2-sample test for proportions.

$H_0: \Delta = 0$

$H_1: \Delta \neq 0$

$\Delta = \mu_1 - \mu_2$

$= p_1 - p_2$

Data

$\hat{p}_1, \hat{p}_2, n_1, n_2$ (samples)

Number of successes (in the samples)

$x = \hat{p}_1 n_1$

$y = \hat{p}_2 \cdot n_2$

$$\hat{p} = \frac{x+y}{n_1+n_2}$$ (pooled sample proportion)

$$z = \frac{\hat{\Delta} - 0}{se}$$ ($\hat{\Delta} = \hat{p}_1 - \hat{p}_2$)

$$se = \sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

$z \sim N(0,1)$