Using birth registration completeness to adjust birth data

Data analysis and Report writing workshop for Civil registration and vital statistics data.

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What is “good enough”?

- Generally, if at least 70-80% of births are captured, we can use the data to calculate fertility indicators by adjusting the completeness of our records upwards.

- CRVS data that is more than 90% complete can generally be used for analysis without adjustment (although the completeness should be reported for context).

  - However, we must be careful, as this assumes that the under-reporting of events is general and not limited to particular sub-groups within the population.

- If our data is not adjusted for completeness, we may make assumptions about fertility and mortality rates that are not true.
Test data birth registration completeness

Completeness of birth registration (%) = \( \frac{\text{Number of registered births}}{\text{Actual number of births}} \times 100 \)

\[
86\% = \frac{5000 \text{ registered births}}{5800 \text{ actual births}} \times 100
\]

- In our test data, our birth registration completeness is 86%
- We know there is a problem with registration in the East Province
- We want to adjust our data up for more reliable fertility indicators
Why do we need to assign mothers’ ages to these new births?

- Fertility indicators such as teenage fertility rates and total fertility rates require data by age of the mother.

Teenage fertility rate = \[ \frac{\text{number of births to women aged 15–19 years}}{\text{total number of women aged 15–19 years}} \times 1000 \]

- These rates will be artificially low if we use only the number of births with known mother’s age.

- How could this affect public policy?
Redistribute births by mother’s age

- We will use the final census number of 5,800 for our number of births.

- We are going to assume births by mother’s age does not vary by province and will use the percent distribution from all 5,000 births.

- Similar to adjusting for unknown age of decedents, we will now redistribute these ‘new’ 800 births and assign their mothers an age.
### Calculate the percent distribution of births by mothers’ age group using the original total as the denominator

<table>
<thead>
<tr>
<th>Mother's age</th>
<th>Original count</th>
<th>Percent</th>
<th>New Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;15</td>
<td>2</td>
<td>0%</td>
<td>2</td>
</tr>
<tr>
<td>15-19</td>
<td>239</td>
<td>5%</td>
<td>277</td>
</tr>
<tr>
<td>20-24</td>
<td>1088</td>
<td>22%</td>
<td>1262</td>
</tr>
<tr>
<td>25-29</td>
<td>1596</td>
<td>32%</td>
<td>1851</td>
</tr>
<tr>
<td>30-34</td>
<td>1298</td>
<td>26%</td>
<td>1506</td>
</tr>
<tr>
<td>35-39</td>
<td>640</td>
<td>13%</td>
<td>742</td>
</tr>
<tr>
<td>40-44</td>
<td>124</td>
<td>2%</td>
<td>144</td>
</tr>
<tr>
<td>45-49</td>
<td>12</td>
<td>0%</td>
<td>14</td>
</tr>
<tr>
<td>50+</td>
<td>1</td>
<td>0%</td>
<td>1</td>
</tr>
<tr>
<td>Total births</td>
<td>5000</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>New Total births</td>
<td>5800</td>
<td></td>
<td>5800</td>
</tr>
</tbody>
</table>

5% = \frac{239 \text{ births to mothers aged 15-19}}{5000 \text{ births}} \times 100

Apply this percentage to the new count of 5,800 births:

\[ \frac{5 \times 277}{100} = 277 \text{ births to mothers aged 15-19 years} \]

Note: New distribution total may not add up due to rounding.
Adjusted vs unadjusted rates

Teenage fertility rate = \( \frac{\text{number of births to women aged 15–19 years}}{\text{total number of women aged 15–19 years}} \times 1000 \)

Unadjusted Teenage fertility rate of 14.9 = \( \frac{239}{16070} \times 1000 \)

Adjusted Teenage fertility rate of 17.3 = \( \frac{277}{16070} \times 1000 \)

Policy makers may erroneously believe that teenage fertility had declined if the unadjusted rate was presented.
Report both adjusted and unadjusted rates

- It’s important to report both the original counts of registered births by mothers age as well as adjusted numbers.

- Be transparent about how numbers were adjusted.
  - Did you use percent distribution from vital statistics? Another imputation method? Etc.
Exercise: Adjusting birth data

- Calculate the new counts of births by mothers’ age using the percent distribution from your test vital statistics data
- Repeat this exercise with your country data