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Walk how far to see doctor in Singapore?

Final Project Proposal
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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 transit mode

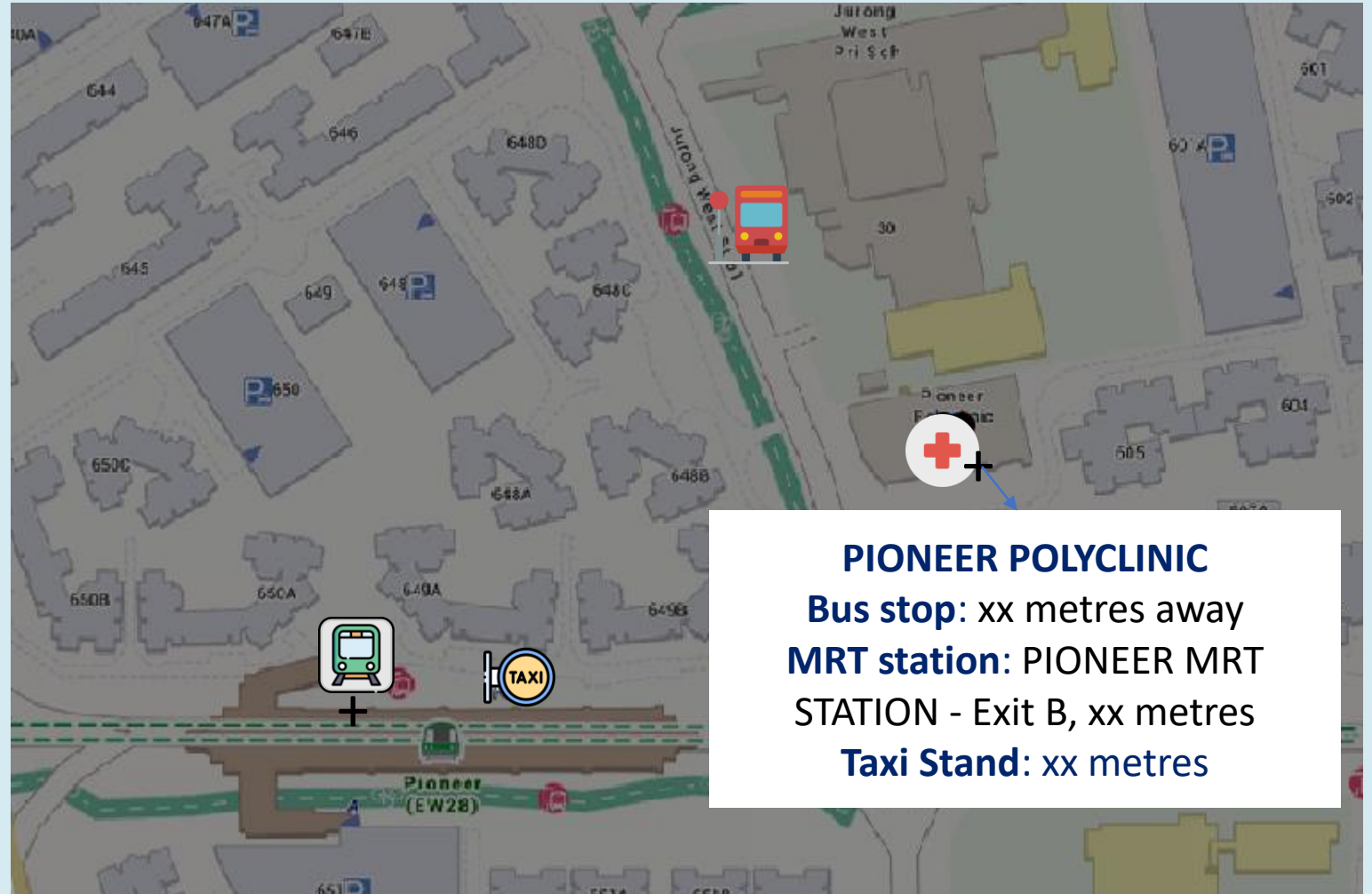


What data?

