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Impact of different public policies against COVID-19 on mental health outcomes

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Abstract

After the COVID-19 outbreak and posterior rollout of the pandemic in early 2020, there was a surge in the cases of mental disorders worldwide. This process is estimated to represent 10% of the total burden caused by the pandemic, which is not negligible. This study investigates the impact of different public policies adopted by governments to contain the spread of the virus and minimize the adverse effects of the pandemic in the mental health of the population. For this purpose, two datasets were used. First, a longitudinal survey implemented by the consulting firm Oliver Wyman during 2020 and 2021 that targeted 10.000 individuals in ten countries about a variety of demographic and behavioral characteristics, including self-reported mental health levels. Second, a dataset organized by Oxford that recorded the existence and intensity of all public policies adopted worldwide during 2020 and 2021. After merging the two data sets, a logistical regression model was built in order to estimate the impact of each public policy on the mental health outcomes. The result is that stringency policies increase the likelihood that individuals experience mental health deterioration and economic support decreases it. No significant relationship could be founded about health policies. Also, woman, aged 18 to 34 years old, with children or aging people under care, from developing countries, were the most likely to suffer.

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1 Background

1.1 Introduction

After the COVID-19 outbreak and posterior rollout of the pandemic in early 2020, there was a surge in the cases of mental disorders worldwide. Santomauro et al. (2021) and Winkler et al. (2020) found that incidents of depression, anxiety, alcohol and drug abuse, and suicide risks all increased substantially the same epoch. Furthermore, according to Cutler and Summers (2020), the prevalence of depression or anxiety in the United States increased by 30% in 2020 compared to 2019, and they estimate that the excess cost of mental disorders represented approximately 10% of the total burden caused by the pandemic.

Several factors had a role in raising such an alarming situation. Firstly, as lockdowns and other restrictions of mobility stroke, people observed significant lifestyle disruptions. Secondly, as the economy plummeted, risks of unemployment and financial burden increased for families and establishments. Thirdly, the fear of contamination and death to oneself or their relatives caused grave distress. These forces combined severely weakened mental health pillars such as the feeling of freedom, financial security, social connection, etc., last instance leading to an increase in mental health disorders. These results hold for all demographic groups, but certain ones were even more affected, like health professionals and the unemployed (Tsamakis et al., 2021).

As mentioned before, the slump in the digits of global mental health after the strike of the pandemic can be traced back to the consequences of the virus itself as well as to the spillovers from public policies implemented to deal with the sharp increase in hospitalization and death rates from COVID-19. It seems reasonable that isolating the first from the second is an important matter for policy makers as a way of augmenting overall knowledge of instruments that work in case of a new pandemic based on more than gross product loss and mortality. For instance, Altindag et al. (2021) found that an age-specific curfew implemented in Turkey increased the level of mental distress in

the treatment group by 20.6% compared to control. Agrawal et al. (2021), otherwise, estimated that vaccine distribution decreased symptoms of anxiety and depression by 30%.

The aim of this paper is to enrich the debate about the impact of diverse types, intensity, and duration of public policies against the advancement of COVID-19 in the prevalence of mental disorders. The main dataset is a pooled cross-section survey of six waves applied to approximately ten thousand respondents in ten countries, including Brazil, which includes extensive questions about demographics, lifestyle, and mental health symptoms between 2020 and 2021. Based on available data about public policy across the world during the pandemic, an econometric model will seek to estimate the possible impact of different strategies to contain the virus in mental health outcomes collected in the main dataset. Generally, government response is categorized as stringency policies, economic policies, and health policies (HALE et al, 2021).

The paper is organized as follows. Section 1.2 exhibit the relevant literature reviewed to build the conceptual framework of this study. Section 1.3 presents the objectives and key hypothesis evaluated. Section 2.1 describes the two sources of data used to enable the analysis and the complete data preparation process. Section 2.2 describes the qualitative and quantitative framework to estimate the impact of different public policies against COVID-19 on mental health outcomes of the sample. Section 3.1 exhibits the regression results and robustness, as well as a discussion of whether the hypothesis matched expectations. Section 3.2 suggest limitations of this study that should be addressed by future research. Section 4 presents the conclusions.

1.2 Literature Review

Currently, about one billion people have some type of mental disorder in the world, around 40 million in Brazil alone, according to GBD Results (2022). Since 1990, this number has grown by approximately 48% worldwide, while in Brazil it has grown by 70%, according to the report by Our World in Data (Number of People with Mental Health Disorders, n.d.). According to Dattani et. al (2021), the most prevalent mental disorders in the world are anxiety (284 million), depression (264 million), alcohol and drug abuse (178 million), and bipolar disorder (46 million).

Mental disorders provoke substantial burdensome to affected individuals and society in general. First, such diseases onset in early adulthood, leading to many years lived with disability (YLD), a major impact in the most productive years of life compared to other kinds of illness, and a reduction in life expectancy. Second, the odds of comorbidity with other harmful conditions such as diabetes and cardiovascular problems are considerable (BONADIMAN et. al, 2017). Third, from

a perspective of economic cost, direct and indirect measures shall be considered. According to Muller et. al (2021), people with moderate to severe cases on average spend 30% to 50% more on medical expenses (all direct costs to prevent or treat the illness, as prescription drugs, hospital expenditures, physician appointments) and take 50% to 130% more days off due to incapacity to work, when compared to people with mild or no disorders. França et. al (2022) shared a staggering estimation that the total economic burden of mental disorders represented 6% of Brazil's GDP in a 12-month window, and that by 2030 the global cost of mental illness will exceed $6 trillion compared to $2.5 trillion in 2010 (FRANÇA et. al apud BLOOM et. al, 2011).

If the numbers were already alarming by 2019, the pandemic increased the incidence of mental disorders considerably. According to Cutler and Summers (2020), there was an increase of 30% in the prevalence of anxiety and depression in the United States, when comparing the third quarter of 2020 with the first quarter of 2019. Due to the fact that such diseases have high disutility, the authors estimate a 20% decrease in the expected value of a year-life of an impacted individual, leading to a loss of 1.6 trillion per year to the economy, roughly 10% of the total loss caused by COVID. It is evident that this result is transferable to the majority of countries, as captured by Kola et al. (2021), Passos et al. (2020) and more.

A central question that consequently arises is why COVID-19 pandemic led to an excess of mental health incidence worldwide. Breslau et al. (2021) built a longitudinal model to capture the impact of pre-existing conditions as well as pandemic conditions that together led to deterioration of mental health. In this study, four determinants are identified: pre-existing mental health conditions; employment changes due to the pandemic; childcare burdensome due to the pandemic; and health care support in the pandemic. Sevilla and Smith (2020 reinforce the childcare force, acknowledging that UK families with children under 12 have been doing the equivalent of a working week in childcare, with mothers bearing most of the burden. In addition, Serafini et al. (2020) discusses that the main forces diminishing psychological wellbeing are aspecific and uncontrolled fear from contamination, by which individuals fear being infected and infecting others; boredom and frustration, due to lifestyle inhibition; loneliness, as social activities are compromised; and pervasive anxiety, main due to uncertainty about the future, low sensory stimuli, etc.

There is robust evidence that different public policies adopted meaningfully impacted the mental health of the population in both directions. Altindag et al. (2022), for instance, studied in a regression discontinuity design the impact of an age-specific curfew implemented in Turkey

targeting people above age 65. They found a 0.2 standard deviation increase in somatic and non-somatic symptoms of anxiety and depression in the group at stay-at-home order compared to control. Contrastingly, Agrawal et al. (2021) found that vaccine distribution reduced anxiety and depression symptoms by approximately 30% in their study. There are three categories of public policies that can be evaluated: containment and closure policies, which led to stay-at-home orders; health support, with facial coverings, testing and vaccine programs; and economic support, with fiscal measures, debt relief and income support (HALE et al., 2021). The existence and intensity of each policy implemented by governments in the pandemic period led to different mental health outcomes, as well as due to demographic and country-specific factors.

From the perspective of demography, several studies have been conducted to understand how age, ethnicity, income, educational level, etc., play a role as mediating factors in the impact of public policies in mental health. Tsubaki's et al. (2021) discusses that elderly, children, health care workers and people with existing mental health disorders were considerably vulnerable. First, elderly people usually lack the ability to use technology, which compromised their health care support in periods of difficult mobility, and furthermore, the fear of fatal contamination as well as the burden of social isolation had a negative impact. Second, children's mental health development is extremely vulnerable to chronic stress conditions, and young adults are at elevated risk of onset of mental disorders. Third, health care workers faced an unpredictable situation, with high workload, resource scarcity, fear of contamination of themselves and loved ones, and stigma. Fourth, people with past mental disorders experiences were at higher risk of relapse. Additionally, Sevilla and Smith (2020) talk about the burden of childcare, discussing that there has been a sizable increase in the total amount of time spent in childcare in UK families, with mothers bearing most of the burden.

