Mental Health Care Is Not an Option for Many Worldwide due to Financial Inequality and Societal Stigma*

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Abstract

Mental Health care is fundamental to a good quality of life, however for many people globally, it is deemed as unimportant or unattainable. Previous research has found that the choice to seek therapy is heavily related to income, gender, and personal views towards mental health, so we use data from the 2020 Wellcome Trust survey on Mental Health to analyze this. We use graphs and tables to evaluate the differences in mental health access for different groups using R (R Core Team 2020) and other packages. We create a logistic regression model to explain and predict the probability that a person belonging to these groups seeks out professional care. We find that the personal income of an individual, relative wealth of the country, gender, and the presence of external support increase the likelihood that a person seeks mental health care. We also find that level of education, employment status and views on the validity of mental health science also affect this choice. This shows the elitism and privilege tied to mental health access, and explains why getting adequate care is not an option for many people. In order to increase the acceptance and availability of mental health treatments, it is important to identify and lessen the sources of these barriers.

Keywords: Mental Health, Therapy, Global, Stigma, Wealth, Inequality, Education, Science, Gender

1 Introduction

Mental health care includes the use of medical or sociological treatments to improve one's emotional, psychological, or social well being. It aims to improve cognition, perception, and behavior. Professional mental health care includes seeking treatment from a therapist, psychiatrist, or psychotherapist, among others. In order to evaluate global perceptions on the importance of mental health as well as global access to professional mental health care to develop better treatments (GallupPolls 2020b), the Wellcome Trust holds a periodic international survey on personal views on and experiences with mental disorders and health services. The Wellcome Global Monitor Survey dataset provides information on the demographic groups each respondent belongs to, as well as their answers to key questions on their opinions and access to mental health services and the science surrounding it. In this report, we create logistic regression model to explain the global relationship in 2020 between seeking professional mental health care and belonging to different demographic and opinion groups. We also aim to test the predictive properties of our model to see if the same prediction results on other samples can be trusted. This report does not include the act of getting mental health medication.

We obtained the dataset from the Wellcome Global Monitor Website (Wellcome 2021). We loaded in, cleaned and analyzed the data using `R` (R Core Team 2020), `dplyr` (Wickham et al. 2021), `tidyr` (Wickham 2021), `haven` (Wickham and Miller 2021), `tidyverse` (Wickham et al. 2019), `broom` (Robinson, Hayes, and Couch 2022), `MASS` (Venables and Ripley 2002) and `tidymodels` (Kuhn and Wickham 2020) packages. Figures and tables were created with `ggplot2` (Wickham 2016), `knitr` (Xie 2014), `dplyr` (Wickham et al. 2021), `rworldmap` (South 2011), `gridExtra` (Auguie 2017) and `kableExtra` (Zhu 2021). The model was created with the `stats` package, from base `R` (R Core Team 2020). We first created histograms and bar charts which showed what our main response variable and key explanatory variables looked like, as well as the relationship

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*Code and data are available at: https://github.com/OlaedoOkpareke/FinalPaperRepository

between them. We then created the model that explained the relationship between the predictors and response, checked the model assumptions, and provided variable justifications. We then created a table and graph interpreting the model coefficients. We then created created line plots which showed the relationship between some variables and our response, as well as a map which showed the average probability that someone seeks professional mental health care in each country. We also created a table which showed the proportion of people who chose to seek help or not, and used test and training datasets with a confusion matrix to test the predictive property of our model.

There is still an uphill battle to legitimize mental health care globally, as this report shows that less than half of those questioned worldwide sought out professional mental health treatment, with more people preferring to seek informal channels such as friends or family to solve their problems. The report also shows that men are much less likely to seek professional mental health care than women, most likely due to patriarchal conditions that persist worldwide. People with a lower level of education, not gainfully employed, as well as a lower level of comfort with their income are also much less likely to seek or have access to mental health care, which reveals the inequalities in getting adequate care for the less privileged. People from less wealthy countries are also less likely to seek or have access to mental care, likely due to either financial reasons or persistence of outdated views. Those who do not believe in the science of mental health are also less likely to seek out care, as they either believe that there is no problem with their mental state, or that the problem can be solved. Finally, the older one is, the more likely that they seek out professional mental health care.

While this survey provides valuable information on how the global population views mental health, mental health care, and the access to such care, biases and collection errors could provide an incorrect view on the true state of mental health care access and acceptance. The data does not collect information on some marginalized groups,thus removing their experiences with accessing mental care due to their status,further propagating their discrimination in society. The data collection also helps propagate preconceived biases against low income and less educated people as being ignorant about their health. This is because the data collects the statistics but not the causes and explanations behind these statistics. The model that answers the main research question reveals global societal problems, such as the gender gap in professional mental health access caused by patriarchal views (Pattyn, Verhaeghe, and Bracke 2015), which translates to other negative effects on society such as an increase in suicides. The decrease in mental health access for the lower educated, the unemployed, and the less wealthy reveals the lingering problem of inaccessibility of mental health care for the lower classes due to high prices and elitism. The model also brings to light the lack of education on the benefits of mental health, which are subjective and cannot be physically seen, leading to it not being seen as legitimate as physical health care. The fact that citizens of lower income nations have lower odds of seeking mental health reveals the poor mental health infrastructure in developing nations, leading to unavailability of these facilities in areas where they are needed. The report shows the need for more education on the benefits of mental health care, and the destigmatization of mental health and victims of the disorders. The report also shows the need for more widespread and affordable health care, as well as the removal of traditional beliefs and expectations on gender.

2 Data

2.1 Data Source and Collection

The survey dataset for this report comes from a February 2020 to August 2021 global survey (Wellcome 2021) performed by the Wellcome Trust, a British non-profit group that deals with health and well being. The survey observes how people consider and cope with anxiety and depression, and explores the perceived role of science to find new solutions. The population is all humans on earth, and the sample contains about 1000 observations each from 113 countries and territories. The survey was conducted via telephone interviews with random, nationally representative samples in their local languages, in collaboration with Gallup Polls (GallupPolls 2020b). The survey data was then stratified by weighting for each nation's population and other demographics such as age and gender, in order to remove collection bias and be representative of the global population (GallupPolls 2020b). The weights were also post-stratified to adjust for non-responses. The survey collected information on respondents' answers to several questions on their current and past mental state, access to care, thoughts on mental health as an individual and as part of a society, as well as answers on their

demographics, income, and other classification groups. The options for most of the questions were "Yes", "No", or "Not sure/Refuse to respond". In the dataset, these translate to numeric observations of 1, 2, or 99 respectively for each respondent. In the survey, demographic and classification questions have more than two possible options, with the dataset containing these results as text categories. The survey only collected data on respondents aged 15 years or older. Non response was indicated as either a 99, or an `NA`. The original dataset has 119,088 observations, 89 variables, and was last accessed April 2nd, 2022.

2.2 Data Cleaning

The dataset was mostly pre-cleaned for publication. To choose our variables, we used the survey sheet stating the questions and their possible responses (GallupPolls 2020a), as well as the guidebook that converted the results to the dataset observations (Monitor 2020). Our research aims to answer the question on mental health attitudes and situations in general, not those related to COVID19. We thus removed variables dealing with COVID19 related questions, which includes the choice of seeking help from professionals as the response. We included variables that we believed could further help answer the main research question. These include whether the respondent sought help from friends, Age, gender, employment status, subjective income, wealth of nation, belief in science behind mental health, education level, comfort on speaking about mental health issues, and country of the individual (for identification and comparison). As our target response dealt with whether someone sought professional mental health care or not, we filtered out all observations for that variable that were missing. An important explanatory variable was whether someone sought out mental help from friend, so we also filtered out missing observations from that variable. We then dropped all missing variables from the employment status variable, in order to be able to make the models of comparison the same size. We chose not to use the objective household income quantiles variable as we believe that how well of someone thinks they are is more important to their well being than how well off they actually are.

2.3 Data Modification

We modified the variables on seeking help from therapy and on seeking help from friends by changing all "Not sure/Refuse to answer" responses to "No" responses by changing all "99" observations to 0. We also changed all "Yes" responses to 1. We then modified a variable dealing with comfortability about speaking on depression. This variable was modified by changing all "Not Sure/Refused" and "Not comfortable" observations to "No" by modifying their numeric equivalents (99 and 3 respectively) to 0. The "Very comfortable" and "Somewhat comfortable" observations were modified to 1. A variable dealing with how much the respondent believed science could explain feelings and emotions was modified by changing the "A lot" and "Somewhat" observations to 1, and all other observations to 0. These previous variables were also all renamed from their original names to more understandable variable names. We modified the names of two observations in the country variable in order to include the countries' information on a map. We also modified the observations on the gender variable from 1 and 2 to "Male and Female". The observations for all other binary variables were relabeled as "Yes" for 1 and "No" for 0. The observations for the categorical dataset were changed from their numerical values to the actual answers for the questions. We then changed these character variables to a factor, and releveled these factor variables for easier interpretation. The final dataset was formed from the previous variables chosen, as well as the modified variables. This final dataset included 23,969 rows and 13 columns, from 112 different countries.

