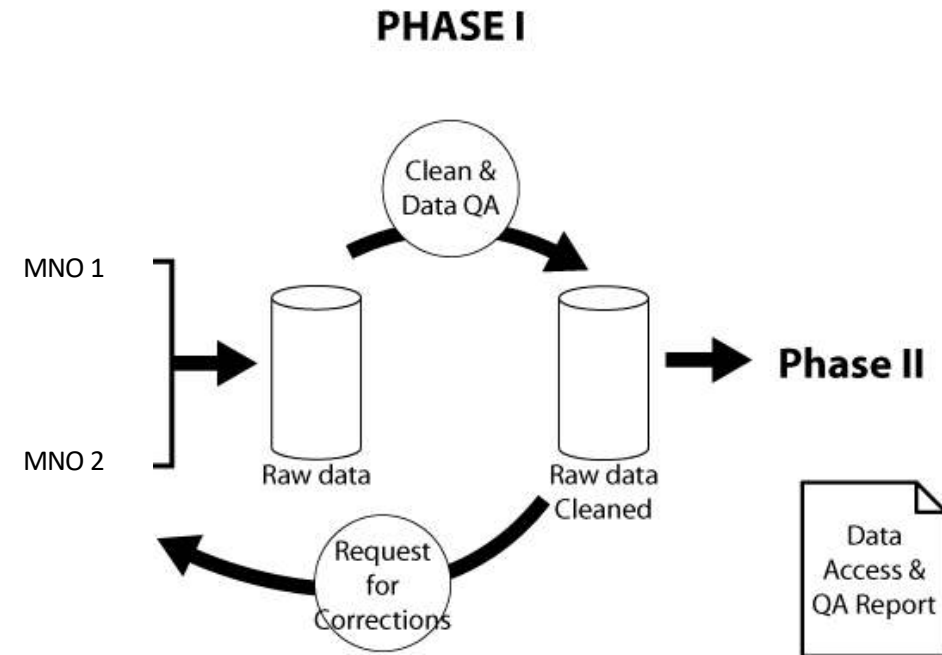


# Coverage challenges to overcome with MPD

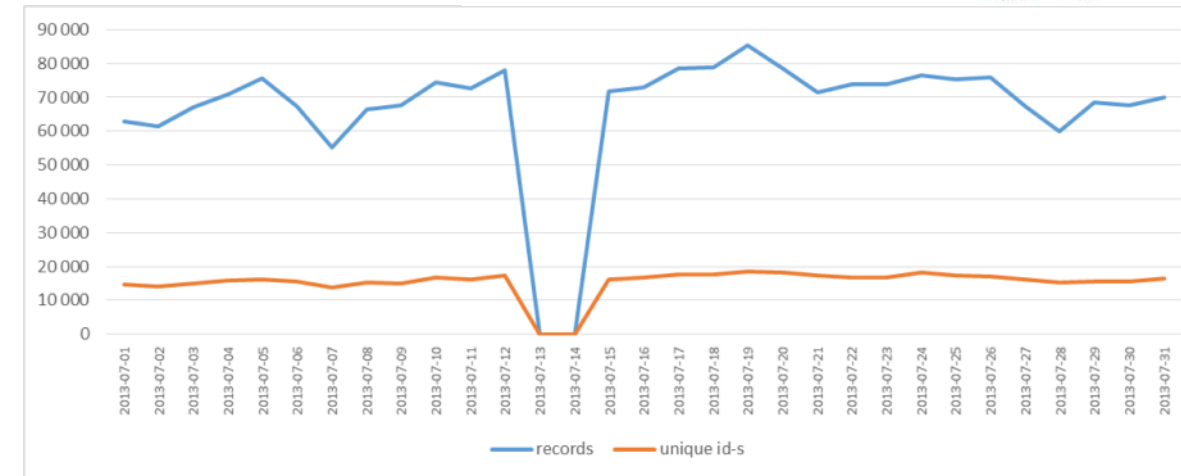
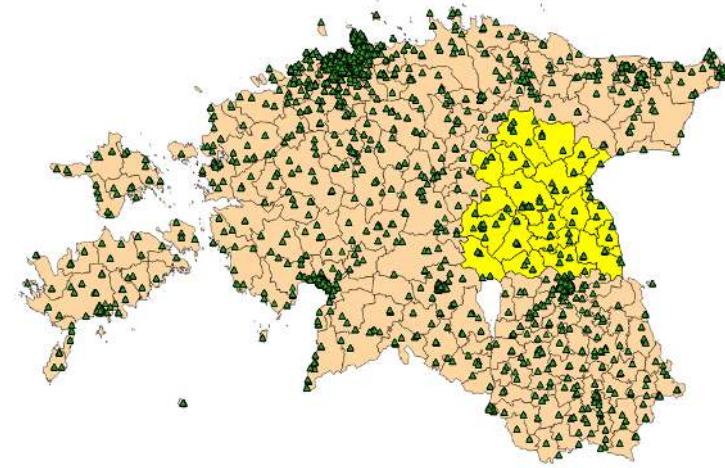




