Measuring SDGs with Mobile Phone Data

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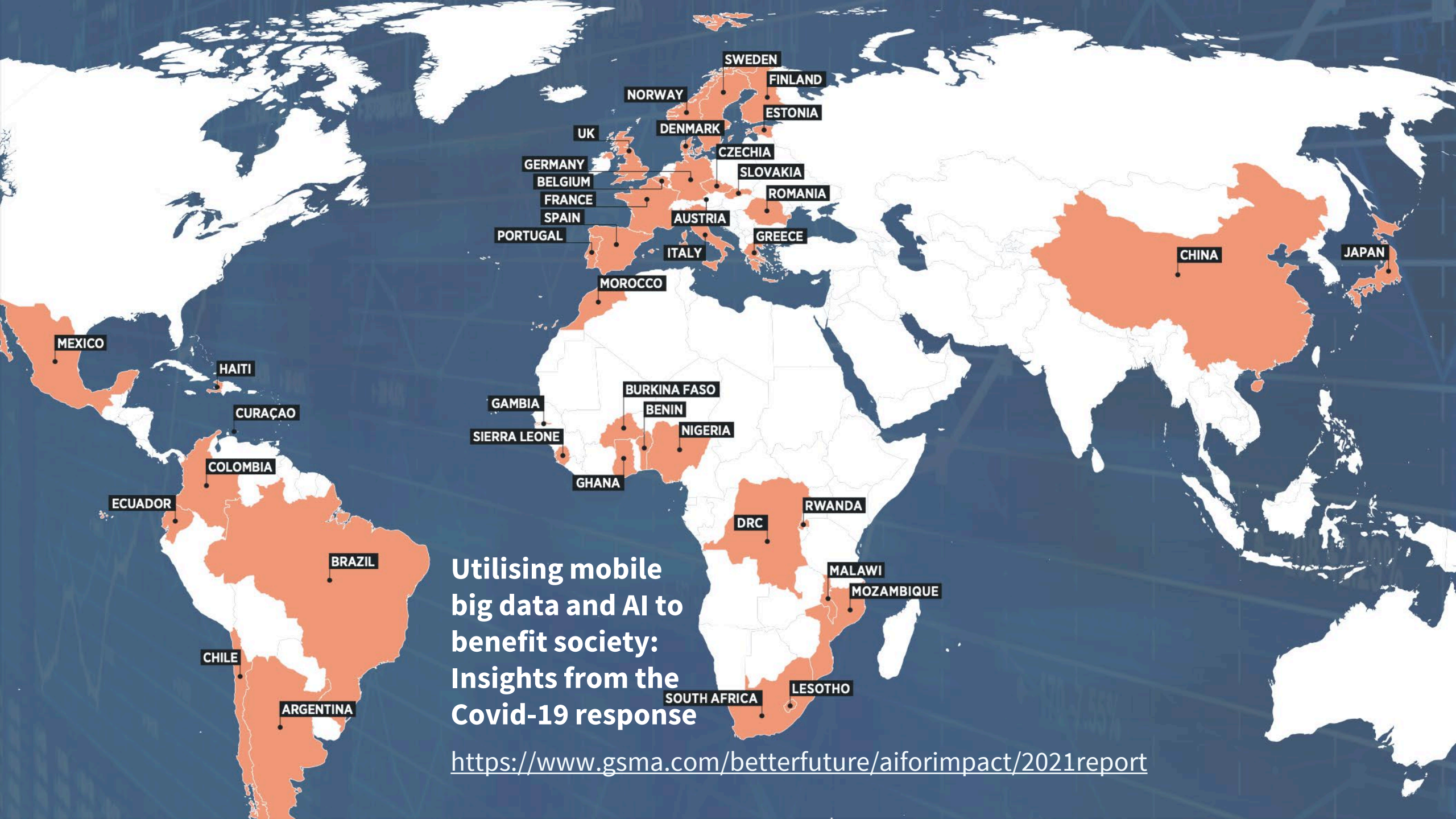
SWEDEN
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Utilising mobile big data and AI to benefit society: Insights from the Covid-19 response
https://www.gsma.com/betterfuture/aiforimpact/2021report

Why mobile phone data for SDGs?

Why not?

