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CDM Executive Board

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Subject: Public Inputs into *Best Practice Examples Focusing on Sample Size and Reliability Calculations and Sampling for Validation/Verification*

Dear CDM Executive Board,

Upon reviewing the *Best Practice Examples Focusing on Sample Size and Reliability Calculations and Sampling for Validation/Verification* we have identified an issue that would benefit from further clarification. This is in relation to using the approximate equation when determining minimum sample size for monitoring proportions (paragraph 23 of the best practice document).

	Approximate Equation	Sample size for the above example
Proportion data	$n = \dfrac{1.645^2 V}{0.1^2}$ Where: $V = \dfrac{p(1-p)}{p^2}$	271 $\left(= \dfrac{1.645^2 \times 1}{0.1^2} \right)$

While we understand that $p(1-p)$ is divided by p^2 to obtain the minimum sample size with precision that is relative to the proportion, this is not clearly explained in the document. We have encountered some confusion, as many text books use variations of the following equations to estimate the minimum sample size required when working with proportions:

$$n = \frac{Z^2 \times p(1-p)}{e^2} \quad OR \quad n = \left(\frac{Z}{e}\right)^2 p(1-p)$$

Where:

n = minimum sample size required

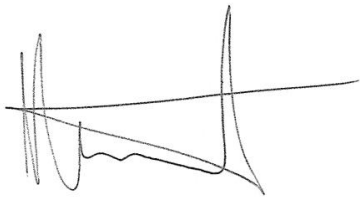Z = Z-value (1.645 for 90% confidence)

e = desired level of precision

p = the proportion of interest

Assuming 90/10 confidence/precision and a conservative value of 0.5 for p, this text-book example would give us the result of 67.65 (rounded to 68). As shown above however, the approximate equation for proportional sampling used in the best practice document, we come to a minimum sampling size of 271.

We believe that the document would benefit from a more detailed explanation of the approximate equation and how relative precision is incorporated into the calculation to avoid any unnecessary confusion.

Warm regards,

Stephen Stewart.