A short glossary of terms (with Swedish translations)

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Confidence interval (Konfidensintervall): An interval $I = I_\theta^{1-\alpha} = (a, b)$ such that $\theta \in I$ with probability $1 - \alpha$. The probability α is referred to as the level of significance, which is the probability for the interval to *not* cover the unknown θ.

Consistent (Konsistent): An estimator $\widehat{\Theta}$ is called consistent if for every $\epsilon > 0$

$$\lim_{n\to\infty} P(|\widehat{\Theta} - \theta| > \epsilon) = 0.$$

The estimator $\widehat{\Theta}_n$ *converges in probability* to θ.

Distribution (Fördelning): The distribution of a random variable. Typically characterized by either the density function (täthetsfunktion) in the continuous case or the probability function in the discrete case.

Estimate (Skattning): The same as point estimate.

Estimator (Skattningsvariabel): The random variable $\widehat{\Theta}$ of which the estimate $\widehat{\theta}$ is an observation of; $\widehat{\theta}$ is an observation $\widehat{\Theta}$.

Expectation (Väntevärde): The expectation of a random variable: $E(X)$.

Hypothesis testing (Hypotesprövning): We test, e.g., $H_0 : \mu = \mu_0$ against some alternative hypothesis, e.g., $H_1 : \mu \neq \mu_0$.

Null hypothesis (Nollhypotes): The hypothesis H_0 that we are trying to disprove.

Alternate hypothesis (Mothypotes): The hypothesis H_1 (for example).

Critical region (Kritiskt område): A region C such that if the *statistic* $t(x_1, \ldots, x_n) \in C$, we reject H_0.

Reject (Förkasta): We reject H_0 if the statistic $t = t(x_1, \ldots, x_n)$ ends up in the critical region: $t \in C$.

Point estimate (Punktskattning): *Any* estimate $\widehat{\theta}$ of an unknown parameter θ.

Power (Styrka): The power at θ of a hypothesis test is the probability of rejecting H_0 when θ is the real parameter value. Defined by $h(\theta) = P(\text{reject } H_0 \,|\, \theta \text{ is the real value})$.

***p*-value (*p*-värde)**: For a given sample $x_1, \ldots, x_n$, the p-value is the lowest probability where we can reject H_0. The lowest possible significance level is p.

Sample (Stickprov): A sequence of observations $x_1, x_2, \ldots, x_n$, typically assumed to be independent observations of random variables $X_1, X_2, \ldots, X_n$ of some distribution(s) that depend on something unknown (a parameter θ).

Significance (Signifikans): The significance of a hypothesis test is the probability of rejecting H_0 when H_0 is true.

Random sample (Slumpmässigt stickprov): The sequence $X_1, X_2, \ldots, X_n$ of random variables that corresponds to the sample $x_1, x_2, \ldots, x_n$.

Unbiased (Väntevärdesriktig): An estimator $\widehat{\Theta}$ is called unbiased if $E(\widehat{\Theta}) = \theta$.