MPD barriers

- ✕ **Data gathered** by external parties, hard to access and control
- ✕ **Large datasets**, requires resources

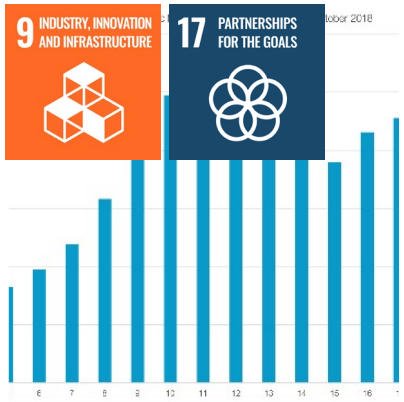
Why yes!

MPD benefits

- ✓ Already gathered by external parties
- ✓ Large datasets with large sample coverage
- ✓ Timeliness
- ✓ Data quality
- ✓ Granularity

Leave no-one behind: Mobile Phone Data (MPD) for SDGs

Information society

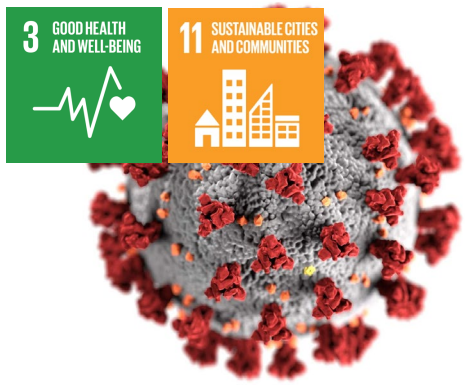


Population

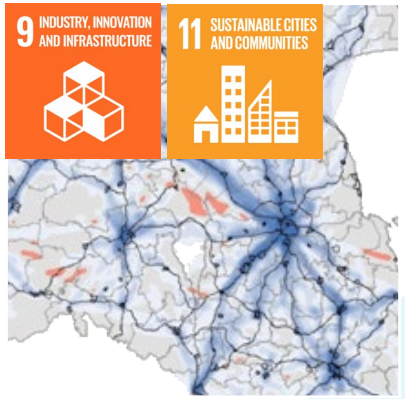
Tourism

Migration

Disaster Management



Transportation



ITU Big Data Project

SDG indicators	Mobile coverage (9.c.1) & internet access (17.8.1)

	Indonesia	Brazil
Interested parties:	National Statistics Office (BPS) Ministry of National Development Planning (Bappenas)	National Statistics Office (IBGE) Centre of Excellence in ICT (CETIC)
Data provider:	1 largest mobile network operator (60% population coverage)	1 large mobile network operator (40% coverage)
Geographical scope:	whole Indonesia	Rio de Janeiro Metropolitan region only
Temporal scope:	1 year	2 months
Contractual scope:	Continuous	Pilot

2 Case Studies

	Indonesia	Brazil
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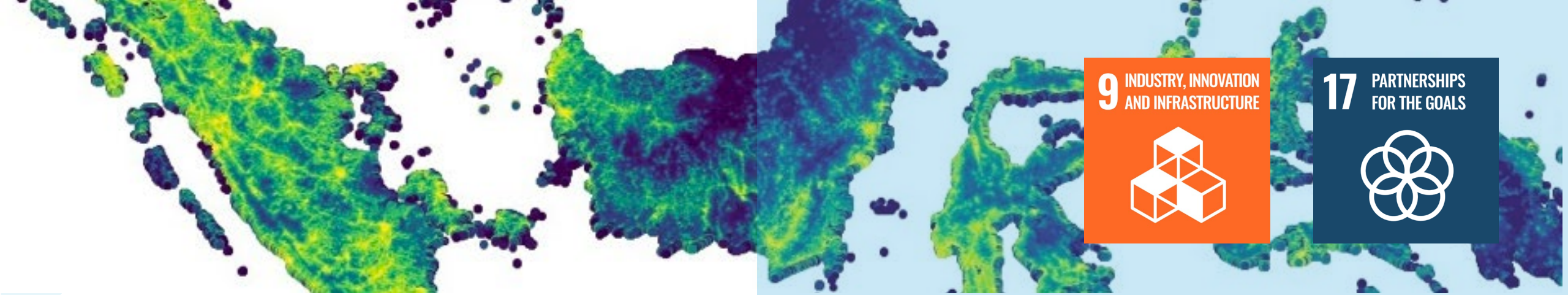
Can we:

1. Measure two SDG indicators with big data – coverage and internet use,
2. Compare to survey and administrative data in these countries, and
3. Conclude that the method that can be used in any country of the world?



