MEMORANDUM

From: Colin Rehnert
To: Dr. Thomas Craig
Date: 02 May 2022
Subj: Strategic Analysis of how COVID-19 has Affected Mental Health

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EXECUTIVE SUMMARY

The purpose of this study is to explain how the COVID-19 pandemic has mentally effected people due to the increased pressures it has brought about. The pandemic has caused widespread confusion, anger, and hate amongst everyone making it a relevant and important topic to study and research. The COVID-19 Pandemic is quite a broad topic because of its complexity and the multiple ways it can affect people. The study will specifically focus on the mental aspect of the pandemic with a focus on the restrictions that have affected daily life. The goal is to look at how the pandemic has affected gender and multiple age groups, there was seven in total. Even in year number two of the pandemic some of the rules and regulations are not very clear which can add stressors to everyday life. Making it that much more important that we study and research COVID-19's effect on mental health issues that we can better understand it and begin to find solutions to treat the issues.

SECTION 1: STATEMENT OF THE HYPOTHESIS

While examining data from the CDC regarding COVID-19 induced mental health issues it will be essential to compare how mental health issues differed between age groups and gender and how they have changed since the beginning of the pandemic. The CDC breaks down the data sets in two-week segments and differentiates the data into phases which are broken up by two-week breaks. Meaning when the CDC took a break afterwards, they would start a new phase. Phase 3.4 began on February 23rd, 2022 and

will run through May 2nd, 2022. The CDC calculated all of the data points based off of the responses they received through surveys. The hypotheses will be tested to determine the relationship between the phases of the samples taken

HYPOTHESES

Null Hypothesis (H_0)- All reported mental health issues are equal in both genders.

Alternative Hypothesis (H_1)- Not all reported mental health issues are equal in both genders.

Null Hypothesis (H_0)- All reported mental health issues are equal in all age groups

Alternative Hypothesis (H_1)- All reported mental health issues are not equal in all age groups.

SECTION 3: DATA AND ANALYSIS METHODOLGY

I obtained the data from the Center for Disease Control (CDC), Household Pulse Survey. There the data is able to give more of an understanding of the social and economic challenges that many were and are still facing today. It is able to give an accurate count of the people who responded and broke them down by age, gender, and state in which the respondent resided. In the data set there is an indicator that is labeled as values, it is simply just the mean number of responses. Minitab, a statistical analysis software, will be used to perform multiple tests to determine the hypotheses above. The tests that will be used are ANOVA one way and 2-sample t-tests. These tests can work because they will compare two means and are able to look at multiple groups.

SECTION 4: RESULTS

Two-Sample-T

Here the Two-Sample-T was used, it examined the values and subgroups in the dataset. The subgroup consisted of the two genders, male and female. The values consisted of the mean of the number of responses.

Figure 1

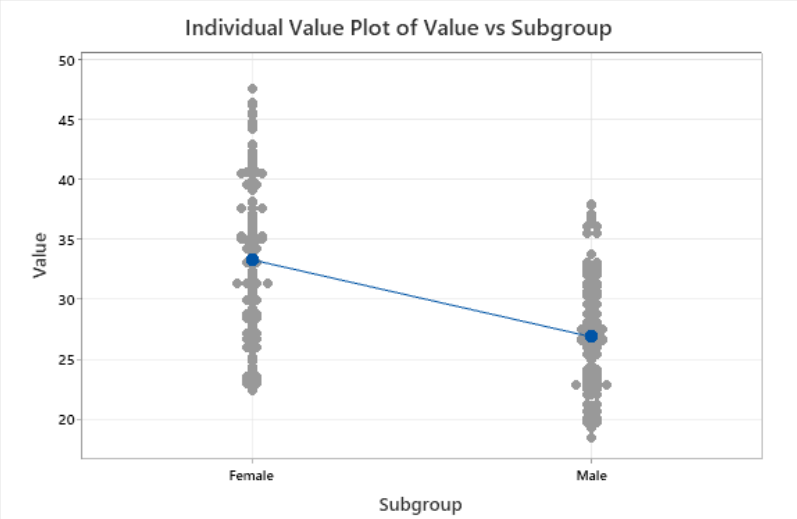

Figure 2

Test

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis	$H_1: \mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
9.25	243	0.000

Figures 1 & 2

In figure 1, the histogram of the female and male comparison, it shows that from the responses that the CDC received it shows that female responses occurred more. In figure 2 , the p-value is 0.000 meaning that the null hypothesis would be rejected.

