

GER1000 (Analysis of Statistics)

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1 Definitions and Formula

2 Misc

TP-SR5 Seat number 12

3 Associations

3.1 Rates

Essentially conditional probability. From here on, define $rate := P$ (probability function)

Definitions and Propositions

- Positive Association of A with B : If $P(A|B) > P(A|B^c) \vee P(B|A) > P(B|A^c)$
- $P(A|B) = P(A|B^c) \implies P(B|A) = P(B) = P(B|A^c)$

3.2 Groups

- Observational group (non-assigned)
- Control Group
- Treatment Group

3.3 Confounders

Confounding variables are associated with both independent and dependent variables.

To reduce confounding, use slicing, so as to compare smaller groups with are relatively homogeneous w.r.t. the factors.

3.4 Simpson's Paradox

3.5 Tutorial 1

Imagine that you are an intern at a large tuition centre catered to students of age 11 and 12 years. Your employer wants to know if it is worthwhile to invest in iPads to improve students' proficiency in English. He gives you authority and resources, and asks you to design an experiment on the thousands of customers.

(a) How would you enrol subjects and assign them into two groups?

Ask for parental consent, then randomly assign consenting students to control and "treatment" groups.

(b) How feasible is it to use a placebo, or to implement double-blinding?

Placebo is not possible, since you can't just fake an ipad.

Blinding students is difficult, since knowledge of having/not having ipad in lesson is easily known by students and by parents.

Single blinding is possible however. For e.g. when testing the students at the end of the trial, do not inform the assessors about which group they belong to.