2.4 Data Visualization

We are interested in the the respondents' choice to seek professional mental care through the form of therapists and other avenues. The data shows the proportions of those who chose these avenues or not, grouped by several explanatory factors. This has ongoing implications for the design of services, public health campaigns, and development of better mental health treatment for these groups. (Figure 1) to (Figure 4) using `ggplot2` (Wickham 2016) show the summary of the mental health care choice by different groups, as well as the spread and distribution of this choice by age.

In (Figure 1), we see that for the distribution of age, most respondents were between the ages of 15 to 90, with a few outliers at 100. This seems to be a poisson distribution, or at least a heavily right skewed distribution,

as most respondents were at the younger end of the age scale. This means that the average age is higher than the median age of respondents. A possible reason is that either more youth were randomly chosen for the survey, or that more youth responded. We see that many younger and middle aged people chose to not seek therapy, while many older people did. This could be because as mental health care is expensive, mainly established older adults are more able to afford it, or that more young respondents are from lower income countries. The older the respondents got, the higher the count of those who sought therapy. This brings into question the reasons that the likelihood of seeking therapy increases with age.
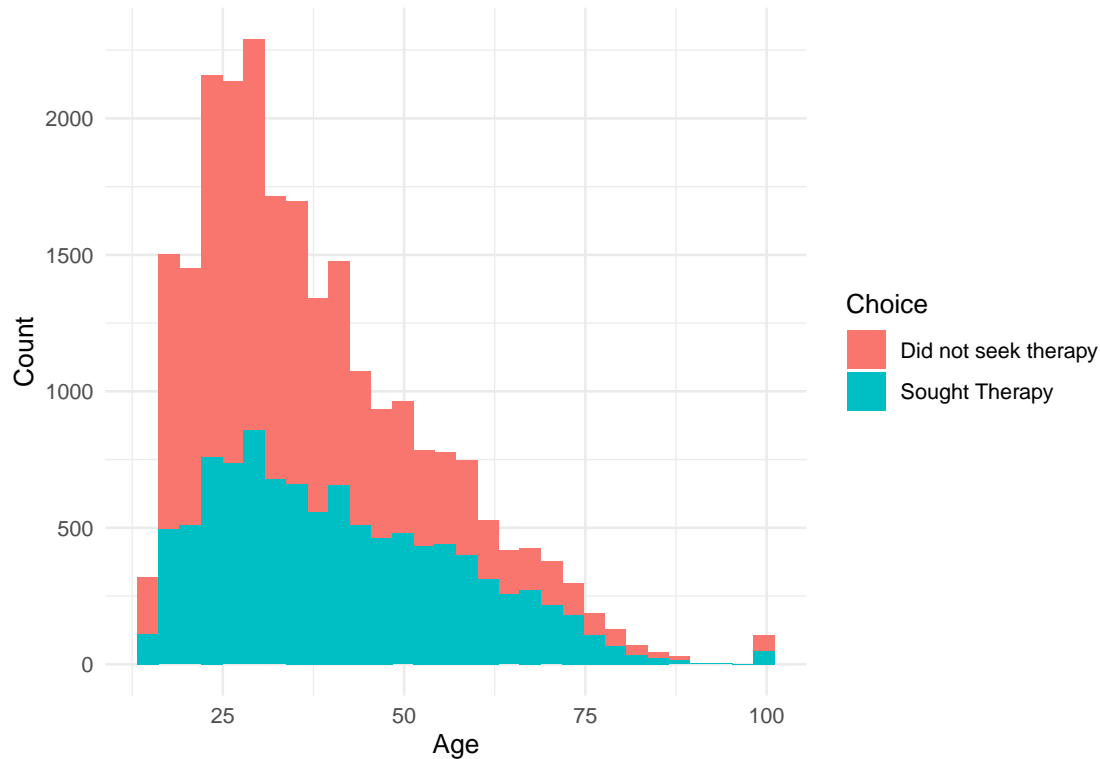

Figure 1: Distribution of Age by Decision to seek Mental Care

From (Figure 2), we see the following variables are binary, having only two possible options.

For Gender, we see that only about 40% of men seek therapy, compared to around 47% of women. This indicates that women are more likely to seek therapy; either due to them being more open with their emotions, or taking mental well being more seriously (Pattyn, Verhaeghe, and Bracke 2015). As women are also more likely to get help for physical ailments, this indicates that men generally do not place high importance in their well being (Tudiver and Talbot 1999). It is clear that gender socialization has an effect on seeking therapy.

When looking at beliefs in the science behind mental health, we see that those who believe in this science and the ability of scientific methods to improve mental well being tend to seek therapy more often than those who don't. Around 48% of those who believe in mental health science seek therapy, while only about 30% of those who do not seek therapy.This is intuitive, as those who believe in its effects will choose to use it. However, it is surprising that the gap between these groups is quite small, as a sizable portion of those who do not believe in it still seek therapy, possibly as they believe in some non-scientific aspects (Weir 2012).

We see that those who sought help from friends are also far more likely to seek therapy. Nearly 48% of those who sought help from friends also sought professional therapy, contrasted to only about 30% of those who did not seek help from friends sought help from therapy. This may be because those who know they have a problem and seek help from friends are also likely to understand the help that therapy provides or be

recommended therapy from said friends. In contrast, those that do not seek help from friends feel like they cannot talk about their issues, so do not wish to talk to a stranger either (Mehta and Edwards 2018).

We note that even among the groups that sought therapy more often, their total percentages are still quite low. This brings into question other economic and societal aspects that affect the choice to seek mental help.
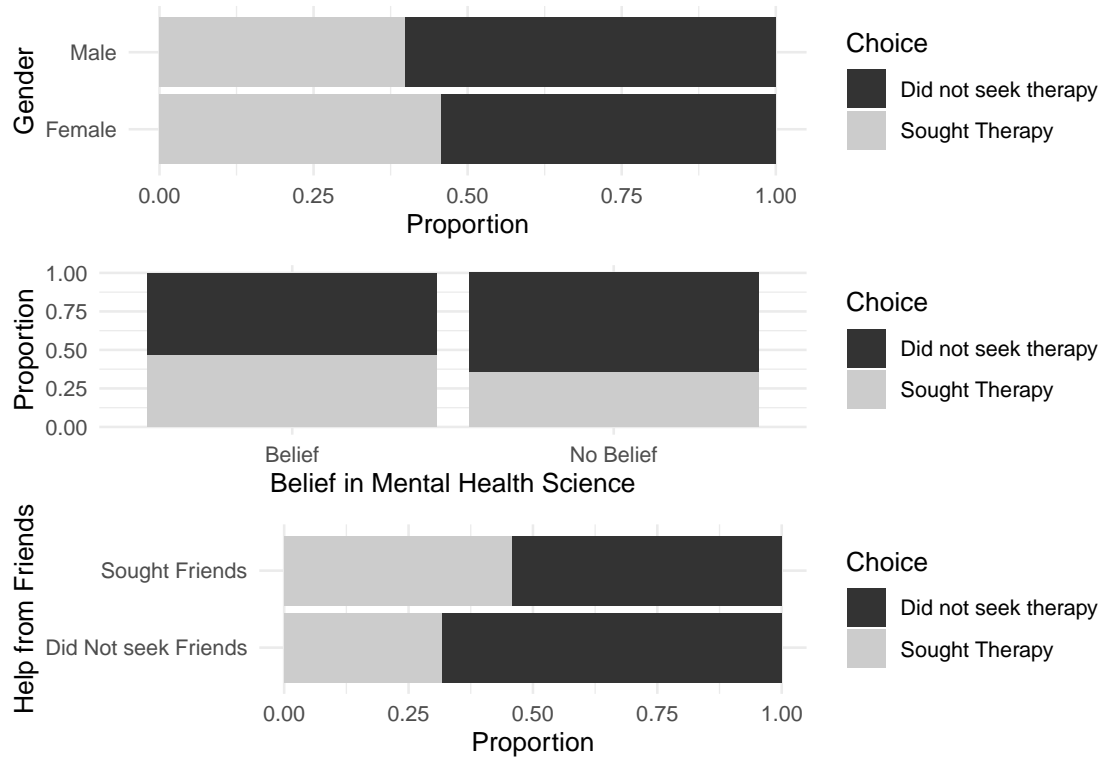

Figure 2: Decision to seek mental health care grouped by Gender, Belief in Mental Science, and Decision to seek Help from friends

From (Figure 3) and (Figure 4), we see that these variables are categorical, having a few possible observations.