From the perspective of country differences, Alon et al. (2020) offers a framework to compare how policy responses should vary based on distinguishing features of rich and poor countries. According to them, there are five traits that should be considered. First, developing countries have younger populations, but COVID fatality rate increases sharply with aging, which suggests a lower share of potential vulnerable people in poor countries. Second, poor countries have lower taxation power, facing hardship increasing taxes and providing public goods. Third, health care capacity is lower in poor countries, with lack of sanitation and scarcity of intensive care units for severe COVID cases. Fourth, people in poor countries have 25% more person-to-person contact in daily activities than rich ones, the household size is on average 5.5 compared to 2.5 in

rich ones, and there is a pattern of intergenerational contact at higher rates than in the latter. Finally, informality is higher in poor countries, making it harder to collect taxes and enforce public policies.

Miguel and Mubarak (2021) also justify that epidemiological models were built based on rich country parameters, but not necessarily predict social benefits of different measures against COVID accurately for poor countries. They argue that low and middle-income countries (LMICs) failed to guarantee widespread vaccination coverage at a good timing, had poor safety nets making people worry about hunger when in stay-at-home orders, and had low baselines of mental health services to support the population. Overall, LMICs suffered more than rich ones when facing the same anti-COVID public policy paradigm.

1.3 Objectives and hypothesis

The aim of this study is to contribute to the debate about the impact of different strategies implemented by governments in selected countries to inhibit the spread of the virus in the mental health of its citizens. In order to be successful, the variation in mental health issues of the sample due to demographic factors, country-specific factors, and public policies implemented shall be estimated. Then, shall be discussed the mechanisms behind the impact of these public policies in mental health outcomes.

Achieving these objectives is crucial, as it might enrich the knowledge of the impact of different public policies in the mental health of the population, rather than only in mortality and aggregate GDP loss. Furthermore, the field of how poor countries should adjust their anti-COVID public policies accordingly with its distinguishing features in a world of rich-country paradigms lacks studies, and it is expected that this thesis contributes to enrich that. Finally, is expected to also understand deeper the impact of different government responses by demographic groups, to clarify existing vulnerabilities that must be considerable for more specific program designs.

A set of hypotheses will be evaluated:

Hypothesis 1*. Stringency public policies increased the incidence of mental health issues in the targeted population.*

Hypothesis 2*. Economic support public policies decreased the incidence of mental health issues in the targeted population.*

Hypothesis 3*. Health support public policies decreased the incidence of mental health issues in the population.*

Hypothesis 4*. Women, aged 18 to 35 years old or above 65, not married, low income, unemployed or unable to work, with children or elderly under care, were the groups that most suffered among the sample.*

Hypothesis 5. *Low and middle-income countries had worse mental health outcome variations compared to rich countries, even when controlled for all the other relevant demographic variables and same public policy structure.*

2 Data and Method

2.1 Data

For the purpose of this study, two datasets will be used. The first one is a pooled cross-section organized by the consulting firm Oliver Wyman between 2020 and 2021 called Customer Sentiment Survey. The survey targeted roughly 10.000 individuals in ten countries – Australia, Germany, Brazil, China, USA, Spain, Italy, France, Mexico, and UK – in 6 waves of interviews on a quarterly basis. By a non-disclosure agreement, two waves of the survey were made available for the purpose of this monograph. Although the study contains more than 200 questions, the main interest is a small subset of variables that capture mental health level, demographic traits, and a country identifier.

The variables in the survey are categorical and numerically coded. Because of that, all of them were transformed into dummy variables to enable an easy and accurate interpretation of the estimates. For the role of dependent variable that could potentially capture mental health level, were selected three questions that answered (a) whether the individual has or lives with someone with mental disorder and (ii) whether the individual seeked help for anxiety or depression in recent time. The controls selected define age, gender, civil status, household income, presence of children under care, presence of elderly or disable under care, employment status and country development level. The transformations are available in Table 1. Also, Appendix A shows the number of individuals and the share in the total for each variable and subgroup.

Table 1 - Oliver Wyman Customer Sentiment Survey - Selected questions and dummy transformations
Source: (WYMAN, 2022)

Question Code	Question	Possible Outcomes	Dummy Variable
D68Ar11	Which of the following conditions have you or do you currently live with? (Mental health disorder (e.g., anxiety, bipolar, depression, schizophrenia)	1 - Checked; 0 - Unchecked	Has or lives with mental disorder (if 1)
O6Q2	When was it that you last considered seeking support for anxiety or depression?	1 - In the past week; 2 - One to two weeks ago; 3 - Two weeks to a month ago; 4 - One to two months ago; 5 - Three to four months ago; 6 - More than four months ago.	Seeked Support (if 1, 2, 3 or 4)
C55r3	How has your monthly spend on mental and emotional wellness services changed? As best you can, please compare to your spend at the same time last year pre-COVID.	1 - Large reduction (reduced more than 50%); 2 - Slight reduction (Reduce by 10-50%); 3 - About the same (+/-10% change); 4 - Slight increase (increase by 10-50%); 5 - Large increase (increased by more than 50%) 6 - N/A -- I don't typically spend on this	Increased Spend (if 4 and 5)
A1	What is your age?	1 - Under 18; 2 - 18-24; 3 - 25-34; 4 - 35-44; 5 - 45-54; 6 - 55-64; 7 - 65-74; 8 - 75-84; 9 - 85 or older	Under 18; Between 18 and 34; Between 35 and 64; Over 64.
A2	What is your gender?	1 - Male; 2 - Female; 3 - Non-binary; 4 - Prefer not to say	Man
A3	Which of the following ranges is closest to your total yearly household income? Please think of your household income as your combined income from all sources of all members of your household	1 - Less than $25k; 2 - $25k-49.9k; 3 - $50k-$74.9k; 4 - $75k-$99.9k; 5 - $100k-149.9k; 6 - $150k-199.9k; 7 - $200k-349.9k; $350k-499.9k; 8 - $350k-499.9k; 9 - $500k-999.9k; 10 - $1M or more	Low Income (if 1 and 2) Middle Income (if 3, 4 or 5) Upper Income(if 6 or above)
D64r1	Does another individual rely on you for care? (Biological, adoptive or foster children)	1 - Checked; 0 - Unchecked	Children Under Care (if 1)
D64r2	Does another individual rely on you for care? (Aging or disabled parent)	1 - Checked; 0 - Unchecked	Aging Under Care (if 1)
D71	What is your curent employment status?	1 - Employed full time (40 hours or more per week); 2 - Employed part time (30-39 hour per week) 3 - Employed part time (20-29 hours per week) 4 - Employed part time (less than 20 hours per week) 5 - Unemployed and currently looking for work 6 - Unemployed and nort currently current for work 7 - Student; 8 - Retired; 9 - Homemaker; 10 - Self-employed; 11 - Unable to work	Employed full time (if 1) Employed part time (if 2, 3 or 4) Unemployed (if 5 and 6) Unable to work (if 11)
E91	What is your marital status	1 - Single; 2 - Married; 3 - Divorced; 4 - Widowed; 5 - Other	Married (if 2)
CountryName	What is your country?	1 - US; 2 - German; 3 - France; 4 - UK; 5 - Brazil; 6 - China; 7 - Australia; 8 - Spain; 9 - Mexico; 10 - Italy	One dummy for each country

The second one corresponds to a dataset that recorded the existence and intensity of all different public policies implemented by countries between 2020 and 2021 to tackle COVID spread and the consequences of the pandemic (HALE et al, 2021). The study systematically categorized all policies adopted by 180 countries, standardized a measure of intensity, and built a panel to monitor the evolution on a daily basis. There are basically three categories: stringency policies; economic support policies; and health support policies. Inside each category, there are policies in detail that compose the indexes. Pertinent to this monograph is to evaluate the subset corresponding to the ten countries that match countries available in Wyman (2022). The following tables display the public policies evaluated.