Data	Type of data	Data processing with open-source tools
1. Names and coordinates of polyclinics in Singapore	<ul style="list-style-type: none"> Nominal Geospatial 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Nominal Geospatial 	<ul style="list-style-type: none"> Download 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	<ul style="list-style-type: none"> Ratio 	<ul style="list-style-type: none"> Calculate walking distance between each polyclinic and nearest travel node using Google Distance Matrix API
4. Walking duration for each travel node	<ul style="list-style-type: none"> Ratio 	<ul style="list-style-type: none"> 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?

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



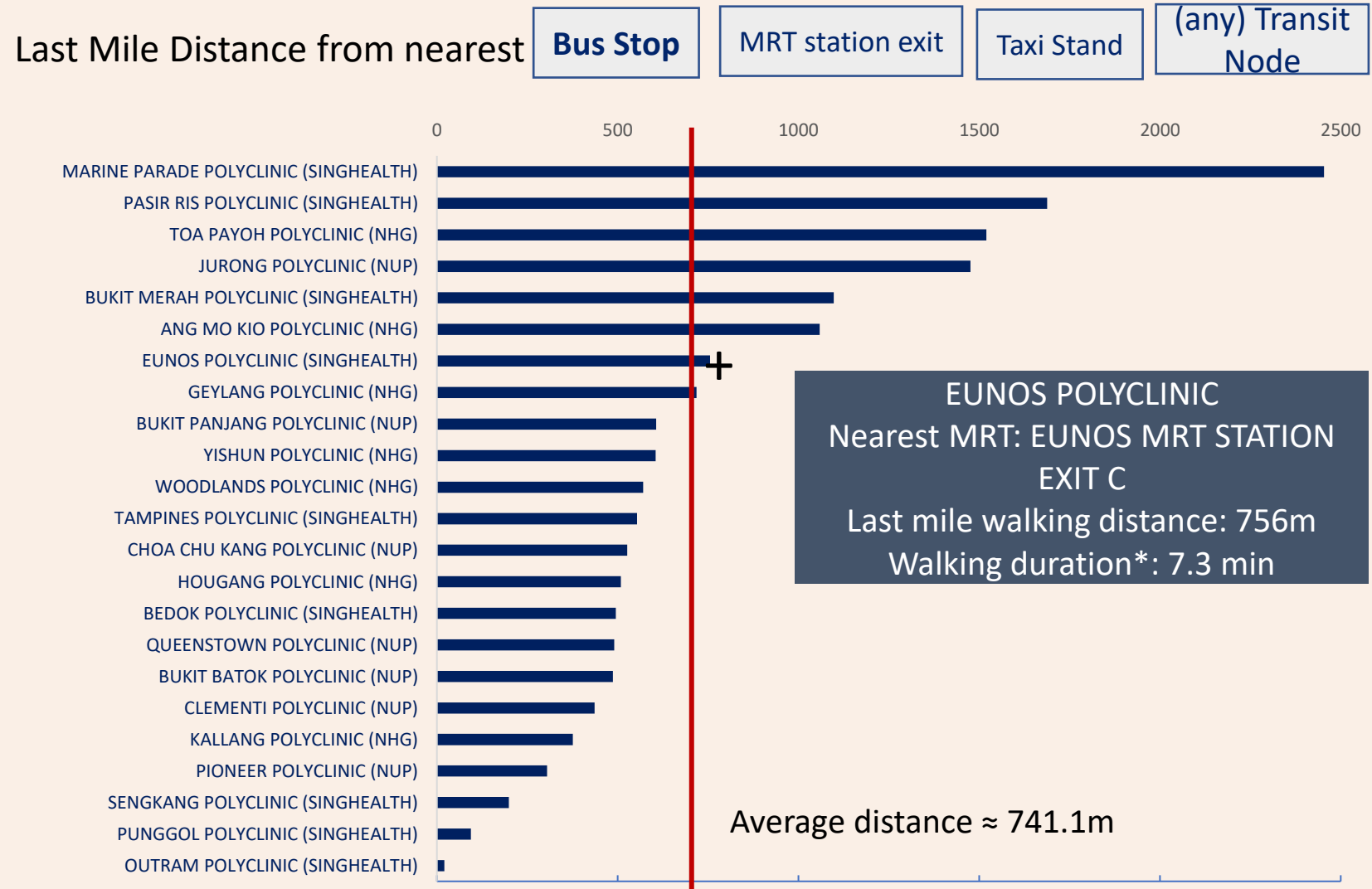
2. What is the last-mile walking distance between each polyclinic and the nearest bus stop / MRT exit / taxi stand?