For relative nation wealth, we see that people from upper income nations are far more likely to seek out therapy than other nations, with about 63% of respondents from these nations seeking mental health care. The general trend is that the lower income nations are less likely to seek out mental health care, with only 27% of people from low-middle income nations seeking therapy. This disparity could arise because people from wealthier nations are more likely to have more disposable income to afford therapy, or have access to free or heavily subsidized mental health care, as well as more mental health facilities (Patel 2007).

For the level of education, we see that generally those with higher levels of education attained seek therapy more often. 50% of people who have have finished undergraduate studies seek professional mental health, compared to about 32% of those who only completed elementary school or less seeking therapy. This is likely as higher levels of education correlate to more income and more educated and updated beliefs on mental health science (Jorm 2000), which was earlier discussed as being positively correlated to seeking help.

As in the previous binary explanatory variables, even among the groups that are more likely to seek therapy, the percentages are still rather low. This shows that general societal and personal factors, not just demographic and economic factors, affect the decision to seek therapy.
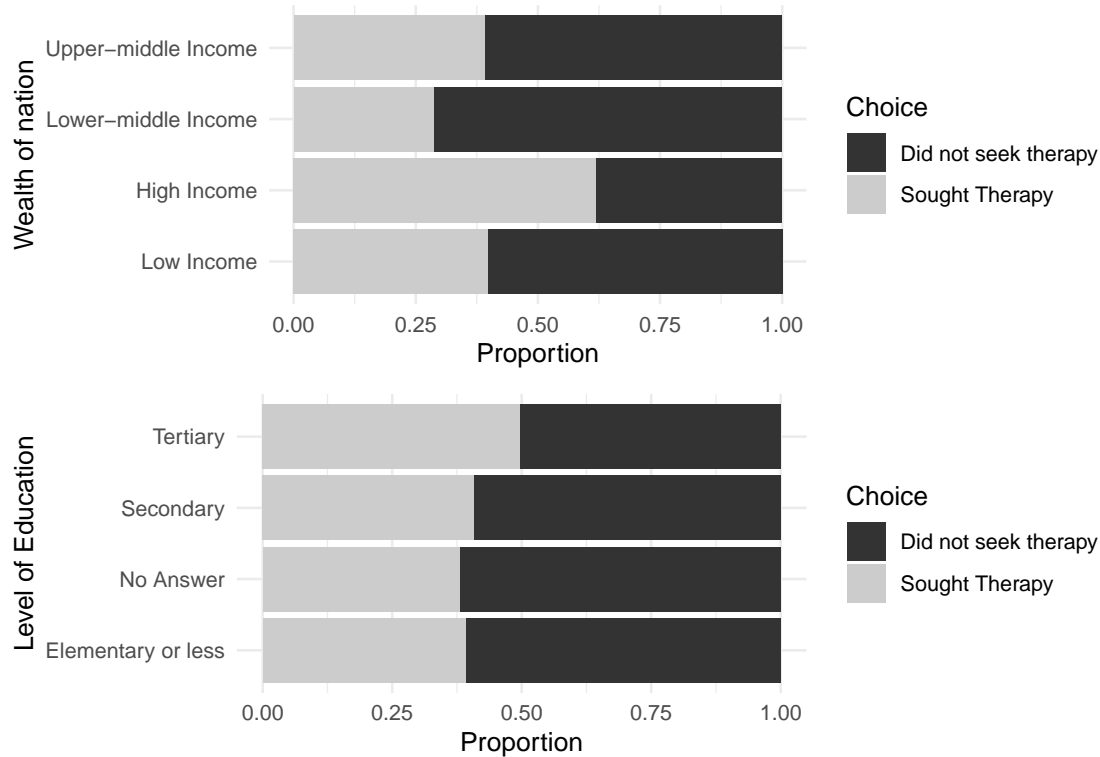
Figure 3: Decision to seek mental health care grouped by Relative Wealth of Nation and Educational Status

Subjective income in (Figure 4) measures how wealthy a person feels they are; if they feel that they are comfortable enough on their current income. It does not mention their objective wealth. We see that those who live more comfortably on their income seek therapy more often than their less well-off counterparts. The percentage of those who sought therapy among the most well is about 52% , compared to those finding it difficult to live off their income only seeking therapy 32% of the time. This is likely because the well off have more spare income to seek therapy, while the less well off choose to spend their money on the more urgent necessities (Hodgkinson et al. 2017).

For Employment Status, we see that those who are employed full time for an employer are among the most likely to seek therapy, with about 45% of respondents in this group seeking therapy. This may be due to them having the funds and free time to seek therapy, as well as the ability to switch if the therapist is not a good match. We see that the unemployed are the least likely to seek therapy, with about 30% of respondents in this group seeking therapy. This may be because the unemployed neither have the funds nor the free time to afford treatment (Hodgkinson et al. 2017). Those who work for themselves are also seen seeking therapy less often, likely due to them being too busy focusing on work to seek help, indicating that they are overworked (Parslow et al. 2004). Those who are employed part time but do not want full time work are the most likely to seek therapy, likely because they find the most happiness from having both work and their own time, so are in touch with their mental state (Meer and Wielers 2011).
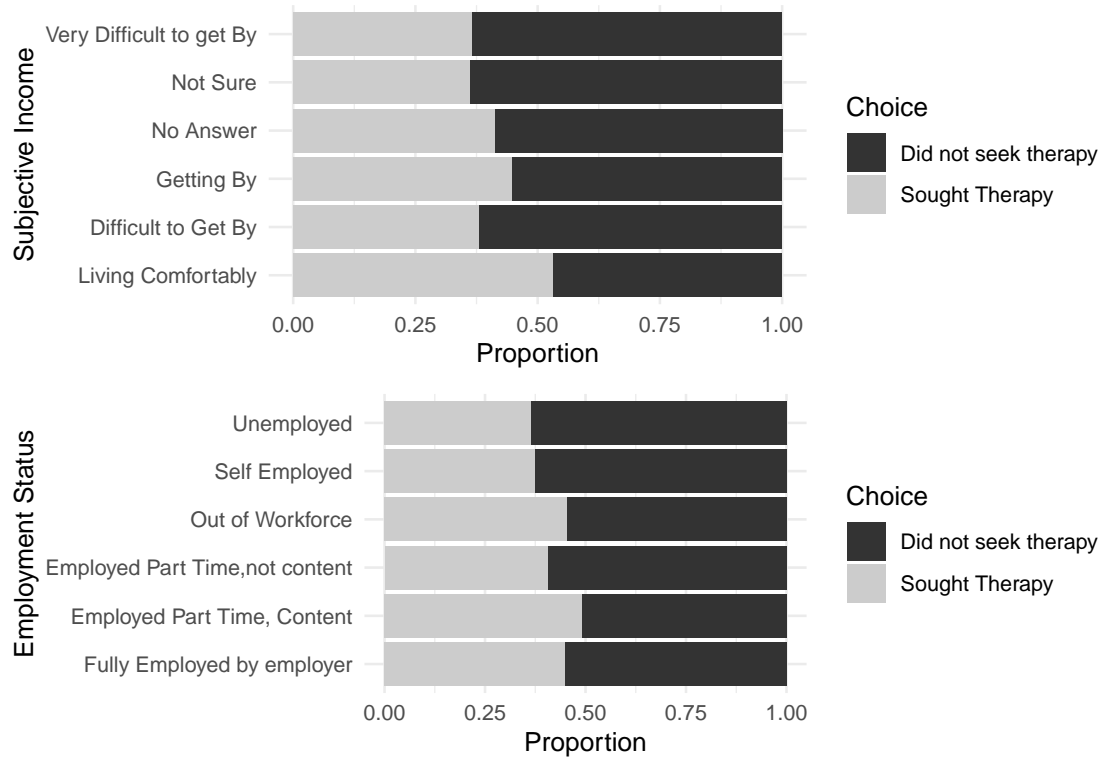
Figure 4: Decision to Seek mental health care grouped by Employment Status and level of Comfort with personal income

3 Model

Our final logistic regression model is

$$log(\frac{\hat{p}}{1-\hat{p}}) = \beta_0 + \beta_1 x_{friends} + \beta_2 x_{science} + \beta_3 x_{age} + \beta_4 x_{employment} + \beta_5 x_{gender} + \beta_6 x_{Education} + \beta_7 x_{Income} + \beta_8 x_{nationwealth}$$

The output of this logistic model gives the probability of whether or not a person plans to seek professional help for their mental problems. The response in the model is the probability that a person chooses to seek therapy based on their status in the explanatory variables. As the response is binary, we used a generalized linear model. To get the probability, we sum the right side of the equation and plug it into $\frac{e^{sum}}{1+e^{sum}}$, which is the odds ratio.

For the report, we focus on these 8 groups and demographics of respondents;

- Our response, Help, is a binary variable with a value of 1 if the person sought professional mental health care and 0 if they did not.

