



STATISTICS INDONESIA

The Use of Mobile Phone Data for Official Tourism Statistics

With Examples from Countries

Sarpono Dimuljo



Dubai, 27 January 2022



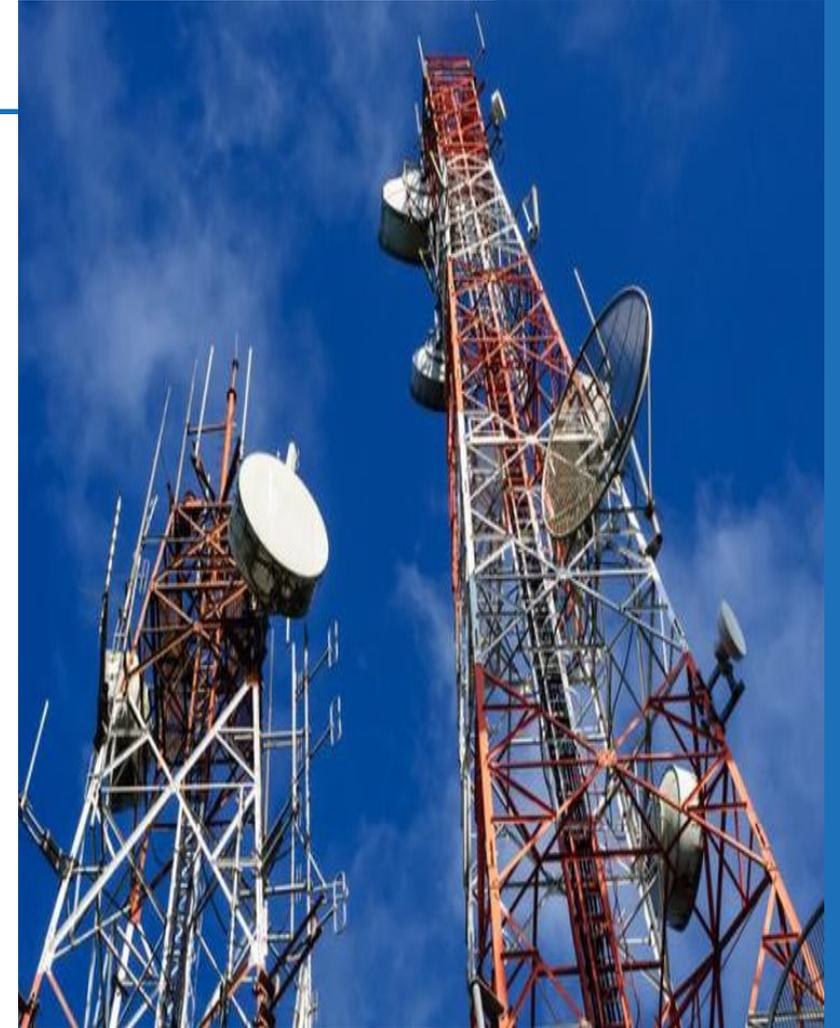
The Use of Mobile Phone Data In Tourism Statistics

Complement for other data sources

- ✓ Complement for immigration data (administrative data)
- ✓ Inbound tourism, when there is no immigration checkpoint, destination analysis
- ✓ Outbound tourism, to obtain country of destination and length of stay in each country

Replacement for other data sources

- ✓ Domestic tourism, replacement of household survey
- ✓ Inbound tourism, replacement of shuttle trade (cross border) survey
- ✓ Event analysis, replacement of survey or ticket sales



Data and Indicators obtained from MPD

- ✓ Inbound Tourists (number of tourists, length of stay, place visited)
- ✓ Outbound Tourists (number of tourists, length of stay, country visited)
- ✓ Domestic Tourists (number of tourists, length of stay, place visited, O-D matrix)
- ✓ Event Analysis (number of visitors, venue/place visited)

