

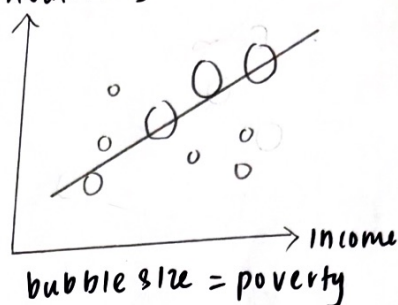
sheet 1: Brainstorm

IDEAS

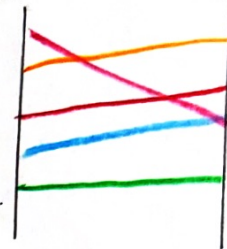
① Choropleth map



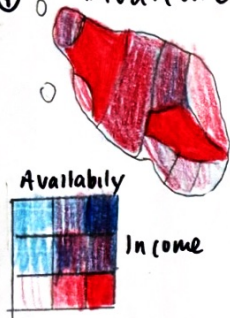
② Scatter (Availability vs Income)



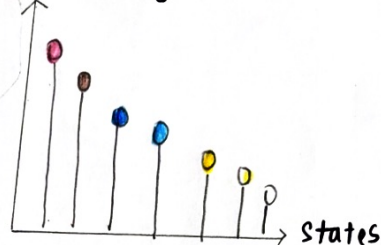
③ slope chart



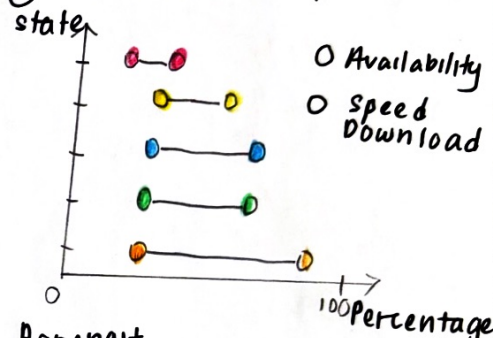
④ Bivariate map



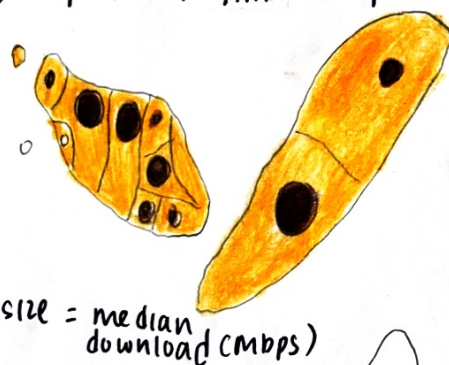
⑤ Lollipop Ranking



⑥ Dumbbell (Gap)



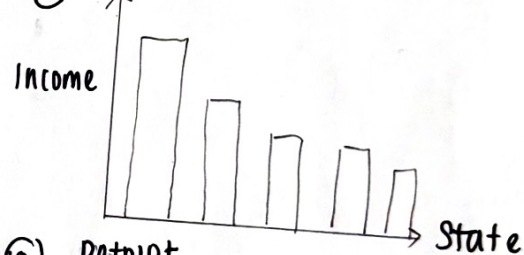
⑦ Proportional Symbol map



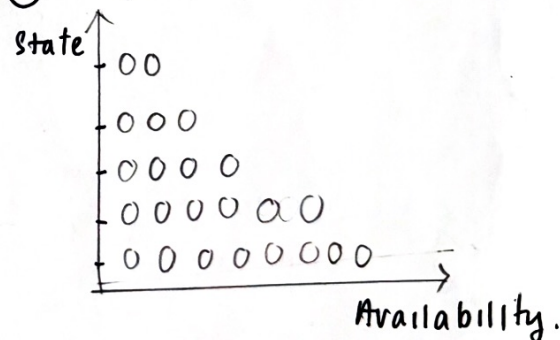
⑧ KPI cards

National Median Availability	Fastest State (Median Download)
Lowest Income State (RM)	Biggest Mismatch

⑨ Bar chart



⑩ Dotplot



⑪ Cartogram



Filter

- ① prop cartogram (too heavy)
- ② merge overlapping → keep lollipop (cleaner).

