

# Normal approximation til binomial

$$X \sim \text{Bin}(n, p)$$

$$E[X] = n \cdot p$$

$$V[X] = n \cdot p(1-p)$$

$$n \gg 1$$

$$np > \text{ca } 5$$

$$n(1-p) > \text{ca } 5$$

$$\begin{aligned} X &\overset{\text{approx}}{\sim} N(\overset{\mu_X}{np}, \overset{\sigma_X^2}{np(1-p)}) \\ Z = \frac{X - np}{\sqrt{np(1-p)}} &\overset{\text{approx}}{\sim} N(0, 1) \end{aligned}$$