Other Indicators

- ✓ SDG 8.9.1
- ✓ SDG 8.9.2
- ✓ SDG 12.b.1

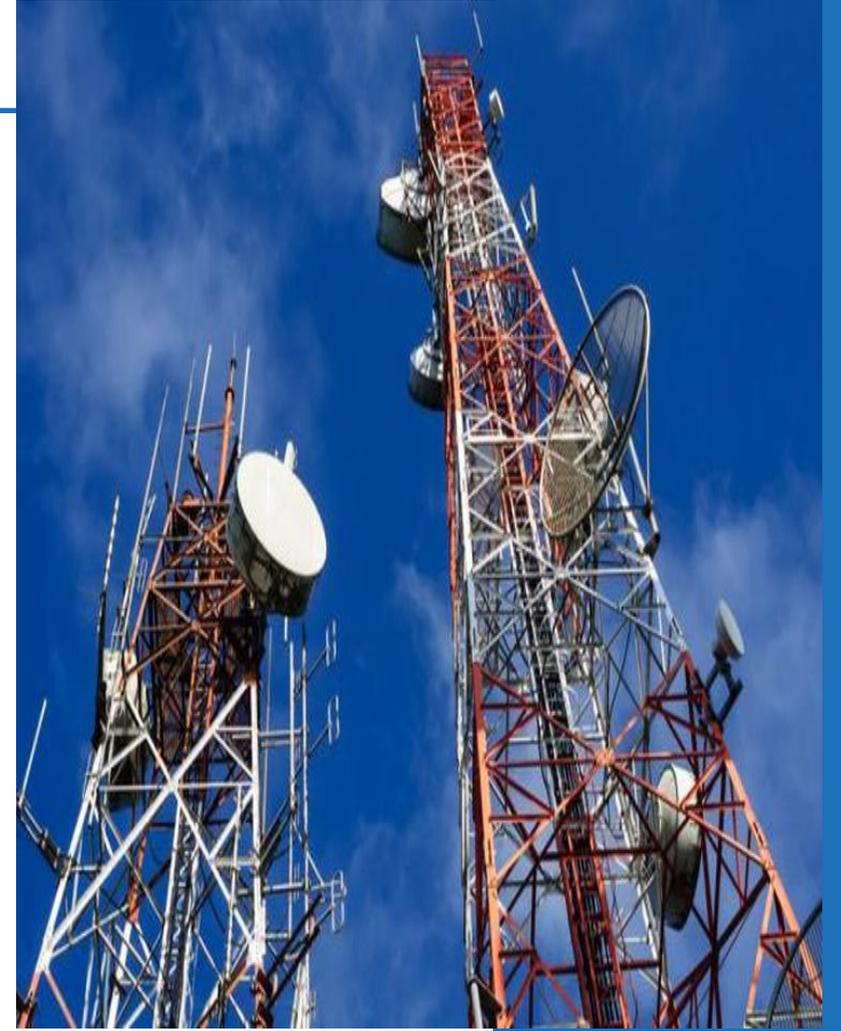


Countries that use MPD for Official Tourism

- ✓ Estonia (Bank of Estonia, since 2008)
- ✓ Indonesia (Statistics Indonesia, since 2016)
- ✓ Italy (bank of Italy)

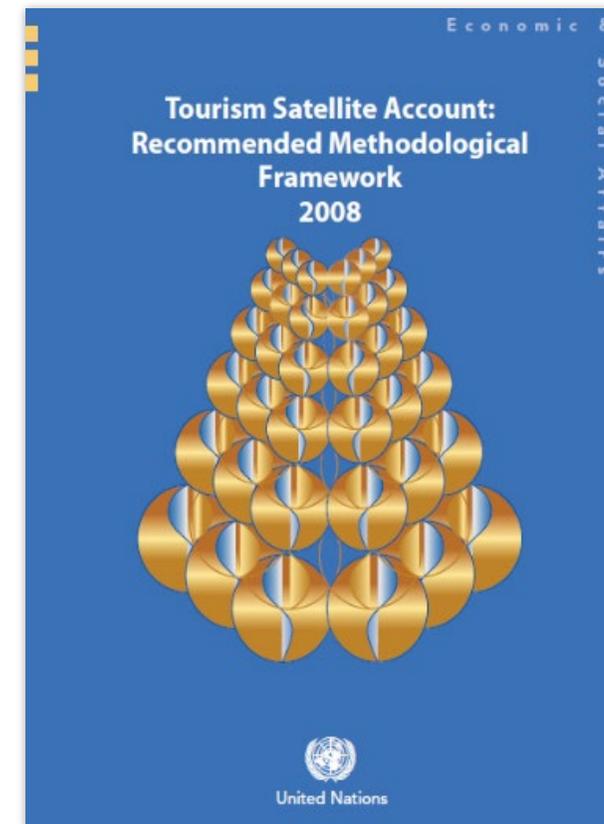
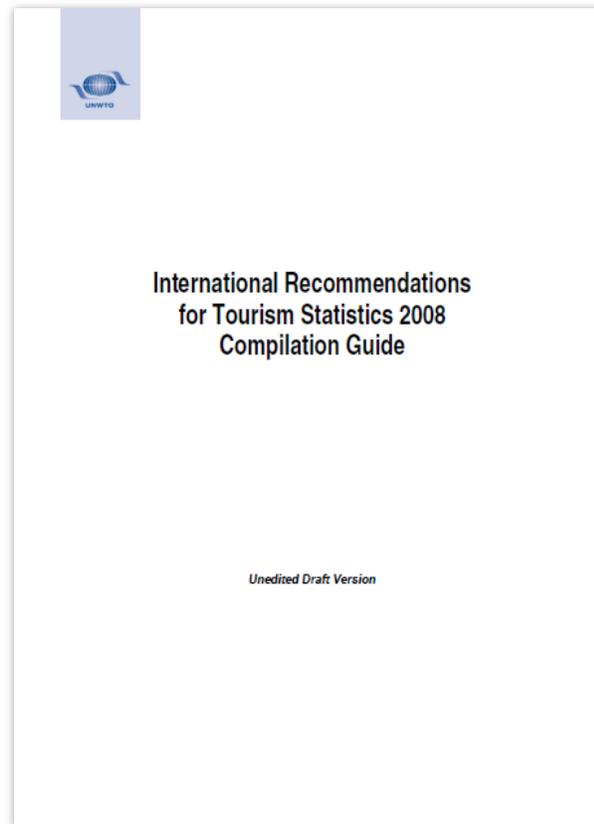
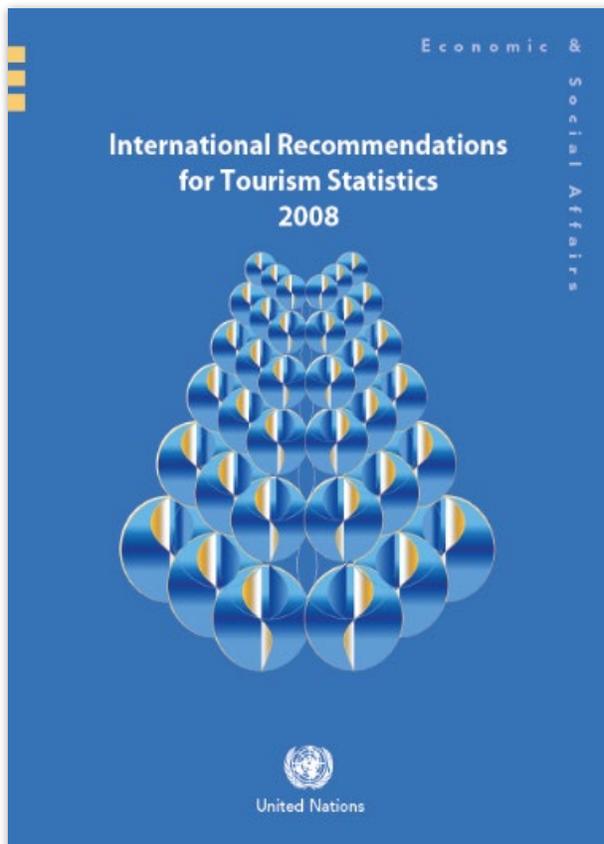
Research

