Population Deviation

• We know that districts are required to be equal to preserve the principle of “one person, one vote”, but is some deviation allowed?

• Congressional districts must be “as nearly equal as practicable”
  • Established in *Wesberry v. Sanders* (1964) – a GA district had nearly 3x population as others
  • A New Jersey plan with average deviation of 0.14% was rejected in *Karcher v. Daggett* (1983)

• Legislative districts require “substantial equality” but have more flexibility
  • Courts have allowed a 10% deviation between the largest and smallest districts
  • Some deviation can preserve communities of interest, avoid splitting counties, etc.
Population Deviation

Suppose we have 100,000 people to be divided into 10 districts

• **Ideal population** – total population $\div$ number of districts

  \[(100,000 / 10) = 10,000\]
Population Deviation

Suppose we have 100,000 people to be divided into 10 districts

- **Ideal population** – total population ÷ number of districts
  
  \[(100,000 \div 10) = 10,000\]

- **District deviation** – difference from ideal as a percentage
  
  A district with 10,200 has a deviation of \[(200 \div 10,000) = 2\%\]
Suppose we have 100,000 people to be divided into 10 districts

- **Ideal population** – total population ÷ number of districts
  
  \[
  \frac{100,000}{10} = 10,000
  \]

- **District deviation** – difference from ideal as a percentage
  
  A district with 10,200 has a deviation of \( \frac{200}{10,000} = 2\% \)

- **Average deviation** – sum of all deviations ÷ number of districts
  
  All deviations should be treated as positive numbers
  
  \[
  \frac{2\% + 1\% + 1\%}{3} = 1.33\% \text{ average}
  \]
Population Deviation

Suppose the largest district has a population of 10,200 and the smallest district has a population of 9,850

- **Deviation range** – the difference in percent deviation between the largest and smallest districts
Suppose the largest district has a population of 10,200 and the smallest district has a population of 9,850

- **Deviation range** – the difference in percent deviation between the largest and smallest districts

  Largest: \( \frac{200}{10,000} = 2\% \)

  Smallest: \( \frac{-150}{10,000} = -1.5\% \)

  Deviation range = 2\% + 1.5\% = 3.5\%

  (for legislative plans courts have established 10\% as the maximum range)
Almost all states use one of three software programs:

- Maptitude for Redistricting (Caliper)
- AutoBound (CityGate GIS)
- Esri Redistricting (Esri)
Redistricting Technology

The biggest difference in the last 10 years isn’t the software programs used by governments, but the availability of user-friendly programs that can be used by the public:

- ★ Dave’s Redistricting App ★
- Districtr (MGGG)
- District Builder