Lecture 18: Wald Tests

Hypothesis test for a population proportion

Let $Y_1, Y_2, \ldots \overset{\text{iid}}{\sim} \text{Bernoulli}(p)$. We want to test

$H_0 : p = p_0 \quad H_A : p \neq p_0$

Wald test for one parameter

Testing multiple parameters

Logistic regression model for the dengue data:

$$Y_i \sim \text{Bernoulli}(p_i)$$

$$\log\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 \text{WBC}_i + \beta_2 \text{PLT}_i$$

Researchers want to know if there is any relationship between white blood cell count or platelet count, and the probability a patient has dengue. What hypotheses should they test?

Testing multiple parameters

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	2.641506279	0.1213233066	21.77246	4.233346e-105
WBC	-0.289290446	0.0134349261	-21.53272	7.689284e-103
PLT	-0.006561464	0.0005932064	-11.06101	1.938945e-28

Can the researchers test their hypotheses using this output?

Wald tests for multiple parameters

Class activity

https://sta711-s24.github.io/class_activities/ca_lecture_18.html