- ✓ Oman



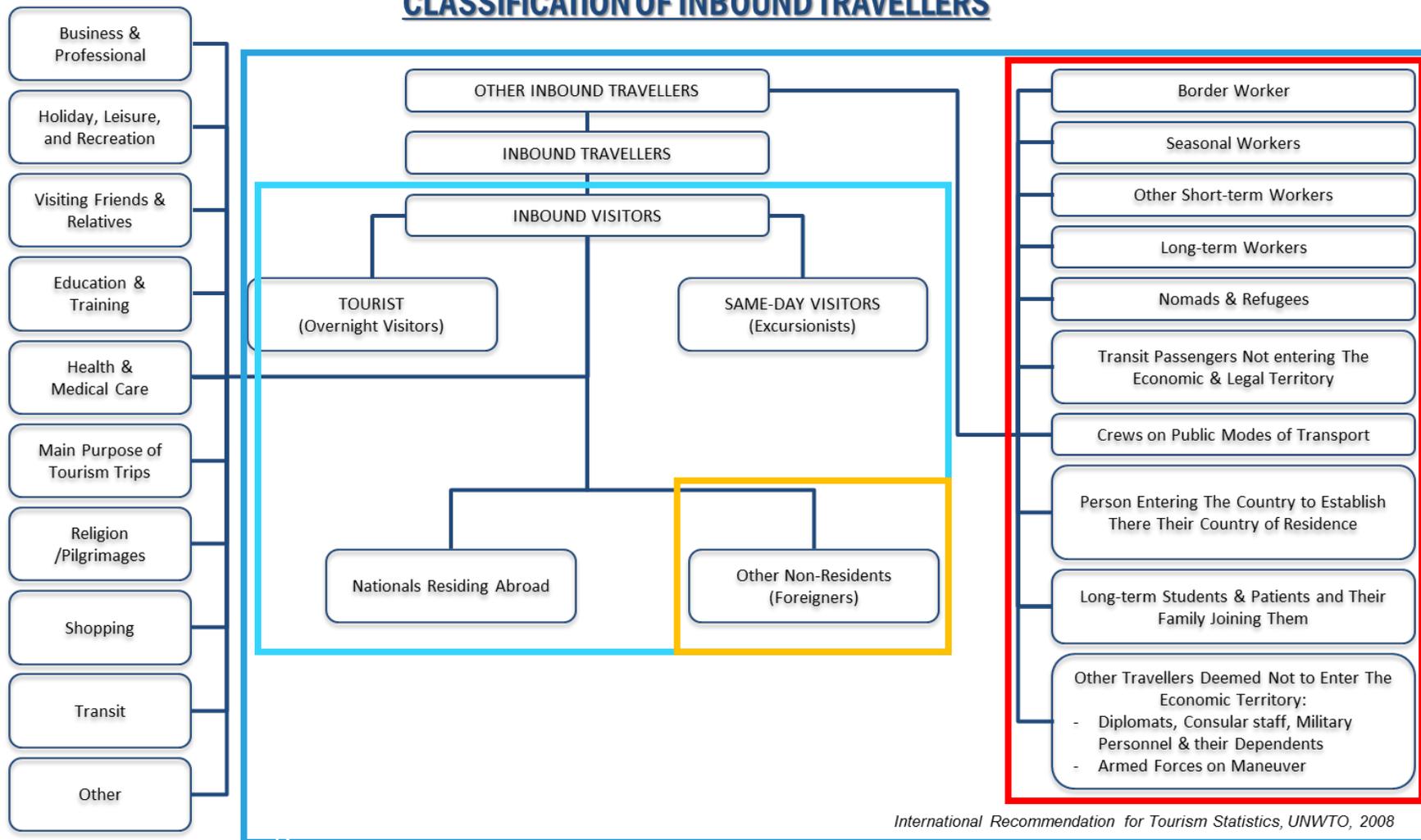


Tourism Statistics Manuals



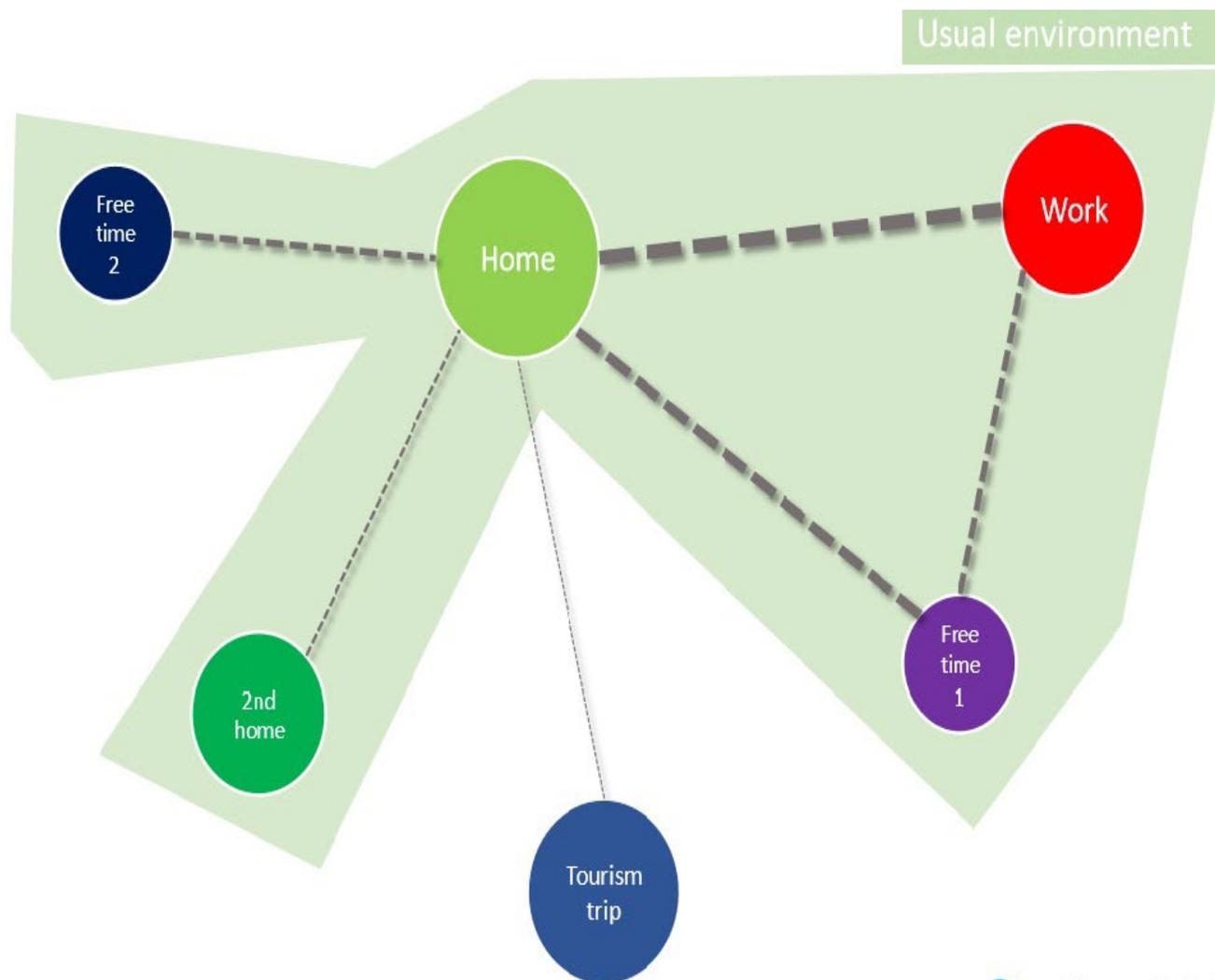
How do we implement the tourism concept to mobile phone data

CLASSIFICATION OF INBOUND TRAVELLERS





Usual Environment



- ✓ Outside usual environment, tourist
- ✓ Home-work, commute
