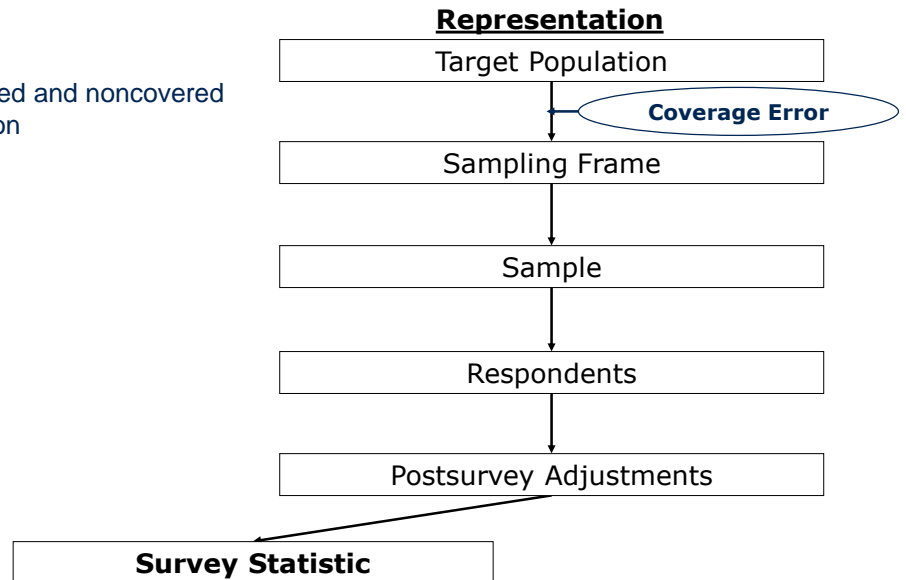


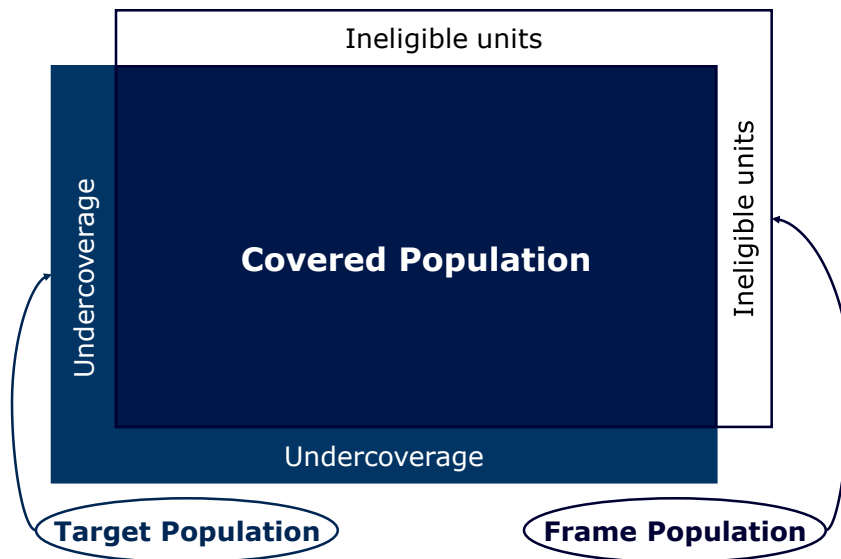
Survey Lifecycle from a Quality Perspective

Difference between covered and noncovered population



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Coverage of a Target Population by a Frame



Coverage Error

Total survey population can be divided into those covered and those not covered by frame:

$$\bar{Y}_N = \left(\frac{C}{N}\right)\bar{Y}_C + \left(\frac{U}{N}\right)\bar{Y}_U$$

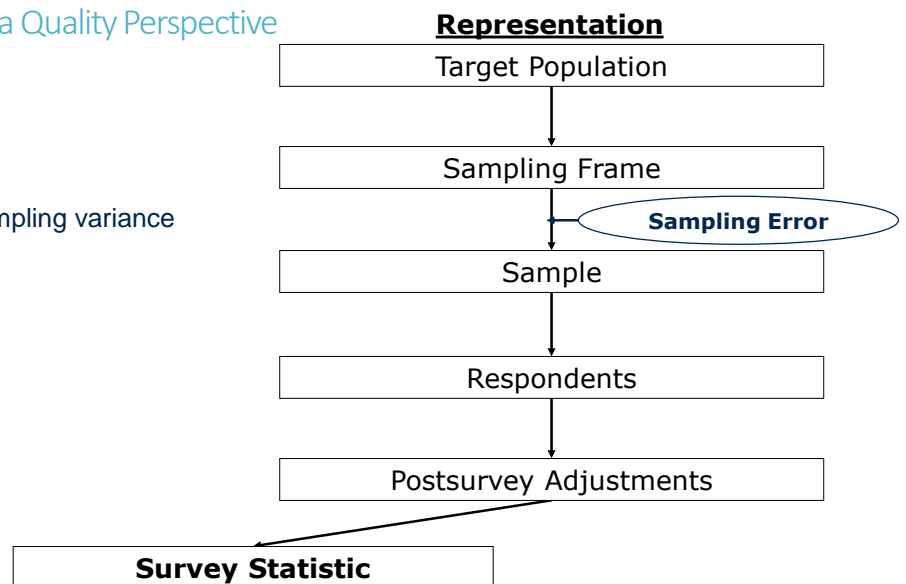
which can be written $\bar{Y}_c = \bar{Y}_N + \frac{U}{N}(\bar{Y}_C - \bar{Y}_U)$