Input

- Gridded population (WorldPop)
- Cell location lat/long (mobile network operator or OpenCellID)
- Cleaned call and data detail records (CDR/DDR)

Output

Sustainable Development Goal indicators:

1. SDG indicator 9.c.1 Proportion of **population covered by a mobile network**
2. SDG indicator 17.8.1 Proportion of **individuals using the Internet**

Measuring cell coverage areas in Indonesia

IF

- Cell location data not available from MNO or Ministry
- Population data not precise enough

THEN

- Open and crowdsourced databases can be used:
  - OpenCellID for cell locations (good match with MNO and Ministry data)
  - WorldPop for population grid (good match with population projection)

Before

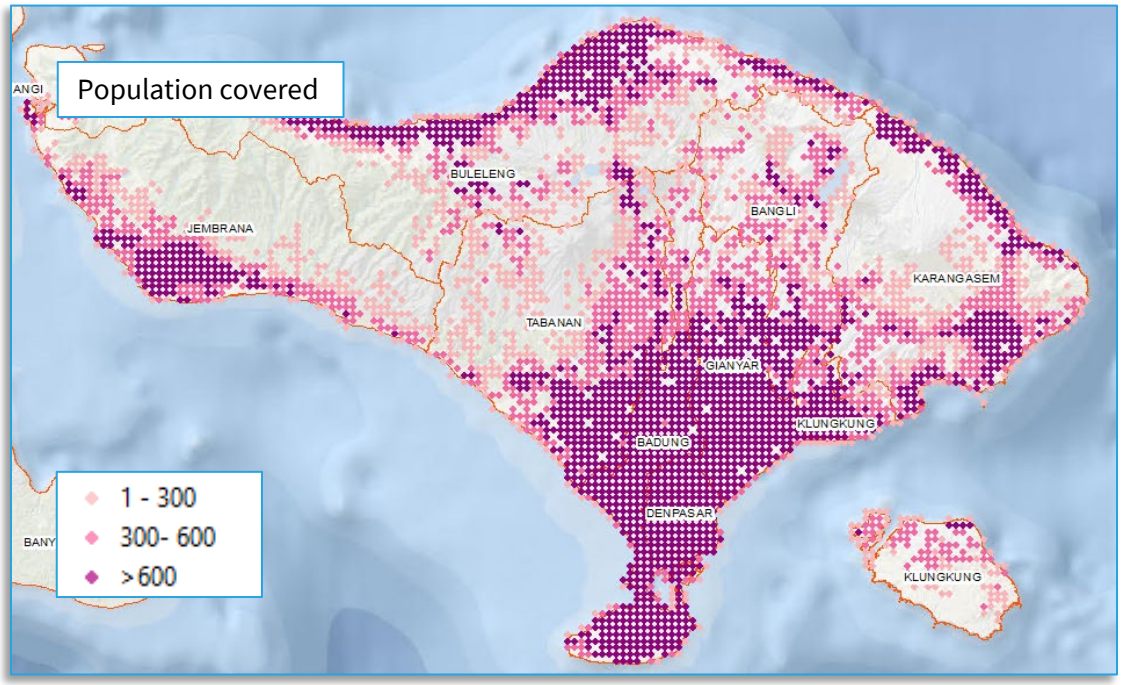
No SDG indicator published for less than national level

The available information is questionable and needed verifying.

- 100% coverage looks comforting, but is it true?