- ✓ Changing home, over a year, internal migration

What data is used

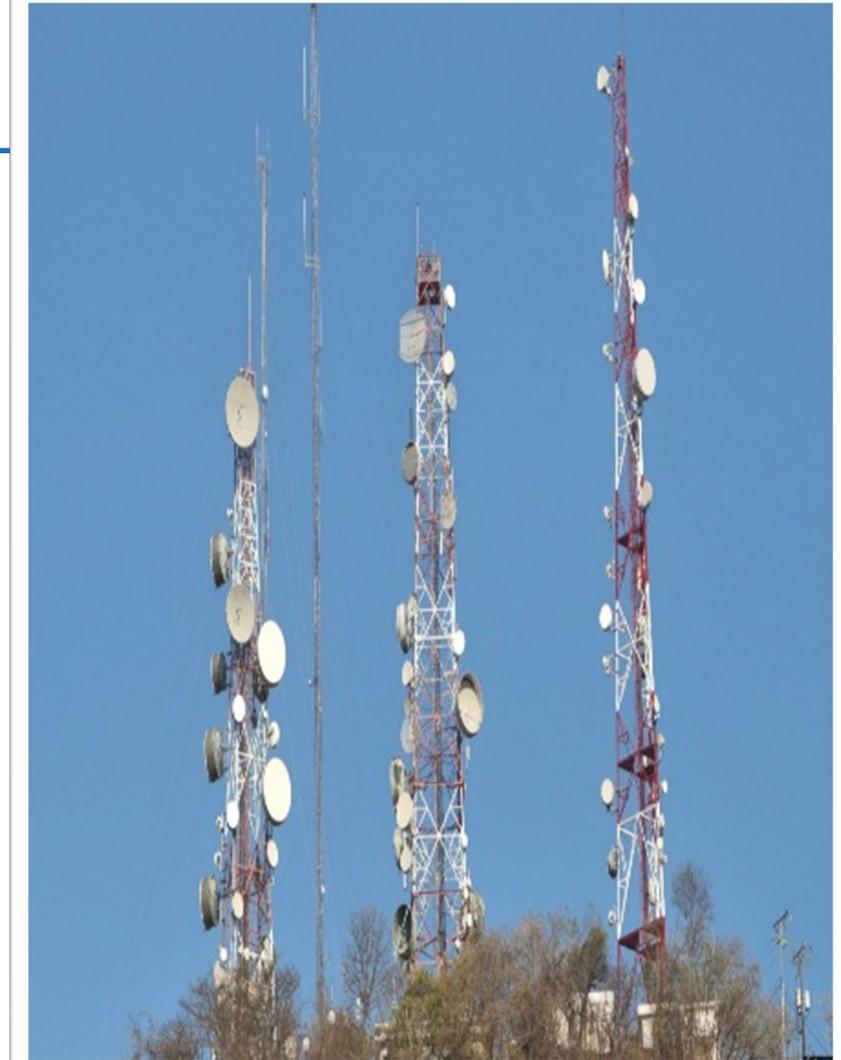
Signalling (probe)

- ✓ Capture more data (very big, especially for domestic tourism)
- ✓ Good for tourism statistics and commuting
- ✓ Add noises (statistical and non statistical)

Call Detail Record (CDR)

