LGBTI Exclusion in Serbia: Measuring its Socioeconomic Dimensions
Analytical Framework

- Education
- Health
- Violence
- Governance
- Employment
Regional: Replication of the European LGBT Survey implemented by the European Fundamental Rights Agency (FRA) in 2012.

Serbia: Two experimental studies examining the access of LGBTI people to housing and education.
- Implemented a revised version of the SILC with specific SOGI related questions.
Monthly Personal Income (median)

- **Median**: 256 (LGBTI sample), 236
- **Female**: 229, 202
- **Male**: 302, 242
- **Aged 18-25**: 173, 177
- **Aged 26-35**: 292, 202
- **Aged 36 and higher**: 407, 299
- **Big city**: 285, 242
- **Other**: 201, 194

Categories: Male, Female, Aged 18-25, Aged 26-35, Aged 36 and higher, Big city, Other

Other: Big city

- LGBTI sample
15% of respondents have experienced discrimination at work because of their SOGI

Due discrimination 10% have quit a paid job in the past

7% took unplanned leave because of discrimination they experienced
Increased Risk of Poverty

- Materially deprived:
  - No Workplace Discrimination: 25
  - Experienced Workplace Discrimination: 52

- Severely materially deprived:
  - No Workplace Discrimination: 12
  - Experienced Workplace Discrimination: 28

- Extremely materially deprived:
  - No Workplace Discrimination: 6
  - Experienced Workplace Discrimination: 16
State of Health

- LGBTI sample
- General population

Very good: 32 (LGBTI) vs. 55 (general population)
Good: 39 vs. 38
Solid: 24 vs. 6
Bad: 5 vs. 1
Very bad: 0 vs. 0
Methodological Overview
OVERVIEW OF THE SILC

➢ A survey that collects data on income, poverty, social exclusion, and living conditions

➢ Survey of approximately 8,008 households (in 2013)

➢ The survey applies the European Statistical Office (Eurostat) definitions and survey items to operationalize key concepts of income, poverty, social exclusion, and living conditions.

➢ The survey also contains key sample demographics that may predict economic outcomes
When designing the LGBTI SILC questionnaire, we wanted to make sure that we included survey items that are predictive of income disparities.

We were also limited by survey length, knowing that we could not replicate the entire SILC questionnaire.

We used employment status as our key dependent variable, and selected a whole host of candidate variables that could be predictive of employment status.

We relied on chi-squared automatic interaction detection (CHAID) – a decision tree method of machine learning – to prune the candidate variable to the key variables that predict this outcome.

The items predictive in this model were included in the LGBTI SILC questionnaire.
The variables that the machine learning analysis selected were:
- Age (HL7)
- Educational attainment (OP6)
- Martial status (OP8)
- Self-evaluation of health (L10_1)
- Having an AC unit (DL_6_7)
Traditional probability-based ways of surveying LGBTI people is extremely limited because:

- There is no sampling frame for LGBTI people
- There are no demographic targets for weighting adjustment
- Existing estimates in other regions suggest 3%-5% of the population identifies as LGBT. Thus, traditional surveys would have to successfully interview approximately 10,000 people to (luckily) have 300-500 LGBT identified respondents.
- This problem compounds with survey non-response. In the US, response rates of 8% means that 125,000 people would have to be contacted to obtain an analytic sample of 10,000 to have a sample of 300-500 LGBT identified respondents.

Operationalizing sexual orientation, gender identity, and people with intersex traits is challenging due to cross-national differences in understandings of the conceptus, the concepts themselves are multidimensional and in fluctuation.
WEIGHTING ADJUSTMENTS TO THE LGBTI SAMPLE

➢ We conducted a systematic review of studies measuring LGBTI populations across a variety of countries across the world. We identified 154 administrative studies and 150 peer-reviewed articles or organizational reports that resulted in 520 estimates of sexual orientation and/or gender identity.

➢ From this, we conducted a Bayesian multilevel meta-analysis, to evaluate the propensity individuals identify as LGBT, taking into account country and regional characteristics.

\[ s^* \sim \text{binomial}(n^*, \pi) \]

\[ \logit(\pi) = b_0 + b_1 \times \text{Sex} + \alpha \times \text{Sexual orientation} + b_2 \times \text{Transgender} + \alpha \times \text{Age} + \alpha \times \text{Country} \]

\[ \alpha_{\text{Country}} \sim \text{Normal}(u_0 + u_1 \times \text{GDP_PC} + u_2 \times \text{LGBT Acceptance} + u_3 \times \text{LGBTI rights}, \sigma^2) \]

➢ This permitted the estimation of a country-specific weight \( W = \frac{1}{\pi} \)

➢ This primarily ensures that our sample is appropriately weighted for estimates of LGBTI people (i.e., not overrepresenting gay men by virtue of the sampling & recruitment strategy).
METHODOLOGICAL CHOICES AVAILABLE TO COMPARE THE LGBTI SAMPLE TO THE SILC IN SERBIA

1) Compare LGBTI sample estimates to unadjusted population estimates from the SILC

2) Adjust the LGBTI sample characteristics to match the general population characteristics from the SILC, then draw comparison.