Table 2 - Public policies description
Source: (HALE et al, 2021)

Policy	Description
Containment and closure policies	
C1 - School Closing	Record closings of schools and universities
C2 - Workplace Closing	Record closings of workplaces
C3 - Cancel Public Events	Record cancelling public events
C4 - Restrictions on gatherings	Record limits on gatherings
C5 - Close Public Transportations	Record closing of public transport
C6- Stay at home Requirements	Record orders to "shelter-in-place" and otherwise confine to the home
C7 - Restrictions on Internal Movement	Record restrictions on internal movement between cities/regions
C8 - International Travel Controls	Record restrictions on international travel for foreign travellers
Economic Policies	
E1 - Income Support	Record if the government is providing direct cash payments to people who lose their jobs or cannot work.
E2 - Debt and Contract Relief	Record if the government is freezing financial obligations for households
Health Policies	
H1 - Public Information Campaign	Record presence of public info campaigns
H2 - Testing Policy	Record government policy on who has access to testing
H3 - Contact Tracing	Record government policy on contact tracing after a positive diagnosis
H6 - Facial Coverings	Record policies on the use of facial coverings outside the home
H7 - Vaccination Policy	Record policies for vaccine delivery for different groups

Each public policy j is ranked based on ordinal scales that range from minimal to maximum strength according to a qualitative analysis. Different policies have different maximum values N_j, so each sub-index must be computed separately as:

$$I_{j,t} = 100\frac{v_{j,t} - 0.5(F_j - f_{j,t})}{N_j}$$

Where $I_{j,t}$ is the sub-index for each public policy in day t, $v_{j,t}$ is the recorded policy on ordinal scale, and F_j and $f_{j,t}$ are indicators of geographical rather than global enforcement. After that, the indexes for Containment and Health Support, Stringency, Economic Support, and overall Government Support are computed based on a simple average of all the sub-indexes of the policies contained in the definition of the index. The following equation shows the index calculation and the table of the public policies contained in each index.

$$index = \frac{1}{k}\sum_{j=1}^{k} I_j$$

Table 3 - Public policies contained in each index
Source: (HALE et al, 2021)

Index name	k	C1	C2	C3	C4	C5	C6	C7	C8	E1	E2	H1	H2	H3	H6	H7	H8
Government response index	16	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Containment and health index	14	x	x	x	x	x	x	x	x			x	x	x	x	x	x
Stringency index	9	x	x	x	x	x	x	x	x			x					
Economic support index	2									x	x						

Two transformations were performed in the Oxford Policy Tracker dataset in order to advance with the study. First, a dummy representing high strength for each policy j was created as based on a qualitative assessment of the stringency of j in t:

$$'Policy\ high'_j = 1\ if\ N_{j,t} > k;\ 0\ otherwise.$$

The table explaining the rationale of all the transformations is available in Appendix C. Second, as the Customer Sentiment Survey is quarterly collected, the same aggregation was also conducted in the database in question by a quarterly simple average of the indexes.

Finally, the two datasets were merged in a way that each individual *i* was appended with the occurrence of each public policy by a key of country and quarter. The result is a dataset where each individual i with its demographic traits is appended with dummy variables expressing whether each anti-COVID public policy j were occurring at quarter q with high or low intensity in the country. This makes it possible to estimate the model described in the next session easier.

2.2 Empirical strategy

Based on the interpretation of the existing literature about the predictive factors of mental health outcomes in the context of COVID-19 pandemic, a qualitative model was built with the purpose of expressing the channels between fixed factors and public policies generating specific pandemic stressors that led to mental health disorders. Fixed factors can be subset into country structure, which describe all the aspects that differentiate the countries in the sample in such a way that is relevant to the overall pandemic government response, as fiscal capacity, health system capacity and income per capita; and demographic factors, which characterize individuals based on age, gender, employment status, civil status, and history of mental health disorders. Public policies coverage all the strategies adopted by governments worldwide to tackle the pandemic and its consequences, from lockdown and other containment measures to slow the spread of the virus and prevent deaths, health support such as with facial masks stimuli and vaccination coverage, and economic support strategies such as with debt relief and income grants. Those two forces together induced the rise of specific stressors such as employment and income loss, lifestyle disruption, increase in social isolation, increase in fear of contamination and death and excess of caring work.

Consequently, individuals proceeded on two outcomes: mental health deterioration (i) or adaptability and mental health maintenance (ii).

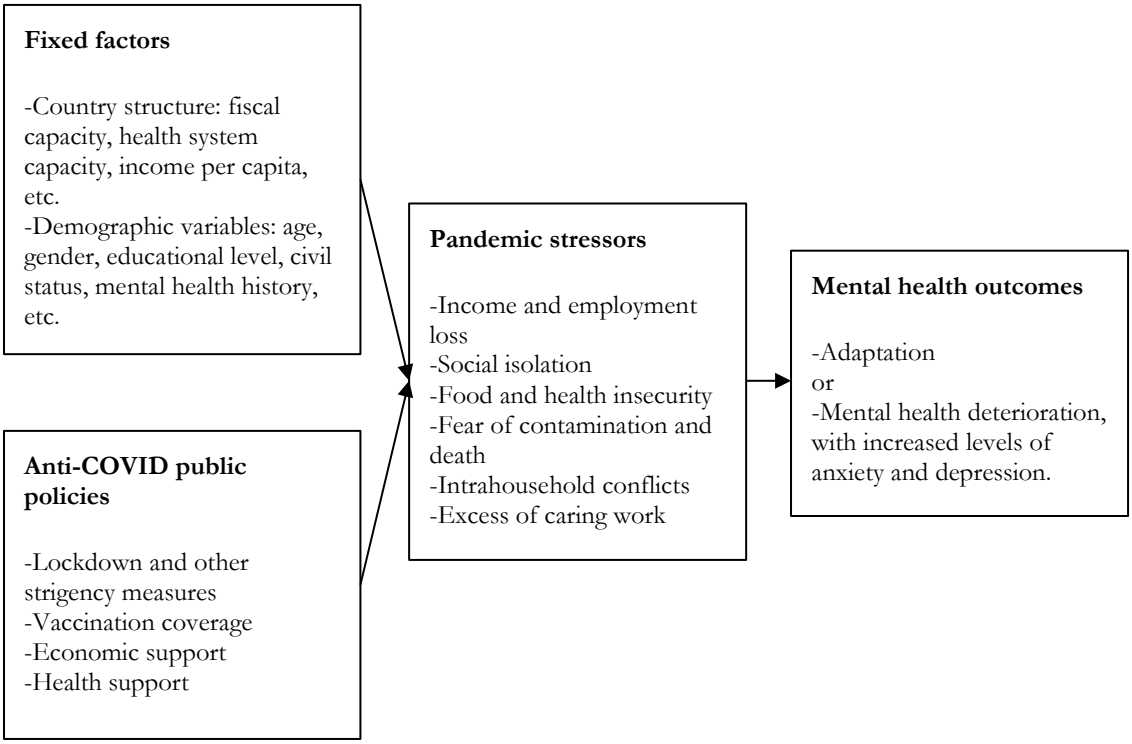

Figure 1 - Qualitative model of anti-COVID public policy impact on mental health outcomes

As mental health outcomes are binary, with each individual *i* reporting $Y_i = 1$ if suffering with mental health issues and $Y_i = 0$ if not, a logistic regression model must be used, which is given by:

$$p_i = e^{\beta 0 + \beta X + u} / (1 + e^{\beta 0 + \beta X + u})$$

Where p_i is the probability of reporting a mental health issue with $p_i = P(Y = 1)$, and q_i is the probability of not reporting a mental health issue with $q_i = P(Y = 0) = 1 - p_i, 0 \leq p_i \leq 1$. The figure below shows the behavior of the logistic curve (FERNANDO et al, 2020).

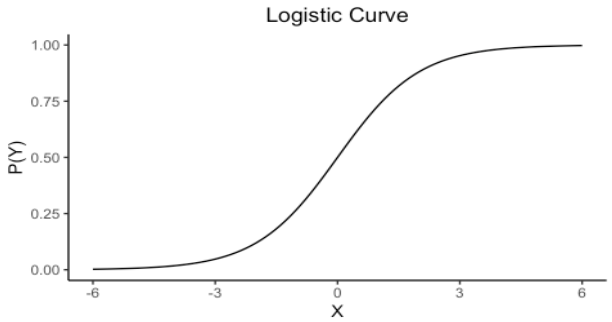

Figure 2 - Logistic regression curve

Also, β_0 and β are the parameters of the model, X is a set of independent variables, and u is the error term. It is possible to transform the function above to linearize the model in respect to its parameters:

$$p_i = e^{\beta_0 + \beta X + u}/(1 + e^{\beta_0 + \beta X + u}) \Rightarrow$$
$$p_i = 1/(1 + e^{-(\beta_0 + \beta X + u)}) \Rightarrow$$
$$1 - p_i = 1/(1 + e^{\beta_0 + \beta X + u}) \Rightarrow$$
$$ln[p_i/(1 - p_i)] = ln(e^{\beta_0 + \beta X + u}) = \beta_0 + \beta X + u$$

Where $p_i/(1 - p_i)$ is the odds ratio, or the probability of the event occurring over the probability of not occurring. Finally, a maximum likelihood estimation is performed to find the parameters, as shown by the following equation:

$$\ell(\beta_0, \beta_1) = \prod_{i:y_i=1} p(x_i) \prod_{i':y'_i=0} (1 - p(x'_i))$$

Specifically in this study, the equation that must be estimated is:

$$ln(p_i/(p_i - 1)) = \beta_0 + \beta_1 * T + \beta * C + u$$

Where T is the dummy variable that captures the enforcement of a certain anti-COVID public policy in a quarter in the country that the individual *i* resides, and $\beta * C$ captures the the effect β_j of each control C_j in the dependent outcomes.

Four assumptions must be satisfied to ensure a good model behavior (PEREDA, 2018):

I. **The dependent variable must be binary**. Each variable selected to capture mental health level was transformed into dummy variables, so this condition is ensured.