- Friends is a binary variable indicating if someone sought mental support from a friend.

- Science is a binary variable indicating if someone believes the science behind mental health and mental health care.

- Age is a continuous numeric variable indicating the age of the person.

- Employment is a categorical variable indicating a person's employment status. The observations include Employed for an employer, self employed, employed part time willingly, employed part time unwillingly, unemployed, and out of the workforce.

- Gender is a binary variable indicating the gender of a person.

- Education is a categorical variable indicating the highest level of education a respondent had at the time of taking the survey. Observations include Primary School, Secondary School and Tertiary Education.

- Income indicates how comfortable one is that their income can satisfy their needs. Observations include Living Comfortably on Income, Getting by on Income, Finding it hard to get by on income, and Finding it very hard to get by on income.

- Nationwealth is a categorical variable indicating the relative wealth of a respondent's nation. Observations include lower income, lower-middle income, upper-middle income, and high income.

- β_0 is the intercept, and each β_j represents a coefficient.

3.1 Assumption Checking and Methods

We check the assumption that the decision to seek therapy or not is binary, which it is evident on the dataset. We also check that all observations are independent, which they are as the respondents were chosen via random sampling. We also assume that the log of the odds ratio is a linear function of the explanatory variables.

We do not use residual plots or pairwise plots as they are not very helpful for a model with a binary response and binary/categorical explanatory variables. The p value is the probability that we see our test statistic given the null hypothesis is true. If the p values are small then the test statistic is not likely, so we reject the null hypothesis.

We check that the predicted values of the response from our final model are binary, which they are as evident from the "S" shape going from 0 to 1 in (Figure 5), which shows that all possible values are between 0 to 1, and that the probabilities do not increase in a linear manner.
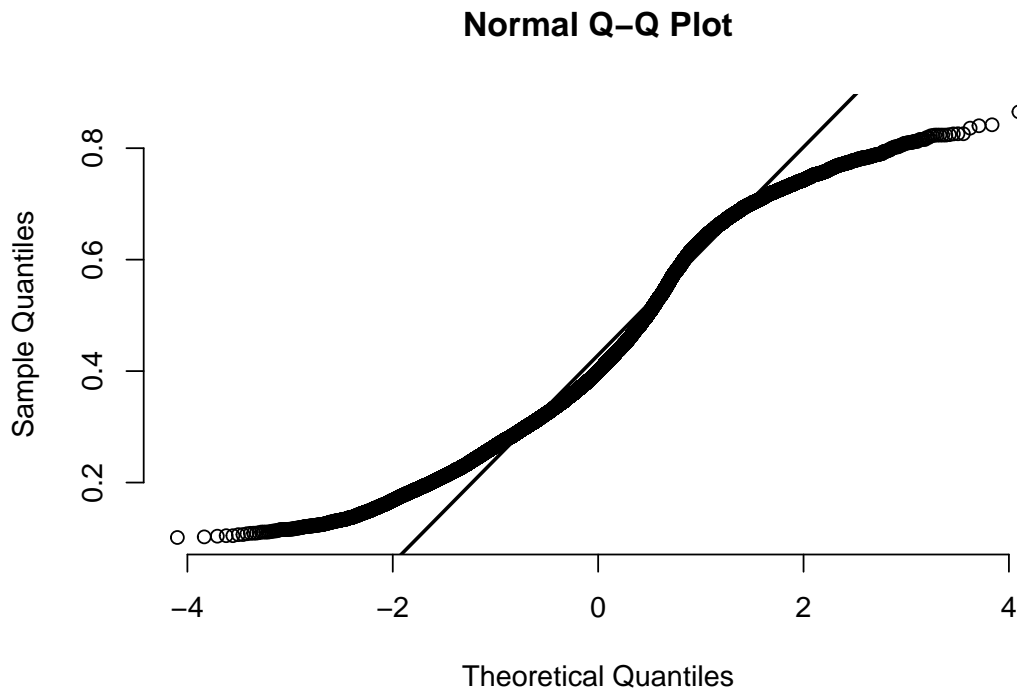

Normal Q–Q Plot

Figure 5: The Binary Fitted Value Probabilities of the Model

We make sure that there is no multicollinearity in the model by performing a stepwise AIC process which removes all highly correlated variables. This involves selection of independent variables to use in a model based on an iterative process of adding or removing variables. We find that the best possible model does not include the comfort variable.

Finally, we check for independence among variables we suspect to be correlated. The null hypothesis is that the variables are independent from each other. All of our results reject the null hypothesis due to the small p values. We find that although all the variables tested are highly dependent on each other, they are still heavily supported by literature,and can stand on their own and thus are kept in the model. For example, not everyone in a wealthy country is wealthy themselves, and we want to see how personal wealth affects the decision to seek therapy. We note however that the results may be inaccurate as our observations are not frequency or count data (McHugh 2013), and our estimated values are small.

To check that the comfort variable truly is not needed, we perform a model comparison test between the model with that variable and the model without it. The null hypothesis is that the smaller model explains the data just as well as the larger model. We find that the p value is 0.8835, which means that we fail to reject our null hypothesis that the model without comfort explains the response just as well as the model with comfort, so we can remove comfort from the model. However several studies have found this to be quite an important factor on an individuals decision to seek mental health care (Mojtabai 2007). This means that it may not be very important in the presence of other factors, which indirectly deal with societal comfort on talking about mental health. From our final model, we see that all the variables are significant, as shown by the very small p values.

3.2   Model Justifications

We chose to evaluate whether seeking help from friends affects the choice to seek help from therapists and other mental care providers, as several studies such as (Helsen, Vollebergh, and Meeus 2000) have found positive relationships between seeking help from these two groups. This is because those who have friends often have a stable support system and are more able to manage therapy. (Taylor et al. 1984) also stresses the importance of a good friend network as a gateway to a better understanding and acceptance of mental health treatment.

We used belief in mental health science as a variable as we believe that those who do not believe in this science or are otherwise averse to therapy are less likely to seek these professional mental health avenues. Those who do not believe in mental health are also more likely to come from societies that stigmatize talking about such issues. Disbelief in the science behind mental health is also correlated to poor mental health literacy, which leads to a lower likelihood of seeking help (Farrer et al. 2008).

We used Age, as a higher age is often related to a higher income and social standing, which leads to a higher likelihood of having adequate funds to seek professional mental help. According to (Mackenzie, Gekoski, and Knox 2006), older ages are associated with a higher willingness to seek help. Older adults exhibited more favorable intentions to seek help from primary care physicians than younger adults, a finding that was not explained by age differences in attitudes.

We use gender in the model as the impact of gender on mental health help has been widely discussed, with many conclusions that women are more likely to seek mental health help than men. (Mackenzie, Gekoski, and Knox 2006) states that Women exhibited more favorable intentions to seek help from mental health professionals than men, likely due to their positive attitudes concerning psychological openness. (Organization and others 2002) states that in industrialized countries, women are consistently more likely to use mental health services than men. Men only seek help at lager stages after symptoms get severe.

We included subjective income in the model as a larger income correlates to a higher ability to pay for health care, irrespective of country. We also decided to use this variable as higher relative income is often tied to higher social standing, and (Rubin, Evans, and Wilkinson 2016) states that a higher social standing is related to a higher sense of well being. In contrast, low income people have less access to mental health care due to an inability to afford it, or unavailability in their area (Hodgkinson et al. 2017).

We included employment in the model as it is both linked to income and stands on its own. Employment is linked to income, as the unemployed and underemployed have less disposable income to afford therapy compared to their employed or self employed counterparts. However this variable is also separate from income due to problems such as overworking of the employed and the hesitation of employers to pay for mental health costs unlike the self employed (Harvey et al. 2009), as well as the general rising health problems of the overworked that part time workers may not relate to (Harvey et al. 2009).

We chose to use level of educational attainment in the model, as the college educated often have higher mental health literacy, which makes them less likely to have misconceptions and stigma on mental health and care (Jorm 2000). Also, people with higher education are more likely to know these problems and avenues for solutions exist in the first place, instead of labeling the problems as personal weakness or spiritually influenced.

Finally, we chose to evaluate the wealth of a nation, as it has been extensively confirmed that citizens of lower and middle income nations are far less likely to seek professional help than citizens of industrialized nations. This is because citizens of these countries are far more likely to be lower income, have poorer knowledge on the benefits of mental health care (Saraceno et al. 2007), and have less accessibility to mental health facilities (Hanlon et al. 2014).

4   Results

(Table 1) shows the summary of choice for mental health care by showing the proportion of people who chose to use these avenues, and those who did not. We see that overall, 57% of respondents worldwide chose not to seek therapy, leaving about 43% who did choose to seek this route. Compared to seeking health for physical problems, we see that mental health care is still not a priority for many people worldwide (Grover et al. 2020). This could possibly be due to gender roles, elitism in mental health care and the cost of care, and unavailability of the necessary facilities. This could also be caused by the respondents beliefs that mental health either is not important, does not exist, or that therapy is ineffective.