After

SDG indicators now available up to grid level



Bali

Lessons from Indonesia

MPD for ICT statistics is a stepping stone

SDG indicators for the local level

Data-sharing with mobile network operators

Lessons from Brazil

Pilot with

2 months of data

from 1 mobile operator

in 1 region (Rio de Janeiro)

Method for assessing reliability of the data

Pilot with existing infrastructure, then invest

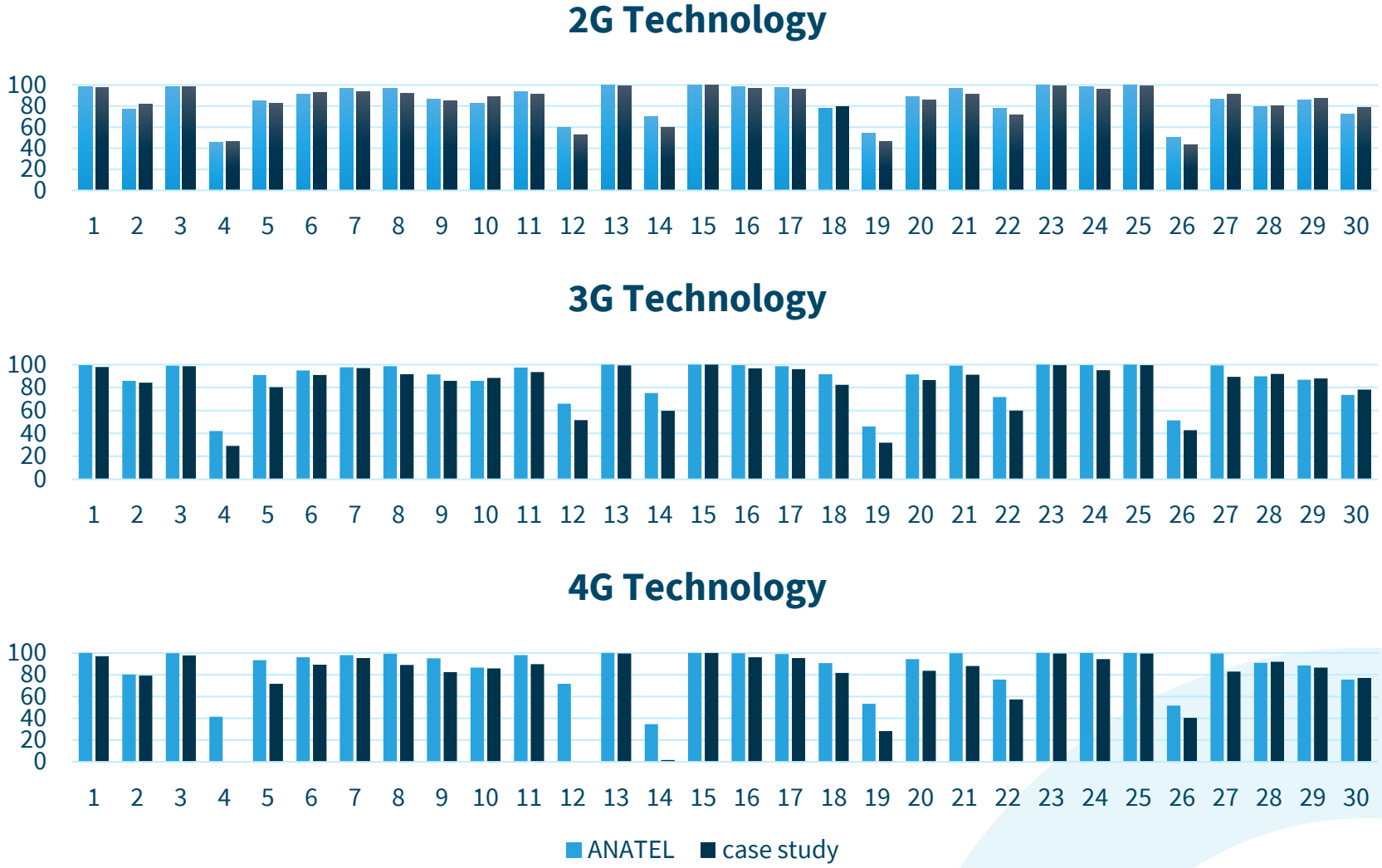
Population covered by a mobile network

Comparison of results from

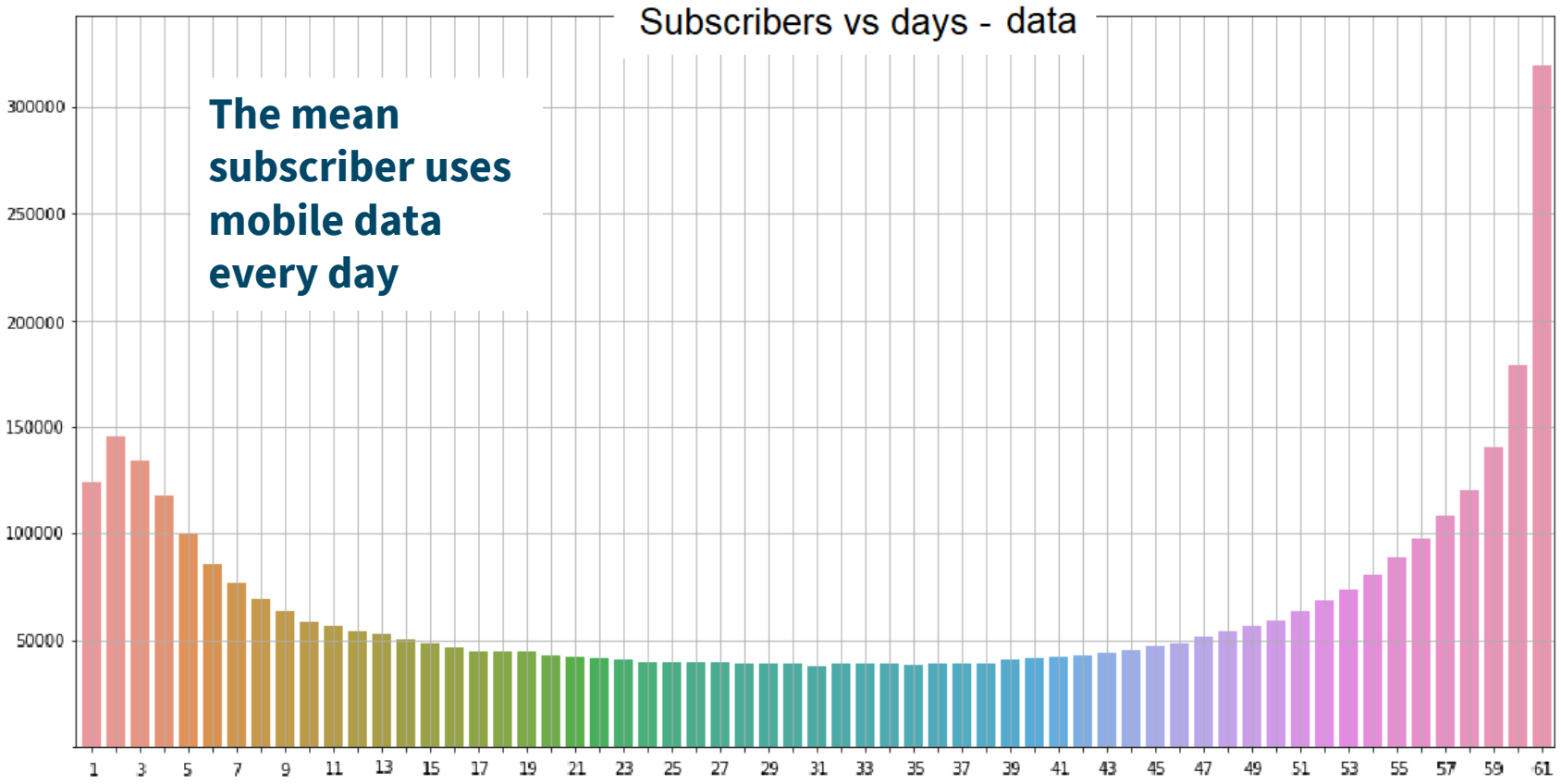
the case study and

ANATEL (the telecommunication regulator)

X axis = municipality
Y axis = population coverage (%)



