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<u>Happiness vs. COVID-19</u>

Over the past 3 years, COVID-19 has taken over our world, impacting every single

aspect of our lives. We have spent most of 2020 and beyond in isolation, and have seen the

world transformed into a virtual setting, where we can be educated via screen, socialize with

family and friends via screen, etc. However, despite these adaptations to battle a global

pandemic, there have been negative impacts towards human happiness as well. What may have

brought society fulfillment pre-pandemic, either can no longer be created safely, or has been

transformed into a virtual setting. Adapting to these strict lockdown regulations can send

individuals into almost a sense of culture shock as this is something they have never experienced

in their life. How has COVID-19 impacted society happiness, and is this forever? Looking

closely at two major case studies created to tackle these questions, light is shed as to how

lockdown has negatively impacted societies across the globe. COVID-19 has negatively

impacted society's level of happiness, and how happiness is measured/calculated will need to be

redefined based on post pandemic trends.

What is happiness? As defined by the Oxford Dictionary, happiness is "feeling or

showing pleasure or contentment". Happiness is a state, rather than a trait, meaning it is a

changeable, not permanent feeling. Happiness can also be felt internally, or expressed externally as well. Happiness can lower stress hormones, ease or negate anxiety and depression, and improve immune systems. Researchers have found that the majority of happiness depends on factors under a person's control. A person can control who they interact with, where they work, where they chose to travel, leisure activities they dedicate their free time to, and so on. However what happens when the world stops and there is no longer access to any of these opportunities? People are no longer able to travel anywhere and everywhere, no longer allowed to leave their homes, only can grocery shop at certain times, risk of losing a job as so many were transferred to virtual or were unable to move forward. Due to the rapid surge of COVID-19 in the early months of 2020, many governments implemented a lockdown regulation in hope to prevent further spreading. From country to country, the level of these lockdowns ranged, with some people being able to have more leeway in their lockdown compared to others, however this was also reflected in cases and surging from place to place. The Global Labor Organization conducted a pooled dataset to analyze the effect these mandatory lockdowns had on happiness, specifically looking at the countries of South Africa, New Zealand, and Australia. To analyze the damage to overall well being, GBO looked at population size, economic development, and well being levels among the population of these 3 countries. Each of these countries differs in how lockdown was handled, for example South Africa was the most strict, and each society functioned differently, so measuring happiness would show many different, ranging results. Prior to COVID-19, New Zealand held an average happiness level of 7.144 (Greyling et al. 2019) and the economic outlook was positive. The annual GDP growth rate in the year to December 2019 was 2.3 per cent, debt as a percentage of GDP was 25 per cent and the

unemployment rate was relatively low at 4.2 per cent (Statistics New Zealand 2020). Australia's

average happiness score was 7.09 (Greyling et al. 2019) with their annual GDP growth rate was

1.9 per cent, debt as a percentage of GDP was 41.73 per cent (Australia Bureau of Statistics

2020). Finally, South Africa held the lowest average of happiness of the three, coming in at 6.32

(Greyling et al. 2019). To conduct proper research and an analysis, the GNH, Gross National

Happiness Index, was used to investigate the relationships between happiness and the

government lockdowns. The main results found that lockdown held a negative correlation to

well being/happiness, more specifically that the stricter or more harsh the lockdown, the greater

the hit towards happiness levels. (Greyling). Being jobless, major lack of social interaction, and

lack of any kind of freedom are all factors that emerged from lockdown, and directly impacted a

person's happiness. People's minds and bodies were not created to be isolated and cut off from

the real world. But when factors such as a pandemic come in and there is no longer control,