Table 1: Number and Proportion of people Who Chose each Decision for Mental health Care

Decision	Number of People	Percentage
Did not seek therapy	13685	0.57
Sought Therapy	10284	0.43

(Figure 6), using code from (Mitrovski, Yang, and Wankiewicz 2020) shows the coefficients from running a regression on the model. The missing levels for each factor or binary variable are the base levels, which all other levels in that variable are compared to.

The coefficients have been exponentiated in order to be interpretable, so this figure shows the results of e^{β_j}. The exponentiated coefficients explain the expected increase in the odds of seeking help for each level of a variable, provided other variables stay constant. The error bars also show the lower and upper bounds of the estimates, to give a full plausible range of values that the coefficient could take. A value of 1 here means that the predicted probability of seeking professional mental help is just as likely when the respondent is in this group than when they are not. Coefficients with values that are less than 1 mean that being part of the group the variable represents, makes the respondent less likely to seek help, while values more than 1 means the respondent is more likely to seek professional mental health care if they are part of this group. For example, We see the odds of men seeking mental health care is only about 0.8 times that of women, meaning that they are 20% less likely to seek mental health care than women. The odds that citizens of the high income nations seek mental health care is about 1.75 times that of citizens of the lowest income nations, meaning they are 75% more likely to seek help. On the other hand, we see that the odds that someone who is finding it very difficult to get by on their income gets mental health care is only 0.75 times that of someone living comfortably on their income, meaning they are 25% less likely to seek help.
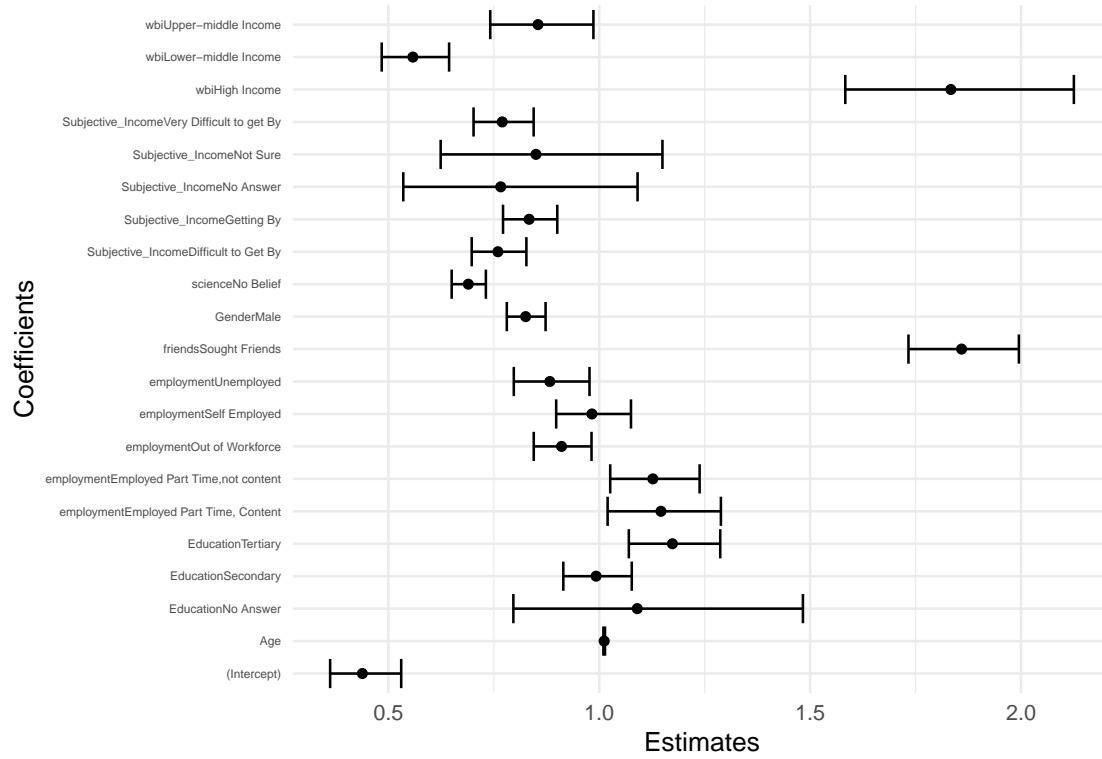
Figure 6: Coefficient Estimates and Confidence Intervals

(Table 2) shows the estimates from (Figure 6) in numerical form, as well as the range of plausible values each coefficient could take, and the p values which indicates the significance of each explanatory variable to the response. We see that although some individual levels in some variables are not significantly related to the response, overall the variable is important to understand whether someone chooses to seek mental health care. We see that for each additional age, the odds of someone seeking mental help is 1.01 times that of their previous age, meaning that as a person ages by a year, they are predicted to be 1% more likely to seek mental health care. This could be due to having higher levels of income at higher ages. We also see that the odds of an unemployed person seeking mental health care is 0.88 times that of people fully employed by an employer, meaning they are 12% less likely to seek help.

Table 2: Estimates of the Model Coefficients

term	estimate	std.error	statistic	p.value	conf.low	conf.high
(Intercept)	0.44	0.10	-8.46	0.00	0.36	0.53
friendsSought Friends	1.86	0.04	17.28	0.00	1.73	1.99
scienceNo Belief	0.69	0.03	-12.40	0.00	0.65	0.73
Age	1.01	0.00	12.22	0.00	1.01	1.01
employmentEmployed Part Time, Content	1.15	0.06	2.29	0.02	1.02	1.29
employmentEmployed Part Time,not content	1.13	0.05	2.50	0.01	1.03	1.24
employmentOut of Workforce	0.91	0.04	-2.44	0.01	0.84	0.98
employmentSelf Employed	0.98	0.05	-0.38	0.70	0.90	1.08
employmentUnemployed	0.88	0.05	-2.41	0.02	0.80	0.98
GenderMale	0.83	0.03	-6.75	0.00	0.78	0.87
EducationNo Answer	1.09	0.16	0.54	0.59	0.80	1.48
EducationSecondary	0.99	0.04	-0.18	0.86	0.91	1.08
EducationTertiary	1.17	0.05	3.40	0.00	1.07	1.29
Subjective_IncomeDifficult to Get By	0.76	0.04	-6.32	0.00	0.70	0.83
Subjective_IncomeGetting By	0.83	0.04	-4.63	0.00	0.77	0.90
Subjective_IncomeNo Answer	0.77	0.18	-1.47	0.14	0.54	1.09
Subjective_IncomeNot Sure	0.85	0.16	-1.04	0.30	0.62	1.15
Subjective_IncomeVery Difficult to get By	0.77	0.05	-5.55	0.00	0.70	0.84
wbiHigh Income	1.83	0.08	8.07	0.00	1.58	2.13
wbiLower-middle Income	0.56	0.07	-8.02	0.00	0.48	0.64
wbiUpper-middle Income	0.85	0.07	-2.16	0.03	0.74	0.99