Measuring internet access in Brazil

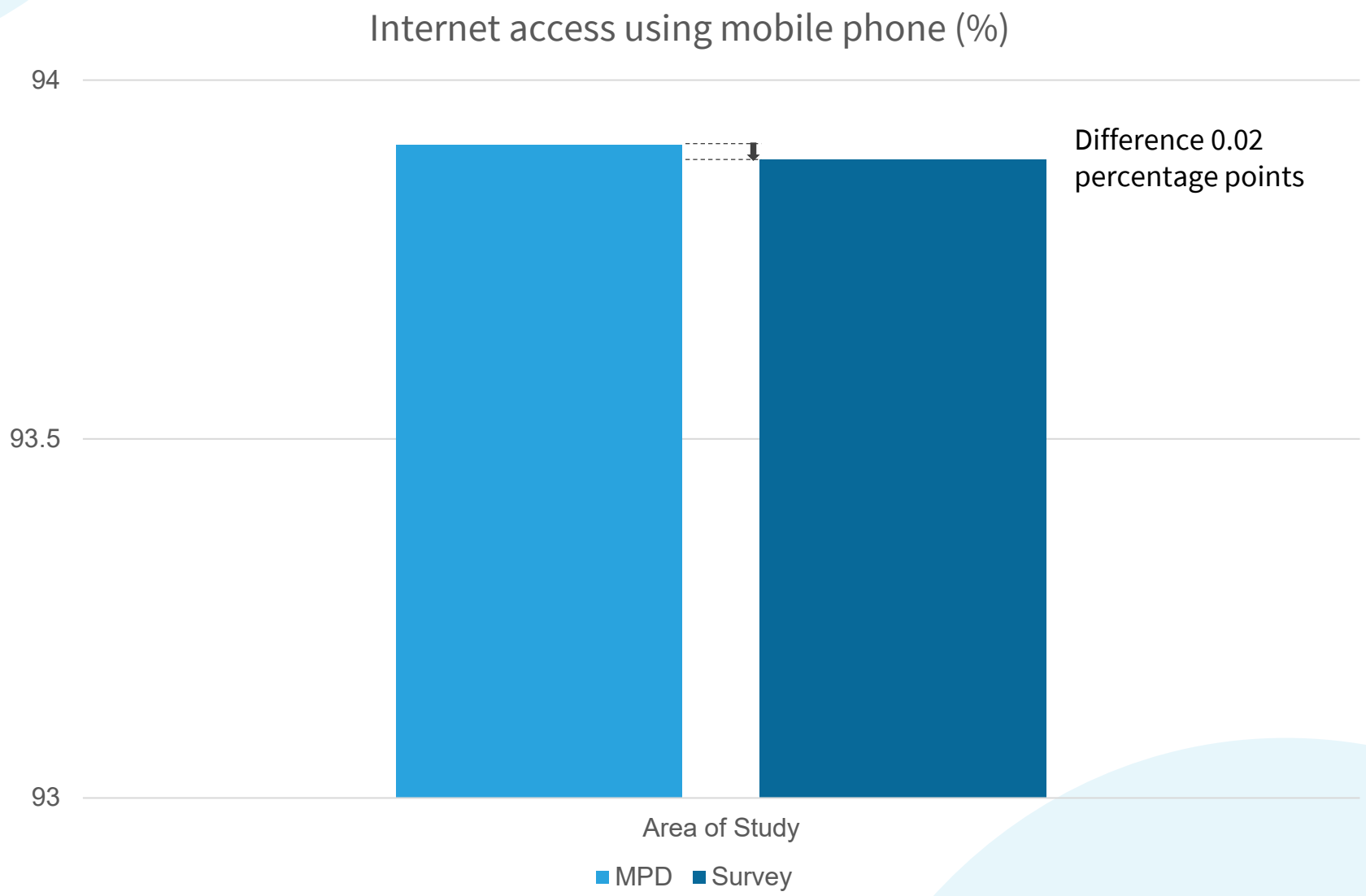


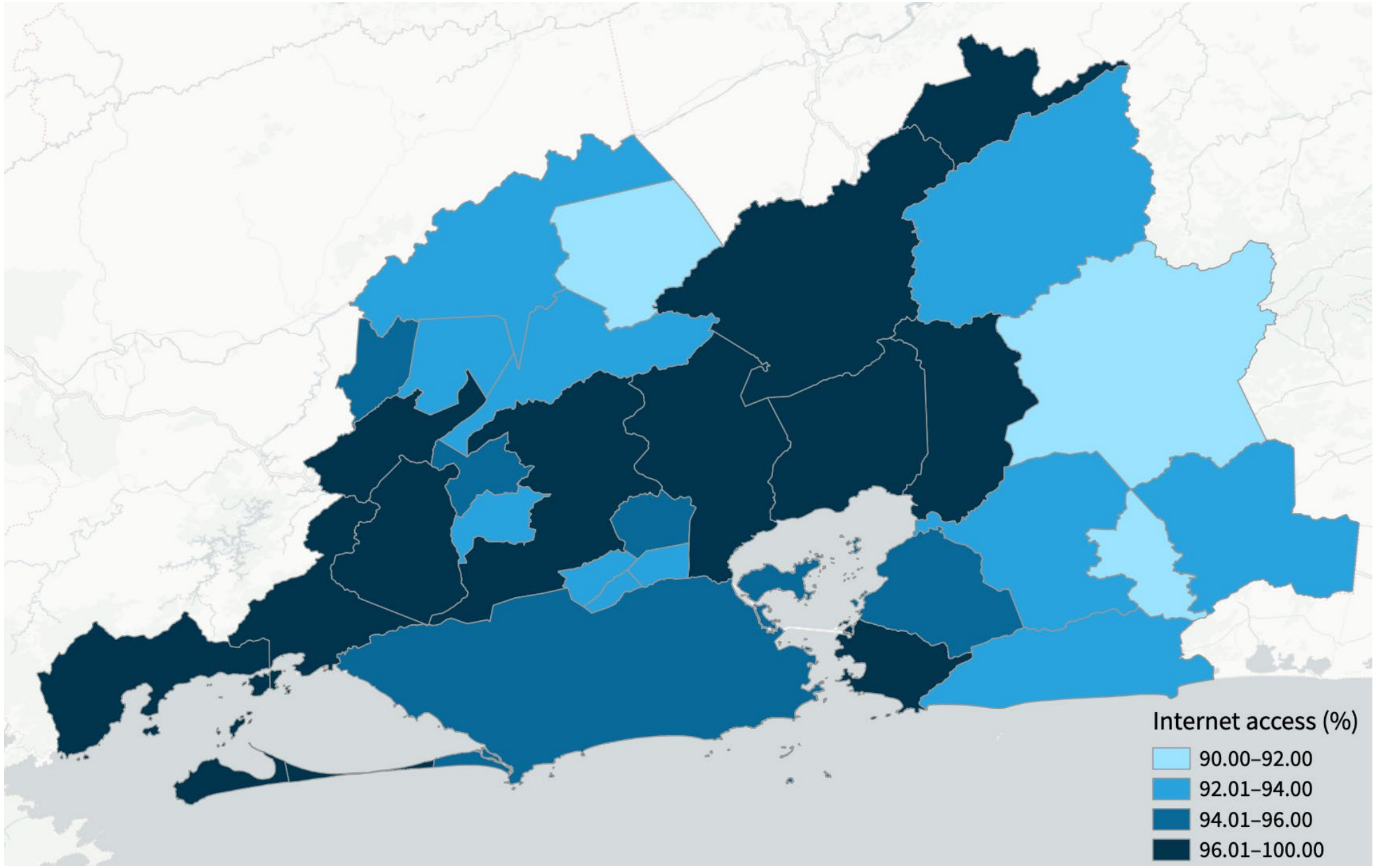
2 months

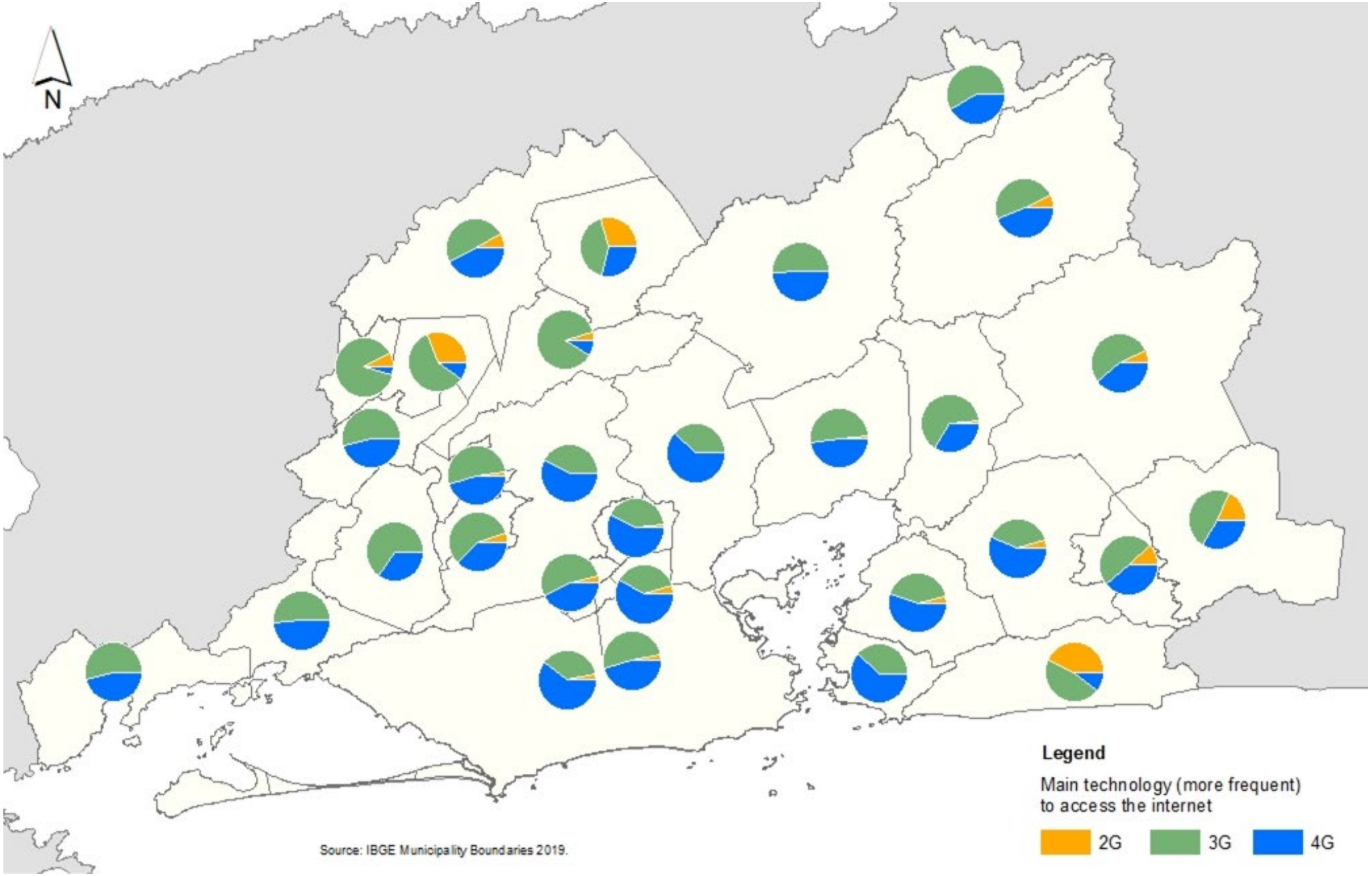
Comparison of MPD & survey data from Rio de Janeiro, Brazil

Sources:

1. Mobile positioning data (MPD) from 2018
2. PNAD Contínua Survey/IBGE Q4 2018




Internet access (%)
90.00–92.00
92.01–94.00
94.01–96.00
96.01–100.00


N
Legend
Main technology (more frequent) to access the internet
2G
3G
4G
Source: IBGE Municipality Boundaries 2019.

7 RJ-129
Engenheiro Paulo de Frontin, State of Rio de Janeiro
Google
Street View - Oct 2021
FARMÁCIA RODEIO
Engenheiro Paulo de Frontin
Google
Image capture: Oct 2021
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Report a problem

Overall conclusion

MPD is **validated** and can be a source for measuring SDGs about mobile phone usage and access

Quality checks are important– at input, throughput and output stage

Produces **accurate small area measurements** to leave no-one behind

How to start

There are countries that **produce official statistics** through mobile positioning data

- ➔ In Estonia, from 2009 until today
- ➔ In Indonesia, from 2017

CENTRAL BANK OF ESTONIA

4x	200x	12x	2.5x	100%
faster	sample size	countries breakdown	more cost-efficient	less burden on tourists

Set up the data pipeline

1. **Attend ITU Academy course** on Big Data for Information Society Indicators
2. **Gather stakeholders** – national statistics office, telecom regulator and data protection authority
3. **Cooperate** with experts and data providers

Follow best practices

Thank you!

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BADAN PUSAT STATISTIK