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Figure 4–1. The joint distribution of two hypothetical standard normal univariate distributions. The correlation coefficient r between both variables has been set to 0.8. Projections of horizontal cross-sections at the 5% probability density level yield two types of reference regions: the square and the ellipse. Differences between these regions are explained further in Figure 4 –2.

Figure 4–2. Discrepancy between a multiple univariate reference region and a single multivariate reference region. Plotted horizontally and vertically are the probability densities of analyte 1 and 2 of Figure 4 –1, respectively. Using the region enclosed by the two univariate reference intervals as a reference region, observations 1 and 2 are a false negative and a false positive observation, respectively when the 95% reference ellipse is taken as the standard [7, 20].

Figure 4–3. The standard deviation correction factor (CF) at 24 specific 2 cut-off fractiles for a bivariate Gaussian distribution.

Figure 4–4. Flow-chart of trimming procedure to determine the background model parameters in a bivariate distribution of patient data. CF is the correction factor for the estimated standard deviations and KS stands for the size-adjusted Kolmogorov-Smirnov test. See text for further explanation.

Table 4–1. Distribution characteristics (m is mean, s is standard deviation and r is Pearson’s product correlation coefficient between PC1' and PC2') after trimming.

Figure 4–5. Fit of the observed cumulative probabilities of the remaining d*2*values of the trimmed ELIbe data set (thick line) with the theoretical cumulative *2*(2) probability distribution (thin line). P is the cumulative probability. \*Dmax is the test statistic of the adapted and size-adjusted Kolmogorov-Smirnov test, indicating the degree of fit of the d*2*values with the theoretical distribution. In this case there is not enough evidence (p > 0.05) to reject the Ho-hypothesis of fit.

Figure 4–6. The 30% equal probability ellipse (inner ellipse) and the 95% equal probability ellipse (outer ellipse) for the ELIbe data set

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Figure 4–8. The 30% equal probability ellipse (inner ellipse) and the 95% equal probability ellipse (outer ellipse) for the OLVGbe data set

Figure 4–9. The 30% equal probability ellipse (inner ellipse) and the 95% equal probability ellipse (outer ellipse) for the SKZbe data set.

Figure 4–10. The 30% equal probability ellipse (inner ellipse) and the 95% equal probability ellipse (outer ellipse) for the ELIab data set.

Figure 4–11. The 30% equal probability ellipse (inner ellipse) and the 95% equal probability ellipse (outer ellipse) for the OLVGab data set.