ITUWTIS
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Information Society Statistics Handbook on using mobile positioning data for SDGs

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World Telecommunication/ICT Indicators Symposium 2020

Handbook

Lead: ITU

Co-lead: Positium

Members:

- BPS (Indonesia)
- IBGE (Brazil)
- CETIC (Brazil)
- DANE (Colombia),
- FCSA (UAE),
- PSA (Philippines)

Goal is to give guideline to the NSOs to produce official ICT statistics from MPD

Case study analysis on two SDG indicators in two countries to learn how to set up a project and what are the challenges and how to prepare

2 case studies

- Indonesia
  - Interested parties: BPS – Statistics Indonesia & Bappenas – Ministry of National Development Planning
  - Data provider: Biggest MNO - Telkomsel
  - Geographical scope: whole Indonesia
  - Temporal scope: 1 year
- Brazil
  - Interested parties: IBGE – Brazilian Institute of Geography and Statistics & CETIC
  - Data provider: 1 large MNO (market share ~40%)
  - Geographical scope: Rio de Janeiro Metropolitan region
  - Temporal scope: 2 months

3 SDG indicators at focus

Needs very good population statistics and data from all MNOs

- ~~SDG indicator 5.b.1 Proportion of individuals who own a mobile telephone;~~
- SDG indicator 9.c.1 Proportion of population covered by a mobile network; and
- SDG indicator 17.8.1 Proportion of individuals using the Internet.

17.8.1 Proportion of individuals using the Internet

The indicator proportion of individuals using the Internet is defined as the proportion of individuals who used the Internet from any location in the defined period.

Statistics on second level of administrative units (LAU-2)

Uses home counts from mobile positioning data

Statistics in 4 groups:

- Proportion of people with no internet data plan
- Proportion of people with internet data plan (2G, 3G, 4G)

$$Proportion\ of\ people\ using\ internet\ (lau2) = \frac{data\ users\ home\ count}{home\ count}$$

9.c.1 Proportion of population covered by a mobile network

Proportion of population covered by a mobile network, broken down by technology, refers to the percentage of inhabitants living within range of a mobile-cellular signal, irrespective of whether or not they are mobile phone subscribers or users. This is calculated by dividing the number of inhabitants within range of a mobile-cellular signal by the total population.

Statistics on second level of administrative units (LAU-2)

Uses MNO data or Worldpop and OpencellID data

Statistics in 3 groups:

- Proportion of people with 2G, 3G, 4G coverage

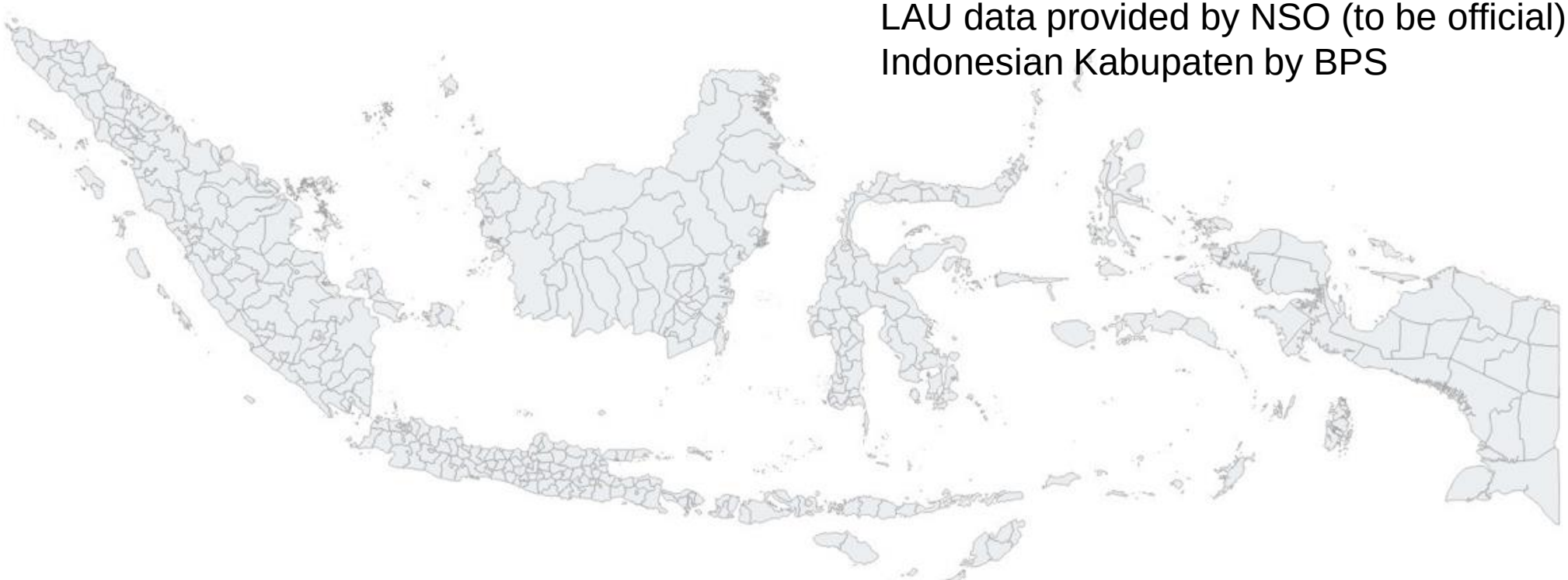
Can be calculated without MNO data

$$Proportion\ of\ population\ covered\ (lau2\ *2G,3G,4G) = \frac{worldpop\ covered\ by\ 2G,3G,4G}{worldpop}$$

Needed data 1/4

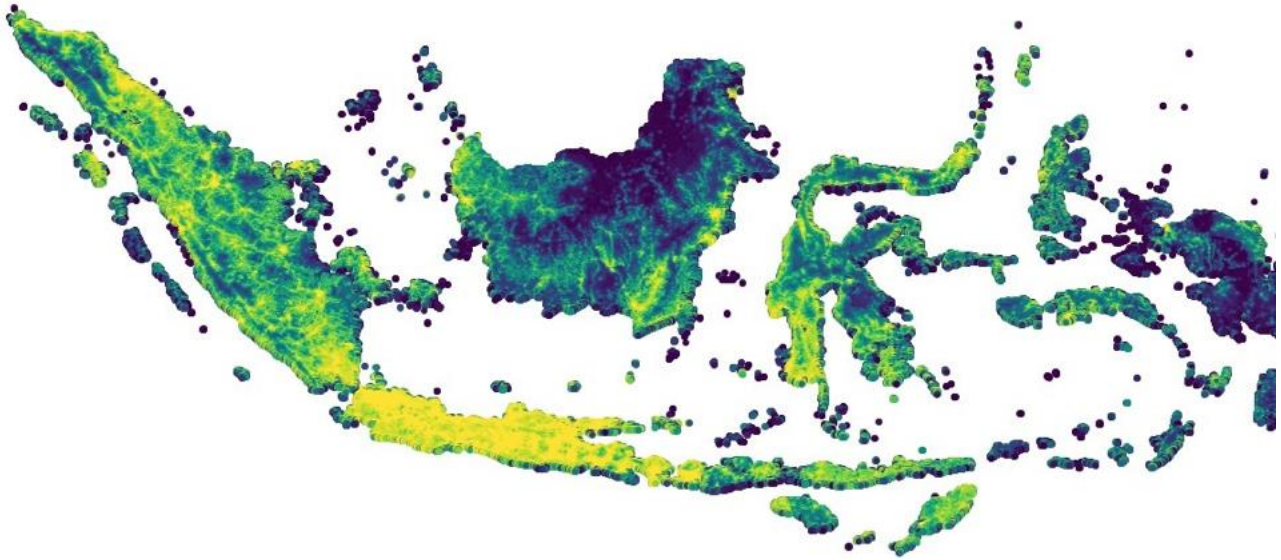
Official Local Administrative Units (LAU) of the country of reference is one of the most important reference data for providing statistics on LAU level