II. **Each observation should be independent of each other**. This assumption is automatically met since the dataset consists of individual records in each wave leading to a pooled cross-section dataset.

III. **The log-odds of the dependent variables must be linear in relation to each continuous independent variable.** A Box-Tidwell test was performed to evaluate all relevant continuous predictors: Stringency Index, Containment and Health Index, and Economic Support Index. The result is that the Stringency Index achieved a p-value < 0.001, Containment and Health Index achieved a p-value > 0.5, and Economic Support Index achieved a p-value < 0.001. It denotes that Stringency and Economic Support Indexes have a nonlinear relationship with the dependent variable, so specification should exponentiate these terms.

IV. **There should be no severe multicollinearity between independent variables**. A correlogram plot between all independent variables were displayed, and all pairwise

variables with higher than 0.8 correlation were filtered so only one of them proceeded for the models. The variables removed by theses process are: "C3 - Cancel public events" and "C4 - Restrictions on gatherings". Economic Support Index and Containment and Health Index, although showing correlations higher than 0.8 with other predictors, were maintained since they are aggregations of predictors, and will be properly processed through specification of the model.

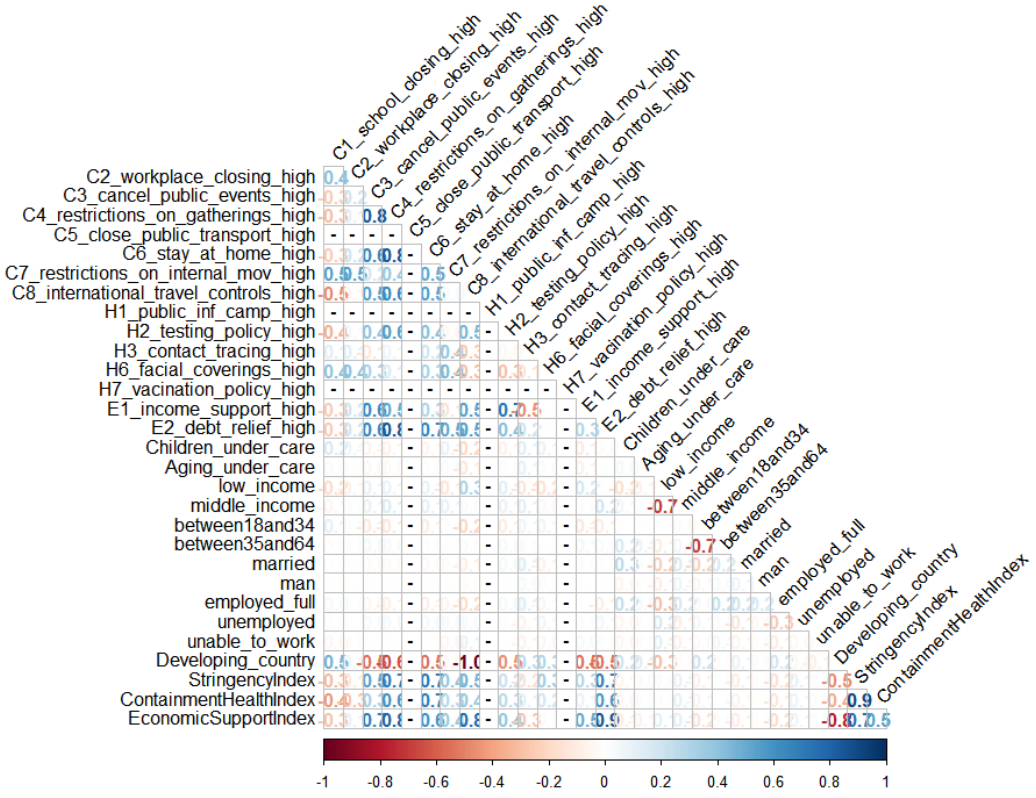

Figure 3 - Correlogram of selected independent variables
Source: (WYMAN, 2022)

3 Results and discussion

3.1 Regression results

Table 4 shows the results of a logistic regression model where the dependent variable is a dummy of whether the individual seeked support for anxiety and depression, by each category of public policies and selected controls. Model 1 estimates the impact of Stringency measures, Model 2 estimates the impact of Stringency and Health measures, Model 3 estimates the impact of Economic Support measures, and Model 4 estimates the impact of all of them together. In model 4, Containment and Health Index was replaced by the sub-indexes that consist of Health policies, as Stringency Index is already contained in macro index so correlation would be harmful high.

Model 1 exhibits that the Stringency Index has no significant effect on the dependent variable as p-value > 0.05. Model 2 exhibits that the Containment (or Stringency) and Health Index has a small but significant effect on the dependent variable (OR = 1.01, 95% CI [1.00, 1.01], p-value = 0.021). Model 3 exhibits that the Economic Support Index has no effect on the dependent variable (OR = 1.00, 95% CI [1.00, 1.00], p-value = 0.11). Model 4 exhibits that the Stringency Index has a negative significant effect on the dependent variable (OR = 0.98, 95% CI [0.97, 0.99]), which is counterintuitive in the first moment. Economic Support Index has a positive significant effect on the dependent variable (OR = 1.02, 95% CI [1.02, 1.03]), which is also counterintuitive. Health measures H2 and H6 had positive significant effects, while H1, H3 and H7 had no significant effect.

Controls had interesting results. The existence of children under family care increases by 41% the likelihood of seeking support for mental health (model 4, OR = 1.41, 95% CI [1.29, 1.54], p-value < 0.05). The existence of aging people under family care had an even higher impact, increasing by 83% the likelihood of seeking support for mental health (model 4, OR = 1.83, 95% CI [1.63, 2.04], p-value < 0.05). Income dummies had a less clear effect on the dependent variable, as the confidence interval is around 1.00 for both variables, but generally increased the likelihood of seeking support by 5%, although insignificant. People between 18 and 34 years old were 198%

more likely to seek support (model 4, OR = 2.98, 95% CI [2.61, 3.4]) than individuals not in this age group, while people between 35 and 64 were only 53% more likely (model 4, OR = 1.53, 95% CI [1.35, 1.73]), both predictors significant. Married individuals do not present a clear effect direction and the result is insignificant. Man is 23% less likely to have seeked support for mental health than woman (model 4, OR = 0.73, 95% CI [0.68, 0.79]), with significance. People unable to work were the most likely to seek support for mental health (model 4, OR = 2.76, 95% CI [2.02, 3.80]) from employment outcomes studied, and being unemployed had no significant effect. Finally, being a citizen of a developing country increases the likelihood of seeking mental health support by 288% compared to developed countries (model 4, OR = 3.88, 95% CI [3.24, 4.66]).

Table 4 - Impact of aggregate public policy categories on seeking support for anxiety and depression. Source: (WYMAN, 2022; HALE et al, 2021)

	Model 1			Model 2			Model 3			Model 4		
Characteristic	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**
StringencyIndex	1.00	1.00, 1.00	>0.9							0.98	0.97, 0.99	<0.001
Children_under_care	1.39	1.28, 1.52	<0.001	1.39	1.27, 1.51	<0.001	1.38	1.27, 1.51	<0.001	1.41	1.29, 1.54	<0.001
Aging_under_care	1.92	1.72, 2.14	<0.001	1.90	1.70, 2.12	<0.001	1.91	1.71, 2.14	<0.001	1.83	1.63, 2.04	<0.001
low_income	1.18	1.04, 1.33	0.011	1.19	1.05, 1.35	0.006	1.20	1.06, 1.36	0.005	1.05	0.92, 1.20	0.4
middle_income	1.20	1.08, 1.34	0.001	1.20	1.07, 1.34	0.001	1.20	1.08, 1.34	<0.001	1.05	0.94, 1.18	0.4
between18and34	2.94	2.58, 3.36	<0.001	2.94	2.58, 3.36	<0.001	2.94	2.57, 3.35	<0.001	2.98	2.61, 3.40	<0.001
between35and64	1.50	1.32, 1.69	<0.001	1.49	1.32, 1.69	<0.001	1.49	1.32, 1.68	<0.001	1.53	1.35, 1.73	<0.001
married	1.02	0.94, 1.11	0.6	1.03	0.94, 1.12	0.5	1.03	0.94, 1.12	0.5	0.96	0.88, 1.05	0.4
man	0.74	0.68, 0.80	<0.001	0.74	0.68, 0.80	<0.001	0.74	0.68, 0.80	<0.001	0.73	0.68, 0.79	<0.001
employed_full	1.11	1.01, 1.21	0.026	1.12	1.02, 1.22	0.014	1.12	1.02, 1.22	0.015	1.05	0.95, 1.15	0.3
unemployed	1.04	0.90, 1.20	0.6	1.03	0.89, 1.19	0.7	1.03	0.89, 1.19	0.7	1.04	0.90, 1.20	0.6
unable_to_work	2.70	1.98, 3.71	<0.001	2.76	2.02, 3.80	<0.001	2.74	2.01, 3.77	<0.001	2.76	2.02, 3.80	<0.001
Developing_country	1.99	1.80, 2.19	<0.001	2.07	1.89, 2.27	<0.001	2.16	1.90, 2.47	<0.001	3.88	3.24, 4.66	<0.001
ContainmentHealthIndex				1.01	1.00, 1.01	0.021						
EconomicSupportIndex							1.00	1.00, 1.00	0.11	1.02	1.02, 1.03	<0.001
H1_Public information campaigns												
H2_Testing policy										1.50	1.34, 1.67	<0.001
H3_Contact tracing										1.08	0.94, 1.24	0.3
H6_Facial Coverings										0.93	0.84, 1.02	0.11
H7_Vaccination policy										1.00	0.96, 1.04	>0.9