(Figure 7) shows the relationship between age and the decision to seek mental health care, grouped by gender. We use the logit link due to the binary nature of the response. We see that due to the increasing trend, the older a person gets, the more likely they are to seek mental health care. The gray areas serve as confidence intervals, showing the range of plausible probabilities each age group could have, which also consistently increasing with age. Thus for both men and women, the older one gets the more likely that they seek mental health care. We also see that at all ages, women are consistently more likely to seek mental help than men are. This shows the stark age differences in mental health care, where (Mackenzie, Gekoski, and Knox 2006) states that due to societal expectations on gender and age, older adults are more likely to seek help than younger adults, and women are more likely to seek help then men. We see that woman at older ages still seek mental help, while men seem not to to do this at all. However this is likely due to collection problems with the dataset or graphical methods, and not with the actual global population of men.
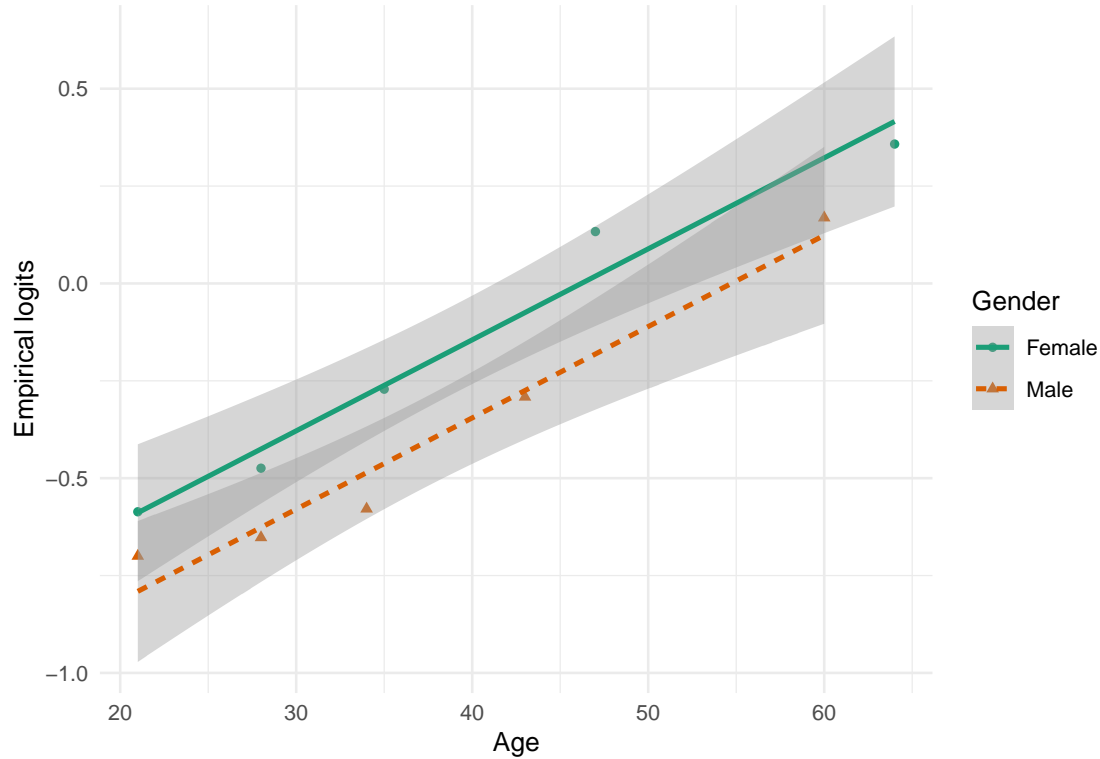
Figure 7: Relationship between the Decision to seek mental Help and Age, grouped by Gender

(Figure 8) shows the average probability of citizens who decided to seek mental health care for their depression and/or anxiety, by country. White-colored countries indicate no data. We see that the results differ by country, but countries in the same continent tend to have roughly similar probabilities of seeking mental health care. We see that most countries in western Europe and the Anglosphere have very high probabilities of seeking mental health, with probabilities of 70% or more. This is most likely due to their first world status, which comes with availability of health facilities, national health care system, and a generally high level of wealth. However for many ex-communist and developing countries, the average probabilities are much lower, ranging from below 70% to about 11%. South America has average probability levels of seeking mental health,ranging from 40%-55%. Central Asia, South East Asia and some of East Asia have a range of probabilities, but none of them are very high. This is indicative of the lower levels of income, less mental health facilities, misconceptions on mental health due to low mental health literacy, and general culture that looks down on such types of care. African countries also have low probabilities of getting mental health care for the same reasons stated, as well as the prevalence of war and general instability hindering the presence of permanent mental facilities, as well as a lack of nationalized health care. This is with the exceptions of Mali and south Africa, the latter likely being as it a relatively rich nation. However it should be noted that high income, developed nations like japan and south korea do not have high average probabilities of seeking mental health; japan's probability of seeking help is around the same as India's. This indicates that there is most likely a social stigma around seeking mental health care and thus a lower demand for mental health professionals, despite the developed health care system (Roh et al. 2016).
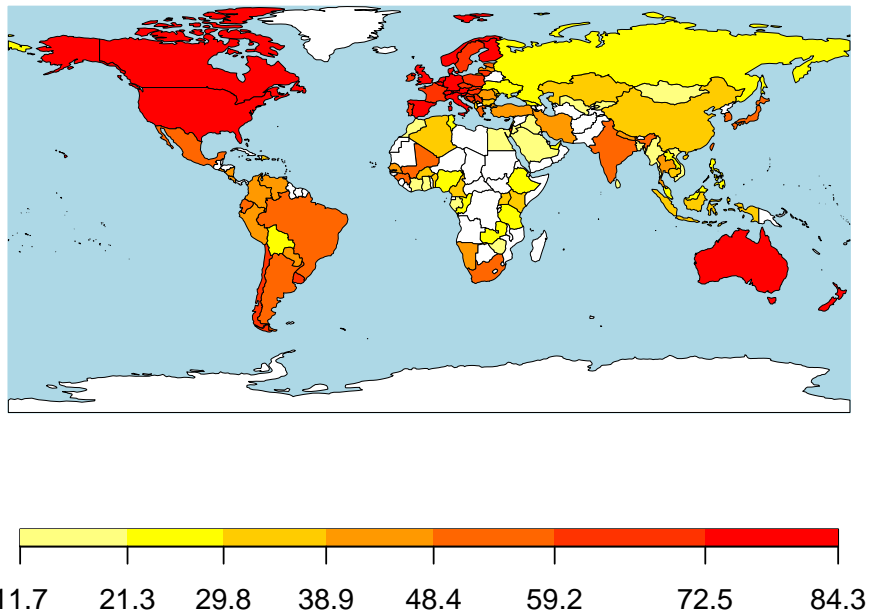
Figure 8: Percentage Probability of seeking Professional Mental Health Care in Each Country

(Table 3) shows the table of our predicted values from running the model on the training and testing datasets, compared to the true values. This is used to test the accuracy of the predictive properties of the model. The table shows the number of predicted values for each decision, as well as the number of true value for the decision. We do this to make sure that the model is good enough to be used on other samples of the global population.

We see that the proportion of predictions that correctly predicted that the respondent sought help is 0.475 (also known as the sensitivity), while the proportion of predictions that correctly predicted that the respondent did not seek help is 0.79 (also known as the specificity). This means that our model is far more likely to predict that the respondent did not seek help than our results in (Table 1) would indicate. Thus our predictive model seems to be biased towards 0. The total predictive proportion is (0.475 x 0.43) + (0.79 x 0.57) = 0.654, so overall the model correctly predicts the results about 65.4% of the time. Thus our model is not very good at predicting the probability that someone seeks help, and should not be used to predict this probability on other samples due to its inaccuracy. This also indicates that the decision to seek help may be due to other personal reasons inherent to the individual that cannot be determined by what group they fit into, and shows that there is a lot of work to get the root behind these decisions and to progress mental health acceptance in general.

Table 3: Training and Testing Model Predictions Compared to True Observations

Prediction	Truth	Truth.
	Did Not seek Therapy	Sought Therapy
Did Not seek Therapy	2206	1068
Sought Therapy	555	965

5 Discussion

5.1 Bias and Ethical Concerns

As this data is based on people and their personal experiences on sensitive topics, there is likely to be some ethical implications that could limit the true accuracy of our data.

A problem with the original data source is that only two genders are listed, male and female. However there are many different gender identities internationally, showing that even if though the dataset is based on a global issue, the way that the data was collected is eurocentric. These different gender identities also come with their own mental challenges and experiences that hinder their decision to seek help. As these different gender identities and their experiences are not included in the original survey, it hinders the accuracy of the main points that the Wellcome Trust intended to make. Gender non-conforming people are often ridiculed, looked down and not allowed to progress in their society due to the effects of colonialism (Hussain 2019), in such a way that they were not included in a survey specifically intended to be used to improve mental health treatment. The dataset also did not include an 'other' option to account for the diversity in gender identities.

The dataset only collected data on anxiety and depression and respondent opinions and experiences with these disorders. They did not include different common but also debilitating mental disorders such as Bipolar Disorder, ADHD and others. Not including these disorders when conducting the survey promotes the further exclusion of people with these illnesses from the general view, and also hinders their ability to seek treatment even as these disorders are also common. It also perpetuates the view that depression and anxiety are the only sympathetic disorders, while other mental disorders that affect the lives of millions worldwide are type cast as dangerous and unpredictable.

The survey collected information on people only 15 years and older, but the mental health for children is also important. Children below the age of 15 make up 26% of the global population, and are also prone to disorders such as depression and anxiety. Child psychology deals with the importance of mental heath treatment for children and how traumatic experiences from childhood can affect adulthood, but such vital information is missing from the dataset. This helps perpetuate the difficulty of child care to be taken into account when dealing with multi-national health topics. Children are also less likely to seek mental health care due to parental situations that were mentioned in the report, and this could have brought up important conversations on when children need to start making their own medical decisions and the advantages or disadvantages of that choice (Fundudis 2003). As their experiences were not part of the survey, the results are likely inaccurate as a measure of global perceptions and experiences towards mental health and mental health care.

Finally, the dataset does not explain why lower income and unemployed people are less likely to seek mental health care to their richer counterparts. This would then lead those analyzing the data to believe that it is correlated to their level of education; that they are not self-aware enough to know that they have a problem. This is often not the case as low income people are often fully aware of the problems they have and the need to treat it, but simply do not have the funds or the availability to utilize mental health resources.

