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# Innovative approaches to measuring migration & human mobility

*Case study from Poland*

CES Plenary Session

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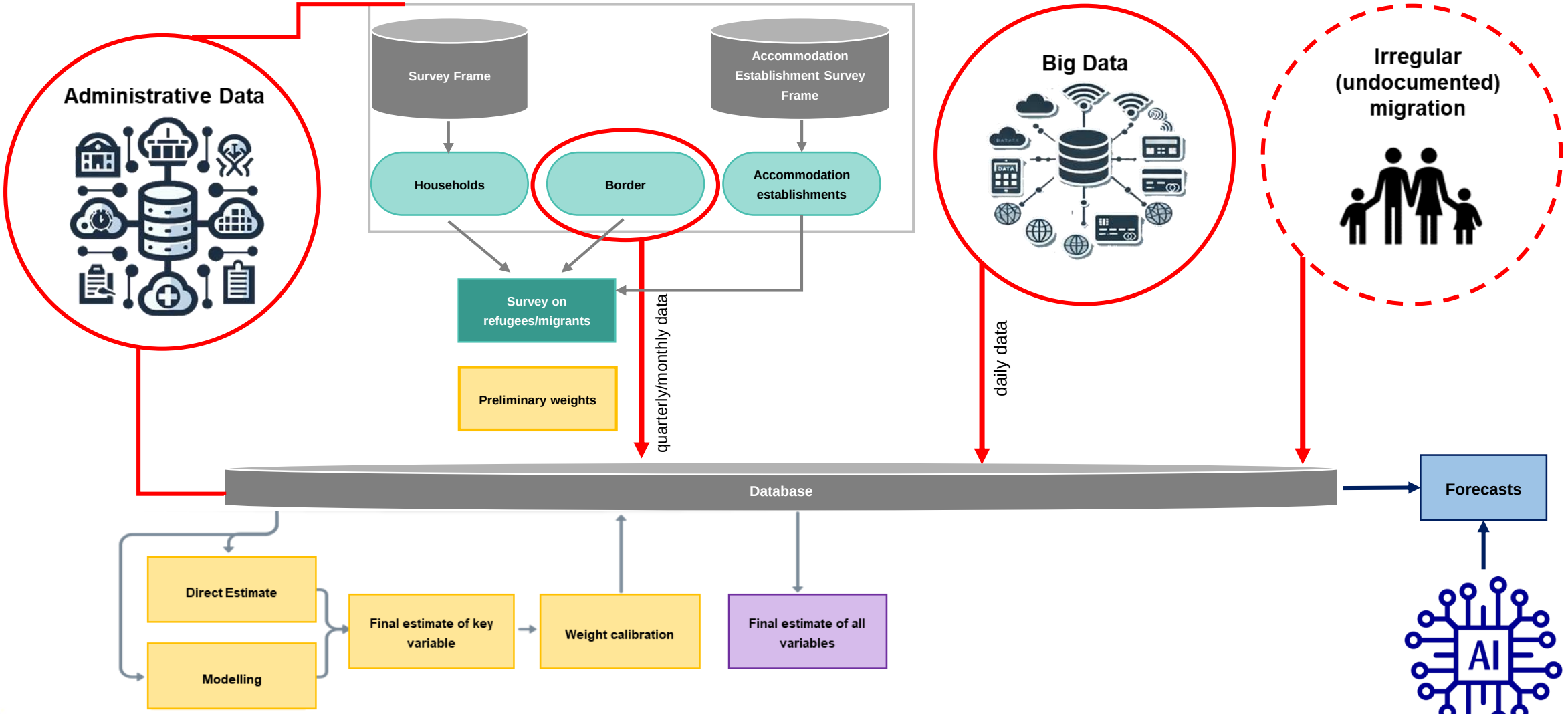
16.06.2025 Geneva