naturally there will be negative impacts mentally, physically, emotionally, etc.
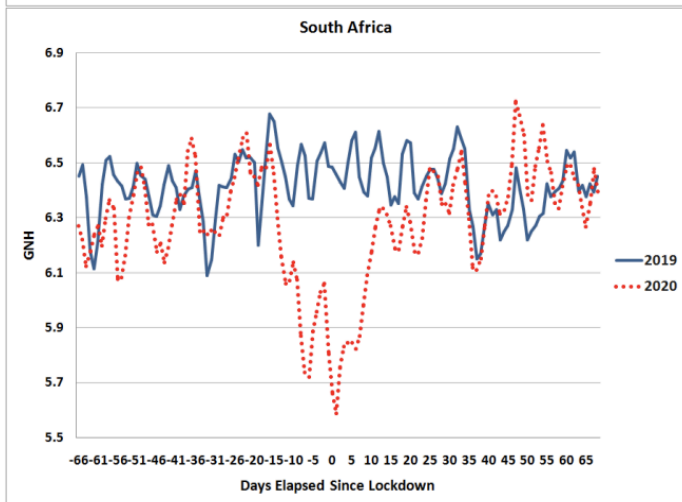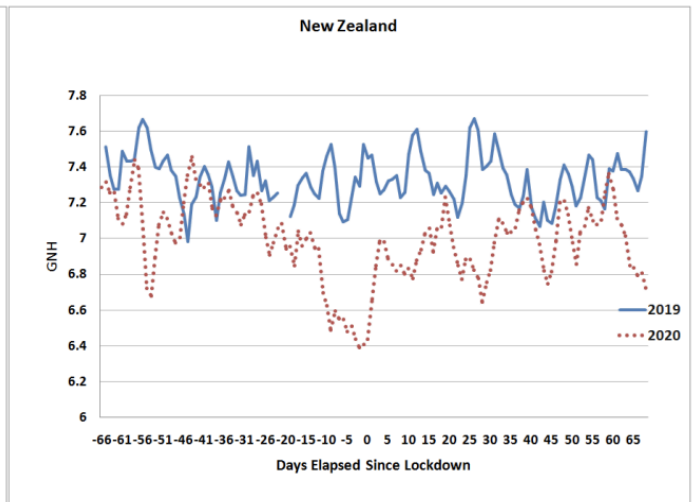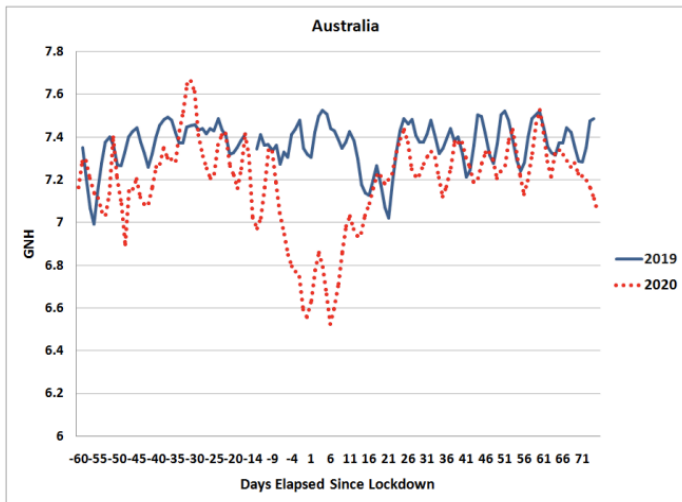

In calculating lockdown impact on happiness, the variable being compared, happiness,

was looked at before and after lockdown. The year 2019 was selected, with the same time period

corresponding to the 2020 time frame of the initial lockdown. By looking at these two years, it

is pretty clear the differences, as the year 2019 can be argued as a "normal" year, or the control,

whereas 2020 is the impacted year where everything changed. As seen in the figure below, the

statistical differences between the two years have drastic differences.

Variable	2019				2020			
	Mean	Standard deviation	Min	Max	Mean	Standard deviation	Min	Max
GNH	7.02	0.507	5.29	7.90	6.81	0.467	5.35	8.00
New Daily Deaths per million	0.00	0.000	0.00	0.00	1.38	0.158	0.00	13.35
Jobs Searches	69.46	14.49	39	99	54.5	18.806	20.00	99.00