3) Compare the LGBTI sample estimates to adjusted population estimates from the SILC, after matching on key demographic characteristics.
Matching is a process that brings two samples that may be different on key characteristics more in line with one another. This balance minimizes differences between the two groups. If done appropriately, it can yield valid causal estimates.

We used the inverse of a Covariate Balanced Propensity Score to weight the Official SILC to match the characteristics of LGBTI sample.
We first subset the Official SILC in Serbia to individuals aged sixty or younger, who had a computer in the household, and had Internet access.

The matching procedure took the following details into account: age, sex assigned at birth, educational attainment, marital status, region, and urbanity.

While the CHAID analysis suggested other variables, the team decided that a minimal model might be preferred, if we consider health status to be an outcome as opposed as something for which to be adjusted.
### COMPARING SAMPLE CHARACTERISTICS BEFORE-AND-AFTER MATCHING

<table>
<thead>
<tr>
<th>Age</th>
<th>LGBTI Sample</th>
<th>Unweighted SILC</th>
<th>Weighted SILC</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-29</td>
<td>55.14%</td>
<td>32.16%</td>
<td>53.78%</td>
</tr>
<tr>
<td>30-44</td>
<td>39.90%</td>
<td>36.52%</td>
<td>41.26%</td>
</tr>
<tr>
<td>45-67</td>
<td>4.95%</td>
<td>31.32%</td>
<td>4.96%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>LGBTI Sample</th>
<th>Unweighted SILC</th>
<th>Weighted SILC</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS11</td>
<td>52.78%</td>
<td>23.48%</td>
<td>52.90%</td>
</tr>
<tr>
<td>RS12</td>
<td>27.79%</td>
<td>33.08%</td>
<td>27.68%</td>
</tr>
<tr>
<td>RS21</td>
<td>11.13%</td>
<td>22.74%</td>
<td>10.89%</td>
</tr>
<tr>
<td>RS22</td>
<td>8.30%</td>
<td>20.70%</td>
<td>8.52%</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>LGBTI Sample</th>
<th>Unweighted SILC</th>
<th>Weighted SILC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Married or Parried</td>
<td>84.67%</td>
<td>44.87%</td>
<td>86.28%</td>
</tr>
<tr>
<td>Married or Partnered</td>
<td>15.33%</td>
<td>55.13%</td>
<td>13.72%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Urban</th>
<th>LGBTI Sample</th>
<th>Unweighted SILC</th>
<th>Weighted SILC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Densely populated</td>
<td>72.25%</td>
<td>36.05%</td>
<td>72.16%</td>
</tr>
<tr>
<td>Medium populated</td>
<td>23.53%</td>
<td>27.81%</td>
<td>23.63%</td>
</tr>
<tr>
<td>Sparsely populated</td>
<td>4.22%</td>
<td>36.14%</td>
<td>4.22%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>LGBTI Sample</th>
<th>Unweighted SILC</th>
<th>Weighted SILC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>3.06%</td>
<td>15.13%</td>
<td>2.82%</td>
</tr>
<tr>
<td>Medium</td>
<td>39.54%</td>
<td>62.44%</td>
<td>39.37%</td>
</tr>
<tr>
<td>High</td>
<td>56.65%</td>
<td>22.43%</td>
<td>57.81%</td>
</tr>
<tr>
<td>Missing</td>
<td>0.75%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
BENEFITS AND LIMITATIONS

- Adjustments overcome inherent limitations in just making comparisons between the LGBTI sample and the general population.

- It still requires estimation assumptions that may mean that model misspecification can harm the internal validity of the study.

- By weighting the SILC to the LGBTI sample distribution, we increase internal validity but decrease external validity.

- Likely the best we can do absent LGBTI measures on the official SILC.
CAREFUL CONSIDERATIONS FOR PURPOSIVE SAMPLES LIKE LGBTI POPULATIONS

- Question wording and operationalizing sexual orientation, gender identity, and intersex traits
- Careful consideration of inclusivity and what one will be able to meaningfully say about subgroups
- Careful consideration of questionnaire design in preparation for data analysis
- Advances in statistical modeling can help combine probability and nonprobability samples for data analysis.
THANK YOU!

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