- ✓ Less data
- ✓ Possible under coverage, especially for inbound and outbound

Combination of both, signalling and CDR

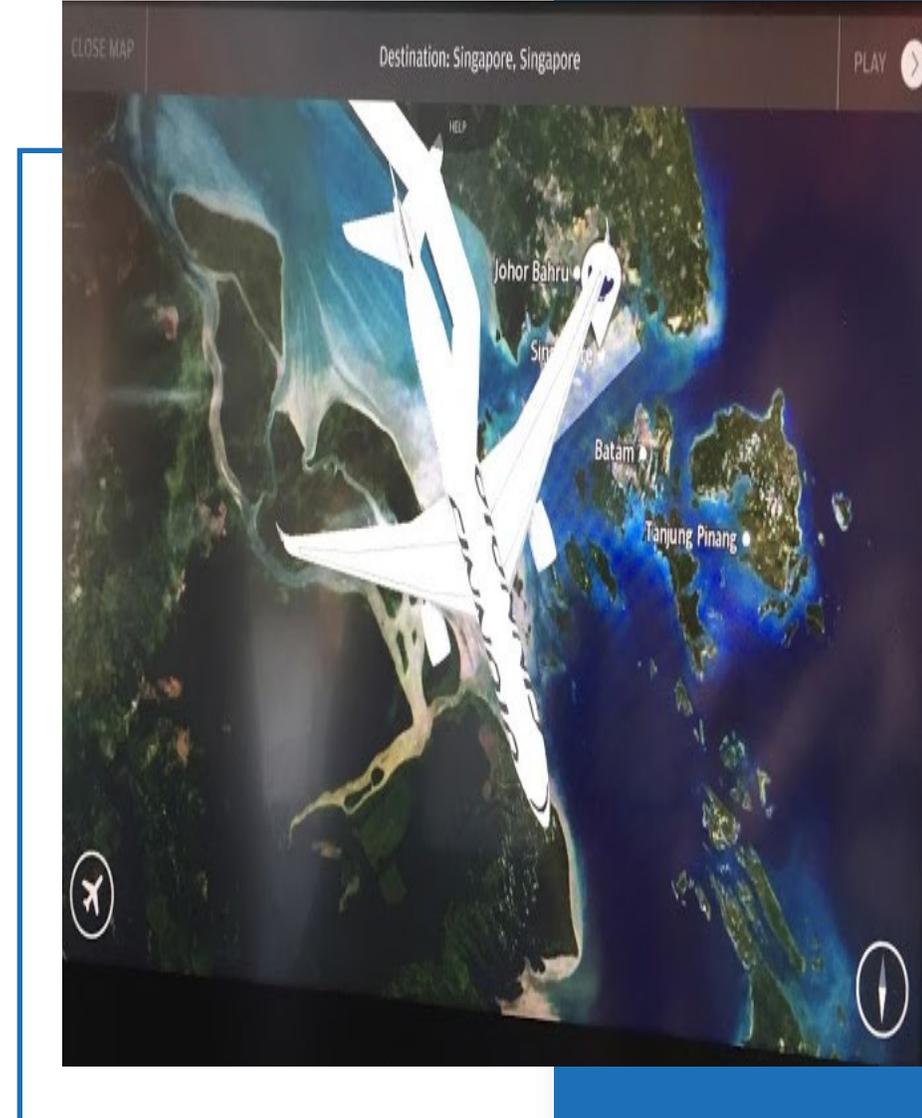


Statistical and Non Statistical Noises

- ✓ Fast fliers
- ✓ Seamen
- ✓ Accidental Roamers
- ✓ Other transit

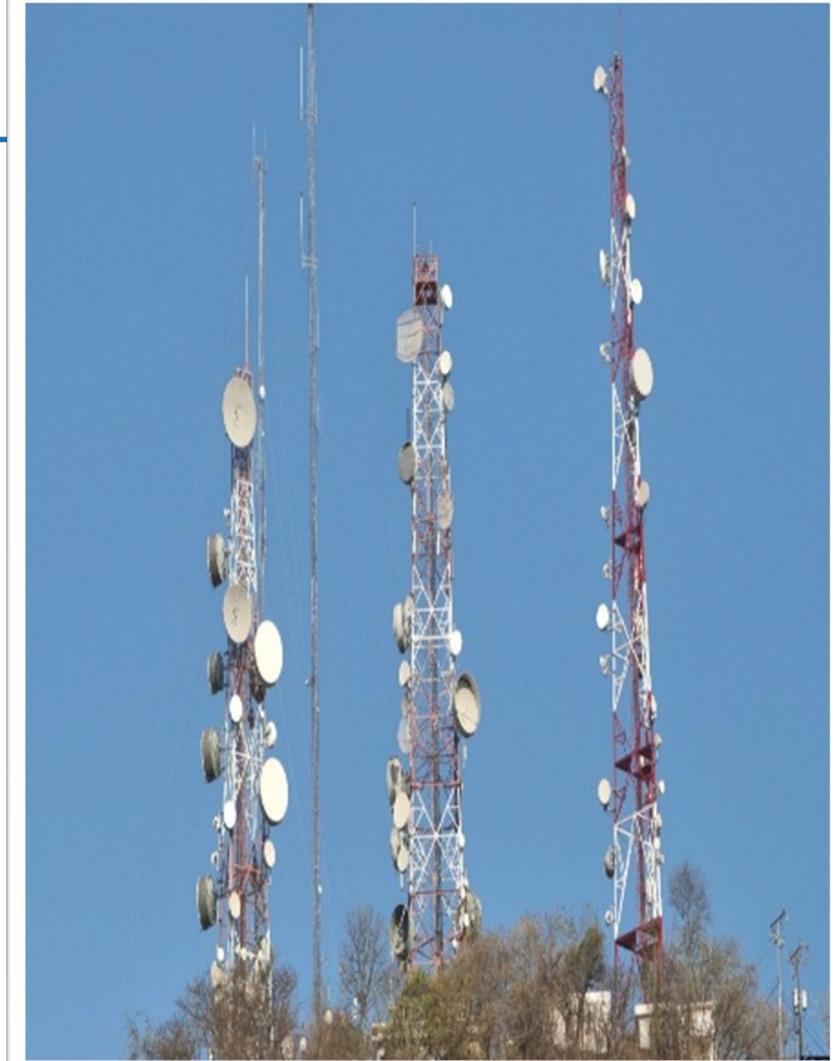
Methodology is important

- ✓ Filtering methods
- ✓ Select appropriate method that reflect reality



Data Access

- ✓ Statistical Law (e.g Estonia)
- ✓ Telco Regulator (e.g Georgia)
- ✓ MoU and Contract (e.g Indonesia)