By using this strategy, "results should thus be interpreted as the average impact of the lockdown on happiness (well-being), comparing pre- and post-lockdown in 2020 to the same time period in 2019, assumed to have normal levels of Gross National Happiness" (Greyling). To measure happiness, the Gross National Happiness Index was used by taking tweets from Twitter that were posted throughout New Zealand, Australia, and South Africa, for the specific dates being analyzed, and labeling them based on positive, negative, or neutral content. This classification is then applied to an algorithm where it will then receive a score. Ranging from 0 to 10, with 5 being neutral, 1 being negative, and 10 being positive, it was found that "the mean level of GNH for the period under consideration is 7.02 in 2019, considerably higher than the 6.81 in 2020" (Greyling). A "Difference-in-Difference estimation" was then used to analyze the causal effect of lockdown on happiness, which compares "the GNH for pre- and post-lockdown periods in 2020 to the same time periods in 2019, assumed to have normal happiness levels" (Greyling). Utilizing the following equation,

$$GNH_{i,t} = \alpha_0 + \alpha_1 lockdown_i * Year + \alpha_2 New\ Daily\ Deaths_{i,t-1} + \alpha_3 New\ Daily\ Deaths^2_{i,t-1} +$$
$$lockdown_{i,t} + \mu_i + \sigma_i + \epsilon_{i,t} \tag{1}$$

Using this equation, the Global Labor Organization was able to calculate GNH values for each

involved country. As seen in the Figure below, all three countries are shown, with GNH scores

on the vertical axis, and days before and after lockdown announcement on the horizontal.

Australia — GNH vs Days Elapsed Since Lockdown (2019, 2020)

New Zealand — GNH vs Days Elapsed Since Lockdown (2019, 2020)

South Africa — GNH vs Days Elapsed Since Lockdown (2019, 2020)

In all three graphs, we see a drastic difference in GNH comparing 2019 to 2020. The biggest decrease can be seen on the day that lockdown was announced, and compared to 2019 there is no large decrease across the board either. There is also a gradual decrease leading up to lockdown announcement date, which can be assumed to correlate to social distancing guidelines starting to be put into place. As social distancing guidelines were implemented, many people realized and assumed that more was coming. Being able to know this beforehand, could lead to mental preparation for the announcement. However, many held onto hope at this time,

specifically students, as they hoped they could return to school, their friends, and a fun lifestyle. However, finding out the news of isolation came as a reality check and made many people come to terms with the severity of the pandemic, as seen in the tanking graph lines in the figure above. However, something important to note is that after the lowest point in GNH, there begins a gradual climb in a positive, score increasing trend. Although it does not meet pre-pandemic, 2019 scoring, this increase can be associated to some of the more positive aspects of lockdown. Many families were forced to quarantine together, uniting families that may not have been all together for this larger amount of time in many years, if not ever. Many were able to work from home, saving on gas, travel expenses, and also were able to feel safer in the confinement of their own space, also noting an extreme decrease in crime. Isolation and lockdown was hard on everyone in different ways, but some individuals really thrived during this time as they were provided a new opportunity to see family, or use this time to work on themselves whether that be physically, emotionally, or mentally. Despite these positives, the GLO still wanted to determine if this decrease in GNH was directly correlated to lockdown or not. To do so, the "estimated coefficient of the interaction variable 'lockdown and year', i.e. the DiD estimator" was compared (Greyling). In doing so, findings discovered that lockdown caused an average decrease of "0.161 points" in GNH when compared to the average value of 2019. Even though each country had different levels of extremity when enforcing a lockdown, overall there was a decline of happiness by almost 6% across the three countries of Australia, New Zealand, and South Africa. The larger the population, the more strict the lockdown restrictions were, the more of a decrease in happiness there can be. Knowing this, it can be concluded that South Africa suffered the most out of these three countries, as it has the largest population of over 57 million people, and had the