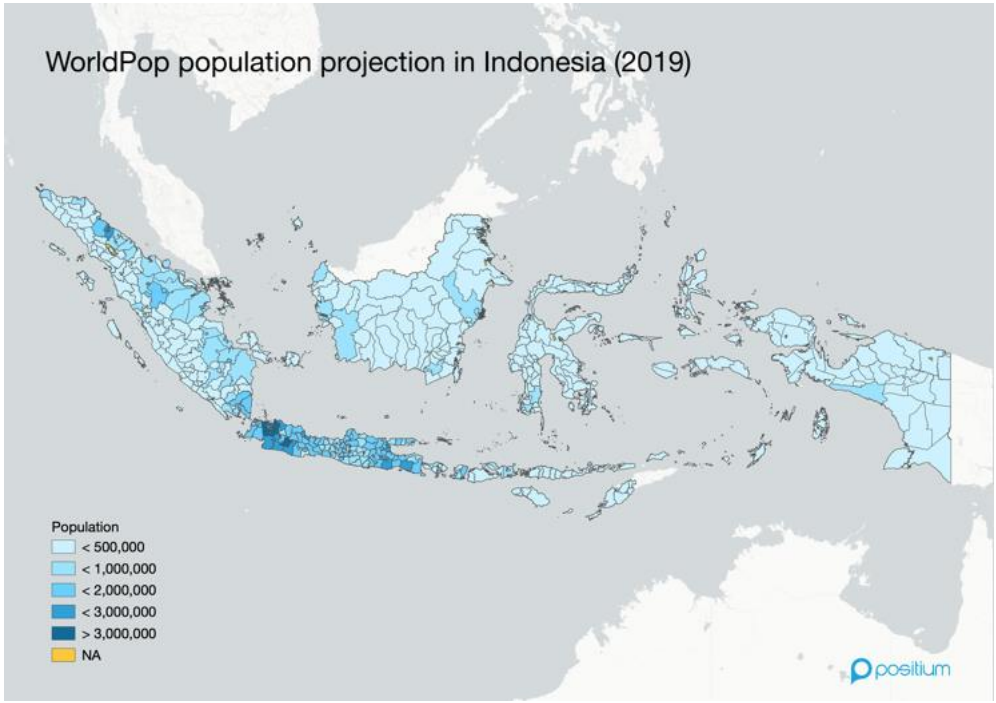
LAU data provided by NSO (to be official)
Indonesian Kabupaten by BPS



Needed data 2/4

WorldPop provides an estimated total number of people per grid-cell (1km grid) using official population estimates and satellite imagery data. We use spatial distribution of population in 2019