[1] OR = Odds Ratio, CI = Confidence Interval

When compared the results of the above regression model with the hypothesis described in section 1.3, public policies behaved in a divergent way. The direction of the effect was the opposite from the prediction for all categories. That could indicate that heavier stringent responses,

although more harmful to mental health, could inhibit individuals from seeking support, while heavier economic and health support led to the opposite behavior. Women, aged 18 to 35 years old, unable to work, with children and aging people under care, citizens of a developing country, were indeed the most likely to seek mental health support for anxiety and depression, consistent with the hypothesis of the most negatively impacted groups. Aged above 65, not married, unemployed, brought weak results, in contrast.

Table 5 - Impact of aggregate public policy categories on having or living with someone who has a mental disorder. Source: (WYMAN, 2022; HALE et al, 2021)

	Model 1			Model 2			Model 3			Model 4		
Characteristic	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**
StringencyIndex	0.96	0.95, 0.98	<0.001							1.04	1.00, 1.08	0.058
Children_under_care	1.27	0.99, 1.64	0.063	1.24	0.96, 1.60	0.092	1.25	0.97, 1.60	0.088	1.28	0.99, 1.65	0.063
Aging_under_care	1.36	1.00, 1.82	0.043	1.41	1.04, 1.90	0.023	1.31	0.97, 1.76	0.070	1.40	1.03, 1.88	0.031
low_income	1.27	0.86, 1.90	0.2	1.38	0.93, 2.04	0.11	1.30	0.88, 1.93	0.2	1.25	0.83, 1.88	0.3
middle_income	1.14	0.80, 1.64	0.5	1.18	0.83, 1.70	0.4	1.15	0.81, 1.66	0.4	1.14	0.79, 1.65	0.5
between18and34	3.54	2.46, 5.11	<0.001	3.47	2.42, 5.01	<0.001	3.50	2.44, 5.06	<0.001	3.70	2.56, 5.36	<0.001
between35and64	2.25	1.65, 3.09	<0.001	2.22	1.63, 3.06	<0.001	2.27	1.67, 3.11	<0.001	2.31	1.69, 3.18	<0.001
married	0.62	0.49, 0.77	<0.001	0.64	0.51, 0.80	<0.001	0.62	0.49, 0.78	<0.001	0.62	0.49, 0.78	<0.001
man	0.70	0.56, 0.87	0.001	0.70	0.56, 0.87	0.001	0.70	0.56, 0.87	0.001	0.70	0.56, 0.87	0.002
employed_full	0.71	0.54, 0.94	0.017	0.73	0.56, 0.96	0.026	0.73	0.55, 0.96	0.024	0.72	0.54, 0.96	0.027
unemployed	1.20	0.83, 1.73	0.3	1.18	0.81, 1.69	0.4	1.18	0.81, 1.70	0.4	1.19	0.81, 1.72	0.4
unable_to_work	2.73	1.77, 4.19	<0.001	2.79	1.81, 4.28	<0.001	2.82	1.83, 4.33	<0.001	2.67	1.72, 4.14	<0.001
Developing_country	0.56	0.42, 0.75	<0.001	0.64	0.48, 0.85	0.002	0.46	0.32, 0.67	<0.001	0.84	0.49, 1.45	0.5
ContainmentHealthIndex				0.96	0.95, 0.98	<0.001						
EconomicSupportIndex							0.98	0.98, 0.99	<0.001	0.99	0.98, 1.01	0.4
H1_Public information campaigns												
H2_Testing policy										0.64	0.46, 0.88	0.006
H3_Contact tracing										0.75	0.48, 1.14	0.2
H6_Facial Coverings										0.49	0.37, 0.65	<0.001
H7_Vaccination policy										1.15	1.02, 1.30	0.020

[1] OR = Odds Ratio, CI = Confidence Interval

Table 5 shows the results of a logistic regression model where the dependent variable is a dummy of whether the individual has or live with someone who has a mental disorder, else equal compared to Table 4. Model 1 exhibits that the Stringency Index has a negative significant effect on the dependent variable as p-value < 0.05. Model 2 exhibits that the Containment (or Stringency) and Health Index has a negative significant effect as well. Model 3 shows the same results for Economic Support. Model 4 exhibits that the Stringency Index has a positive but insignificant effect on the dependent variable (OR = 1.04, 95% CI [1.00, 1.08], p-value > 0.05). Economic

Support Index has a negative and insignificant effect on the dependent variable (OR = 0.99, 95% CI [0.98, 1.01]). Health measures H2 and H6 had negative significant effects, while H1and H3 insignificant effects and H7 had a positive significant effect.

Some of the controls results changed compared with Table 4. The existence of children under family care increases by 28% the likelihood of expressing the outcome, but not significantly anymore (model 4, OR = 1.28, 95% CI [0.99, 1.65], p-value > 0.05). The existence of aging people under family care kept a positive but smaller impact on the outcome, increasing the likelihood by 40% (model 4, OR = 1.40, 95% CI [1.03, 1.88], p-value < 0.05). Income variables became non-significant and with lower impact on the outcome. Married individuals became a significant predictor, decreasing the likelihood of expressing the outcome by 38% (model 4, OR = 0.62, 95% CI [0.49, 0.78], p-value < 0.05). Being a man kept an approximately the same effect on this outcome compared to outcome of Table 4 (model 4, OR = 0.70, 95% CI [0.56, 0.87], p-value < 0.05). People unable to work showed once again a significant relationship with the outcome (model 4, OR = 2.67, 95% CI [1.72, 4.14], p-value < 0.05), and compared to employed full-time individuals, are 370% more likely to have or live with someone who has a mental disorder. Finally, being a citizen of a developing country now had a negative but insignificant effect on the outcome.

When compared the results of the above regression model with the hypothesis described in section 1.3, Stringency Index did contribute to a deterioration on the mental health outcome evaluated, but not significantly; Economic Support Index did not contribute to worse mental health, but again not significantly; and Health policies had mixed results. Moreover, women, with aging people under care, unable to work, remained strong predictors of expressing mental health disorders. Age and being citizen of a developing country did not deliver significant results, although the direction of the effect of the former continued the same as in Table 4. Married and employed people showed strong negative correlation with expressing mental health disorders, which is consistent with the literature.

Looking for the impact of each public policy in greater detail, Table 6 analyses the impact of income support and debt relief on the mental health outcomes of interest, controlled for demographic factors and the other Indexes that represent the effects of simultaneous policies at play. High income support is associated with a smaller likelihood of seeking support for anxiety and depression (not significant) and smaller likelihood of having or living with someone who has a mental disorder (significant). High debt relief is associated with greater likelihood of seeking support for anxiety and depression (significant) and smaller likelihood of having or living with mental disorders (not significant). Controls showed the same behavior as on previous models.

Table 6 - Impact of economic policies on seeking support for anxiety and depression (i) and on having or living with someone who has a mental disorder (ii). Source: (WYMAN, 2022; HALE et al, 2021)

	Seeked support for anxiety and depression			Has or live with mental disorder		
Characteristic	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**
E1_income_support_high	0.94	0.85, 1.04	0.2	0.60	0.45, 0.78	<0.001
E2_debt_relief_high	1.44	1.28, 1.62	<0.001	0.74	0.52, 1.04	0.080
ContainmentHealthIndex	1.00	0.99, 1.00	0.4	0.97	0.96, 0.99	0.001
Children_under_care	1.36	1.24, 1.48	<0.001	1.26	0.97, 1.62	0.080
Aging_under_care	1.87	1.67, 2.09	<0.001	1.41	1.04, 1.89	0.025
low_income	1.22	1.08, 1.39	0.001	1.35	0.92, 2.02	0.13
middle_income	1.17	1.05, 1.30	0.006	1.22	0.86, 1.76	0.3
between18and34	2.92	2.56, 3.34	<0.001	3.58	2.48, 5.17	<0.001
between35and64	1.49	1.32, 1.69	<0.001	2.26	1.66, 3.11	<0.001
married	1.02	0.94, 1.11	0.6	0.64	0.51, 0.80	<0.001
man	0.73	0.68, 0.79	<0.001	0.70	0.56, 0.87	0.002
employed_full	1.13	1.03, 1.24	0.007	0.76	0.58, 1.01	0.056
unemployed	1.02	0.88, 1.18	0.8	1.20	0.82, 1.72	0.3
unable_to_work	2.90	2.12, 3.98	<0.001	2.82	1.82, 4.36	<0.001
Developing_country	2.33	2.07, 2.62	<0.001	0.46	0.34, 0.63	<0.001

[1] OR = Odds Ratio, CI = Confidence Interval

Table 7 analyses the impact of each health public policy on the mental health outcomes of interest. High public information campaigns and high vaccination coverage did not displayed results due to the fact that as the data from individuals is from close periods of time, and in the case of vaccines most countries had not yet began to widely distribute it to citizens, there is insufficient data to estimate its effects. In contrast, high testing policy and contact tracing is associated with a higher likelihood of seeking mental health support and lower likelihood of having or living with someone who has mental disorder. This results it is interesting, as it might indicate that the former outcome has a more positive context than the latter or, in other words, countries with stronger policies in these areas could lower mental health distress and increase the search for support, decreasing overall burden. Facial covering policies, differently, is associated with negative contributions to both outcomes, but the interpretation is harder.

