Appendix A: Confidence intervals

As survey estimates presented in this publication are based on a sample, they are subject to sampling error. Sampling error is the difference between the published estimates, derived from a sample of persons, and the value that would have been produced if the entire population had been surveyed.

One measure of the likely difference is given by the standard error, which indicates the extent to which an estimate might have varied by chance because a sample of the population was taken.

Figure 4.1 presents the prevalence estimates and 95% confidence intervals for selected drugs from the 2004 NDSHS. In these cases, we can be 95% confident that the prevalence estimates will differ by less than 1.96 multiplied by the standard error from the prevalence that would have been obtained if the entire population had been included.

A relatively simple approximation of the confidence interval that readers might use when interpreting Figure 4.1 is:

$$\text{95\% confidence interval} = p \pm 1.96 \times \sqrt{\frac{p(1-p) \times DE}{n}}$$

where:

p is the sample prevalence estimate expressed as a proportion

DE is the design effect

n is the sample size.

The design effect is the net result of a number of factors affecting the sample population. The design effect is the ratio of the variance of an estimate derived from the survey to the variance of an estimate of the same thing based on a true simple random sample of the same size. Departure from simple random sampling may sometimes be due to the nature of the population being measured, as well as to the practical limitations of field sampling operations.

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