

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## **Vietnam War Draft Exploration**

**Statistics course objectives.** Students will....

- Explain the need for choosing a sample, including the importance of representativeness and randomness in sampling
- Infer statistical significance based on probability.

### **Historical Background – Vietnam War Draft**

The Vietnam War was a conflict in Vietnam, Laos, and Cambodia from 1955 to 1975. The war was officially fought between North and South Vietnam, with the North being supported by the Soviet Union, China, and other communist states, and the South being supported by the United States and other anti-communist allies.

The United States sent soldiers to fight in Vietnam between 1964 and 1973. While two thirds of the soldiers volunteered to go, one third of the soldiers were selected for military service through the Select Service System, or the draft. In the beginning of the war, eligible men were required to go to a local draft board made up of various community members to determine their draft status or not. Men could get out of service if they were in college, had a political connection, or had a family doctor that could give them a medical deferment. Because of this, men with connections were able to get out of the draft, while men who were considered poor, working-class, and/or minorities often got drafted disproportionately. For instance, while 11% of the U.S. population in 1964 was Black, 15% of draftees were Black. This inequity led many to protest the draft.

In 1969, the Selective Service System decided to conduct a national lottery to decide the order of people chosen for the draft (for all draft-eligible men born between 1944-1950). This process was meant to give everyone a fair chance of being chosen and was televised on live television as an act of “good faith”. But how fair was it?

### **Part 1: Develop a fair system to choose people for a draft**

1. With your partner(s) think of how you might conduct a system so that everyone has an equally likely chance of being chosen to serve in the military during the Vietnam War? Why do you think your system is fair? What parts of it might be problematic? Be prepared to share your ideas.

## The 1969 Draft Lottery

The official draft lottery of 1969 was conducted at the Selective Service System headquarters in Washington D.C. on December 1, 1969. There were 366 blue plastic capsules containing birth dates (including February 29) placed in a glass container. The capsules were drawn by hand, opened one by one, and then assigned to a sequence from 1 until 366. The first date drawn was September 14, followed by April 24, which was assigned to “001” and “002” respectively. The process continued until each day of the year was assigned to a lottery number.

The lower the number was, the higher the probability was that men with that birthday would be called to serve. Eventually all men with number 195 or lower were called to report for physical examinations in 1970.

Was your number drawn? Go to this chart to see what your number was.

<https://bit.ly/1970DraftNumbers> If it was less than 195, you were to report to the draft office!

My draft number \_\_\_\_\_ Was it called? \_\_\_\_\_

## Part 2: Theoretical Probability

2. For this investigation, we will first think about how likely it would be for any month to be chosen for the draft. There are 366 possible dates in the container. Fill out the chart below to calculate the theoretical probability of being chosen for the draft given your birth month.

| Month     | Days in Month | Probability of a Month being chosen for draft<br><br>Hint: Calculate Days in Month ÷ 366 | Expected number of days of each chosen for 195 draft numbers called<br><br>Probability x 195 |
|-----------|---------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| January   | 31            | $31/366 = 0.0847$                                                                        | $0.0847 \times 195 = 16.5$                                                                   |
| February  | 29            | $29/366 = 0.0792$                                                                        | $.0792 \times 195 = 15.4$                                                                    |
| March     | 31            | $31/366 = 0.0847$                                                                        | $0.0847 \times 195 = 16.5$                                                                   |
| April     | 30            | $30/366 = 0.0820$                                                                        | $0.0820 \times 195 = 16.0$                                                                   |
| May       | 31            | $31/366 = 0.0847$                                                                        | $0.0847 \times 195 = 16.5$                                                                   |
| June      | 30            | $30/366 = 0.0820$                                                                        | $0.0820 \times 195 = 16.0$                                                                   |
| July      | 31            | $31/366 = 0.0847$                                                                        | $0.0847 \times 195 = 16.5$                                                                   |
| August    | 31            | $31/366 = 0.0847$                                                                        | $0.0847 \times 195 = 16.5$                                                                   |
| September | 30            | $30/366 = 0.0820$                                                                        | $0.0820 \times 195 = 16.0$                                                                   |
| October   | 31            | $31/366 = 0.0847$                                                                        | $0.0847 \times 195 = 16.5$                                                                   |
| November  | 30            | $30/366 = 0.0820$                                                                        | $0.0820 \times 195 = 16.0$                                                                   |
| December  | 31            | $31/366 = 0.0847$                                                                        | $0.0847 \times 195 = 16.5$                                                                   |
| Total     | 366           | 1 or 100%                                                                                | ~195                                                                                         |

### Part 3: Empirical Probability

Let's watch this video about what happened during the actual draft lottery:

<https://www.youtube.com/watch?v=OkJH6sapQMA>

3. Recall any number that was chosen between 1-195 was eventually called to report to the draft board for military service. The numbers below show how many days out of each month were actually chosen to report (that is had a number of 195 or less). Calculate the empirical probability of each month based on these numbers.