Table 7 - Impact of health policies on seeking support for anxiety and depression (i) and on having or living with someone who has a mental disorder (ii). Source: (WYMAN, 2022; HALE et al, 2021)

	Seeked support for anxiety and depression			Has or live with mental disorder		
Characteristic	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**
H1_public_inf_camp_high						
H2_testing_policy_high	1.18	1.08, 1.29	<0.001	0.63	0.49, 0.82	<0.001
H3_contact_tracing_high	1.22	1.12, 1.33	<0.001	0.68	0.51, 0.88	0.005
H6_facial_coverings_high	0.80	0.72, 0.88	<0.001	0.65	0.47, 0.89	0.008
H7_vacination_policy_high						
StringencyIndex	1.00	1.00, 1.01	0.6	0.98	0.96, 1.00	0.084
EconomicSupportIndex	1.01	1.00, 1.01	0.007	1.00	0.99, 1.01	>0.9
Children_under_care	1.39	1.27, 1.51	<0.001	1.28	0.99, 1.65	0.060
Aging_under_care	1.84	1.64, 2.05	<0.001	1.45	1.07, 1.96	0.016
low_income	1.11	0.98, 1.26	0.10	1.34	0.90, 2.01	0.2
middle_income	1.10	0.99, 1.23	0.090	1.23	0.86, 1.78	0.3
between18and34	2.95	2.59, 3.38	<0.001	3.64	2.52, 5.27	<0.001
between35and64	1.52	1.35, 1.72	<0.001	2.26	1.66, 3.12	<0.001
married	0.98	0.90, 1.06	0.6	0.64	0.51, 0.81	<0.001
man	0.73	0.68, 0.79	<0.001	0.69	0.56, 0.87	0.001
employed_full	1.07	0.97, 1.17	0.2	0.74	0.56, 0.98	0.037
unemployed	1.04	0.90, 1.20	0.6	1.20	0.82, 1.73	0.3
unable_to_work	2.84	2.08, 3.90	<0.001	2.69	1.73, 4.17	<0.001
Developing_country	2.67	2.30, 3.10	<0.001	0.73	0.47, 1.13	0.2

[1] OR = Odds Ratio, CI = Confidence Interval

Table 8 analyses the impact of stringency policies on the same outcomes. High school closing is associated with less likelihood of expressing the outcomes, although significant only for the first one. This result is counterintuitive, as more children out of school lead to more caring work. A possible explanation is that after controlling for the existence of children under care, this policy does not contribute for the outcomes as expected. A stringent workplace closing program is associated with 89% more likelihood of having or living with someone with mental disorder, significantly, even after controlling for employment status and income. Other policies such as closed public transport, stay-at-home orders, restrictions on internal moving and international travel controls did not result in significant effects.

Table 8 - Impact of stringency policies on seeking support for anxiety and depression (i) and on having or living with someone who has a mental disorder (ii). Source: (WYMAN, 2022; HALE et al, 2021)

	Seeked support for anxiety and depression			Has or live with mental disorder		
Characteristic	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**
C1_school_closing_high	0.51	0.38, 0.68	<0.001	0.54	0.22, 1.31	0.2
C2_workplace_closing_high	1.16	1.00, 1.35	0.053	1.89	1.17, 3.07	0.009
C5_close_public_transport_high						
C6_stay_at_home_high	0.85	0.62, 1.16	0.3	1.04	0.41, 2.67	>0.9
C7_restrictions_on_internal_mov_high	1.20	0.90, 1.62	0.2	0.86	0.36, 2.07	0.7
C8_international_travel_controls_high	0.36	0.29, 0.45	<0.001	1.14	0.58, 2.25	0.7
EconomicSupportIndex	1.00	1.00, 1.01	0.081	1.00	0.98, 1.01	0.5
H2_testing_policy_high	1.15	1.02, 1.31	0.026	0.54	0.38, 0.75	<0.001
H3_contact_tracing_high	1.22	1.04, 1.42	0.013	0.68	0.41, 1.11	0.13
H6_facial_coverings_high	0.88	0.72, 1.08	0.2	0.52	0.27, 0.97	0.041
Children_under_care	1.41	1.29, 1.54	<0.001	1.29	1.00, 1.67	0.049
Aging_under_care	1.82	1.63, 2.04	<0.001	1.44	1.05, 1.94	0.020
low_income	1.08	0.95, 1.23	0.2	1.31	0.88, 1.97	0.2
middle_income	1.07	0.95, 1.19	0.3	1.21	0.84, 1.75	0.3
between18and34	2.98	2.61, 3.40	<0.001	3.64	2.52, 5.27	<0.001
between35and64	1.52	1.35, 1.72	<0.001	2.30	1.69, 3.17	<0.001
married	0.97	0.89, 1.06	0.5	0.62	0.49, 0.79	<0.001
man	0.73	0.68, 0.79	<0.001	0.69	0.55, 0.87	0.001
employed_full	1.06	0.96, 1.16	0.2	0.72	0.54, 0.95	0.021
unemployed	1.03	0.89, 1.19	0.7	1.19	0.81, 1.72	0.4
unable_to_work	2.82	2.06, 3.88	<0.001	2.67	1.72, 4.12	<0.001
Developing_country						

[1] OR = Odds Ratio, CI = Confidence Interval

4 Conclusion

This study aimed to estimate the impact of different public policies against COVID-19 on the mental health of the population. Based on a dataset that categorized and recorded public policies by Hale et al (2021) and a survey applied to individuals by Wyman (2022), it was possible to estimate the impact of distinct strategies in the population, controlled for demographic and country-specific factors.

The results suggests that stringency policies increase the likelihood of having or living with someone who has a mental disorder, while economic support decreases it. The opposite effect is found when looking at individuals who seeked support for mental health, indicating that more stringency can lead to a higher level of mental deterioration and less pronation to find help. As expected, individuals with children under care or aging people under care are more likely to have more mental disorders and seek more support. The weight of caring work should certainly be addressed by future research. Again, as predicted, man, employed-full time, married, from developed countries, were the groups less likely to have or live with some with mental disorder. Finally, income had an unclear relationship with the outcomes, as well as health policies, what should be deeper investigated in future studies.

This study has potential limitations. First, the setup of the study is a pooled cross-section rather than longitudinal sample. The latter can enrich our capacity to measure the effects of public policies among individuals through time, as well as considering possible anticipation and delay of impact. Second, as many policies coexisted in the period, it is harder to isolate the effects to achieve more causal power, so isolated experiments as reviewed in the literature have the potential to better understand the impact of each program in greater precision. Third, the mental health outcomes are self-reported, which carry idiosyncrasies in its measurement that can influence the results. Fourth, the dataset available of individuals corresponds only to waves of January 2021 and April 2021. That led to low variability of predictors, and certainly a less than optimal explanatory effect as a complete view from January 2020 to December 2022 have a potential to explain more completely the subject matter. Fourth, further studies should be able to control for pre-existing history of mental health,

as it is evident in the literature that it is an important predictor of mental health disruption in future humanitarian crises.

Apart of methodological constraints, the effectiveness of the results must be evaluated against the described study objective. Fortunately, a satisfactory explanatory power was obtained when regressing the outcomes against the macro-indexes. It is clear that more stringency means more people having or living with mental disorders, and less people seeking support for the same issue. Also, economic support led to less people having or living with mental disorders and more people seeking support for the same issue. Opposed to that, Health Policies could not be precisely evaluated. Moreover, is arguable that it was not possible to understand the impact of many of detailed public policies studied, but macro directions of effects reflected by the indexes. Even so, it is conceivable that important relationships were found that contribute to the existing literature, mainly related to demographic traits that prone certain individuals to more suffering than others in times of crisis.