Categorise

- A) map
 - choropleth, bivariate, proportional symbol
- B) relationship:
 - Scatter + regression, slope dumbbell
- C) Ranking
 - lollipop, KPI cards
- D) interaction
 - hover, click focus.

Combine & Filter

- A) map (availability) + KPI cards, scatter (availability vs income, size = poverty, labelled outliers), lollipop
- B) Bivariate map (availability x income) dotplot by region
- C) side by side map (availability | download) slope chart

Sheet 2

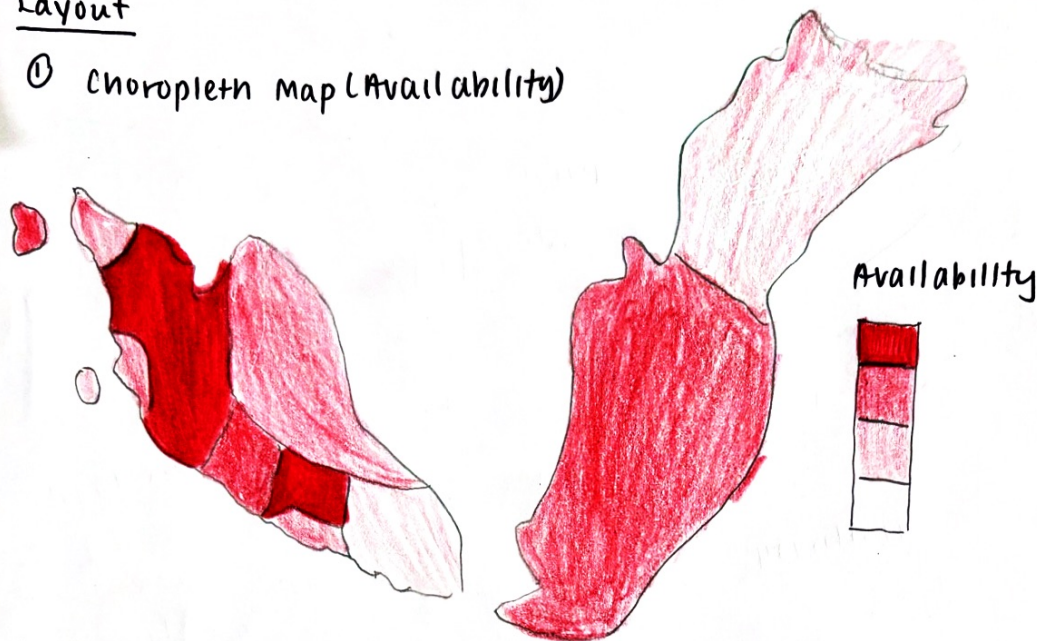
Title: Mind the mobile gap (2022)

Author: Yap Hwee Tong

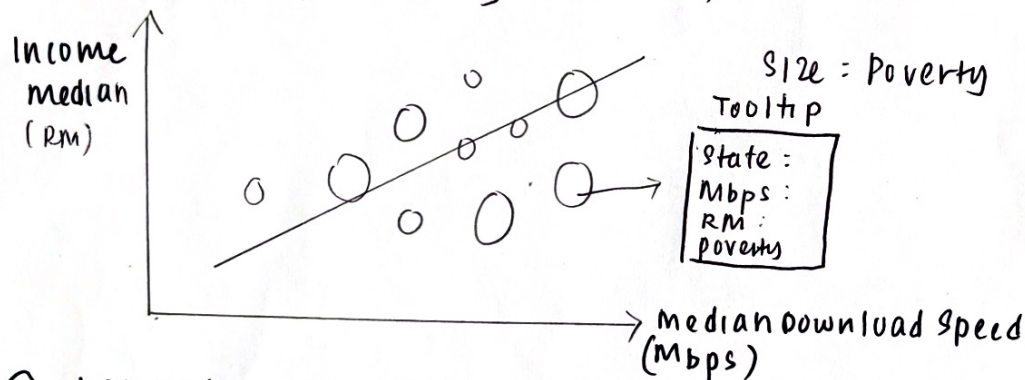
Date: 20/9/2025

Layout

① choropleth map (Availability)



② Scatter plot (Availability vs Income)



③ KPI cards

National Median Availability:	Fastest state download
XXX	XXX
Lowest Income (RM)	Biggest mismatch
XXX	XXX

④ Lollipop chart Availability %



Discussion

Pros:

- clear narrative
- satisfies map requirement
- low cognitive load

Cons:

- Availability \neq Adoption

→ Two maps if toggle is on may confuse.