For Official Statistics

1

Quality Assurance

- *In line with UN-QAF, UNECE Big Data QAF, NSO's QAF*

2

Sound Methodology

- *Various methodologies*
- *Choose that reflect reality*

3

Privacy-Preserving Processing

- *Privacy protected*
- *Aggregate data*





Quality Assurance

Quality Assurance

- In-line with BPS QAF Handbook (for Census, Survey and Administrative data)
- In-line with UN QAF and Unece QAF for Big Data
- Quality check (Input, Throughput, Output)

Input Quality Checking (First gate)

- Data gaps
- Missing data
- Incorrect timestamps
- Duplicate record

Throughput Quality Checking (Second gate)

- Errors in data processing
- Overwrites

Output Quality Checking (Third gate)

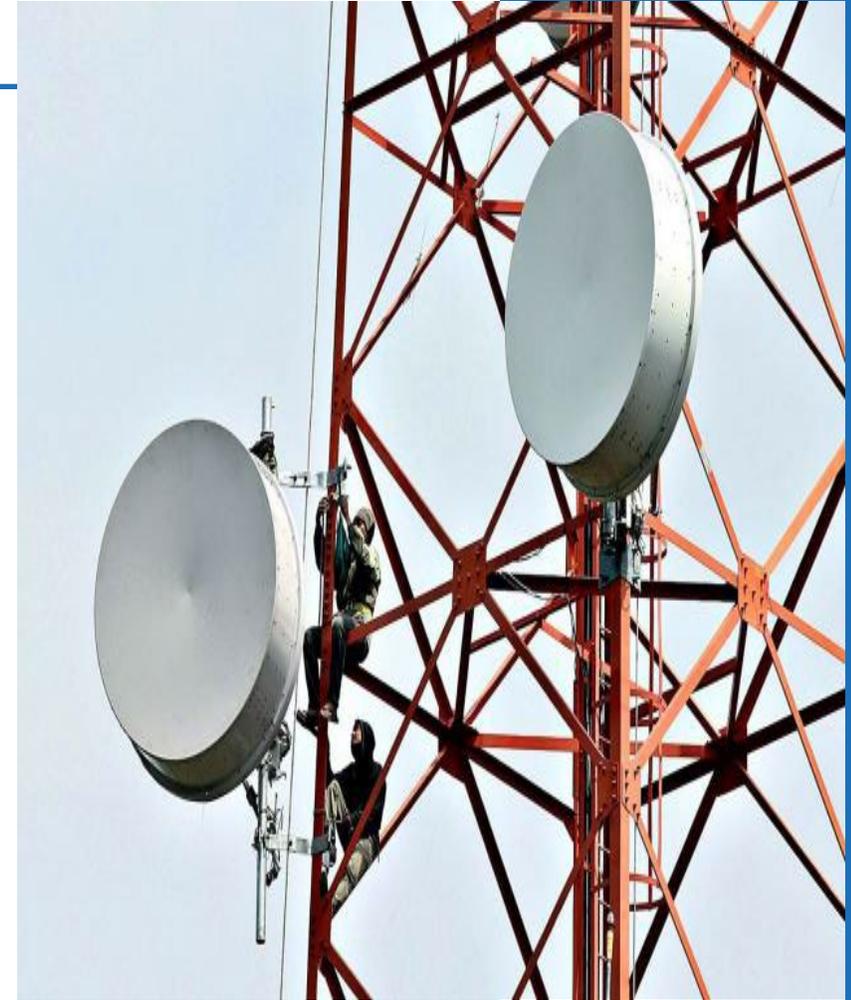
- Anomalies checking
- Coherence with other data
- New phenomena can be explained
- Passed Calibration/Comparison with other data