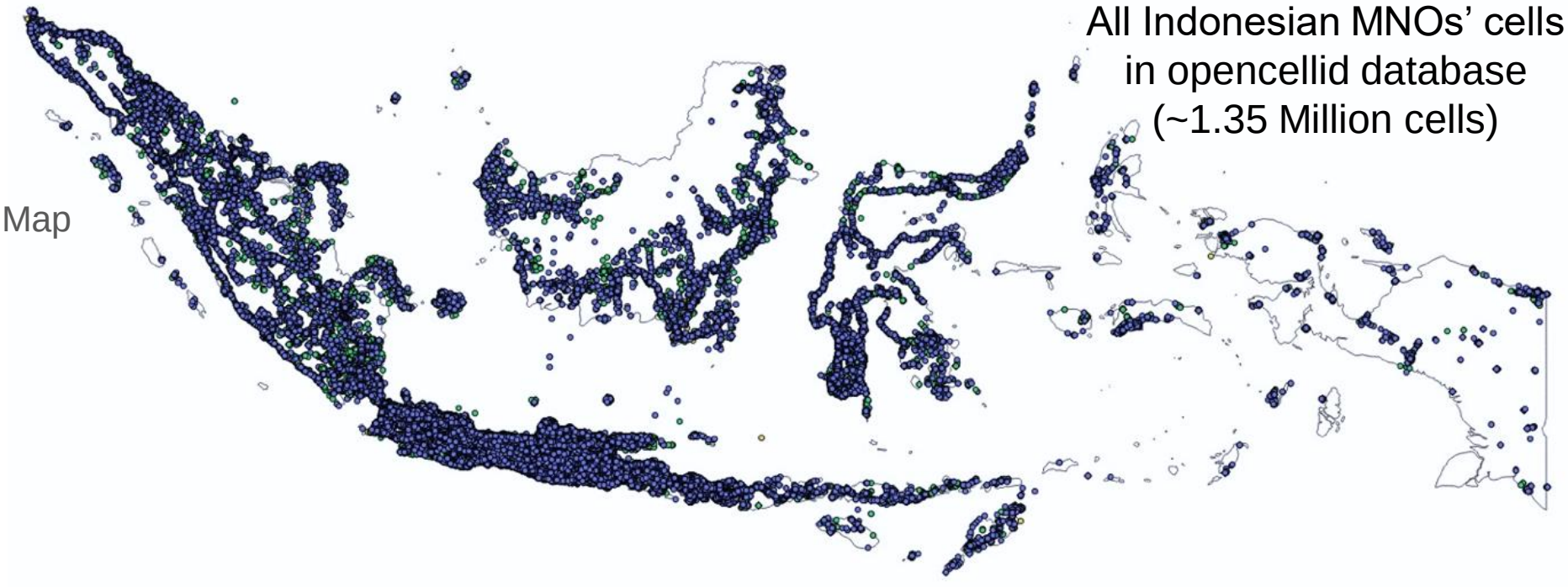




Needed data 3/4

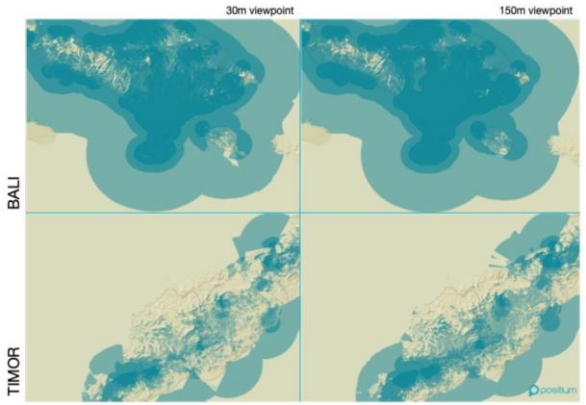
MNO cell coverage map or

OpenCellID as the world's largest collaborative community project that collects GPS positions of cell towers, used free of charge, for a multitude of commercial and private purposes.



All Indonesian MNOs' cells in opencellid database (~1.35 Million cells)

OpenCellID + Digital Elevation Map



Needed data 4/4

Cleaned mobile positioning data (only humans) – QA necessary

Method for calculating place of residence

Aggregated data example:

QA checklist

- Location attribute presence and geography;
- Subscriber distribution and density;
- Subscriber related identity presence and type;
- Subscriber related identity continuity;
- Number of subscribers;
- Number of records per subscriber;
- Time between subsequent events;
- Number of different locations per subscriber;
- Diurnal and weekly distribution of records;
- Subscriber origin and geographic analysis;
- Identification of gaps in data (time and geography);
- Etc.

month	lau2_code	lau2_name	total_home_count	no_data_home_count	2G_home_count	3G_home_count	4G_home_count
01-2019	123	AreaName1	234,567	14,234	94,234	65,432	60,667

Next steps

- We create methodology to calculate two indicators
- We prove it through comparison to reference data as an example in two countries
- Handbook serves as guidebook so others could learn and implement
- Handbook report on findings on the project:
  - Used data sources
  - Operation model
    - Stakeholders
    - Data protection and ethics
  - Quality Assessment
  - MNO calculations
  - Indicator calculations
  - Case study in two countries + lessons learned
- Handbook release planned at the beginning of 2021

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BigData UN Global Working Group

ITU

STATISTICS INDONESIA

IBGE
Instituto Brasileiro de Geografia e Estatística

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Thank You!

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