# Integrated migration-related information system

## Data integration model – real-time picture of refugees/migrants

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**Website:**

https://healthofrefugees.stat.gov.pl

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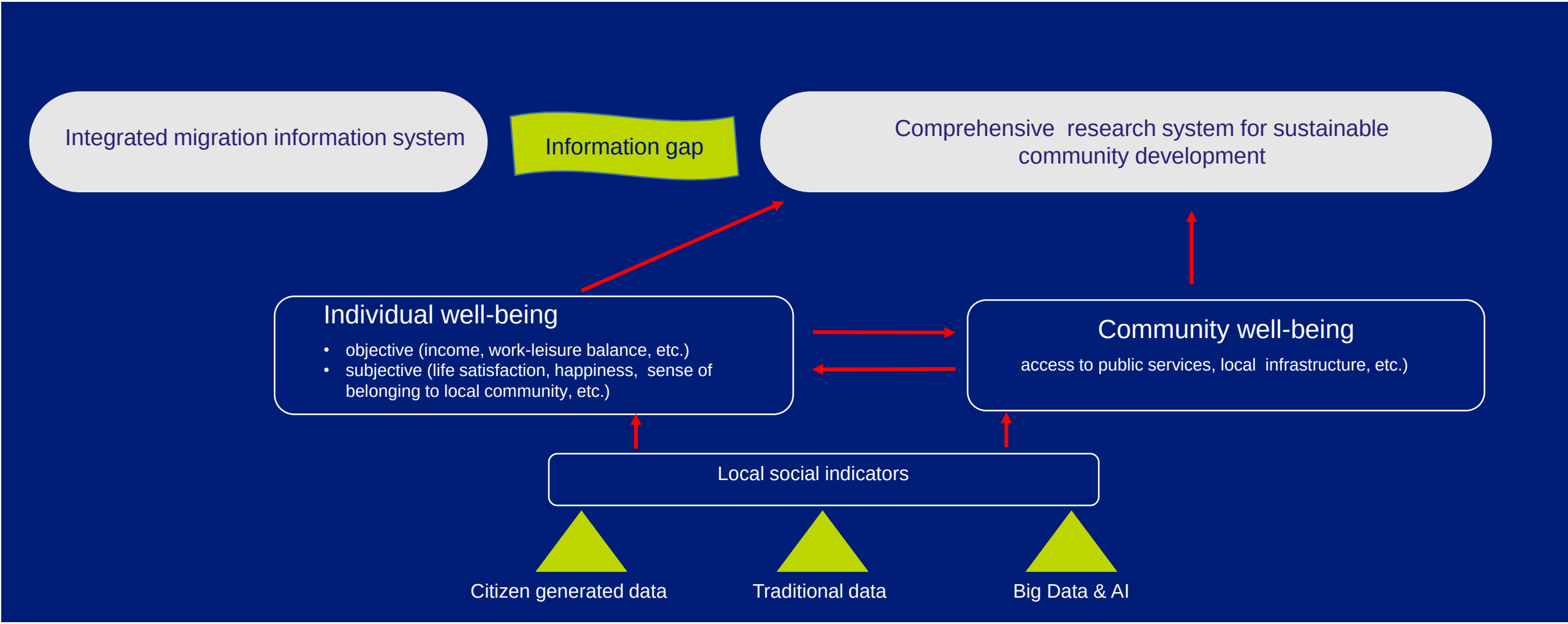
# How to make use of the integrated migration-related information system?



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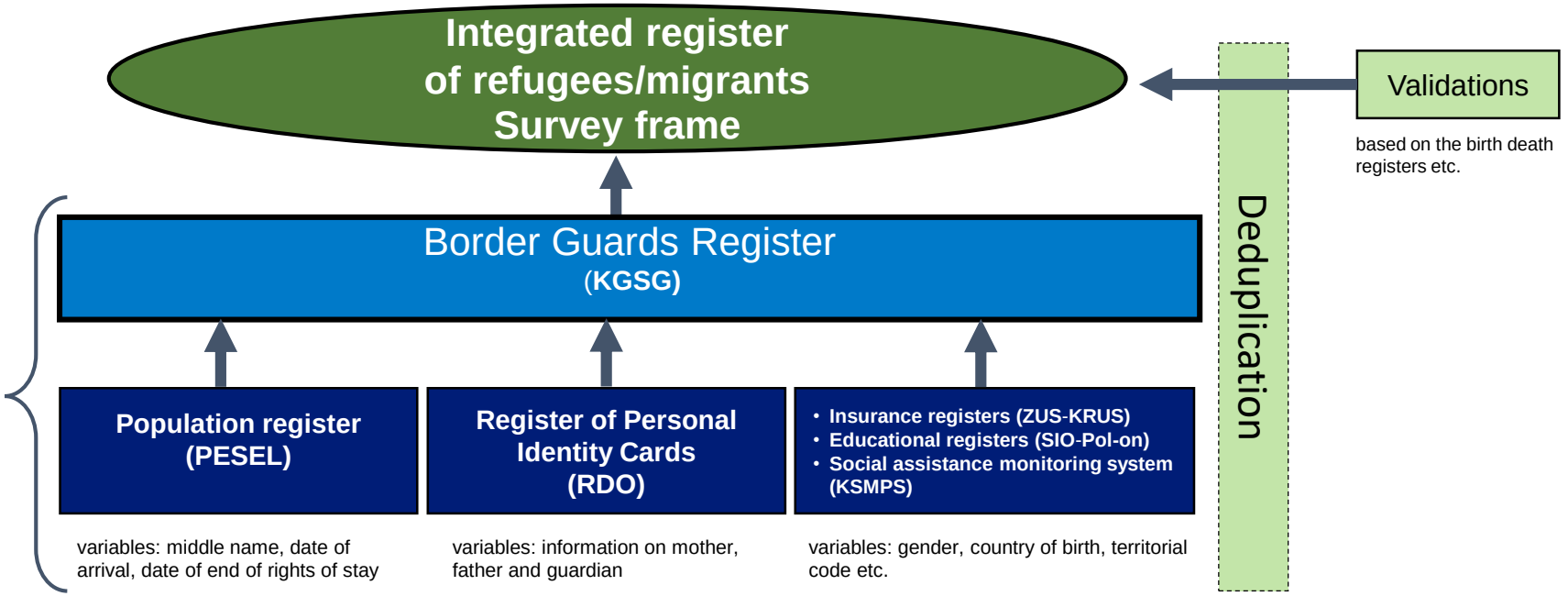
# Thank you for your attention

