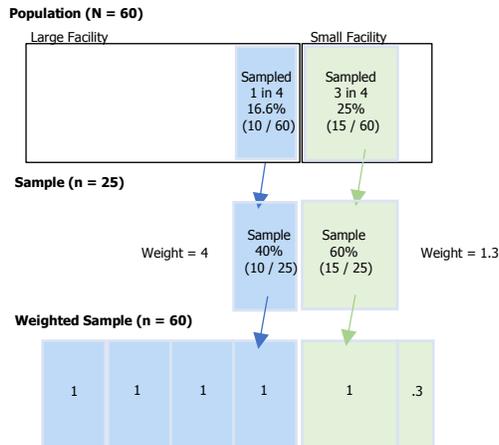


What are Survey Weights?

A weight is a value assigned to each survey respondent in the data. It indicates how much each survey respondent represents the target population. Surveys with a complex sampling design, such as disproportionate stratified random sampling that over sample patients from smaller facilities and under sample patients from larger ones often will result in samples that poorly reflect the target population.



Under this sampling design, patients across different facilities do not have an equal chance of being selected (unequal probabilities of selection). Survey weights are designed to correct these imbalances (e.g., over and under sampling) and potential biases by making the results of analyses more representative of the target population on key characteristics such as organization level attributes and demographic characteristics.

Weights can be calculated at the organization-level, individual-level, or both. Organization-level weights are weights that adjust for differences between the target population and the sample on some attributes of an organization (e.g., facility discharge volume). Individual-level weights are weights that account for differences in person characteristics between sampled individuals and the population (e.g., age or gender).

Why use Survey Weights?

- To compensate for unequal probabilities of selection.
- To compensate for unit non-response.
- To make samples analyses more representative of the target population.

Types of Survey Weights

- **Design Weights** are the inverse probabilities of selection (reciprocals of the chance of being selected) associated with each sampled case. The values indicate the number of survey respondents in the population that each sampled case is taken to represent.
- **Calibrated Weights** incorporate auxiliary information to adjust the weights such that estimates of these characteristics satisfy known totals (i.e., control totals).
- **Poststratification Weights** are weights computed after data collection, with a different weight for each strata (subgroup) to make sample analyses more representative of the target population.

When to use Survey Weights?

We use weights when we want to predict population values. Weights are not used when describing the demographic characteristics of sample respondents. Your analytical questions should guide your decisions as to whether to weight the data (i.e., are you interested in making claims about a target population, or are you interested in describing a set of observed data?).

Using Survey Weights for PCM sector surveys

When working with the PCM sector surveys, if the analytic questions involve comparing results across organizational units (e.g., unit, facility, & peer group), survey weights are recommended to ensure the analyses yield estimates that are less likely to be biased. If the analysis focuses on findings from only a single organizational unit (i.e., the unit level), consider applying additional individual level weights to account for demographic differences due to sampling as the supplied survey weights for PCM data often only account for differences at the organizational level. If the goal is to estimate causal effects and examine relationships between variables, then there are situations that call for the use of weights and situations that don't. Consult with a statistician for recommendations.

What are Expansion and Normalized Weights?

Expansion weights are weights where the sum of the weights adds up to the population counts.

Normalized weights are rescaled weights where the sum of the weights equals the number of completed surveys (sample). The relative values of the weights are not changed but are adjusted so that the mean of the weights is 1.

When to use Expansion Weights?

Survey analysis software that incorporates complex sampling design (e.g., SAS, Stata, R, SPSS Complex Sample, SUDAAN, WestVar) can use expansion weights without rescaling to obtain unbiased point estimates as well as accurate interval estimates and standard errors.

When to use Normalized Weights?

Use normalized weights when doing statistical tests with non-survey analysis software that assume simple random samples (e.g., SQL, SPSS Base, Excel, Tableau, Power BI).

Software that does not consider sampling design equates the sum of the weights with the number of observations, which:

- Underestimates variability (standard error)
- Increases false positive findings in statistical tests

By rescaling the weights to sum to the number of completed surveys used in the analyses, normalized weights address the problem with inflated observations and can give correct standard errors.

How to calculate Normalized Weights?

The provided normalized weights are only valid for province-wide analysis. For other analyses, the supplied survey weights can be adjusted by dividing the weight of each survey respondent by the unweighted average of weights of all the analyzed cases.

$$\text{Normalized Weights} = \frac{\text{Weight}}{\text{Mean(Weights)}}$$

Why using Survey Weights may not be enough?

Weighting gives unbiased point estimates but does not always give correct standard errors and confidence intervals. Using survey weights alone does not consider other aspects of the sampling design (e.g., stratification, cluster sampling, calibration).

Consult with a statistician for recommendations if your analyses involve custom subgroups or have specific requirements.