Collaboration on use of Mobile Phone Data

How to adhere to the fundamental principles of official statistics when compiling data during the Covid-19 pandemic?

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Guiding principles to maintain public trust in the use of mobile operator data for policy purposes

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United Nations Statistics Division
² Positium
³ Statistics Estonia
⁴ Flowminder
⁵ GSMA
⁵ University of Tokyo
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⁷ International Telecommunication Union

Background

Emergency situation

- COVID-19 pandemic, early 2020
- Governments imposed lockdown to reduce the spread of the virus

Request to the NSO

- How can we monitor the effectiveness of government interventions?
- We need data, that are
 - o Timely
 - o Frequent
 - o Geospatially detailed

Background

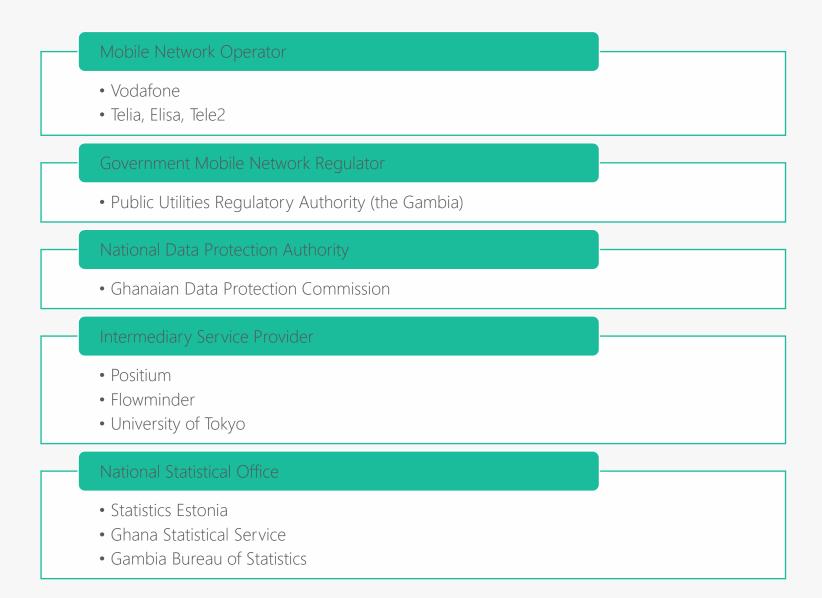
Collaborative Projects in

Ghana – MNO (1), NSO and Flowminder

The Gambia – MNO (2), Regulator, NSO and University of Tokyo / World Bank

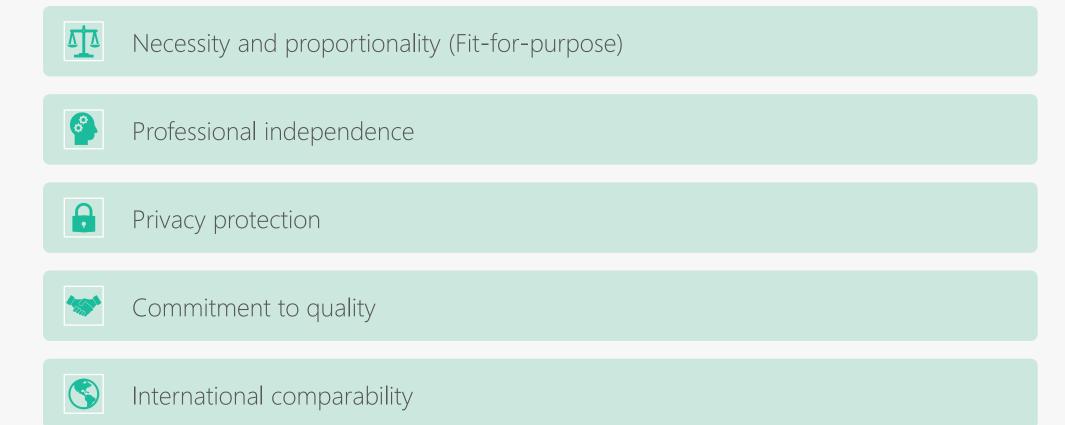
Estonia – MNO (3), NSO and Positium

Partners in setting up the mobile phone data projects



Five Principles to ensure trust

Following the Fundamental Principles of Official Statistics



Conclusions from the 3 country projects



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- Necessity and proportionality (Fit-for-purpose)
- Mobile Phone Data are necessary and proportional to the emergency

Professional independence

- NSOs are the gatekeepers on independence, transparency, code of conduct



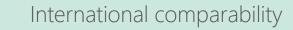
Privacy protection

- MNOs performed data pre-processing and aggregation / joint testing needed



Commitment to quality

- All known limitations of the data were described / further analysis planned



- Methodologies and code are publicly shared

Link with "Big Data for Travel Demand Modelling"



- Necessity and proportionality (Fit-for-purpose)
- Defined purposes/minimum required; Relevance



- Professional independence
- Credibility; Transparency / Accessibility



Privacy protection



Commitment to quality

- Accuracy; - Coherence; - Interprtability



International comparability

- Guidelines; - Handbooks

Privacy Protection

MPD country projects during COVID-19

- Data stayed with the Mobile Network Operator
- "Raw Data" collaboration only on premises of MNO
- Only aggregated and anonymized data released from MNO

Application of Privacy Preserving Techniques

- Data are accessed remotely
- Perform operations on data without "seeing" the data through
 - o Differential Privacy
 - o Secure Multi-Party Computation
 - o Secure enclaves
- Connection via trusted network node (UN)

What we found (linked to publication)



Partner with Private Sector

Yes: adhere to principles to maintain public trust



Need for socio-demographic data

Use detailed socio-demographic data from NSO

Overlay using geospatial framework

UN Committee of Experts on Big Data and data science for official statistics

- Inter-governmental body with 31 countries and 16 international agencies (under Stat Commission)
- Collaboration of more than 300 experts from all stakeholder communities
- 9 Task Teams, including
 - on use of Mobile Phone Data (Tourism, Migration, Dynamic Population, Displacement, Information Society and Transport)
 - on Rural Access to services

United Nations **Big**Data



Collaborate with us:

Join a Task Team of UN-CEBD



Mobile Phone data for Transport statistics



Access to private sector data



Privacy Preserving Techniques



Training & Skills

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United Nations Statistics Division

Slide 30

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United Nations BigData