Focus

① Map → Relationship
→ Rank

② Lead with where (Map), explain why/ How (scatter), who's worst / best (rank)

operation

① Map

- Hover state
: Tooltip coverage % median down.

- Toggle
- recolour map using median_down - mbps.

② KPI cards.

- show my median availability

③ Scatter

- Click point → pins label =
- Legend hover (region)
- optional trendline toggle

Sheet 3

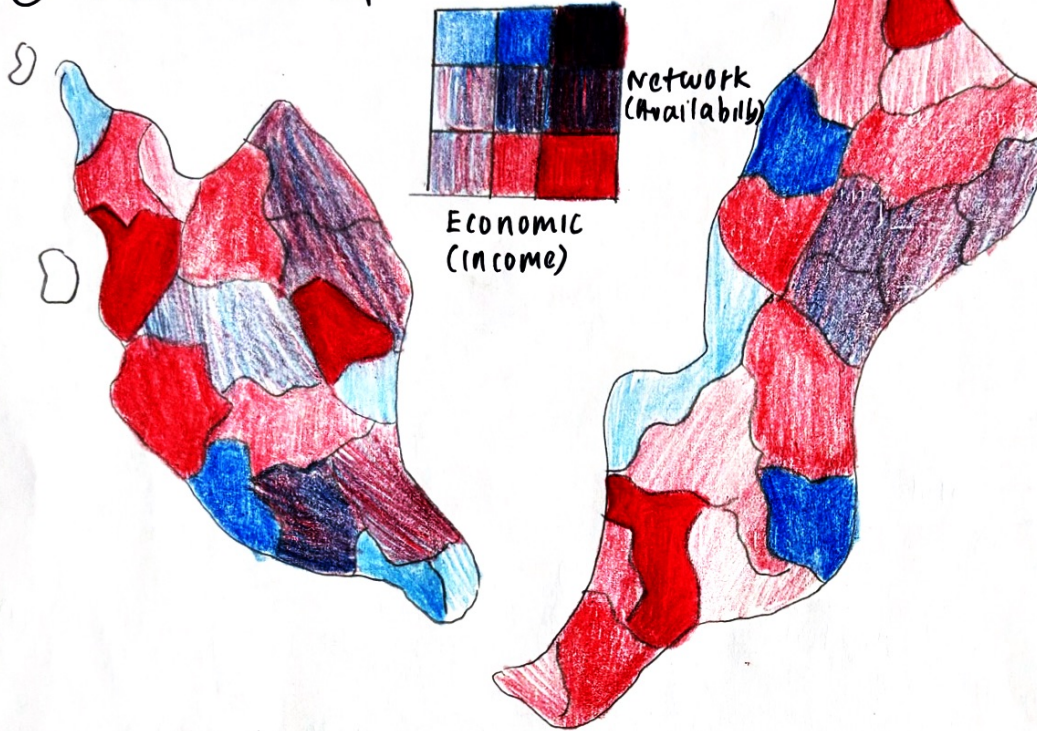
Title: Two sides of Access (Availability x Income)