Undercoverage error for sample mean is function of

- undercoverage rate and
- difference between means for covered and uncovered cases

Survey Lifecycle from a Quality Perspective

Sampling bias vs. sampling variance



Sampling Variance vs. Sampling Bias

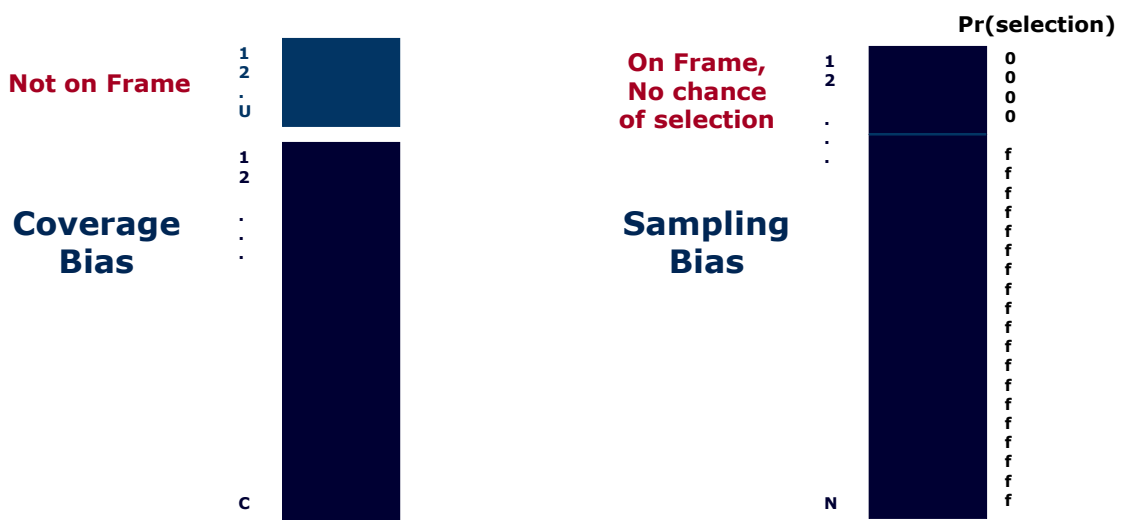
Sampling variance:

- Variation in values of survey statistic because different subsets of the population fall into sample over replications of same sample design
- Most commonly measured statistic in surveys
- Confidence intervals, standard errors

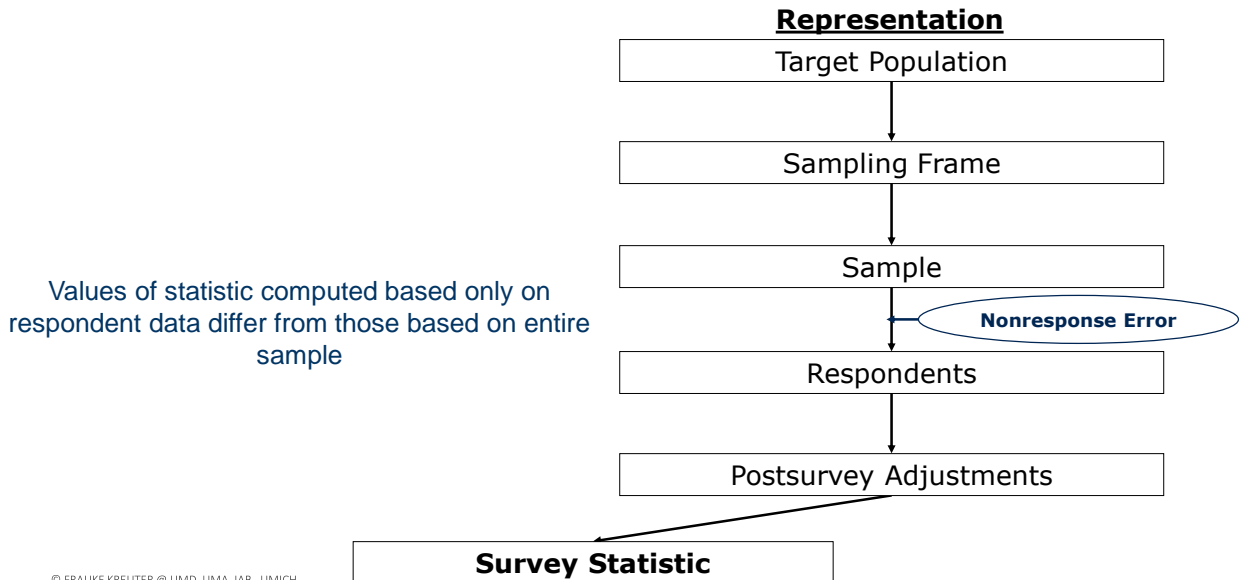
Sampling bias:

- Consistent failure to estimate a proportion of population
- E.g., those in military in *HH* samples which exclude military bases from every sample
- Sampling bias is 0 for probability samples

Confusion between Coverage Bias and Sampling Bias



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Unit and Item Nonresponse

[illegible]

Nonresponse Error

Total sample can be divided into respondents and nonrespondents

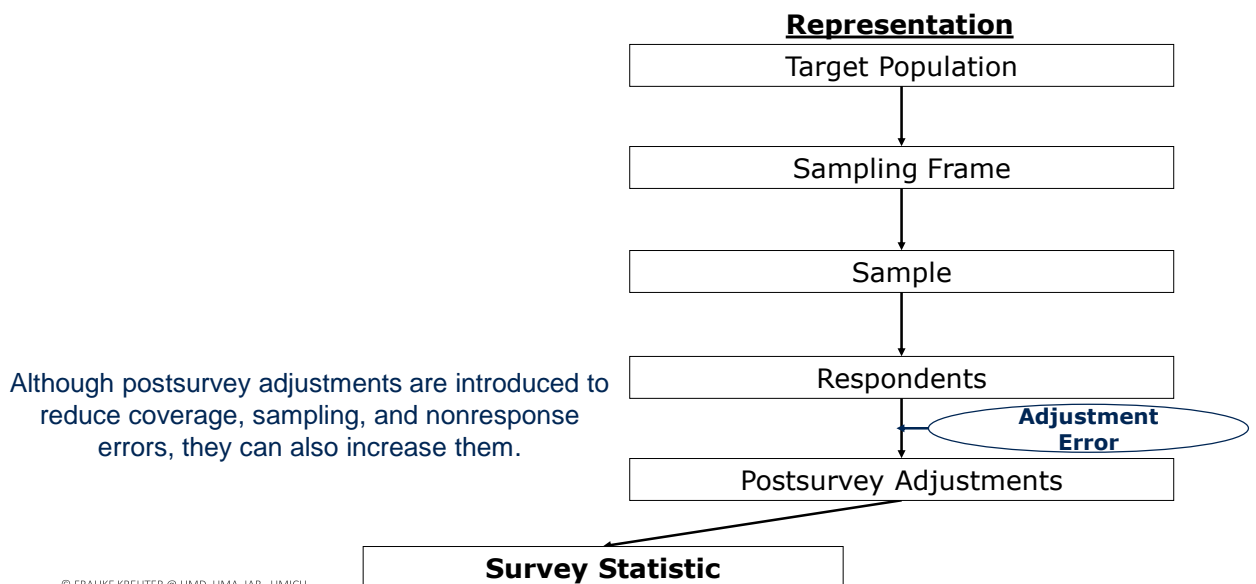
$$\bar{y}_s = \left(\frac{r_s}{n_s} \right) \bar{y}_r + \left(\frac{m_s}{n_s} \right) \bar{y}_m$$

which can be written as

$$\bar{y}_r = \bar{y}_s + \left(\frac{m_s}{n_s} \right) (\bar{y}_r - \bar{y}_m)$$

Nonresponse error for sample mean is function of
nonresponse rate and
difference between means for respondents and nonrespondents

Survey Lifecycle from a Quality Perspective



Key Notions

Variable errors; systematic errors

- Some errors common to all trials of survey for given statistic (e.g., coverage bias due to missing cell phone-only *HH* in landline CATI survey)
- Some errors vary over trials (e.g., variable response errors)

There are no good or bad surveys – only good or bad survey statistics

- Errors are properties of statistics (e.g., sample mean is biased estimate of target population mean)
- From same survey, some statistics may have large errors; others, small errors

Survey methodology research discovers how to reduce errors and applies these to surveys.