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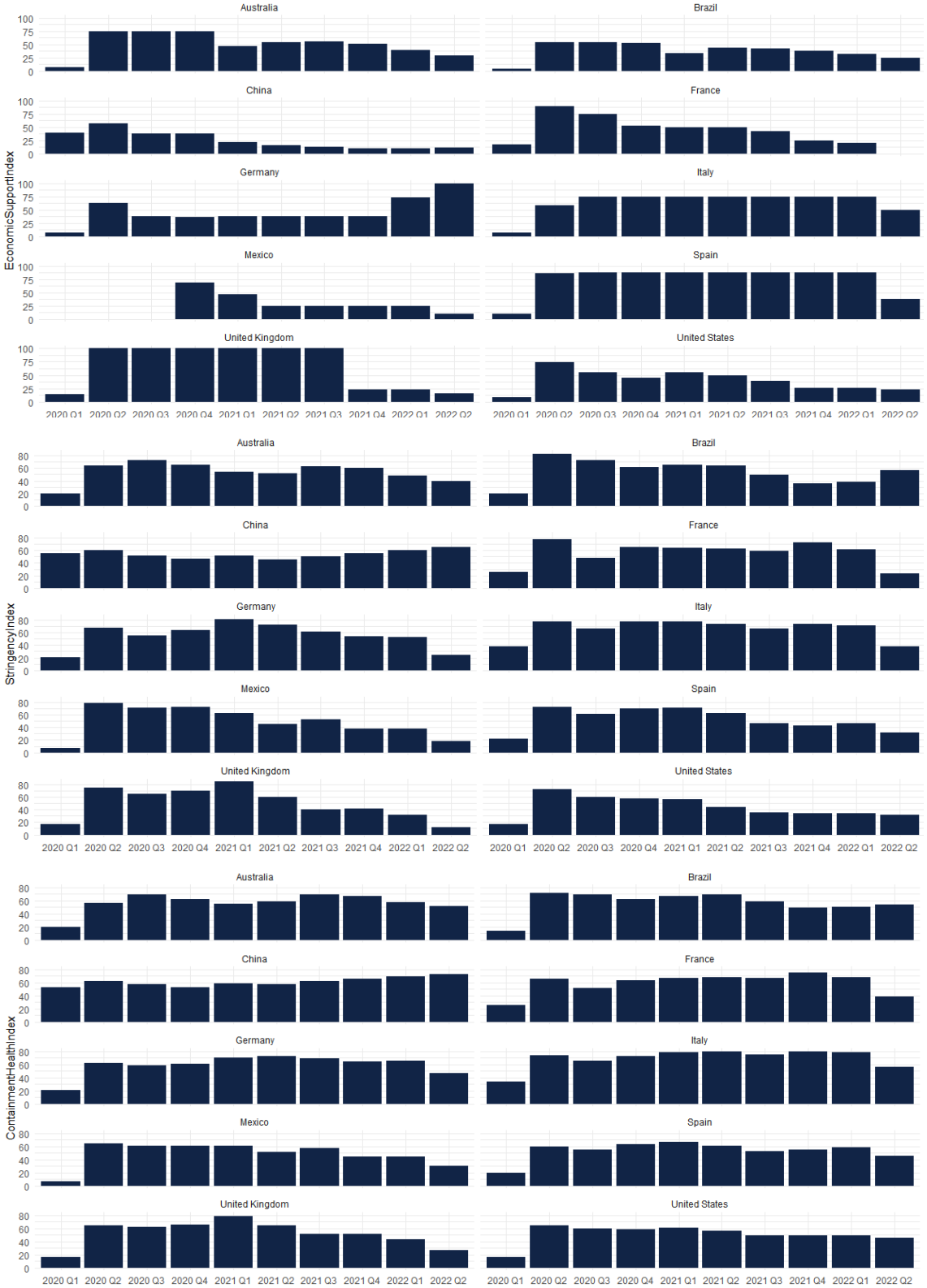
Appendix A. Customer Sentiment Survey Sample Descriptive Statistics

Variable	Count	Share
Has or lives with mental disorder	**4784**	
Yes	853	17,8%
No	3931	82,2%
Seeked support for MD (last 3 months)	**18718**	
Yes	7393	39,5%
No	11325	60,5%
Increased spend with mental wellness	**18718**	
Yes	1958	10,5%
No	16760	89,5%
Age	**18718**	
Under 18	0	0,0%
Between 18 and 34	4357	23,3%
Between 35 and 64	10513	56,2%
Over 64	3848	20,6%
Gender	**18718**	
Man	8561	45,7%
Woman	10157	54,3%
Married	**18718**	
Yes	10503	56,1%
No	8215	43,9%
Yearly Household Income	**18718**	
Upper (U$150k or more)	2659	14,2%
Medium (U$50k-149,999k)	8185	43,7%
Low (U$49,999 or less)	7874	42,1%
Employment	**12922**	
Employed full-time	7492	58,0%
Employed part-time	2263	17,5%
Self-employed	1399	10,8%
Unemployed	1371	10,6%
Unable to work	397	3,1%
Children Under Care	**18718**	
Yes	4307	23,0%
No	14411	77,0%
Aging Under Care	**18718**	
Yes	2120	11,3%
No	16598	88,7%
Country	**17998**	
Australia	1815	10,1%
Brazil	1823	10,1%
China	1754	9,7%
German	1805	10,0%
France	1087	6,0%
Mexico	1813	10,1%
Italy	1808	10,0%
Spain	1808	10,0%
UK	1809	10,1%
US	2476	13,8%

Appendix B. Evolution of Public Policies Indexes Over Time



Appendix C. Dummy Transformations of Public Policies

Variable	Description	Intensity	Dummy of high intensity
Containment and closure policies			
C1 - School Closing	Record closings of schools and universities	0 - no measures 1 - recommend closing or all schools open with alterations resulting in significant differences compared to non-Covid-19 operations 2 - require closing (only some levels or categories, eg just high school, or just public schools) 3 - require closing all levels Blank - no data	1 - if 2, 3 0 - else
C2 - Workplace Closing	Record closings of workplaces	0 - no measures 1 - recommend closing (or recommend work from home) or all businesses open with alterations resulting in significant differences compared to non-Covid-19 operation 2 - require closing (or work from home) for some sectors or categories of workers 3 - require closing (or work from home) for all-but-essential workplaces (eg grocery stores, doctors) Blank - no data	1 - if 2, 3 0 - else
C3 - Cancel Public Events	Record cancelling public events	0 - no measures 1 - recommend cancelling 2 - require cancelling Blank - no data	1 - if 2 0 - else
C4 - Restrictions on gatherings	Record limits on gatherings	0 - no restrictions 1 - restrictions on very large gatherings (the limit is above 1000 people) 2 - restrictions on gatherings between 101-1000 people 3 - restrictions on gatherings between 11-100 people 4 - restrictions on gatherings of 10 people or less Blank - no data	1 - if 3, 4 0 - else
C5 - Close Public Transportations	Record closing of public transport	0 - no measures 1 - recommend closing (or significantly reduce volume/route/means of transport available) 2 - require closing (or prohibit most citizens from using it) Blank - no data	1 - if 2 0 - else
C6- Stay at home Requirements	Record orders to "shelter-in-place" and otherwise confine to the home	0 - no measures 1 - recommend not leaving house 2 - require not leaving house with exceptions for daily exercise, grocery shopping, and 'essential' trips 3 - require not leaving house with minimal exceptions (eg allowed to leave once a week, or only one person can leave at a time, etc) Blank - no data	1 - if 2, 3 0 - else
C7 - Restrictions on Internal Movement	Record restrictions on internal movement between cities/regions	0 - no measures 1 - recommend not to travel between regions/cities 2 - internal movement restrictions in place Blank - no data	1 - if 2 0 - else
C8 - International Travel Controls	Record restrictions on international travel Note: this records policy for foreign travellers, not citizens	0 - no restrictions 1 - screening arrivals 2 - quarantine arrivals from some or all regions 3 - ban arrivals from some regions 4 - ban on all regions or total border closure Blank - no data	1 - if 3, 4 0 - else

Appendix D. Impact of Stringency Policies on seeking support and having or living with MD

