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Thursday

· Human RCT are often impossible on ethical grounds.
∴ Many times observational studies are used.
— A SECOND BEST STUDY

→ (Y) Outcome: Systolic Blood Pressure

→ (X) Treatment (supposedly causal factor): pill use v/s non pill use

Basic Design: Observational Study
(of Kaiser Study)
ENEMY: Potential confounding Factor: $\boxed{\text{AGE}}$

* Is age a PCF:? TEST
1. Is it possible that Z and Y are associated?
   age↑ v/s BP↑

2. Is it possible that Z and X are associated?
   age↑ v/s pill use↓

→ If we don't attempt to defeat this PCF the results will be biased in favour of the pill.

HOW TO DEFEAT PCF?
1. at Design X
2. At analysis

Key idea: To defeat PCF make both group's PCF constant.

→ Make groups with similar PCFs. withing sample.

After controlling (adjusting) ~~for~~ age, taking the pill increases sys. BP by 5 mmHg.

Is this difference practically significant?

- ~~NOT SIGNI~~

Yes, it's <u>small</u> but important.

accumulating over time will lead to worse health ~~con~~ conditions.

PROBABILITY

~~[illegible]~~

Probability: Numerical mode of uncertainty

2 main ways of ~~thing~~ thinking about meaning of probability:

- THE frequentist (Relative freq. approach): 2+ repeats of one event that doesn't effect each other (in identical cond.)
- The Baysian approach

EQUALLY LIKELY MODEL (ELM)

$$P(A) = \frac{\#\text{ of outcomes favourable to A}}{\text{total \# of possible outcomes}}$$

$\begin{bmatrix} 1 \\ 2 \\ 9 \end{bmatrix} \xrightarrow[\text{Random}]{\text{at}} [\,Y\,]$ n=1 'at Random' – ∴ equally likely.

~~50%~~ 25% ~~33.3%~~ 50% 25%

Hh x Hh → HH, Hh, Hh, hh

⇒ equally likely model also applies

at least one can mean:
1 T-S baby or 2 TS babies of 3 TS babies or 4 TS babies or 5 TS babies.
"1 or more" = "Not 0".

# of children	P(at least one T-S kid)
1	25%
2	> 25%
⋮	⋮
5	?

P(A) ? P(not A) ?

'not exactly 0' = not TS baby (1) and not TS baby 2 ... and not TS Baby (r)

| Ⓐ not A | } total area: 1

P(▭) = 100%. 1 = P(A) + P(not A)

$\boxed{P(A) = 1 - P(\text{not } A)}$

0% ≤ P(A) ≤ 100%