# 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.

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

- 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

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

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

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

=277 births to mothers aged 15-19 years

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

# Adjusted vs unadjusted rates

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

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

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

**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