Manual Transmission versus Automatic Transmission

According to a report from U.S News and World Report, only 18% of U.S drivers know how to operate a stick shift/manual transmission.

The goal of this project is to determine whether 18% is an accurate representation of the number of drivers who can operate a manual transmission in central Louisiana.

Using a simple random sample of residents of St Landry Parish and Lafayette Parish, subjects were asked age, gender and whether or not they could drive a manual transmission vehicle.

To determine sample size required for a proportional data binomial experiment, at a 90% confidence level with a Margin of Error at 5%, I used the following formula:

$$n = 0.18(1-0.18)\left(\frac{1.645}{0.05}\right)^2$$

I used the previous studies sample data of 18% as a multiplier.

This gave me a required minimum sample size of 159. I surveyed 162 participants from hospitals in St Landry Parish and Lafayette Parish; nurses, doctors and EMTs.

The results of my survey were as follows:

Response	Quantity	P
Yes	95	0.5864
No	67	0.4136

Using purely yes or no answers, based on the data collected 58.6% of my sample could operate a manual transmission, while 41.4% could not operate a manual transmission.

I further wanted to break my data down to see if there was a difference in the male versus female population of my sample.

Gender	Yes	P(Yes)	No	P(No)
Male	48	0.6486	26	0.3514
Female	46	0.5227	42	0.4773

Out of my sample data, men were more likely to drive a manual transmission (64.9%) compared to females (52.3%), but the rates were still not close to the 18% found in the previous study by U.S News and World Report.

I decided to further break my data down into age groups of the survey participants.

Age Group	Yes	P(Yes)	No	P(No)
17-27	18	0.45	22	0.55
28-38	21	0.5677	16	0.4324
39-49	28	0.6829	13	0.3171
50+	28	0.6364	16	0.3636

Based on the age group data, the age group that was least likely to know how to use a manual transmission was 17-27 year age group, with 45% knowing how to drive a manual.

The age group most likely to know how to drive a manual transmission was the 39-49 year age group, with 68% knowing how to drive a manual.

When looking at the overall age group data, the sample mean age for driving a stick shift was 41.35 years with a standard deviation of 11.6 years, and the sample mean for not being able to drive a stick shift was 37.54 years with a standard deviation of 12.59 years.

Using the T-Interval function, I am 90% confident that the mean age for being able to drive a stick shift was between 39.362 years and 43.338 years. For not being able to drive a stick shift, I am 90% confident that the mean age fell between 34.972 years and 40.102 years.

Typically, younger drivers were less likely to be able to drive a stick shift than older drivers.

Overall, none of the data collected in my sample came close to the previous data of only 18% of Americans being able to drive a stick shift. There are several reasons that could contribute to

the variation in my data and the previous data. The location of my survey is typically considered a more rural, or country lifestyle area. This may lead to a greater number of people able to use farm equipment or recreational vehicles. My survey also included a greater percentage of older drivers, while it is possible that the previous survey participants were younger in a more urban area.