# QA Procedures of Extraction

# Common errors in raw data

- Wrong antenna coordinates or attributes
- Errors in antenna coordinates transformation
- Data gaps
- Missing data from some sub part of the system
- Time zone issues
- Incorrect format of timestamps and incorrect times
- Changes in continuity of the ID-s
- Duplicated records
- ...



# Undercoverage Issues

**CDR  
subscribers  
of one  
MNO**

**vs**

**official  
visitor  
estimates  
(from  
MPD)**

**by country**

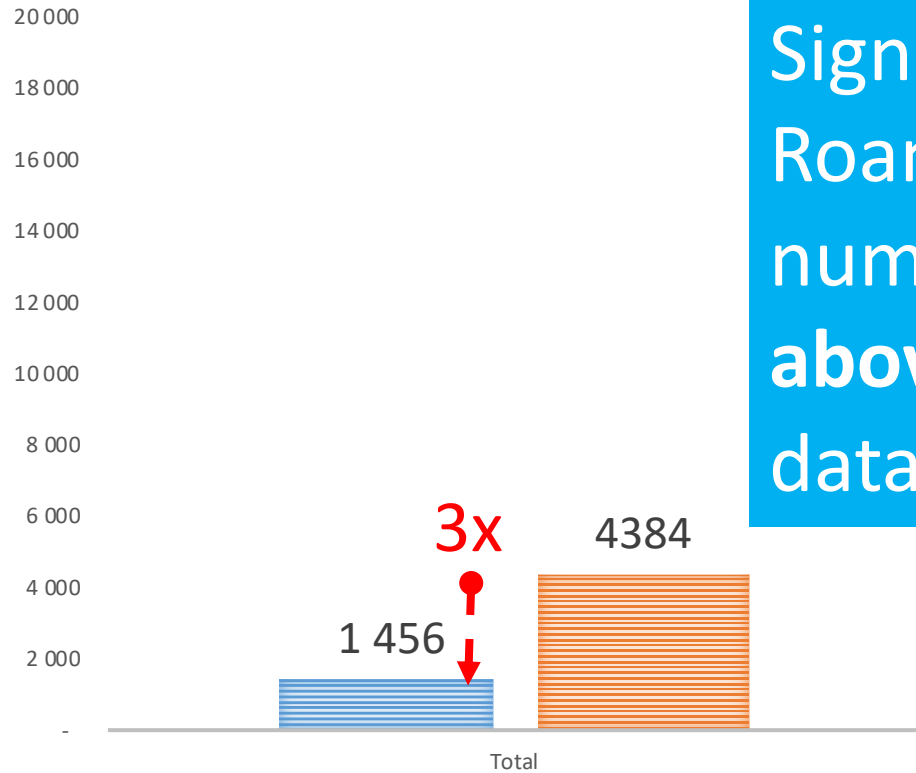
**Estonia  
2018H1**

Country	Visitors	MNO subscriber	Single MNO %
