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Sampling Weights for POEM Project

Let:

S_p = Sampling Probability for a case in the subsample

S_w = Sampling Weight = $1/S_p$

C_n = a given complication = 1 in NSQIP Data record. = 0 otherwise. These ~~is~~ the "True" complication status.

C_p = a given complication = 1 via the poem classification system. = 0 o.w. These are the "test's" complication status.

Data = the sub-sample of NSQIP cases.

$$\text{Sensitivity} = \frac{\text{True Positives}}{\text{True Pos} + \text{False Neg}}$$

$$= \frac{\sum_{i \text{ cases}} \left[(C_{p_i} \times C_{n_i}) S_{w_i} \right]}{\sum_{i \text{case}} \left[C_{p_i} \times C_{n_i} \times S_{w_i} \right] + \sum_{i \text{ cases}} \left[(1 - C_{p_i}) C_{n_i} S_{w_i} \right]}$$

Note if $S_{w_i} = S_{w_j}$ for all i, j then we can factor out S_w*. This will likely be the case for sensitivity, but it's better to leave it in just ~~ica~~ in case we change plans. It won't be the case for specificity or PPV.

* after accounting for terms that = 0.