Migration flows based on border crossings:
Data integration for (sub)national estimates.

Republic of Moldova

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Context & Premises

High flow of **unregistered** international migration

**Alignment** of the national statistical system with international and European standards

Implementation of the concept of **usual residence** in official statistics (Census)
Stages passed in estimation of international migration

1. Identify suitable data source & methodology
2. Get data from the identified data holder
3. Apply international definition using border crossing data
4. Data analysis, imputation and processing
5. Calculate the (e/i)migrant status at national level
6. Calculate the (e/i)migrant status at sub-national level

Data analysis, imputation and processing

Stages passed in estimation of international migration

MINISTERUL AFACERILOR INTERNE | GUVERNUL REPUBLICII MOLDOVA

PUBLIC SERVICES AGENCY
1. Data sources (backbone of IS “Population & migration statistics”)

- **Statistical surveys**
  - collect info for relatively small part of population
  - limited use of disaggr. data (by small population groups, geog. subareas)
  - (+) following UN FPOS

- **Population census**
  - conducted once in a while, expensive, long-running processes
  - cannot be used for yearly estimates *(stocks)*
  - (+) exhaustive and following UN FPOS

- **Administrative data**
  - not always available in reliable and complete form, lacking metadata
  - (+) suitable sources for statistical analysis of UR, mobility and/or migratory flows

**Different sources**

**Initial database**

**Production database**

**Final statistical database**

**Usages**

- **Direct tabulation**
- **Substitution, supplementation**
- **Record linkage**
- **Editing and imputation**
- **Indirect estimation**
- **Data validation, confrontation**

**pseudonymization**
1. Identify suitable METHODOLOGY

= Threshold =

= TOLERANCE =

\[
T-1 \quad T \quad T+1
\]
### 2. Get DATA from identified data holder

**Table:**

<table>
<thead>
<tr>
<th>Year</th>
<th>RM citizens crossings</th>
<th>RM citizens unique persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>11,097,009</td>
<td>1,558,048</td>
</tr>
<tr>
<td>2014</td>
<td>10,752,441</td>
<td>1,477,918</td>
</tr>
<tr>
<td>2015</td>
<td>12,203,259</td>
<td>1,594,607</td>
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<tr>
<td>2016</td>
<td>13,174,721</td>
<td>1,665,127</td>
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<tr>
<td>2017</td>
<td>13,467,354</td>
<td>1,742,104</td>
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<tr>
<td>2018</td>
<td>13,014,154</td>
<td>1,635,606</td>
</tr>
<tr>
<td>2019</td>
<td>13,034,988</td>
<td>1,632,251</td>
</tr>
<tr>
<td>2020</td>
<td>3,787,353</td>
<td>775,190</td>
</tr>
<tr>
<td>2021</td>
<td>5,451,280</td>
<td>1,002,123</td>
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</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>foreign citizens crossings</th>
<th>foreign citizens unique persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>7,667,424</td>
<td>1,163,364</td>
</tr>
<tr>
<td>2014</td>
<td>7,420,109</td>
<td>1,080,351</td>
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<tr>
<td>2015</td>
<td>8,804,900</td>
<td>1,291,662</td>
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<td>2016</td>
<td>10,125,732</td>
<td>1,488,449</td>
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<td>2017</td>
<td>10,006,456</td>
<td>1,589,730</td>
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<td>2018</td>
<td>10,353,572</td>
<td>1,714,162</td>
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<td>2019</td>
<td>10,961,150</td>
<td>1,787,970</td>
</tr>
<tr>
<td>2020</td>
<td>3,372,200</td>
<td>688,588</td>
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<tr>
<td>2021</td>
<td>5,602,630</td>
<td>1,054,525</td>
</tr>
</tbody>
</table>
2. Get DATA - build DATABASE for each year

2020 is the last year for which international migration (final) was estimated based on the described methodology.

For 2021, the NET migration is estimated based on the international migration rate of the 2020 and these estimates are used for annual estimation of the usual resident population (1\textsuperscript{st} of January).
3. Apply DEFINITION - international migration

**Immigrant**

A person who entered the Republic of Moldova and stayed in the country for at least 12 months after arrival, after living abroad for at least 12 months.

**Emigrant**

A person who exited the Republic of Moldova and lived abroad for at least 12 months, after living in the Republic of Moldova for at least 12 months before exiting the country.

