for each polyclinic and travel mode (leaflet.js)
- **Mouseover** for tooltip to show **walking distance** and **travel node information**

PIONEER POLYCLINIC
Bus stop: xx metres away
MRT station: PIONEER MRT STATION - Exit B, xx metres
Taxi Stand: xx metres

MRT station exit: PIONEER - Exit B

3. Which polyclinic has the longest furthest average distance for each travel mode?
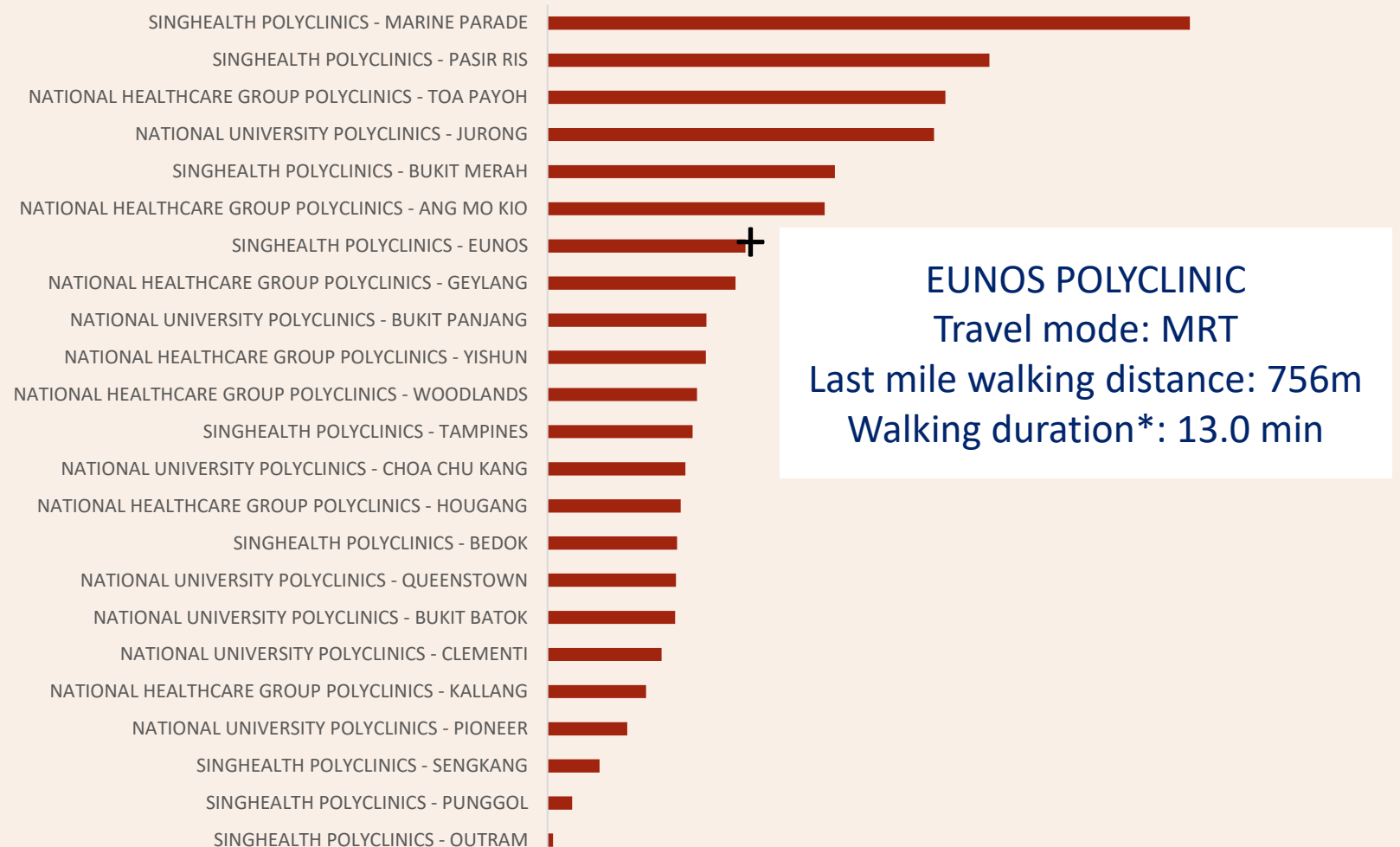
4. How does this translate to duration for seniors' walking speed?

