Konfidensintervall for σ^2 og σ:

$X_1, \ldots, X_n \overset{iid}{\sim} N(\mu, \sigma^2)$ - Vi vet at $\frac{(n-1)S^2}{\sigma^2} \sim \chi^2_{n-1}$

Vi har:

$$P\left(\chi^2_{1-\alpha/2, n-1} \leq \frac{(n-1)S^2}{\sigma^2} \leq \chi^2_{\alpha/2, n-1}\right) = 1 - \alpha$$

$$\longrightarrow P\left(\frac{\chi^2_{1-\alpha/2, n-1}}{(n-1)S^2} \leq \frac{1}{\sigma^2} \leq \frac{\chi^2_{\alpha/2, n-1}}{(n-1)S^2}\right) = 1 - \alpha$$

$$\longrightarrow P\left(\frac{(n-1)S^2}{\chi^2_{1-\alpha/2, n-1}} \geq \sigma^2 \geq \frac{(n-1)S^2}{\chi^2_{\alpha/2, n-1}}\right) = 1 - \alpha$$

$$\longrightarrow P\left(\sqrt{\frac{n-1}{\chi^2_{1-\alpha/2, n-1}}} S \geq \sigma \geq \sqrt{\frac{n-1}{\chi^2_{\alpha/2, n-1}}} S\right) = 1 - \alpha$$

Hypotesetesting

- Eksempel med selve : $H_0 : p \leq 0,50 \qquad H_a : p > 0,50$

  X = antall pasienter som fikk best resultat med ny selve.

  Vi antar $X \sim Bin(n, p)$.

  Vi har :

  $$P(\text{Type I-feil}) = P(\text{Forkaste } H_0 \mid H_0 \text{ er sann})$$

  $$= P(X \geq k \mid p \leq 0,50)$$

  $$\leq P(X \geq k \mid p = 0,50) \leq \alpha$$

  Videre er

  $$P(X \geq k \mid p = 0,50) = 1 - P(X \leq k-1 \mid p = 0,50)$$