strict regulations of the three. South Africa implemented one of the strictest lockdown regulations. In having a strict lockdown, based on results, South Africa is a country that suffered more than others in terms of happiness and well being, as there was little wiggle room if any for individuals to have any form of interaction, change of scenery, etc. South Africa had 5 levels of lockdown, 1 being the most lenient, 5 being the harshest. In March of 2020, level 5 was implemented, which meant people were only allowed to leave their home to purchase essential food/good items, no travel, work from home only, and the sale of alcohol banned, and no exercise allowed outside of the home (Greyling). With this level of restrictions, every aspect of society as it was known was cut off, almost sending South Africans into a sense of culture shock. Life they had known for years had been instantly turned upside down, seeming foreign, or unfamiliar, either way something that most people were not comfortable or willing to assimilate to. Adapting to the close confinements of one's home, only being able to exercise indoors, working from a screen, are all things no one was used to. Adapting to this, amidst fighting off and or protecting oneself and family from a pandemic, can add a lot of mental pressure and fatigue, evidently resulting in a decrease of happiness and well being. By analyzing and having these results, government and policymakers can use this information to learn from and adapt their lockdown or other protocols that may be necessary in the future. If happiness was at a strong low point this past lockdown, this information can be used to adapt new programming that will still follow distancing rules, but may also be able to provide more resources to hopefully increase happiness levels. Having these results also is helpful because as COVID-19 is still going on, tests, surveys, statistics etc can all be calculated and discovered compared to past pandemics where it may have taken years to see the impact of government decisions.

Another case study looked at the country of China and how lockdown has impacted levels of happiness there. This case study is interesting to look at, as it provides a unique perspective. The COVID-19 pandemic originated in China, and from there spread throughout all parts of the world. China followed lockdown protocol and unhappiness emerged from these regulations, however an additional level of pressure is added on to all this. Being located where COVID-19 was created, adds societal pressure from all over the world as many countries or governments may have expressed anger or frustration for what was going on. Knowing one's country is under heat, can add another level of unhappiness as well. Conducted using surveys across the nationwide Chinese population before as well as during the pandemic, it was found that there was an overall drop of 74% in regards to emotional well being (Haiyang). Compared to the Global Labor Organization's case study, this study conducted by the Data Intelligence and National Development Lab of Peking University, looks more at environmental, intellectual factors that may have an impact on happiness amidst a government lockdown. From the study's findings, those that either resided near the epicenter of the COVID-19 outbreak, were of older age, married, or a combination of any of these factors, experienced more of a tanking of emotional well being compared to those that are the opposites of these traits. Those that have less of a chance of contracting COVID-19 due to younger age, better health, or relational advantages (single), held a higher level of emotional well being throughout the pandemic. Often those with less of a worry held less worry because they were young, alone, or lived alone, meaning they only had to handle and take care of themselves, compared to a whole family or community. Another aspect that was analyzed throughout this study, looked at the amount of knowledge

individuals felt they had about how to handle, battle, and protect themselves from COVID-19.

Those that felt they had a large amount of knowledge or understanding about the COVID-19

pandemic, led to a stronger sense of control, which impacted emotional well being less

(Haiyang). However, those that may have known nothing, or had a natural tendency to worry and

assume the worst case scenario, showed higher levels of lessened well being. The first survey

was conducted before the pandemic began, in December of 2019. Those that were a part of this

survey were "$N = 11,131$; from 32 provincial regions; 48% women; average age of 37.78; 66%

married" (Haiyang). Conducted amidst the pandemic in the month of February 2020, the second

survey included "$N = 3,000$; from 30 provincial regions; 50% women; average age of 34.7; 69%

married" (Haiyang). The contents of both surveys included a measure of emotional well being by

answering questions of whether or not they smiled or laughed, and if they experienced levels of

enjoyment, happiness, anger, sadness, stress, worry, etc. Demographic questions were answered

as well (in terms of age, sex, marital status, region, income, etc). Since the second survey was

conducted amidst the pandemic, additional questions were asked to collect data pertaining to the

amount of knowledge understood about the pandemic itself. Questions ranged from how does

COVID-19 spread, how can the spread be prevented, how much control does one have in regards

to the outbreak, etc. To create an index of emotional well being, the average negative affect

measures were subtracted from the average of the positive affect measures, becoming the

dependent variable (Haiyang). Analysis found that there was a consistent, negative effect of the

outbreak on emotional well being. It was also revealed that locational factors impacted levels of

well being as well. Those living closer to the center of the outbreak, in Hubei, showed a larger

decline in emotional well being. Since more patients resided in this area as well, many