5.2 Data Collection Concerns

As seen in (Figure 8), there were several countries in which no data was recorded. This could be because either these people were not being randomly chosen due to a small population, or that no-one that was chosen in the country decided to participate in the survey. Many of these missing countries were from Africa, and this missing data from these countries introduced bias in the dataset as these countries make a significant portion of the total global population. The results presented are thus likely very different from the true global perceptions of mental health and care, and is likely biased towards experiences of the western world and South America as most countries in those continents were included.

Some countries' mental health data were collected in a non-representative way. This was due to all respondents being from just one city in the country; for example all respondents from Congo lived in Brazzaville. The data for these countries are thus not randomly sampled, and doesn't contain the true overall perspective as the views of city dwellers are likely different from those in smaller towns or rural areas.

There is not direct, "one size fits all" way to determine or measure depression and anxiety within an ethnographic context, as not all expressions of these illnesses are the same, and different cultures may express them in different ways. As the ways that respondents understand these concepts are likely very broad, creating a standardized way as stated in the methodology section (GallupPolls 2020b) is too restrictive and also has the possibility of following eurocentric standards of mental illness. Thus, the dataset may not be getting the full picture of the ways that people relate to mental disorders in their daily life and their perceptions of these illnesses.

The survey put "Don't Know" and "refused to answer" in the same option. This causes problems as the people who truly do not know could actually have an opinion or answer, but due to not understanding the question because of the strict interpretation of questions, were confused. "Don't know" is also not related to "Refused to answer", as not knowing is an opinion in itself and could be used for analysis, however grouping them in with those who refused to answer at all makes these results harder to interpret.

There is also the possibility that people submitted fake answers. Although this is less likely over the phone (the way the survey was conducted) than over the internet, it still poses a problem. Filtering out this data is thus difficult as there is no indicator of which information is real and which is fake.

5.3   Impact of Age and Mental Health Access

(Figure 7) revealed that the older one is, the higher the probability that they seek mental health care, gender notwithstanding. There are several mental health stresses related to age, such as a decline in capabilities and functional ability. As these are less likely to happen to younger people, they are less likely to seek therapy because of it. Older people may also feel that as they are getting older they are more of a burden to society and less functional, due to ageism. This may also induce age related problems such as depression over loss of function and anxiety over being replaced (Lori A. Harris 2001). For middle aged adults, the stress of work may also contribute to these mental health problems and the decision to seek help, which young adults do not relate to as they are in college or just starting their careers. This could also be associated with the mid life crisis common in men around 40, an attempt to hang onto youth. This can affect the decision to finally seek help over the anxiety of aging and their new positions in life. In addition, older people are more likely to experience events such as bereavement, or a drop in socioeconomic status with retirement. All of these stresses can result in isolation, loneliness or psychological distress in older people, for which they may seek mental health care (Organization 2017). As younger people still do not have as many societal pressures on them as older adults, or are not as knowledgeable on the existence of mental health and treatment compared to those with more life experience, they are less likely to seek help. Mental health problems are under-identified by health-care professionals and younger people themselves, and the stigma surrounding these conditions makes younger adults reluctant to seek help (Corrigan, Druss, and Perlick 2014). Older adults are also more likely to have a larger income than young people, making them more likely to be able to afford treatment compared to young adults who don't have an accumulation of funds from decades of being in the workforce. This means that young adults who suffer from these disorders are less likely to seek the help they need.

5.4   Impact of Gender on Mental Health Access

Gender is one of the critical determinants of mental health expression and the decision to seek mental health care. Many studies such as (Pattyn, Verhaeghe, and Bracke 2015) have shown that women, irrespective of segmentation in other groups such as age, employment status, etc. are consistently more likely to seek mental help than men are. This is not due to a lack of need of mental health care from men, but mainly due to different patriarchal societal expectations of men and women, which restricts the emotional vulnerability that men are allowed to express in society. Men and women think and act as they do due to cultural ideas of femininity and masculinity, not because of role identities or psychological qualities (Mackenzie, Gekoski, and Knox 2006). People have preconceived biases about what behavior is acceptable for different genders and perpetuate these gender difference during social encounters. Women in the United States reported higher degrees of distress than males, and they were more likely to perceive having an emotional disorder than men with similar levels of symptoms (Coveney 2022). Emotional expression, health care, and asking for help are all framed as feminine traits. Men are expected to be emotionally stable and be strong, self-reliant, and

independent. On the contrary, women are expected to show their emotions, be frail, and rely on others. Thus, men separate themselves from women by hiding their own health needs and refusing to seek care to conform to the standard male roles. These happens worldwide in some form, irrespective of the specific ideas of masculinity, or how socially progressive the country is. Men may be hesitant to seek professional help because of this conflict in gender roles, and the fear of increased stigma and "demasculinaztion" if they decide to seek help. Men are thus more likely than women to deal with mental disorders on their own, or delay getting treatment to the point that avoiding the problem becomes impossible. If they do seek professional help, they prefer quick solutions, which is why they are more likely to seek medical treatment over therapy (Pattyn, Verhaeghe, and Bracke 2015). Therapy also involves being emotionally vulnerable to another person, which is discouraged in the strict standards for masculinity. These standards start young, as boys are more likely to be discouraged from crying or showing emotions when they are sad; the general "be a man" concept, as opposed to young girls where similar actions are encouraged (Vogel et al. 2011). Male socialization discourages these behaviors as being weak or womanly,which leads these boys as they get older to conceal their emotion to the point of not recognizing inner problems. This also leads to the much higher suicide rates for men as they do not seek help to the extent that women do.

5.5   Impact of Income and Employment on Mental Health Access

Professional mental health care is expensive and unattainable for many as the cost of a single session can cost over a hundred US dollars, and in many cases several therapy sessions are needed over a long period of time. This makes mental health care inaccessible for many people worldwide who have neither the time nor the money to undergo the full extent of treatment. This increases the barriers that low income people who often work demanding jobs have to go through to get the help that they need.

The report, specifically (Table 2) and other literature shows that lower income people do not have the ability to seek mental health care as much as higher income people do. Low income people spend their money on necessities instead, and as lower income people often do not see mental health care as an important cost to bear (Hodgkinson et al. 2017). Poverty itself has a negative effect on mental health, with the stress and anxiety of not being able to afford bare necessities or partake in recreational activities which cost money, as well as raising children on a low budget and the stigma of being poor that exists globally (Hodgkinson et al. 2017). Still, there is a vast unmet need for mental health services in this population. It is estimated that among people experiencing poverty in the US who are in need of mental health care, less than 15 percent receive mental health care, and even fewer complete treatment (Hodgkinson et al. 2017). People living in poverty also face non-financial barriers that reduce their ability to access mental health services. Families in rural areas, for example, often have to travel long distances to access mental health services. A lack of insurance and state funded health care can also prevent lower income people from accessing the help that they need. Mental health clinic hours are also often during the day and do not accommodate for low income people working in low wage jobs, who often do not have the flexibility to consistently attend therapy (Hodgkinson et al. 2017). The effects of these barriers are increased by the stress and demand of living in poverty. (Hodgkinson et al. 2017) adds that some mental health professionals need to confront their failures on addressing the needs of lower income people, including a lack of training for practice in the context of poverty, facing their own personal biases and beliefs, stigma associated with working with families from low-income communities, and difficulties applying the standard diagnostic framework with people struggling to get by. This also influences why some low income people do not trust the health care system, and by association, the mental health care system. This also causes a negative feedback loop in which poor mental health makes unemployment much more likely and also increases the length of unemployment (W.LINN, SANDIFER, and STEIN 1985), which then affects their ability to earn an income, which makes it harder to seek mental health care (Drake and Wallach 2020). This is a cycle that keeps poor people from accessing help to treat their problems and further perpetuates their stigmatization in society as being both low income and mentally ill.

Even higher income people who are employed do not seek mental health services because they likely see the stress and anxiety they face in work as normal factor of their highly stressful jobs. Places where the employed are overworked will often make them believe that this is an inherent characteristic of the work environment, and not pay for mental health care for workers. Those who are employed but underpaid, or are part time

employed but want full employment also have issues similar to unemployed and low income people. Self employment also has no positive mental benefit for men and a negagive benefit for women, and they are also less likely to seek help as seeking treatment for mental disorders is not a priority due to a lack of free time (Parslow et al. 2004). However, high income people are more likely to have stability, can afford therapy and can afford to seek better options if things go wrong. This is in contrast to those who are unemployed or underemployed, who often suffer from anxiety/depression that they cannot afford to treat (Drake and Wallach 2020).