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
Characteristic	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**
C1_school_closing_high	0.65	0.58, 0.74	<0.001															
EconomicSupportIndex	1.01	1.00, 1.01	<0.001	1.01	1.00, 1.01	<0.001	1.01	1.00, 1.01	<0.001	1.01	1.00, 1.01	<0.001	1.01	1.01, 1.01	<0.001	1.01	1.00, 1.01	<0.001
H2_testing_policy_high	1.14	1.04, 1.25	0.005	1.18	1.08, 1.29	<0.001	1.18	1.08, 1.29	<0.001	1.12	1.01, 1.24	0.034	1.16	1.06, 1.27	0.001	1.18	1.08, 1.29	<0.001
H3_contact_tracing_high	1.27	1.17, 1.38	<0.001	1.22	1.12, 1.33	<0.001	1.23	1.13, 1.33	<0.001	1.11	0.98, 1.26	0.10	1.46	1.30, 1.64	<0.001	1.23	1.13, 1.33	<0.001
H6_facial_coverings_high	0.88	0.80, 0.96	0.006	0.81	0.73, 0.89	<0.001	0.81	0.74, 0.89	<0.001	0.71	0.61, 0.83	<0.001	0.92	0.82, 1.02	0.12	0.81	0.74, 0.89	<0.001
Children_under_care	1.41	1.29, 1.54	<0.001	1.39	1.27, 1.51	<0.001	1.39	1.27, 1.51	<0.001	1.39	1.27, 1.52	<0.001	1.40	1.28, 1.53	<0.001	1.39	1.27, 1.51	<0.001
Aging_under_care	1.82	1.62, 2.03	<0.001	1.84	1.65, 2.06	<0.001	1.84	1.65, 2.06	<0.001	1.83	1.64, 2.05	<0.001	1.83	1.64, 2.04	<0.001	1.84	1.65, 2.06	<0.001
low_income	1.08	0.95, 1.22	0.3	1.11	0.98, 1.27	0.10	1.11	0.98, 1.26	0.10	1.10	0.97, 1.25	0.13	1.09	0.96, 1.24	0.2	1.11	0.98, 1.26	0.10
middle_income	1.06	0.95, 1.19	0.3	1.10	0.99, 1.23	0.085	1.10	0.99, 1.23	0.086	1.09	0.98, 1.22	0.12	1.08	0.97, 1.21	0.2	1.10	0.99, 1.23	0.086
between18and34	2.97	2.60, 3.40	<0.001	2.95	2.59, 3.38	<0.001	2.95	2.59, 3.38	<0.001	2.95	2.59, 3.38	<0.001	2.96	2.59, 3.39	<0.001	2.95	2.59, 3.38	<0.001
between35and64	1.52	1.35, 1.72	<0.001	1.52	1.35, 1.72	<0.001	1.52	1.35, 1.72	<0.001	1.52	1.35, 1.72	<0.001	1.52	1.34, 1.72	<0.001	1.52	1.35, 1.72	<0.001
married	0.97	0.89, 1.06	0.5	0.98	0.90, 1.06	0.6	0.98	0.90, 1.06	0.6	0.97	0.89, 1.06	0.5	0.97	0.89, 1.06	0.5	0.98	0.90, 1.06	0.6
man	0.73	0.68, 0.79	<0.001	0.73	0.68, 0.79	<0.001	0.73	0.68, 0.79	<0.001	0.73	0.68, 0.79	<0.001	0.73	0.68, 0.79	<0.001	0.73	0.68, 0.79	<0.001
employed_full	1.06	0.97, 1.16	0.2	1.07	0.97, 1.17	0.2	1.07	0.97, 1.17	0.2	1.06	0.97, 1.16	0.2	1.06	0.96, 1.16	0.2	1.07	0.97, 1.17	0.2
unemployed	1.03	0.89, 1.19	0.7	1.04	0.90, 1.20	0.6	1.04	0.90, 1.20	0.6	1.04	0.90, 1.20	0.6	1.04	0.90, 1.20	0.6	1.04	0.90, 1.20	0.6
unable_to_work	2.85	2.08, 3.92	<0.001	2.83	2.07, 3.89	<0.001	2.83	2.07, 3.89	<0.001	2.83	2.07, 3.89	<0.001	2.85	2.09, 3.92	<0.001	2.83	2.07, 3.89	<0.001
Developing_country	2.94	2.52, 3.42	<0.001	2.67	2.30, 3.10	<0.001	2.67	2.30, 3.10	<0.001	3.03	2.50, 3.67	<0.001	2.75	2.37, 3.19	<0.001			
C2_workplace_closing_high				1.01	0.89, 1.14	0.9												
C5_close_public_transport_high																		
C6_stay_at_home_high										1.24	1.01, 1.52	0.040						
C7_restrictions_on_internal_mov_high													0.75	0.66, 0.85	<0.001			
C8_international_travel_controls_high																0.38	0.32, 0.44	<0.001

[1] OR = Odds Ratio, CI = Confidence Interval

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
Characteristic	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**
C1_school_closing_high	0.63	0.41, 0.95	0.029															
EconomicSupportIndex	1.0	0.99, 1.00	0.3	0.99	0.99, 1.00	0.2	0.99	0.99, 1.00	0.2	0.99	0.99, 1.00	0.2	1.00	0.99, 1.01	0.7	0.99	0.99, 1.00	0.2
H2_testing_policy_high	0.59	0.46, 0.75	<0.001	0.59	0.46, 0.76	<0.001	0.61	0.47, 0.78	<0.001	0.59	0.44, 0.78	<0.001	0.59	0.46, 0.76	<0.001	0.61	0.47, 0.78	<0.001
H3_contact_tracing_high	0.69	0.52, 0.90	0.007	0.62	0.46, 0.82	<0.001	0.66	0.51, 0.86	0.003	0.61	0.40, 0.90	0.016	0.79	0.55, 1.13	0.2	0.66	0.51, 0.86	0.003
H6_facial_coverings_high	0.60	0.45, 0.79	<0.001	0.50	0.36, 0.68	<0.001	0.56	0.42, 0.74	<0.001	0.50	0.30, 0.82	0.006	0.63	0.45, 0.87	0.005	0.56	0.42, 0.74	<0.001
Children_under_care	1.28	0.99, 1.65	0.061	1.28	0.99, 1.65	0.062	1.27	0.98, 1.64	0.067	1.27	0.98, 1.64	0.068	1.28	0.99, 1.65	0.061	1.27	0.98, 1.64	0.067
Aging_under_care	1.40	1.03, 1.89	0.028	1.46	1.07, 1.97	0.015	1.43	1.05, 1.93	0.020	1.42	1.05, 1.92	0.022	1.42	1.04, 1.91	0.024	1.43	1.05, 1.93	0.020
low_income	1.32	0.89, 1.99	0.2	1.35	0.90, 2.02	0.15	1.34	0.90, 2.01	0.2	1.33	0.89, 2.00	0.2	1.33	0.89, 2.00	0.2	1.34	0.90, 2.01	0.2
middle_income	1.21	0.84, 1.75	0.3	1.24	0.86, 1.79	0.2	1.23	0.86, 1.77	0.3	1.22	0.85, 1.77	0.3	1.22	0.85, 1.76	0.3	1.23	0.86, 1.77	0.3
between18and34	3.65	2.53, 5.28	<0.001	3.62	2.51, 5.25	<0.001	3.63	2.52, 5.26	<0.001	3.64	2.53, 5.27	<0.001	3.63	2.52, 5.26	<0.001	3.63	2.52, 5.26	<0.001
between35and64	2.31	1.69, 3.18	<0.001	2.26	1.66, 3.12	<0.001	2.28	1.67, 3.13	<0.001	2.28	1.67, 3.14	<0.001	2.29	1.68, 3.15	<0.001	2.28	1.67, 3.13	<0.001
married	0.63	0.50, 0.79	<0.001	0.64	0.51, 0.81	<0.001	0.64	0.51, 0.80	<0.001	0.64	0.51, 0.80	<0.001	0.63	0.50, 0.80	<0.001	0.64	0.51, 0.80	<0.001
man	0.69	0.55, 0.87	0.001	0.69	0.55, 0.87	0.001	0.69	0.55, 0.87	0.001	0.69	0.55, 0.86	0.001	0.69	0.55, 0.87	0.001	0.69	0.55, 0.87	0.001
employed_full	0.73	0.55, 0.97	0.029	0.74	0.56, 0.98	0.039	0.75	0.56, 0.99	0.040	0.74	0.56, 0.98	0.038	0.73	0.55, 0.97	0.031	0.75	0.56, 0.99	0.040
unemployed	1.18	0.81, 1.71	0.4	1.20	0.82, 1.74	0.3	1.19	0.82, 1.72	0.4	1.19	0.81, 1.72	0.4	1.19	0.81, 1.71	0.4	1.19	0.82, 1.72	0.4
unable_to_work	2.70	1.74, 4.18	<0.001	2.70	1.74, 4.18	<0.001	2.71	1.75, 4.20	<0.001	2.71	1.75, 4.20	<0.001	2.70	1.74, 4.18	<0.001	2.71	1.75, 4.20	<0.001
Developing_country	0.81	0.52, 1.26	0.3	0.75	0.48, 1.18	0.2	0.73	0.47, 1.13	0.2	0.82	0.45, 1.50	0.5	0.74	0.48, 1.14	0.2			
C2_workplace_closing_high				1.39	0.95, 2.03	0.088												
C5_close_public_transport_high																		
C6_stay_at_home_high										1.20	0.63, 2.30	0.6						
C7_restrictions_on_internal_mov_high													0.75	0.49, 1.13	0.2			
C8_international_travel_controls_high																1.37	0.88, 2.12	0.2

[1] OR = Odds Ratio, CI = Confidence Interval