Europe 1			23.0%
Europe 2			17.9%
Europe 3			13.2%
Europe 4			7.8%
Europe 5			15.1%
United States			3.4%
Europe 6			<b>38.5%</b>
Europe 7			23.1%
Asia 1			<b>0.4%</b>
Europe 8			28.1%
Europe 9			9.1%
Europe 10			15.2%
Europe 11			33.9%
Europe 12			33.0%
Europe 13			23.7%
Europe 14			19.2%
Asia 2			<b>0.4%</b>
Europe 15			19.0%

**CDR:  
Roaming subscriber  
numbers are well  
below the visitor  
estimation**

## BINTAN, JULY 1

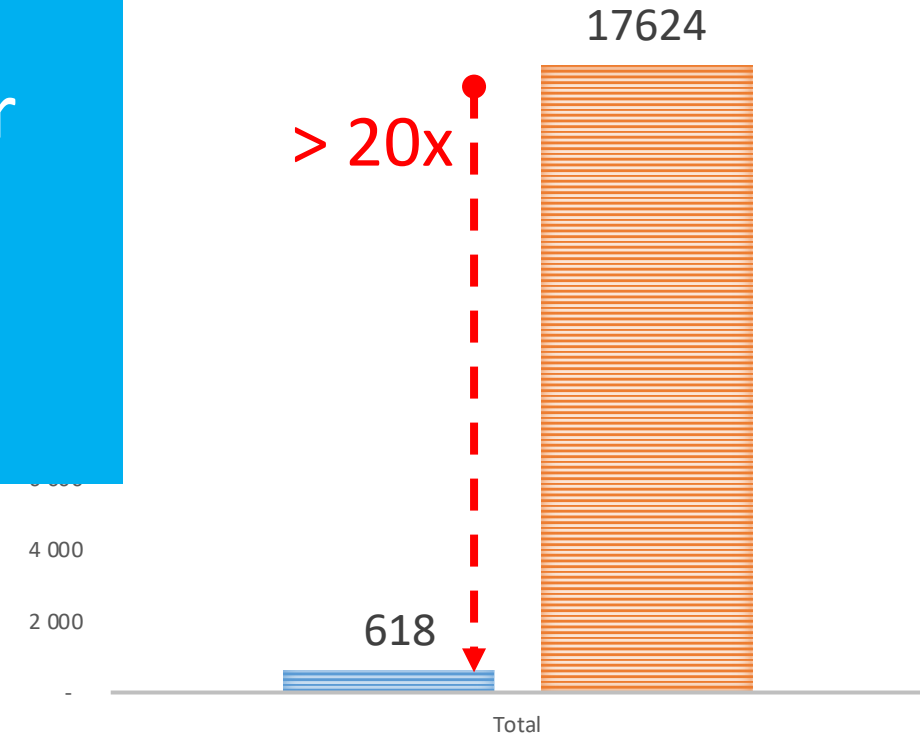
IMMIGR MPD



Signaling:  
Roaming subscriber  
numbers are well  
**above** immigration  
data

