THE EFFECTS OF SAMPLING AND SAMPLE PREPARATION ON ANALYTICAL SENSITIVITY

R.A. Lewis[1], T.L Eudey[1]

[1]*Chiron Corporation, Emeryville, USA*

Email: *richard_lewis@chiron.com*

We investigate the probability of obtaining a positive assay result when the concentration of the analyte is low. In this situation, sampling and/or sample preparation can have significant effects on assay sensitivity, especially for assays that use small sample volumes. For example, due simply to chance, the analyte may not be present in a small sample, or, even if present in the sample, may not make it all the way through the sample preparation steps. In order to explore the potential impact of these effects, we use a relatively simple two-stage probability model. The first stage (sampling) employs a Poisson distribution and the second stage (sample preparation) employs a binomial distribution. Calculations can easily be carried out in Microsoft Excel®. We illustrate our findings with several examples.