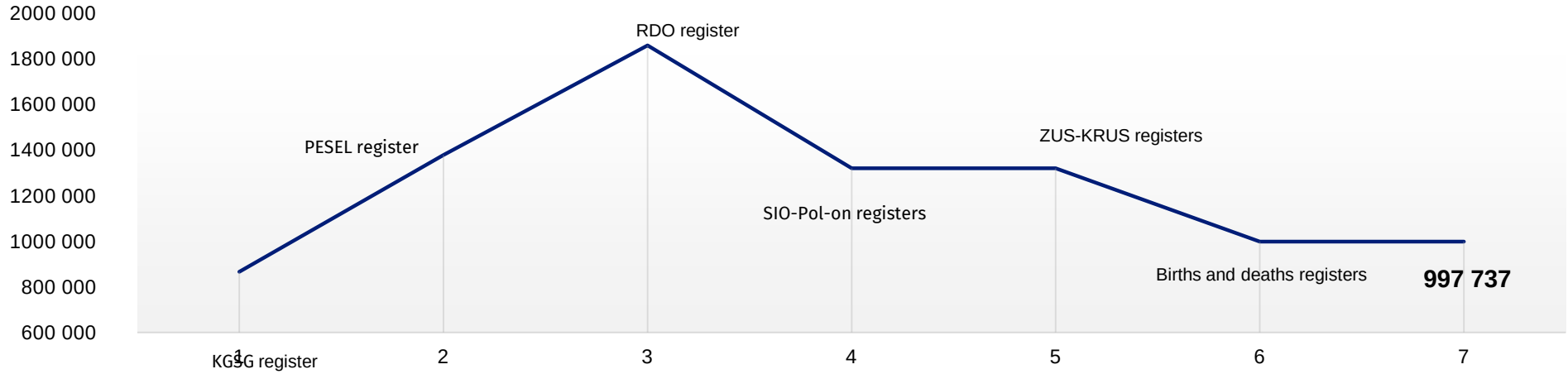
Marek Cierpiał-Wolan, *Assoc. Prof.*

# Developing integrated register of refugees/migrants

**Connection key:**

1. ID numer (PESEL)
2. series and number of the identity document and date of birth
3. set of variables: surname, first name, middle name and date of birth