## BINTAN, JULY 23

IMMIGR MPD



# Method

Method of profiling the roaming data to reach a statistical estimate of tourism

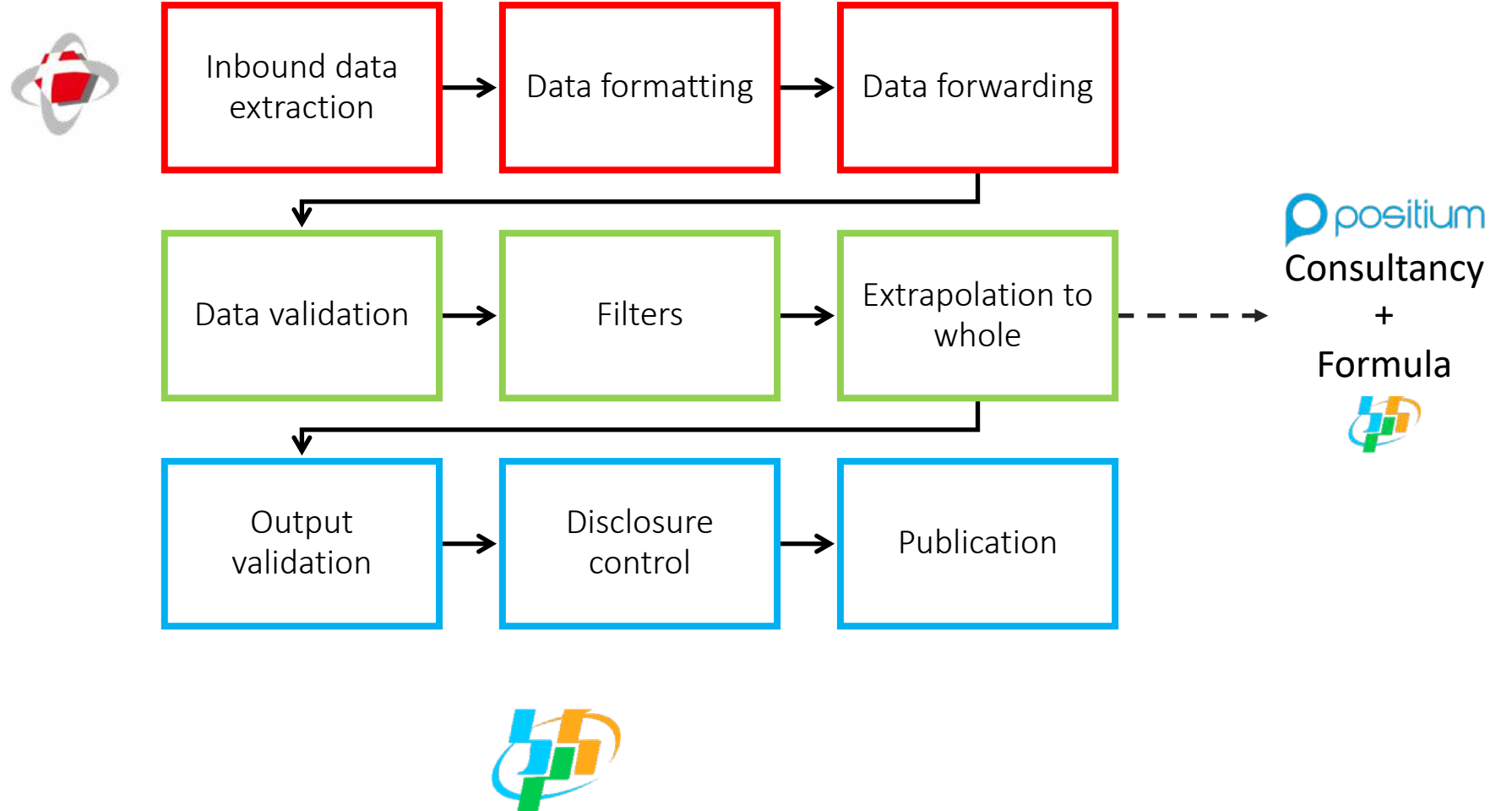