Privacy Protected through Pseudonymization and k-Anonymity

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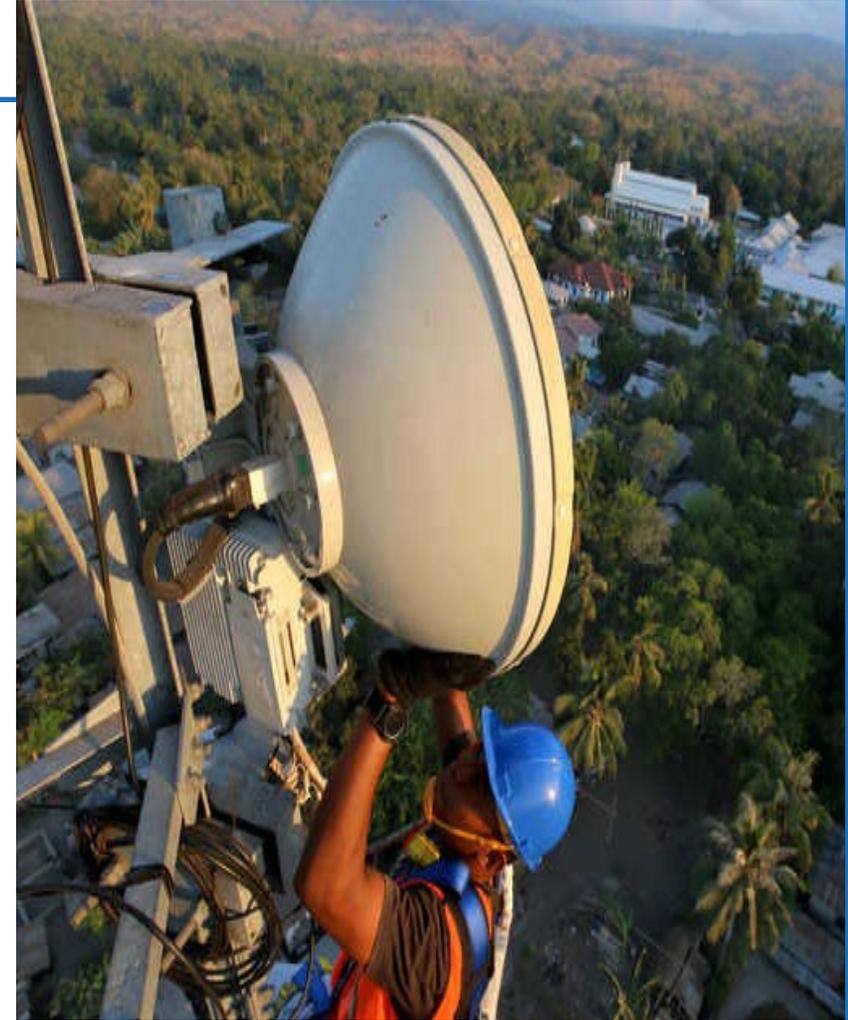
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0	2020-01-27 01:15:32	-6280891885648479061	LBA	-6.24991	106.60868	36	03	051	3G	2020-01-26
1	2020-01-26 19:15:23	-6280891885648479061	LBA	-6.24991	106.60868	36	03	051	3G	2020-01-26
2	2020-01-26 16:15:19	-6280891885648479061	LBA	-6.24991	106.60868	36	03	051	3G	2020-01-26
3	2020-01-26 03:49:04	8422727271182682645	UPCC	-6.48370	107.68290	32	13	120	4G	2020-01-26
4	2020-01-27 06:53:55	8422727271182682645	LBA	-6.48378	107.68292	32	13	120	3G	2020-01-26

- ✓ The subscribers is masked with hash, when data scientists processed
- ✓ The data produce is aggregate data (tables)



CHALLENGES

- Data access (if there is no direct rule or regulation).
- Administrative and legal process (administrative review, contract, negotiation, etc.)
- Once the MNO has committed, keeping that commitment
- MNO staff/data scientist lack understanding of Statistics
- Data processing volumes (e.g for Indonesia up to 144 TB data/year)





Press Release of Tourism Statistics (Indonesia)

Press Release

BERITA RESMI STATISTIK
No. 91/12/Th. XXIV, 1 Desember 2021

Perkembangan Pariwisata dan Transportasi Nasional Oktober 2021

- Jumlah kunjungan wisman ke Indonesia di bulan Oktober 2021 mencapai 151,03 ribu kunjungan. Sementara TPK hotel klasifikasi bintang mencapai 45,62 persen.
- Jumlah penumpang angkutan udara domestik di bulan Oktober 2021 naik 48,45 persen.

BADAN PUSAT STATISTIK

<https://www.bps.go.id/pressrelease.html>



YouTube

badan pusat statistik

Jumlah Kunjungan Wisman Menurut Pintu Masuk (kunjungan)

Mode Transportasi	Total Jun'21	Persentase
DARAT	90.440	64%
UDARA	16.234	12%
LAUT	34.171	24%
Total Jun'21	140.845	

Pintu Masuk	Jun'21	Mei'21	Mei'20	Mei'21 vs Mei'20 (%)
Sukarno-Hatta	13.715	13.448	909	5,27%
Sam Ratulangi	1.370,43	130,90	1.239,53	811,99%
Juanda	287	1.015	728	13,13%
Batam	246	250	4	2,04%
Tanjung Uban	34	30	4	0,00%
Tanjung Benoa	0	0	0	-100,00%
Atambua	11	13	2	1.000,23%
Anik	0	0	0	-100,00%
Entikong	0	0	0	-100,00%

