Get every one in the picture

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

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

$$86\% = \frac{5000 \text{ registered births}}{5800 \text{ actual births}} * 100$$

- 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.

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

- 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 5800 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

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

Calculate the percent distribution of births by mothers' age group using the original total as the denominator

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

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

$$= \frac{5 \times 277}{100}$$

=277 births to mothers aged 15-19 years

Note: New distribution total may not add up due to rounding

Adjusted vs unadjusted rates

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

Unadjusted Teenage fertility rate of **14.9** $= \frac{239}{16070} * 1000$

Adjusted Teenage fertility rate of **17.3** $= \frac{277}{16070} * 1000$

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