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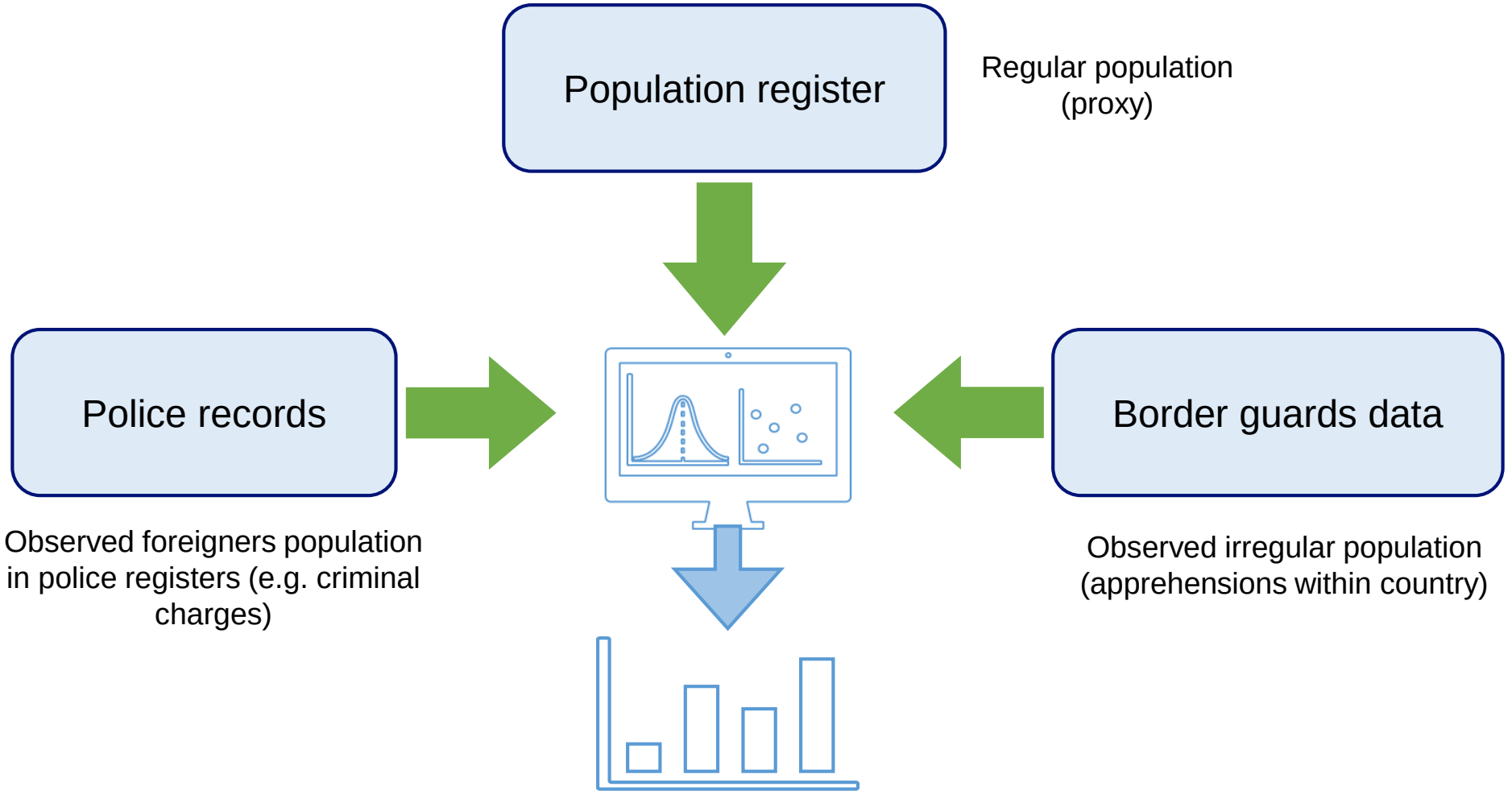
# Deriving the size of irregular migration

