Population

US adults that are registered to vote

Population of United States

OR voters

"likely" voters

Variable

→ Support : Yes No

Absolutely Support

+10

Absolutely do not support

-10

→ Age, Income, Gender

Parameter

Mean or Median on Likert Scale for all units in our population

Proportion that answered "Yes"

Mode on Likert Scale

Question

How does support (proportion in all votes in each State) vary by State?

- point estimate
  - → populations proportions state by state
- hypothesis test
  - → ~~does~~ does CA proportion differ from OR proportion population

Is the population mean equal to "neither support nor oppose"?

1-7 scale = 4

→ Hypothesis test

What proportion of US population supports?

→ Point Estimate
→ Interval Estimate

Properties of Normally Distributed variables

is distributed — multiplying σ — adding μ

If $X \sim N(0,1)$ then $\sigma X + \mu \sim N(\mu, \sigma^2)$

(μ: mean, σ^2: variance)

Also if $Y \sim N(\mu, \sigma^2)$ then $\frac{Y-\mu}{\sigma} \sim N(0,1)$ → use a lot

all you need table of Standard Normal

More generally, if $X \sim N(\mu, \sigma^2)$ then

$$aX + b \sim N(a\mu + b, a^2\sigma^2)$$

Properties of Normally Distributed variables

If $X \sim N(\mu_X, \sigma_X^2)$ and $Y \sim N(\mu_Y, \sigma_Y^2)$, independent of X.

Then,

$$Z = X + Y \sim N(\mu_X + \mu_Y, \sigma_X^2 + \sigma_Y^2)$$

→ require independence

Independent: knowing value of one variable doesn't help to guess value of other.