Sampling People, Records, & Networks

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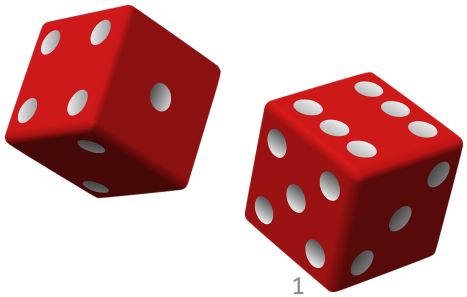
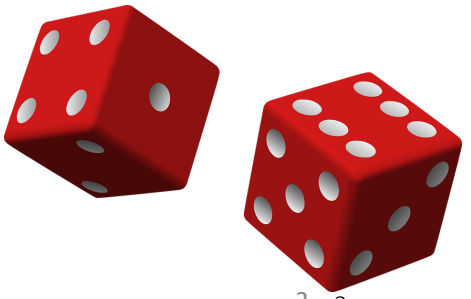
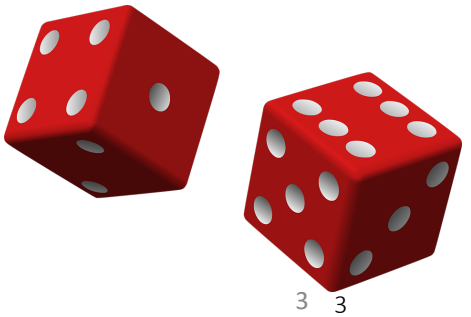


Unit 4

- 1 Forming groups
- 2 Sampling variance
- 3 More on grouping
- 4 Allocate sample
- 5 Other allocations
- 6 Weights

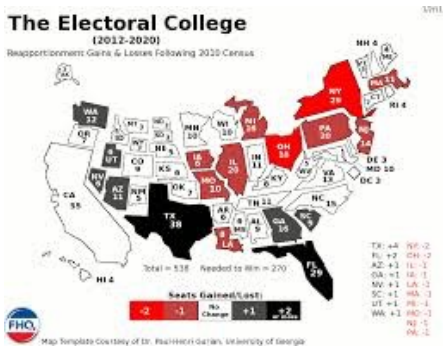


- **Allocations**
- **Proportionate**



- Allocations
- Proportionate

- **The stratified sampling approach has several advantages:**
  - **Gains in precision (depending on allocations)**
  - **Administrative convenience**
  - **Guaranteed representation of important domains**
  - **Acceptability/credibility**
  - **Flexibility**

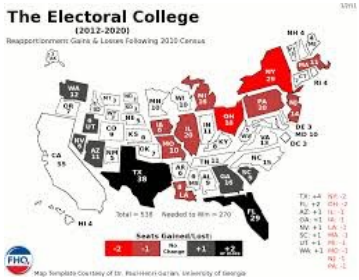


- Allocations
- Proportionate

- How should we determine sample sizes across groups?
- Consider the basic parts of stratified sampling:

$$f_h = \left(\frac{n_h}{N_h} \right) \qquad \sum_{h=1}^{H} n_h = n$$

- Many allocations are possible
- For our H = 6, n = 80, for example,
- $(n_1, n_2, n_3, n_4, n_5, n_6)$
- (1,1,1,1,1,75),(2,1,1,1,1,74),(2,2,1,1,1,73), …



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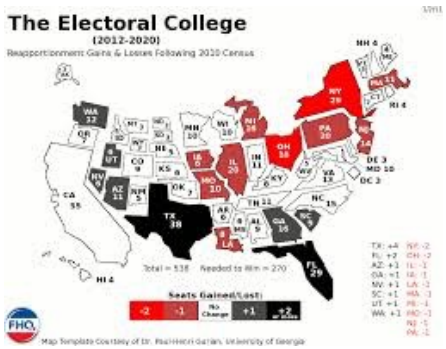
- We used one of these allocations in the sample of 80 from 400 faculty … (8,5,4,15,10,38)



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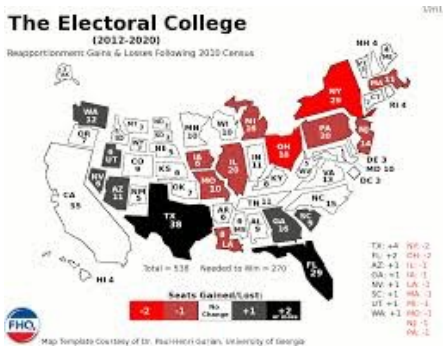
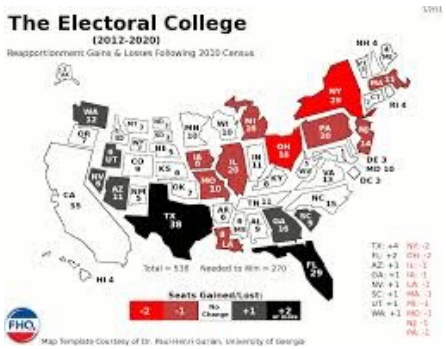
- We used one of these allocations in the sample of 80 from 400 faculty … (8,5,4,15,10,38)
- Why this allocation?
- Recall that this happens to be an allocation we got by taking the same percent or fraction of the elements in each of the six strata



- Allocations
- Propor-tionate

- We used one of these allocations in the sample of 80 from 400 faculty … (8,5,4,15,10,38)
- Why this allocation?
- Recall that this happens to be an allocation we got by taking the same percent or fraction of the elements in each of the six strata
- That is, we selected the sample using the same sampling rate, $\frac{n_h}{N_h} = f_h = \frac{n}{N} = f$



- Allocations
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- For example, for stratum 1, where in the population there are 40 of the 400, or 10% (W_h)
- But when we sampled at the same rate across strata, the number in the sample from stratum 1 is 10% of the sample, 8 out of 80, or 10%

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- The *epsem* sampling rate gives us a proportionately allocated sample

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- **In other words, if we make the sample look like the population**

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$$f = \frac{n}{N} = \frac{n_h}{N_h}$$

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- **But that's the same as having the same sampling fraction in all strata**

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- **And as select samples proportionately, we get design effects that are less than 1:** $deff(\bar{y}) < 1$

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- Unit 1: Sampling as a research tool
- Unit 2: Mere randomization
- Unit 3: Saving money
- Unit 4: Being more efficient
  - Forming groups
  - Sampling variance
  - More on grouping
  - Allocate sample
  - **Other allocations**
  - Weights to combine across strata
- Unit 5: Simplifying sampling
- Unit 6: Some extensions & applications