| Month     | Expected Value (from above) | Number of days in month chosen for 1969 draft<br>Actual Value |
|-----------|-----------------------------|---------------------------------------------------------------|
| January   | 16.5                        | 14                                                            |
| February  | 15.4                        | 13                                                            |
| March     | 16.5                        | 10                                                            |
| April     | 16.0                        | 12                                                            |
| May       | 16.5                        | 14                                                            |
| June      | 16.0                        | 14                                                            |
| July      | 16.5                        | 18                                                            |
| August    | 16.5                        | 19                                                            |
| September | 16.0                        | 19                                                            |
| October   | 16.5                        | 14                                                            |
| November  | 16.0                        | 22                                                            |
| December  | 16.5                        | 26                                                            |

a. Which months were chosen most often? Which months were chosen least often?

December and November were chosen most often and March and April appeared the least often

b. Does there seem to be a significant difference between what we would expect to happen and what happened? That is, compare the actual and expected values.

The months from January to June all had a negative difference, meaning they were chosen lower than expected, March and April seem most significantly different. Likewise November and December appear most often at a much higher rate.

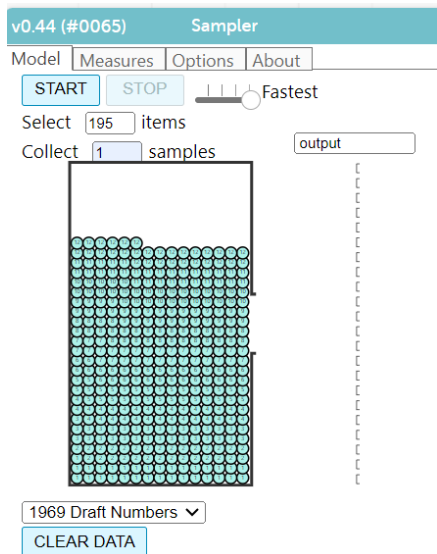
c. Does it seem like these numbers were randomly chosen for the 1969 draft? Why?

No, the differences are quite large for many of the months.

## Part 4: Simulating the 1969 Draft

Though it may seem that the way the numbers were chosen was not random, all things being fair, the way it happened may have happened by chance. Now we will use an online sampler to simulate the 195 dates that were chosen and see how likely the outcome that happened would happen by chance.

4. Go to the following CODAP site: <https://tinyurl.com/1969Vietnamdraft> (note this should be opened using Google Chrome or Firefox, does not work well with Safari or on phones/tablets)



In this simulation, notice there is an “urn” simulating the 366 days that were in the original glass container used for the 1969 draft.

The sampler is set to choose 195 days (without replacement).

There is a graph that will show the number of days out of 195 chosen from each month.

There are two graphs that show how many times (based on the number of samples you take) that the expected number compares to the actual number from the draft for December and March.

For the actual 1969 draft, about 26 of the 195 days chosen were from December and about 10 were from March.

a. Take one sample. For your one sample record the following.

Number of days from March chosen: \_\_\_\_\_

Number of days from December chosen: \_\_\_\_\_

Were these percentages close to the actual numbers of 26 and 10 days respectively (note the green lines marking these values)? How do they compare?

b. Take more samples. Change the Collect 1 samples input to collect 50 samples.

How many samples had the number of days for December be 26 or higher? \_\_\_\_\_

- What percentage of samples were greater than 26? \_\_\_\_\_

How many samples had the number of days for March be 10 or lower? \_\_\_\_\_

- What percentage of samples were less than 10? \_\_\_\_\_

c. Now that you have simulated the 1969 draft 51 times, do you think it likely that the actual outcome of the draft was truly random? Would the actual outcome have happened if all days had an equally likely chance of occurring? Why?

### **Part 5: Bringing it all together**

How could such a simple procedure go so wrong? In theory, pulling capsules from a well-mixed tumbler should provide random results and more-or-less uniform results across the months.

The key word in the previous sentence is “well-mixed.” In fact, the tumbler was anything but well-mixed. When the tumbler was filled, January capsules were placed in first, followed by February, and so on. Evidently, the mixing process did a poor job of shuffling the capsules around, leaving the capsules in the tumbler striated like a layer cake.

But why did they do it like this? Why not just use a computer to create random assignments?

Remember in 1969 computers were relatively new, people didn’t trust that technology yet, so the government thought airing the drawings where everyone could see the outcome would make them feel that the process was more equitable.

Almost immediately after the drawing, many statisticians cried foul, and posted articles and arguments showing just how unfair this was. This led to the next drafts being chosen in different ways.

**Extension:** Look up how the 1970 and 1971 drafts were conducted. Do you think these drafts resulted in more random drawings than the 1969 draft? Why?