individuals felt they had a higher chance of contracting COVID-19, therefore feeling they had less control as well. Compared to GLO's case study, there was an argument that lockdown brought together families that otherwise were not usually together. However, from this study by the Data Intelligence and National Development Lab of Peking University, there was a larger decline of emotional well being among those that were married, as the close confinement led to many relational issues throughout the pandemic as well (Haiyang). Couples may not have been used to being together 24 hours a day, 7 days a week, and this level of togetherness often led couples to realize maybe they were not the best together, but being in lockdown, there was no other option to turn to. Even students, that may be studying internationally were either sent home in time to be with their loved ones, or were stuck in a foreign country on lockdown until airlines opened up, or an alternate route was created to return home. Being in isolation, away from your family, with no one around you to turn to, can add a lot of emotional damage especially at a young age. In the figure below, calculated statistics are shown that highlight the levels of well beings based on the list of environmental factors on the left hand side.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Mod 11
Outbreak	-.323*** (.012)	-.322*** (.012)	-.316*** (.012)	-.317*** (.012)	-.322*** (.012)	-.318*** (.012)	-.315*** (.012)	-.311*** (.012)	-.149*** (.044)	-.145*** (.044)	-.327*** (.017
Hubei		.023 (.023)	.024 (.023)	.024 (.023)	.023 (.023)	.026 (.023)	.054* (.025)	.057* (.025)		.026 (.023)	
Age			.002*** (.0004)	.002*** (.0004)	.001 (.0005)	.001 (.0005)		.001 (.0005)	.002*** (.0004)	.001** (.001)	
Sex				.008 (.01)	.006 (.01)	.006 (.01)		.006 (.01)		.005 (.01)	.005 (.011
Married					.052*** (.013)	.04*** (.013)		.039*** (.013)		.041*** (.013)	
Income						.002*** (.0003)		.002*** (.0003)		.002*** (.0003)	
Outbreak × Hubei							-.183*** (.06)	-.179*** (.06)			
Outbreak × Age									-.005*** (.001)	-.005*** (.001)	
Outbreak × Sex											.008 (.024
Outbreak × Married											
Outbreak × Income											
Constant	.437*** (.006)	.436*** (.006)	.365*** (.015)	.361*** (.016)	.372*** (.016)	.347*** (.017)	.434*** (.006)	.346*** (.017)	.346*** (.016)	.327*** (.018)	.434* (.008

Notes:

Through this case study's findings, it is evident that there is a direct correlation between lockdown and a decrease of happiness/emotional well being. Those that identify with the factors of location in relation to epicenter, age, relational issues, can all increase the chances of worsening emotional well being. Lockdown made it harder to be in control of these factors, such as leaving the home for work or to be away from your partner. This increased lack of control also led to worsening well being as well. Having this study be conducted in February of 2020, was a good time to analyze individuals' approach ot COVID-19 / pandemic knowledge. There is a lot of perceived knowledge, but not much actual knowledge on the subject, given how new it was for so many people. Not being educated on a topic, or not having answers to provide to loved ones can be a difficult feeling to navigate, which can be another factor of well being and lack of happiness.

Understanding the impact of COVID-19 lockdowns on happiness is important to know as a society, government, and individually. There have been other instances where governments have had to issue a state or country wide lockdown for safety. In understanding these findings, governments can work on improving a lockdown system for the future that allows for more opportunity to still maintain a strong mental and emotional well being. Happiness is important for society to function properly. Everyone needs to remain happy, and often policy makers look to the state of societal happiness for proper indication in policy making. Social interaction is one of the biggest predictors in well being, and happiness. The more time spent with people, the happier one may feel. The more time seeing and doing things one loves, the happier one may feel as well. Whether that be buying a car, shopping, spending time with family, these are all necessary aspects of life needed to maintain emotional well being. When making government decisions that will impact society, Happiness should be considered at the forefront of concern, as

without happiness, society and the world as we know it may not be able to function. COVID-19 has left so many impacts on society, but it can be argued that the impact on happiness and emotional well being is one of the greatest ones. Almost three years out from March of 2020, the emotional toll is still being discovered. People from all walks of life, any age, have all been impacted in some way. Society has had to alter where and how happiness is found, who impacts happiness, and new ways to keep this feeling longer, rather than feeling it only time to time. Happiness post pandemic looks drastically different from pre pandemic, and that may be a choice society lives with for the rest of time.

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