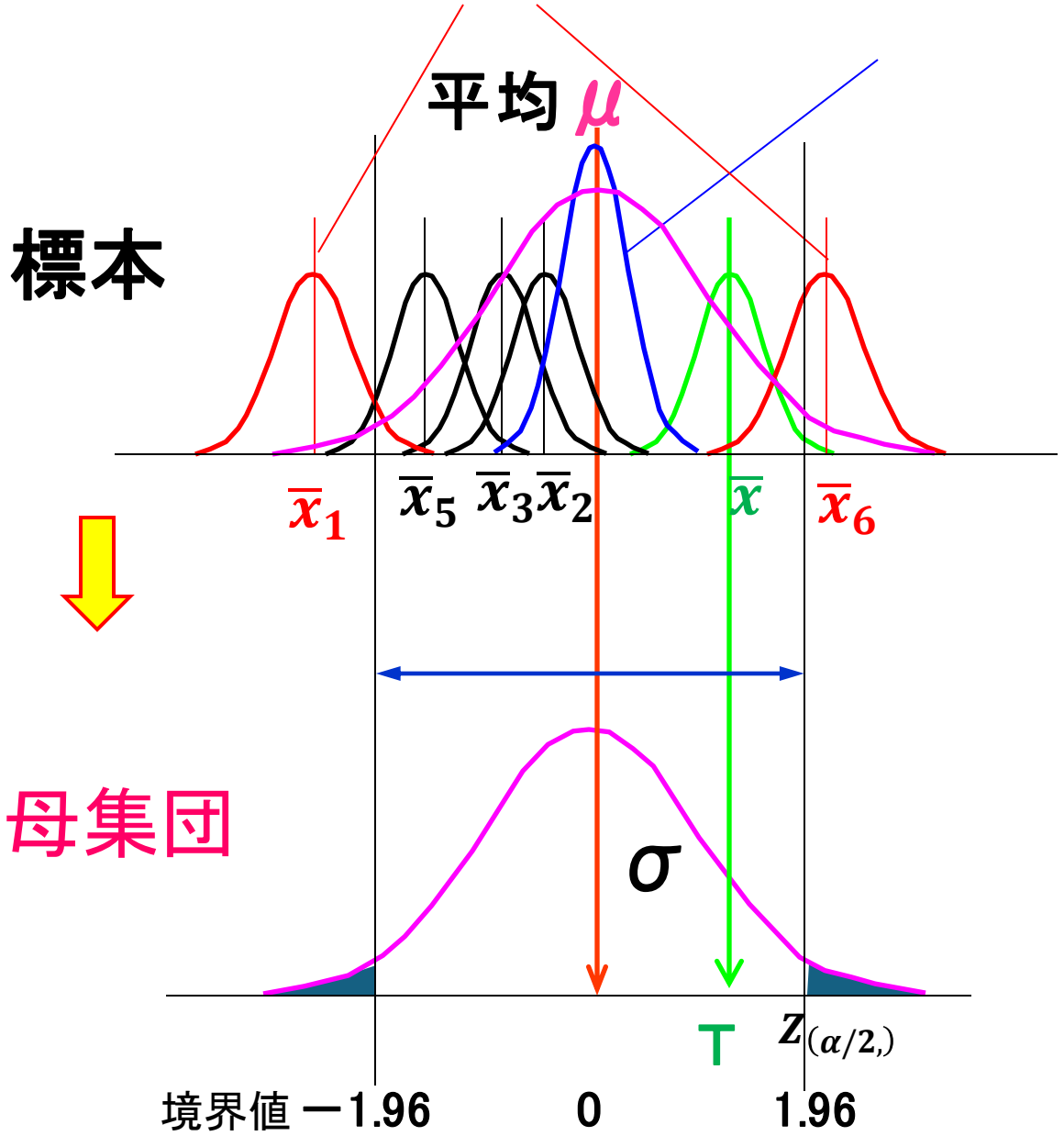
平均値の推定

5%の確率で推定を間違う



$\alpha = 0.05$の時　$Z_{(\alpha/2)} = 1.96$

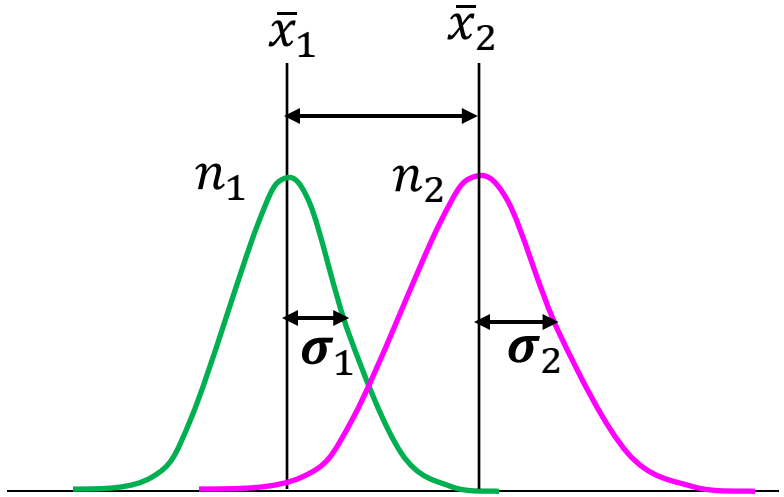
$$P\left(-1.96 < T = \frac{\bar{x} - \mu}{\sqrt{\frac{\sigma^2}{n}}} < 1.96\right) = 0.95$$

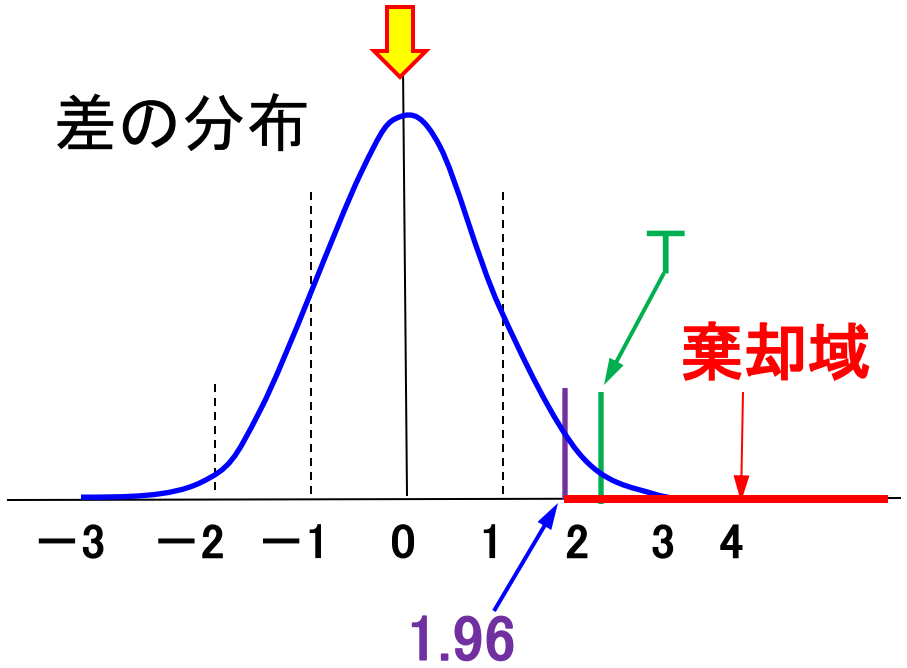
$$-1.96 < T = \frac{\bar{x} - \mu}{\sqrt{\frac{\sigma^2}{n}}} < 1.96$$

変形して平均値 μ の推定式は

$$\bar{x} - 1.96\frac{\sigma}{\sqrt{n}} < \mu < \bar{x} + 1.96\frac{\sigma}{\sqrt{n}}$$

統計的検定





統計量T＞1.96（境界値） →棄却

$$T=\frac{\bar{x}_1-\bar{x}_2}{\sqrt{\frac{{\sigma_1}^2}{n_1}+\frac{{\sigma_2}^2}{n_2}}}$$

α＝0.05の時　$Z_{(\alpha/2)}$＝1.96

$$P\left(-1.96<T=\frac{\bar{x}_1-\bar{x}_2}{\sqrt{\frac{{\sigma_1}^2}{n_1}+\frac{{\sigma_2}^2}{n_2}}}<1.96\right)=0.95$$

$$-1.96<T=\frac{\bar{x}_1-\bar{x}_2}{\sqrt{\frac{{\sigma_1}^2}{n_1}+\frac{{\sigma_2}^2}{n_2}}}<1.96$$

変形して$\bar{x}_1-\bar{x}_2$の推定式は

$$-1.96\sqrt{\frac{{\sigma_1}^2}{n_1}+\frac{{\sigma_2}^2}{n_2}}<\bar{x}_1-\bar{x}_2<1.96\sqrt{\frac{{\sigma_1}^2}{n_1}+\frac{{\sigma_2}^2}{n_2}}$$