ANOVA

Here the ANOVA- one way test was performed, it examined the value and subgroups column in the dataset. Instead of focusing on two factors it looks at multiple factors in this case seven different age groups were compared. The Tukey comparison was the comparison method used in the study. This time the subgroup was focused on age groupings and the value was the same as the one performed in the Two-Sample-T test.

Figure 3

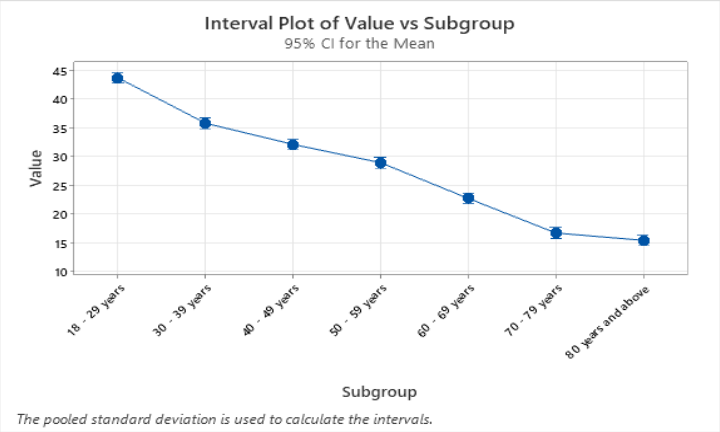

Figure 3

In figure 3, the interval plot shows an obvious downward trend among the age groups. It seems like the older respondents got the less likely they were to report a mental health issue.

Figure 4

Means

Subgroup	N	Mean	StDev	95% CI
18 - 29 years	132	43.683	6.196	(42.738, 44.629)
30 - 39 years	132	35.797	6.395	(34.852, 36.742)
40 - 49 years	132	32.118	6.110	(31.173, 33.064)
50 - 59 years	132	28.936	5.776	(27.990, 29.881)
60 - 69 years	132	22.732	5.171	(21.786, 23.677)
70 - 79 years	132	16.717	4.497	(15.772, 17.663)
80 years and above	132	15.442	4.180	(14.497, 16.388)

Pooled StDev = 5.53438

Figure 4

Figure 4 shows that the means are very widespread, and it is able to support the claim that the older people got the less likely they reported a mental health issue.

Figure 5

Grouping Information Using the Tukey Method and 95% Confidence

Subgroup	N	Mean	Grouping
18 - 29 years	132	43.683	A
30 - 39 years	132	35.797	B
40 - 49 years	132	32.118	C
50 - 59 years	132	28.936	D
60 - 69 years	132	22.732	E
70 - 79 years	132	16.717	F
80 years and above	132	15.442	F

Means that do not share a letter are significantly different.

Figure 5

Figure 5 shows the Tukey comparison among the different age groups. It shows that only the age groups of 70-79 and 80 years and above can be similarly grouped. The rest of the age groups are in their own grouping.

SECTION 5: CONCLUSION

Using the two-sample-t test I was able to test the hypothesis that all mental issues were equally reported among both genders . The null hypothesis had to be rejected because the p-value was 0.000 and that means there is no chance of having equally reported mental health issues among both genders. The ANOVA tested seven different age groups. In this case the null hypothesis also had to be rejected due to its p-value also being 0.000. Meaning there is valid evidence that the distribution of even reported mental health issues among age groups are not equal.

Works Cited

"Mental Health - Household Pulse Survey - COVID-19." *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, 20 Apr. 2022, https://www.cdc.gov/nchs/covid19/pulse/mental-health.htm. Accessed 26 April 2022