Author: Yap Hiew Tong

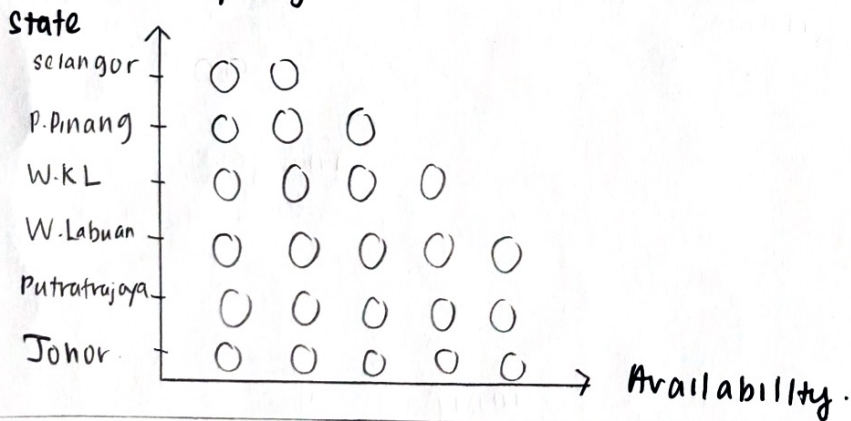
Date: 20/9/2025

Layout

① Bivariate Map



② Dotplot by Region



Discussion

Pros: → Single view comparison

→ memorable

→ quick audience read

→ legend driven exploration

Cons: → Discrete bins hide within-bin variations.

→ legend learning cost.

→ must use colorblind safe palette + text tooltips.

Focus

Parti Name: 9 cell Lens

Essence: Encode two variables into one glance; the legend is the interface - users hover a legend cell to see corresponding states.

operation

① Bivariate Map

- Hover state
→ Tooltip: coverage% - Income(km)

- Click state
→ Highlights in B3 dot plot

② Legend grid

- Hover a cell
→ Highlights states in that class on the map

Sheet 4

Title: Not Just coverage - Performance & Equity (2022)

Author: Yap Hiew Tong

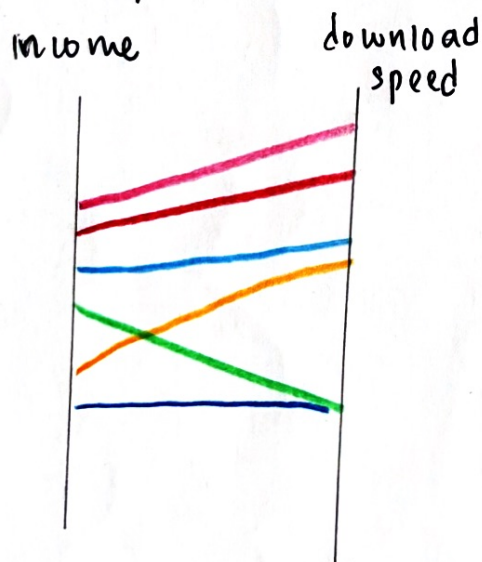
Date: 20/9/2025.

Layout

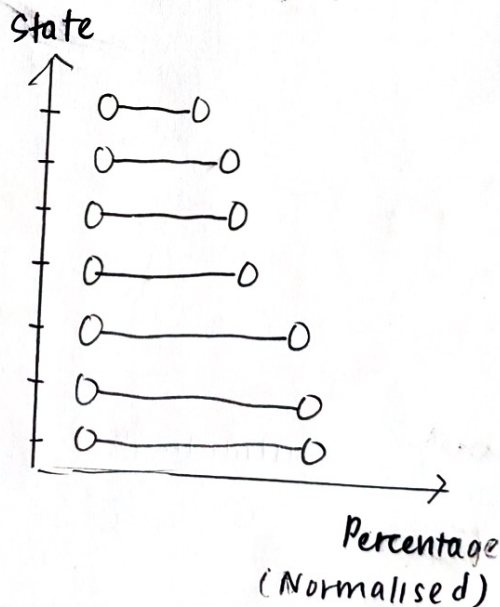
① Proportional symbol map.



② Slope Chart



③ Dumbbell (Gap)



Focus

Parti Name: Quality Matters

Essence: - distinguish between being connected and being fast enough
- show where performance lags despite decent nominal coverage and who is most affected.

operation

① Maps

- Toggle paired legend to maintain comparable ranges

② Dumbbell

- sort by gap

- hover → show both numbers.