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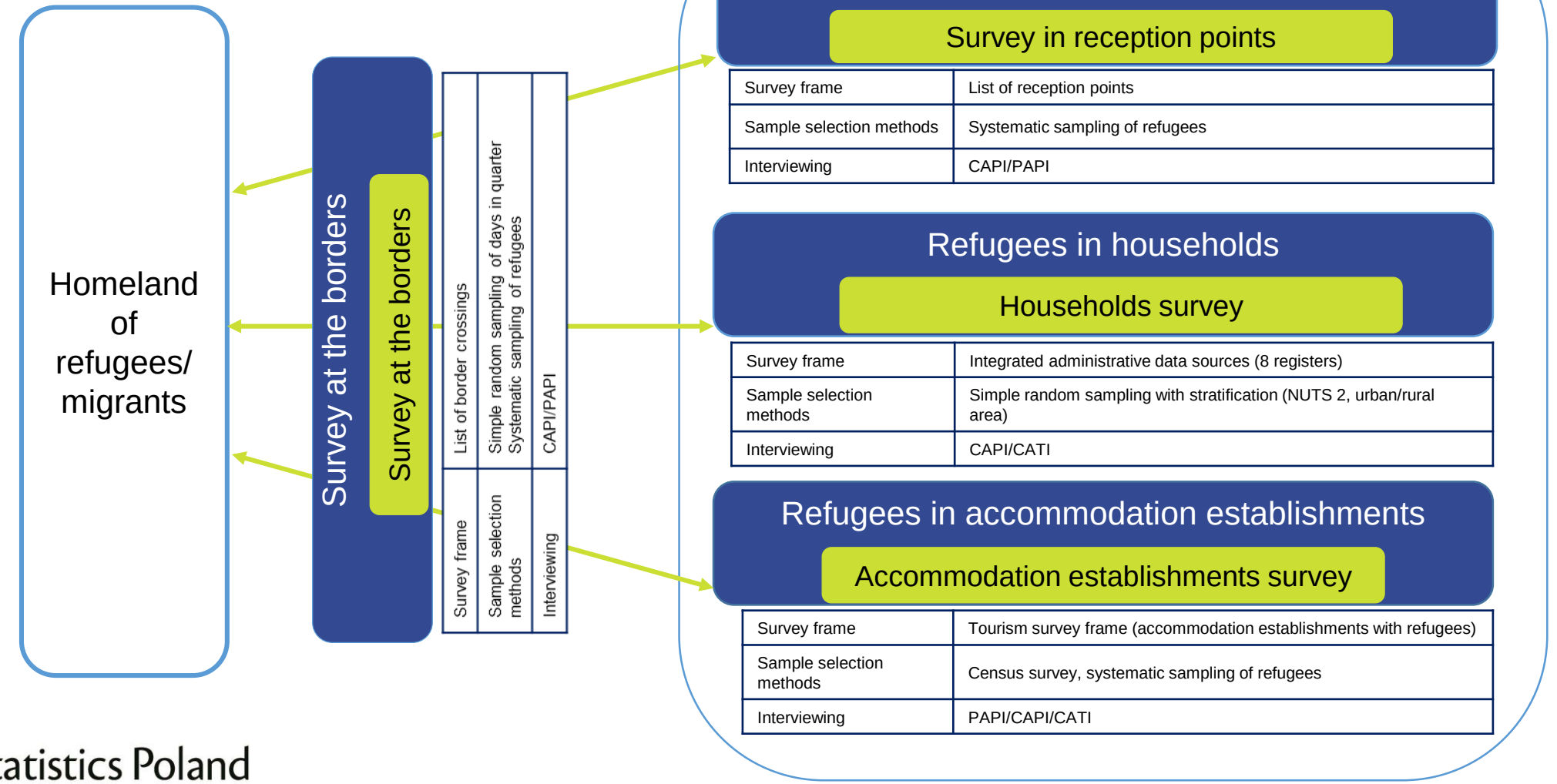
# Sample surveys
## WHO and Statistics Poland

### Methodology – selected aspects

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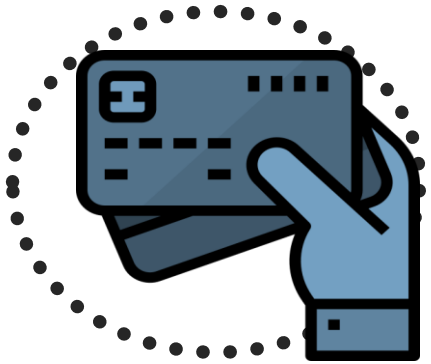
# Big data sources

## Mobile network operators

T-Mobile provides daily data



## Payment/credit card operators

Samples of data

# Big data
# Mobility model

- MNO: SIM card must be active for at least **3 hours** in a given area - multiple counting


$y_1 = x_1$

Two-stage procedure of estimation:

- Mobility model of SIM card users for deduplication and mobility assessment: based on the idea of the transition matrix of Markov process with parameters estimated with fixed point method

- Estimator of total number of refugees: based on MNO's market share, digital literacy by age cohorts, average SIM cards per card user, age-sex structure of refugees from administrative data

MNO data may „reveal" refugees not covered by administrative data sources.

$y_i$ – active SIM cards with duplicates, $x_i$ - unique active SIM cards, $p_{ij|k}^{(s)}$ - share of SIM card holders who moved in $s$-th step from $i$-th area to $j$-th area after visiting $k$-th area.

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