- **Bar chart** (D3.js) in terms of walking distance
- **Mouseover** to show travel distance and travel time
- **Filter** to see data based on different travel mode

XX Polyclinic has the highest average walking distance regardless of travel mode

Last Mile Distance from nearest

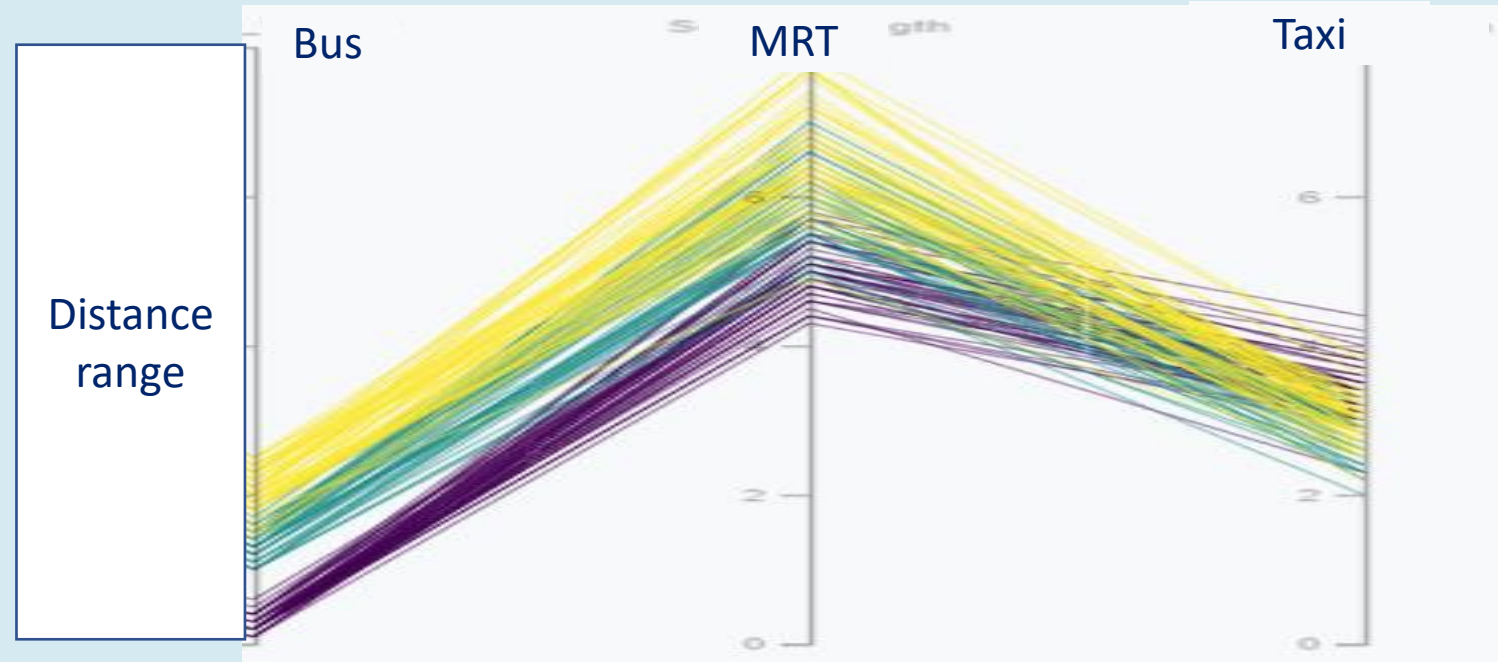Bus Stop / **MRT** station / Taxi Stand / All (average)

EUNOS POLYCLINIC
Travel mode: MRT
Last mile walking distance: 756m
Walking duration*: 13.0 min

* Assumed gait speed of seniors is xx m/min according to Lau et al., 2020

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5. What is the extent of equity across travel nodes across polyclinics?

6. Which polyclinic has the highest average walking distance regardless of travel mode?

- **Parallel chart** (D3.js) to show **direction** and **steepness** of relationship between each travel node
- The steeper the slope between 2 modes, the less equivalent

Generally, there is greater disparity between XX and other travel modes in terms of walking distance.

Bus   MRT   Taxi

Distance range

Each line = 1 polyclinic
Expected direction: bus << MRT > taxi

+ Implications e.g. If Singapore is pushing for the use of more <travel mode>, polyclinics become less attractive options for seniors to fulfill medical appointments

Thank You! ☺