3. Which polyclinic has the longest furthest average distance for each transit mode?

4. How does this translate to duration for seniors' walking speed?

- **Bar chart** in terms of walking distance per transit mode, showing **constant average line**
- **Interactivity**
 - **Mouseover** to show travel distance and travel time
 - **Filter** to see data based on different transit mode
 - **Auto sort** bars based on values

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



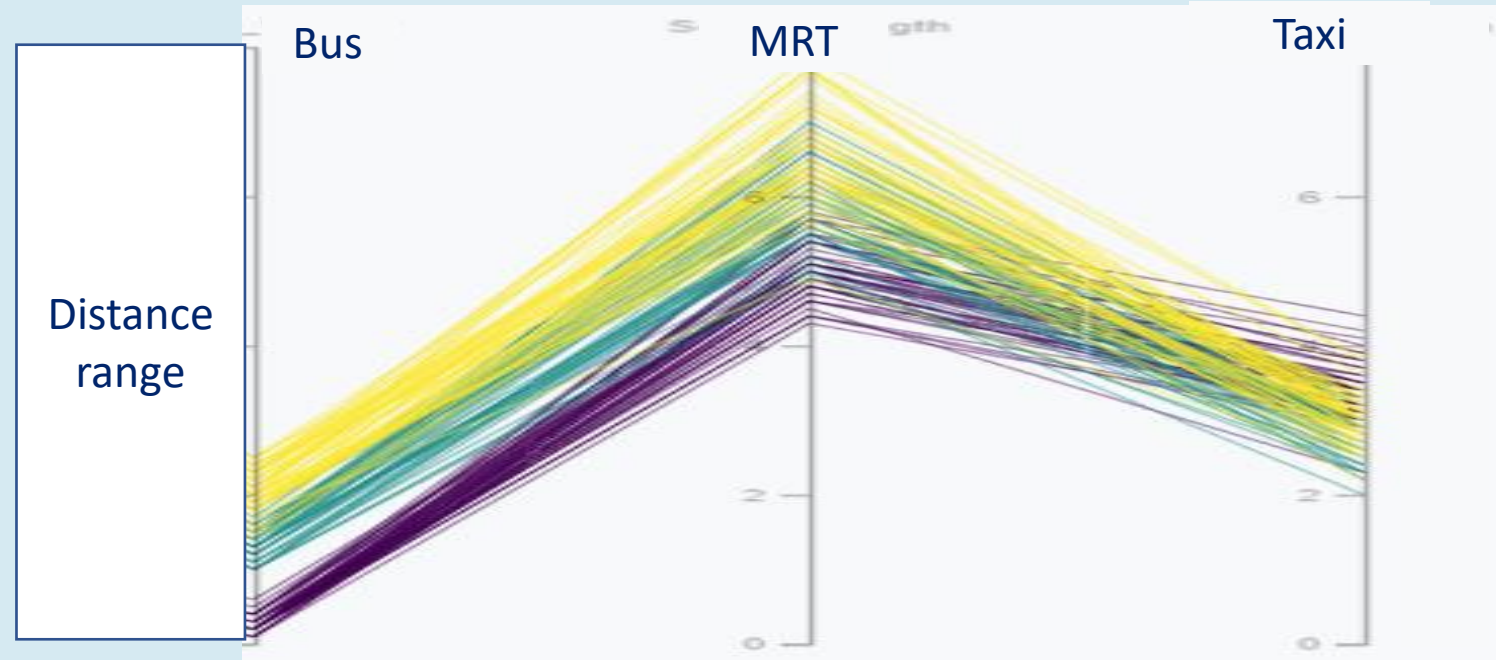
* Assumed gait speed of seniors is xx m/min according to Lau et al., 2020

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

6. Which polyclinic has the highest average walking distance regardless of transit 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 transit modes in terms of walking distance.



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

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



Thank You! 😊