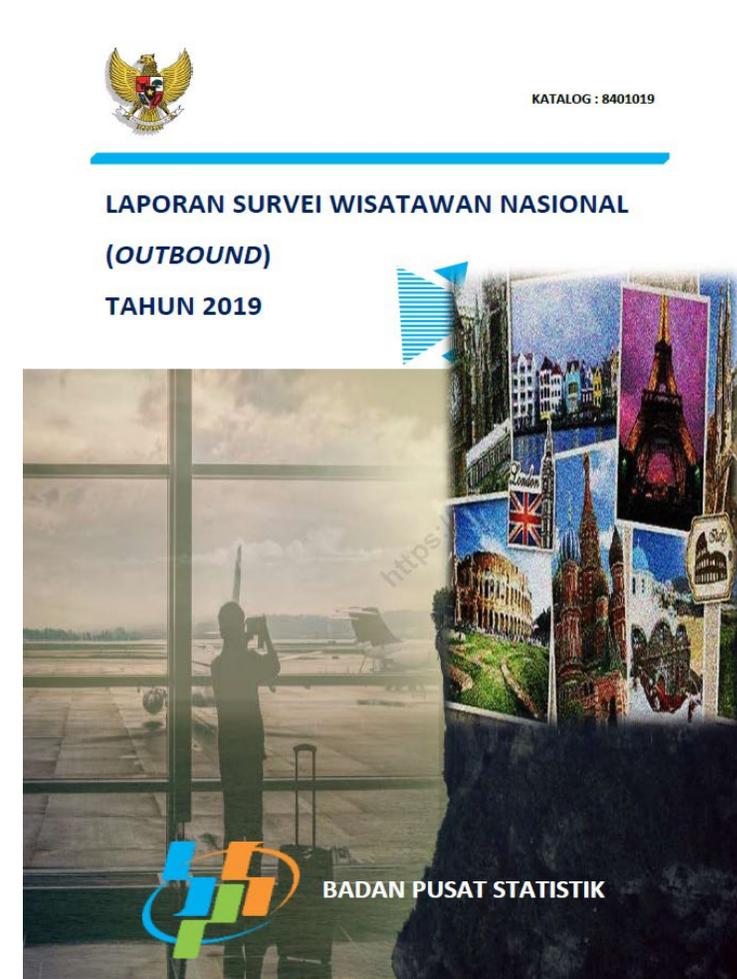
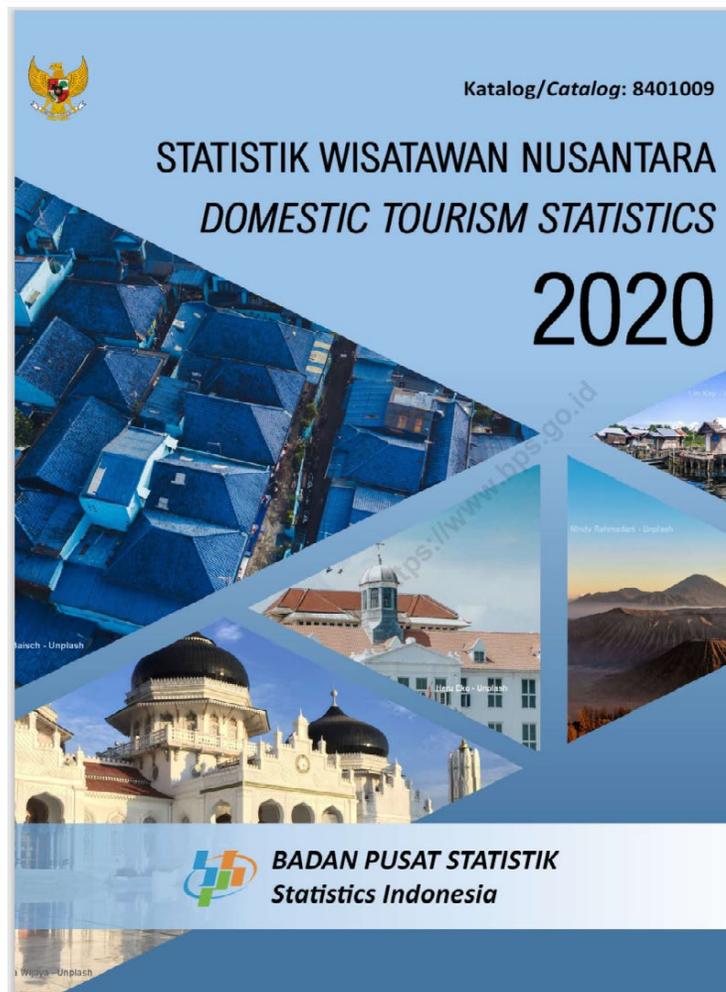
RILIS BERITA RESMI STATISTIK - 2 AGUSTUS 2021

11:46:07



Publications of Tourism Official Statistics

Publications





MPD for SDGs



- ✓ Demand Side data for TSA
- ✓ SDG Goal 8 (Indicators 8.9.1 and 8.9.2)
- ✓ MPD give better coverage than household survey, better match with supply side in TSA Framework
- ✓ Linking TSA and SEEA to obtain SDG Goal 12 (Indicator 12.b.1)

UN-CEBD MPD Task Team

- ✓ Gather experiences of MPD Task Team members
- ✓ Develop Second Handbook for various use cases
- ✓ Create e-learning and course materials

*ITU

CBS, Stat Netherlands
Geostat, Stat Georgia
Istat, Statistics Italy
Saudi Arabia Statistics
DOSM, Malaysia
PSA, Philippines
BPS, Stat Indonesia

Eurostat
Positium
UNSD
Flowminder

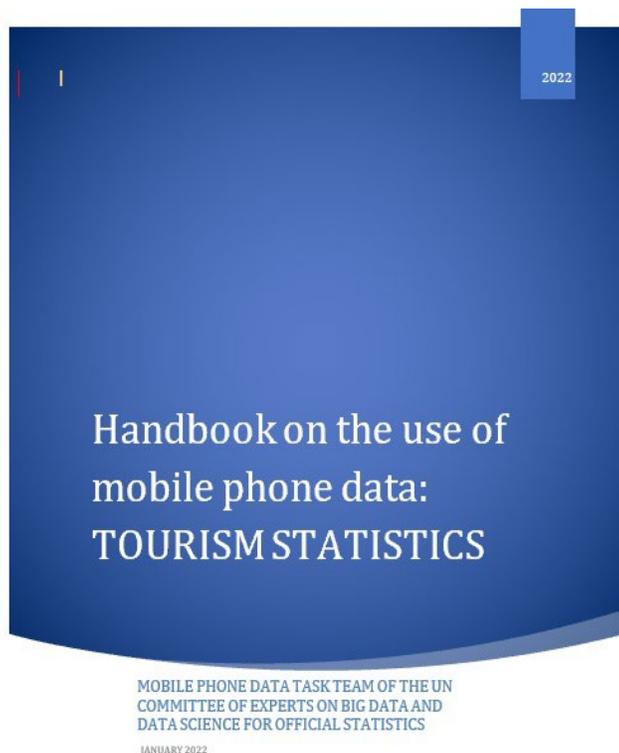
* Task Team lead





UN MPD Handbook for Official Tourism Statistics

Draft Handbook



ST/ESA/STAT/SER.F/##/Vol.#

Department of Economic and Social Affairs
Statistics Division

Studies in Method Series X No. ##, Vol. #

Handbook on Big Data

**Handbook on the Use of Mobile Phone
Data: TOURISM STATISTICS**





THANK YOU