# Positium's Data Model Principle no 1

**Data = Reality**

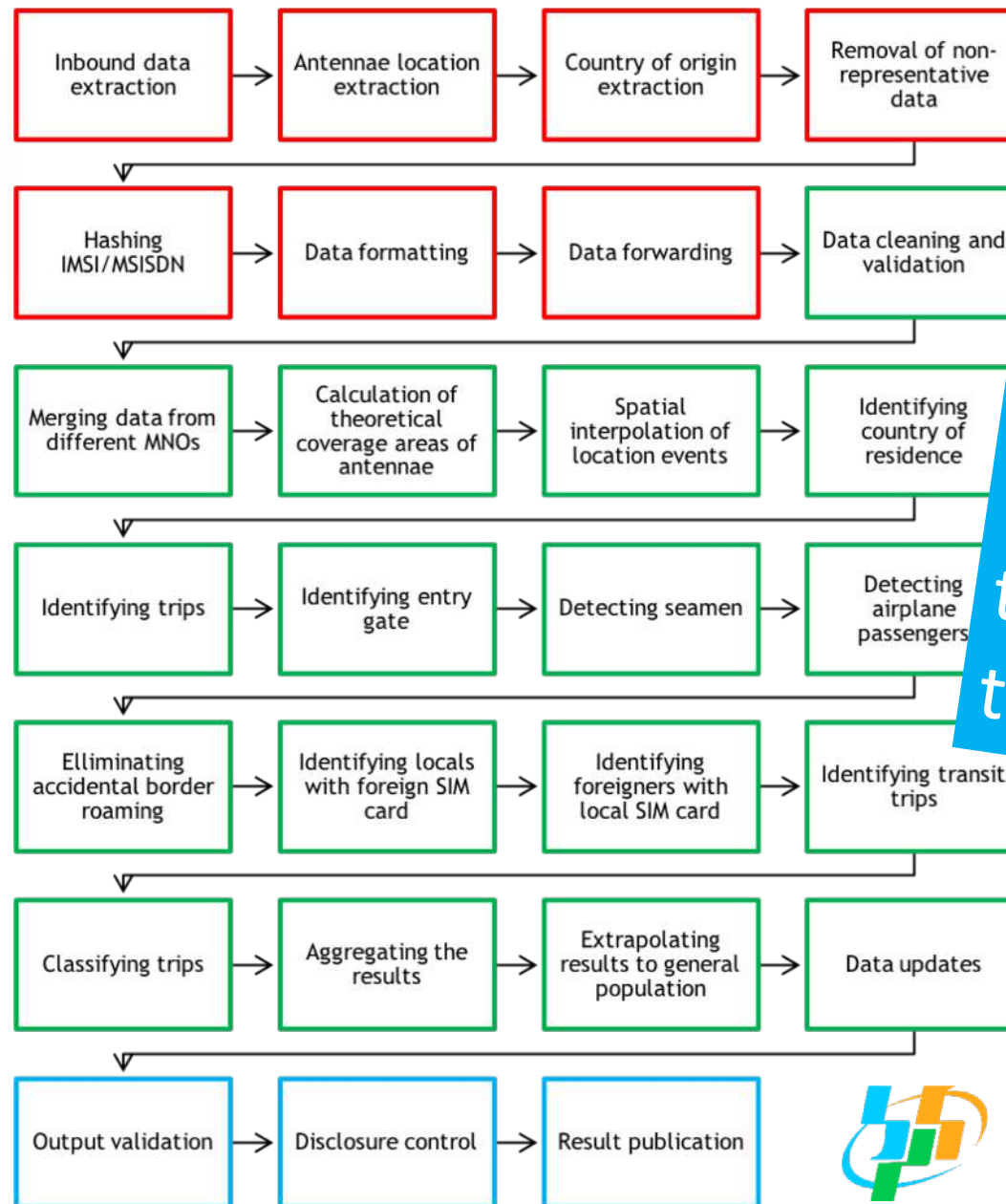
Data must reflect reality as closely as possible



