

### Medical 1 Analysis

1. The descriptive statistics analysis infers that individuals 65 and older who are living in Florida tend to have lower depression scores as determined by the central tendency measures of mean, median, and mode which are all lower than the scores from individuals who are in the same age category from New York and North Carolina. The mean and median values from individuals living in New York are higher than Florida and North Carolina. In addition to this, New York has the highest maximum value of 13.
2.  $H_0$  = The depression scores of individuals 65 years of age and older who are residents of Florida, New York, and North Carolina are all equal to each other.

$H_a$  = The depression scores are not all equal to each other.

Conclusion. Using the p-value approach, the p-value of  $0.0081 \leq 0.05$  (the significance level), therefore, we should reject the null hypothesis. The critical value approach leads to the same conclusion because the F-statistic  $5.240 > 3.1588$  (the critical value).

We conclude that the depression levels from individuals 65 years of age or older from different geographic locations (Florida, New York, and North Carolina) are not all the same.

3. Further study and analysis can be done to determine the contributing factors to the varying levels of depression in the different geographic locations. Because all individuals included in the sample were in reasonably good health, there may be other outside contributing factors. It would be worthwhile to determine the differences between those in Florida and New York because the mean value in these locations were the lowest and highest respectively.

Also, we rejected the NULL hypothesis, and from the below table we see that the “between groups” estimate of population variance is larger than “within groups” and their ratio is somewhat large at 5.240.

MEDICAL 1						
Mean	5.55	Mean	8	Mean	7.05	
Standard Error	0.4783	Standard Error	0.492	Standard Error	0.6344	
Median	6	Median	8	Median	7.5	
Mode	7	Mode	8	Mode	8	
Standard	2.1392	Standard	2.2005	Standard	2.8373	
Sample	4.5763	Sample	4.8421	Sample	8.05	
Kurtosis	-1.062	Kurtosis	0.6264	Kurtosis	-0.905	
Skewness	-0.274	Skewness	0.6257	Skewness	-0.056	
Range	7	Range	9	Range	9	
Minimum	2	Minimum	4	Minimum	3	
Maximum	9	Maximum	13	Maximum	12	
Sum	111	Sum	160	Sum	141	
Count	20	Count	20	Count	20	
Anova: Single Factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Florida	20	111	5.55	4.576315789		
New York	20	160	8	4.842105263		
North Carolina	20	141	7.05	8.05		
ANOVA						
<i>Source of</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between	61.033	2	30.517	5.240885809	0.0081	3.1588
Within Groups	331.9	57	5.8228			
Total	392.93	59				

## Medical 2 Analysis

1. The mean values for depression for individuals 65 and older with a chronic health condition did not vary much between the samples. However, New York once again had the highest mean, 15.25, and range, 15. The median value for Florida and New York are the same at 14.5 and North Carolina's median is 14. North Carolina also has the lowest mean, 13.95, and standard deviation, 2.9465.
2.  $H_0$  = The levels of depression for individuals 65 years of age or older who have a chronic health condition living in Florida, New York, and North Carolina are all equal to each other.

$H_a$  = The depression levels are not all equal to each other.

Conclusion: Using the p-value approach: The p-value of 0.4939  $\geq$  0.05, the level of significance. Therefore, we will fail to reject the null hypothesis. The same conclusion can be determined using the critical value approach. The F-statistic of 0.7142  $\leq$  3.1588, the critical value.

There is insufficient evidence to conclude that the mean depression levels from individuals 65 years of age or older with a chronic health condition from different geographic locations (Florida, New York, and North Carolina) are not all the same.

3. From the ANOVA table below, we failed to reject the NULL hypothesis, and the "between" and "within groups" estimate of population variance are similar and their ratio are close to one as evidenced by the F-statistic of 0.7142.

The overall sample mean in this case is  $(14.5+15.25+13.95)/3 = 14.567$  which is relatively close to each of the sample means.

MEDICAL 2						
Florida		New York		North Carolina		
Mean	14.5	Mean	15.25	Mean	13.95	
Standard Error	0.709	Standard Error	0.923	Standard Error	0.6588	
Median	14.5	Median	14.5	Median	14	
Mode	17	Mode	14	Mode	12	
Standard Deviation	3.1706	Standard Deviation	4.1279	Standard Deviation	2.9465	
Sample Variance	10.053	Sample Variance	17.039	Sample Variance	8.6816	
Kurtosis	-0.341	Kurtosis	-0.03	Kurtosis	-0.592	
Skewness	0.2807	Skewness	0.5254	Skewness	-0.042	
Range	12	Range	15	Range	11	
Minimum	9	Minimum	9	Minimum	8	
Maximum	21	Maximum	24	Maximum	19	
Sum	290	Sum	305	Sum	279	
Count	20	Count	20	Count	20	
Anova: Single						
SUMMARY						
Groups	Count	Sum	Averag	Variance		
Florida	20	290	14.5	10.05263158		
New York	20	305	15.25	17.03947368		
North Carolina	20	279	13.95	8.681578947		
ANOVA						
Source of	SS	df	MS	F	P-value	F crit
Between Groups	17.033	2	8.5167	0.714212152	0.4939	3.1588
Within Groups	679.7	57	11.925			
Total	696.73	59				