Temporary cumulative stays of up to 3 months are not considered as a break of the 12 months periods.
4. Data analysis, imputation, processing at MICRO level

<table>
<thead>
<tr>
<th>IDNP</th>
<th>gender</th>
<th>birth_date</th>
<th>set</th>
<th>id</th>
<th>m_dir</th>
<th>citizenship</th>
<th>date</th>
<th>Y</th>
</tr>
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<tbody>
<tr>
<td>201</td>
<td>18</td>
<td>10.07.1990</td>
<td>1</td>
<td>676</td>
<td>exit</td>
<td>MOLDOVA</td>
<td>03.11.2015</td>
<td>2015</td>
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<td>204</td>
<td>19</td>
<td>11.09.1991</td>
<td>1</td>
<td>679</td>
<td>exit</td>
<td>MOLDOVA</td>
<td>27.01.2013</td>
<td>2013</td>
</tr>
<tr>
<td>210</td>
<td>19</td>
<td>11.09.1991</td>
<td>1</td>
<td>685</td>
<td>entry</td>
<td>MOLDOVA</td>
<td>23.05.2014</td>
<td>2014</td>
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<tr>
<td>211</td>
<td>19</td>
<td>11.09.1991</td>
<td>1</td>
<td>686</td>
<td>exit</td>
<td>MOLDOVA</td>
<td>01.09.2015</td>
<td>2015</td>
</tr>
<tr>
<td>217</td>
<td>20</td>
<td>19.10.1990</td>
<td>1</td>
<td>692</td>
<td>entry</td>
<td>MOLDOVA</td>
<td>09.10.2013</td>
<td>2013</td>
</tr>
</tbody>
</table>

Identification of “illogical” itineraries:
- movements of a person for 2013-2015
- illogical itinerary

Imputation of a missing movement:
- imputed movement, the date is at the half of the illogical itinerary

Assignment of a date to the missing movement:
On average, per year, there are 10.1% of immigrants who do not have locality of residence:

1. children until they receive an ID card (around age 16),
2. adults with a domicile withdrawn for various reasons (by request, request of the new homeowner, decision of the law enforcement bodies, etc.
3. foreigners who in fact are unidentified Moldovans (multiple citizenship).

On average, per year, there are 18.6% of emigrants who do not have locality of residence.
5. Calculating migration status – by MOVEMENTS / individuals

IF No days ABROAD in 1 year before the movement > 275 days

IF No days IN COUNTRY in 1 year before the movement > 275 days

IF He/she has at least 1 movement classifying the individual as immigrant

immigrant

The status of the last movement

emigrant

IF He/she has at least 1 movement classifying the individual as emigrant
International migration by sex, 2014-2020, thou persons

- Immigrants: 66,8
- Emigrants: 73,9
- Net migration: -7,1

* - provisional data, based on the assumption that migration rates by age and sex registered in 2021 remained the same in 2020
International migration by sex and age groups, 2019-2020, rates by 1000 persons
International migration by sex and age groups, 2019-2020, rates by 1000 persons

International IMMIGRATION rates by sex and age groups, 2019 and 2020

International EMIGRATION rates by sex and age groups, 2019 and 2020
CHALLENGES versus ACTIONS

- Lack of **reliable data** on international migration based on the definition of *place of usual residence*
- Access to **individual/personal** data from administrative sources
- **Double/multiple citizenship** and uncontrolled border through Transnistria region
- **Processing big volumes** of records

- Comparative analysis, negotiation, communication
- **Pseudonymization procedures** applied
- Usage of several software for data imputation, editing and processing of big volumes (170 mln. crossings for the period 2013-2021) (*Oracle, Visual FoxPro, R, STATA, SPSS*)
Conclusions

- Moldovans are **intensively involved in international migration** in both directions challenging existent migration definitions and concepts.
- Migration should **not only** be measured in terms of the **net migratory balance**: high exposure of RM inhabitants to other cultures and countries may have extremely **positive implications** and open **new opportunities**.
- Based on a **solid basis**: the border-cross recording of entrances and exits to/from RM at **individual level**, but still **pseudonymized** data.
- For each individual it was possible to **calculate accurately** how much **time was spent abroad/in-RM**.
- Migration estimates was calculated using **international recommended definitions**.
- For the **first time** in many years RM has a **full and realistic picture** of **migration flows** in and out the country.

Next steps

- **Provide reliable** migration statistics for policy design, funding, monitoring & evaluation, planning and research.
- Get access to border-crossing records of entrances and exits to/from RM at **individual level** (not pseudonymized) via the Government **interoperability platform**.
- Finalize the development of **Information System** on “Population and Migration Statistics”, integrating **administrative data** (State Population Register, border crossings, legal migration and asylum data, death/birth records, other).
- Disseminate the usually resident population and migration at **subnational level** (by areas of residence, districts, commune).
Thank you!