# Processing 2018



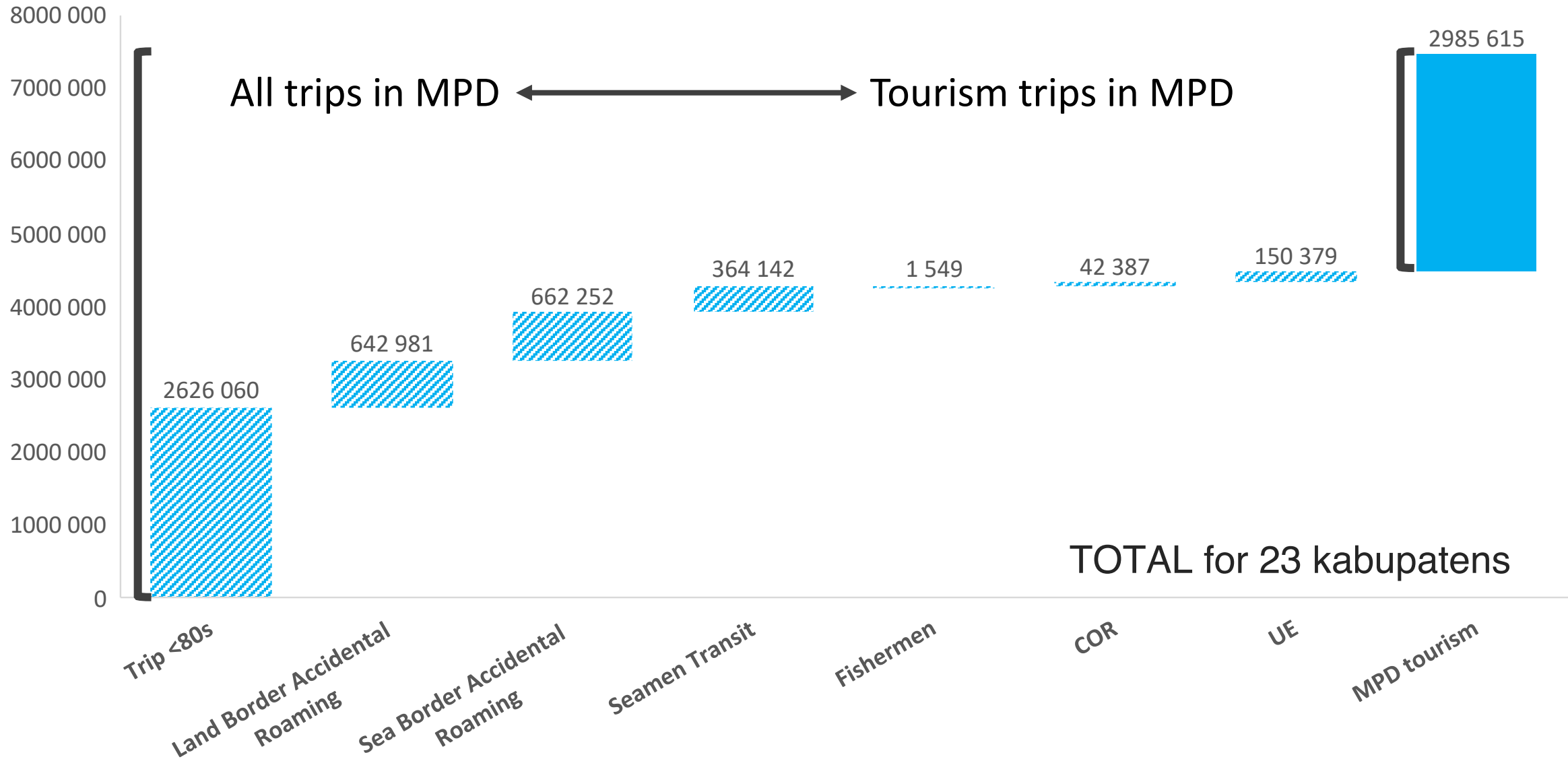
# Processing 2019



Each process is designed carefully to bring data closer to the definition of tourism



# Cascading of MPD data across error classes, one year



# Summary of methodology discussion

- Mobile phone data is not clean – has to go through rigorous testing and cleaning
- There will always be coverage issues
  - With CDR, undercoverage – process and estimate up
  - With signaling, overcoverage – clean from a lot of noise, process and estimate
- Methodology of processing is important to get to final statistics