Discussion

Pros: → Elevates discussion beyond coverage

→ Highlights equity by linking performance to income and poverty

Cons: → more charts = High cognitive load

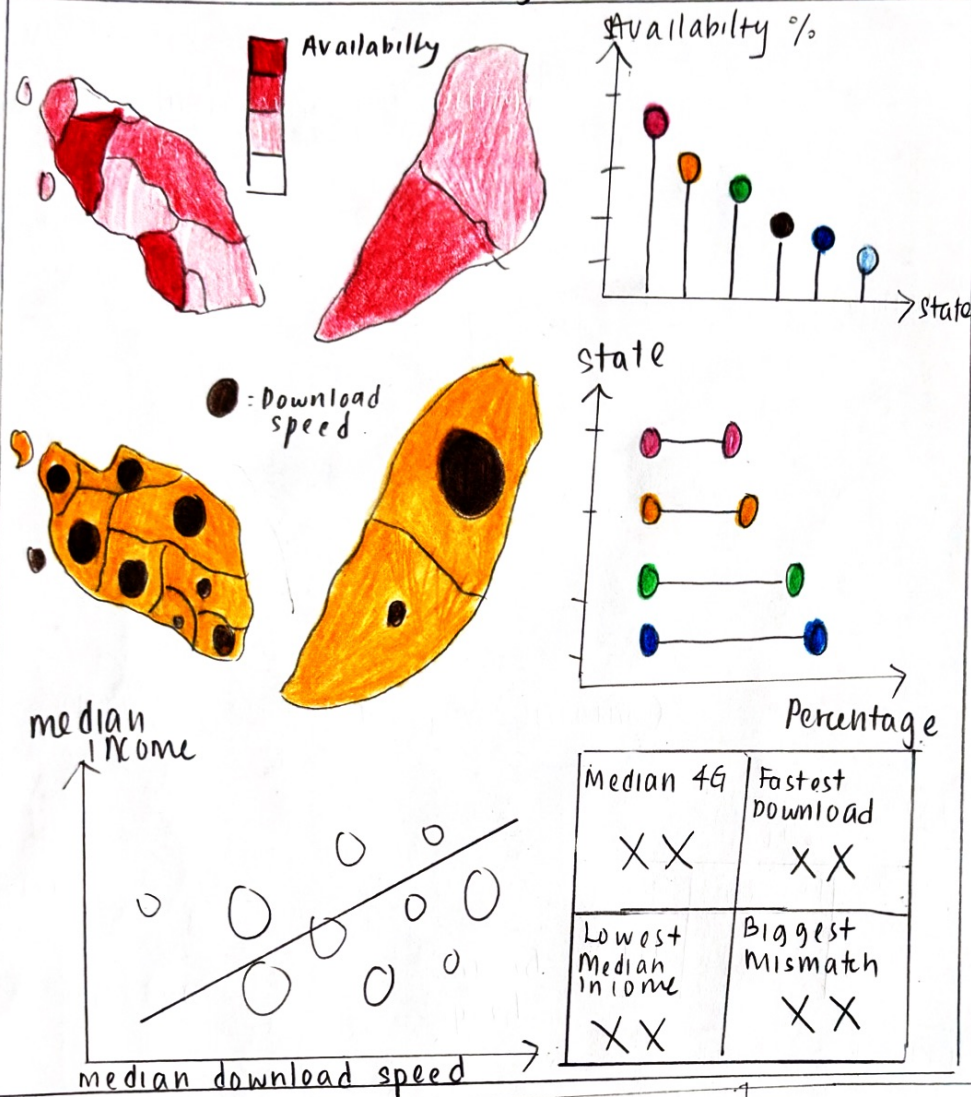
→ normalisation step must be clearly explained.

sheet 5: Realisation

Author: Yap Hiew Tong

Date: 20/9/2025

MIND the Mobile Gap (Malaysia, 2022) subtitle: 4G availability Vs Household Income



Focus

Parti Tilele: Map → why
→ Rank.

Essence: - Lead with where
coverage is strong
- explain why via
performance & socio
economics.

Summary

Title: mind the
Mobile Gap

Author: Yap Hiew Tong

Data: State level availability
& median download
+ DOSM Household Income
2022

Audience: Non-expert
Malaysian
readers.

operation & Components

1) Map - Availability

Hover state → tooltip: coverage%,
median download,
income, poverty

2) KPI cards

computed in spec: national
medians.

3) Map - Download Symbols

circles at state centroids;
size = median-down-mbps.

detail

A) Algorithm / Calculation

- Lookup joins = Vega Lite Lookup
to merge TopoJSON
- Normalisation
- Gap metric: coverage - download
speed

B) Dependencies:

- Runtime: Vega lite.
- Fonts: Roboto Via Google font

C) specific Requirement

- Performance budget
= total download < 1MB