5.6 National Differences

The average probability of seeking mental health care varies by country and continent, as shown by (Figure 8). We see that overall Europe had a higher average probability of seeking mental health care, Africa had a lower average probability, and the average probability for Asia was in the middle. The countries that had a lower probability of seeking mental health care are often lower income countries, which translates to less funding for mental health facilities, as well as more isolated rural areas where these facilities and knowledge of mental health in general, are scarce. In these countries there are also less amount of trained professionals in mental health psychology, and those who are trained often often migrate to higher income countries, contributing to brain drain and a worsening mental health care network (Saraceno et al. 2007). Mental health is also not seen as a priority in many low income countries, with many countries having mental heath services being less than 1 percent of the total health budget (Patel 2007). In these countries there is also a distrust for the usually western based mental health care, seeing it as foreign and preferring to seek more traditional avenues for mental health problems, usually religion based (Weatherhead and Daiches 2010). Less progressive beliefs and attitudes towards mental health also are more prevalent in these nations. In these countries, especially the poorest income countries, mental health treatment is less of a necessity compared to acquiring physical treatment for physical ailments which can hinder physical work, and is needed for survival. People in these countries with visible problems are also often labeled as being possessed or crazy, without inspection of the underlying problems. Thus locally available, affordable mental health treatment options are not an option for these countries(Patel 2007). This is especially true for countries in Africa and the middle east which are currently undergoing war. This leads to a major drain of professionals and destruction of health facilities.

In contrast, wealthier and more developed nations have a well endowed, developed network of mental health professionals, and the care is either free or heavily subsidized. The facilities are easily available and the public is more educated on mental disorders, how they can be treated, and the importance of treatment. However, this is not true for all first world nations, as industrialized East Asian countries still have a bias against victims of mental disorders (Roh et al. 2016), which lead to their stigmatization in society. Mentally ill people are often seen as weak or the cause of their own problems, and thus are less likely to seek help. This indicates that culture and education, not just wealth of a nation, affects the choice to seek mental health care.

Colonialism also affects these actions as some mental health stigmas or situations that can cause mental health disorders that is found in some countries did not exist before the age of imperialism. This includes the stress and anxiety that LGBT people often get due to oppression from countries not known to be historically homophobic (Dagsvold, Møllersen, and Stordahl 2015). More rigid gender binaries were introduced by colonialism, which did not exist in some more gender-egalitarian precolonial societies, thus enforcing the gender gap in mental health care seen today. The introduction of religion, primarily Christianity and Islam, also influences the decision by people in colonized nations to seek religious help over professional mental health care.

5.7 Views of Mental Health and Mental Health Care in Society

The report shows that there is still a long way to go for mental health to be seen as important as physical health. Despite mental disorders being very common, there are several social, cultural, financial, systemic, and personal stigmas that lead people to choose not to seek care. All of these need to be addressed to see a real change in mental health care awareness.

In many societies there is still a lot of misconceptions on what constitutes mental disorders and illnesses, and how to treat them. Views on mental disorders are heavily affected by religion, in which some relegate these

problems to spirits or other supernatural entities (Gadit 1997), while other beliefs see them as a punishment (Zolezzi et al. 2018), while in others, people with mental problems are seen as religious leaders. The decision to seek mental health care is also influenced by religion, as some religions see this form of care as fake science and encourage seeking religious authority instead.

Negative views towards mental health care in the west may also be influenced by historic and present treatment of mental health patients in wards and asylums. In the past, the main purpose of these mental institutions were not to truly help the patients, but to lock them away from society, where the abuse that these patients underwent under staff was concealed. Nowadays, there are fears that mental health institutions will separate people from society, i.e institutionalize them, if they reveal too much to therapists (Richman and Harris 1982). Mental disorders with less obvious symptoms are often overlooked or misdiagnosed.

Mental health care has also had a negative history with racial and ethnic minorities worldwide, that paints a negative view of the system in the modern day. Legitimate mental problems that occurred in these minorities were discarded due to their minority status, or were given worse treatment due this status, leading to modern day distrust of the system (Dagsvold, Møllersen, and Stordahl 2015). Racial and ethnic minorities are also less likely to have access to adequate care, leaving them with less than stellar treatment, which negatively affects their view on all forms of mental health treatment (Surgeon General 2001).

A popular view on mental health is that any mental problems a person may face is from their own shortcomings and within their control (Murt 2016). Many do not understand the medical reasons behind mental disorders, and see mental disorder symptoms as a failure of personal responsibility. The more negative symptoms of some mental disorders such as violent outbursts or poor hygiene also paint a negative light on the mentally ill as bad people rather than as sufferers of debilitating disorders (Corrigan, Druss, and Perlick 2014). This makes it hard to not only talk about these problems with others, but also to seek help, as the sufferers a sense of guilt over their own mental state.

People with mental health problems are less likely to find work, be in steady relationships, live in decent housing, and be socially included in mainstream society. This is due to institutional biases such as having less faith in the mentally ill, manifesting in ways such as landlords not believing that those with disorders can hold a house, or employers seeing them as unpredictable and unstable. This shows why those with less obvious symptoms choose not to come out and seek help (Corrigan, Druss, and Perlick 2014). Mental health is demonized through stereotypes that perpetuate preconceived negative notions about the mental ill, such as being violent or lazy. The media in many countries often link mental illnesses with violence or portray victims as dangerous or criminal, or unable to live normal lives. In contrast, those who have the support system and confidence to be vulnerable with others, such as friends, on sensitive topics are more likely to be willing to seek help from professionals (Mojtabai 2007).

However, being part of groups that are more likely to seek mental health care does not guarantee that one actually does seek help. This may be due to personal stigma and guilt over their own mental state. Although this guilt is heavily influenced by societal views on mental disorders, many disorders come with inherent self doubt or lack of desire to seek help and recognize a problem, such as paranoid personality disorders. Education on such types of disorders are not well known, and symptoms of these disorders are often attributed to inherent qualities of the person instead. Thus further awareness on the diverse types of mental health and the improvement of current global societal views are crucial to be able to identify sufferers of such disorders and deliver treatment.

6 Weaknesses and Next Steps

During data cleaning, we removed all observations that had a missing value in the response variable; the choice to seek professional mental health care. This removed a lot of observations from the model, even removing all the observations of one country. If these observations were not dropped randomly from the dataset, there is bias and we are not getting the true results. All observations which included "Not Sure" were changed to a "No" in our dataset. As the true beliefs of a person who put "Not sure" could have actually been a "Yes" if they understood the question, or a "Not Sure" was their genuine answer, putting a "No" introduces bias in the model. The predictive effect of our model was quite weak, only getting 65.4% of total

observations correct. This may indicate that our model did not have the best variables possible to explain the choice to seek mental health care. Also as our model has a binary output, we are not able to account for not just the decision to seek care, but how many sessions of therapy were attained. We are generalizing that everyone who sought help at least once sought it multiple times, which is often not the case. Finally, a lot of our variables in model assumptions were very dependent on each other, meaning that this multicollinearity could have caused less precise estimates of our coefficients.

For further reports, the dataset does not state whether a person chooses not to seek help because they do not want help, or because they are not able to seek help, or both. Dividing these decisions into two variables could help with further analysis on the barriers to getting mental health treatment. We could also include other mental disorders and their effect on societal attitudes and decisions to seek help, as well as respondent experiences with these disorders. This will create a fuller idea of how mental disorders are viewed worldwide. We could also focus specifically on mental health in the COVID19 era, and how COVID19 and subsequent lockdowns changed attitudes towards mental health. We could use a linear mixed model to include a random effect for the respondent's country to account for the possibility that not all observations in the same country are truly independent from each other, as they may have similar shared experiences. We could also use other variables in our model related to perceptions and opinions on mental health and mental health care to improve the predictive properties of the model.

7 Appendix

7.1 Datasheet for Dataset

7.1.1 Motivation

1. **For what purpose was the dataset created?**

This dataset was created to collect information on the global perceptions of mental disorders and mental health related topics, as well as experiences with mental disorders. The dataset was edited to evaluate the importance of mental health to people worldwide, as well as the probability that a person seeks mental health care, dependent on their belonging to various groups.

2. **Who created this dataset (e.g. which team, research group) and on behalf of which entity (e.g. company, institution, organization)?**

This dataset was created by the Wellcome Global Monitor on behalf of the Wellcome Trust, and edited by Olaedo Okpareke of the University of Toronto.

3. **What support was needed to make this dataset?**

The project was funded by the Wellcome Trust.

4. **Any other comments?**

No.

7.1.2 Composition

1. **What do the instances that comprise the dataset represent (e.g. documents, photos, people, countries)?**

Each row of the main dataset is a person, and contains the information about that specific person.

2. **How many instances are there in total (of each type, if appropriate)?**

There are about 119,000 instances in the original datset. The dataset used for the report contains about 23970 instances.

3. **Does the dataset contain all possible instances or is it a sample (not necessarily random) of instances from a larger set?**

The dataset is a sample of the total global population. The sample is intended to be representative of the global population. This was validated by stratification of the dataset by the authors.

4. **What data does each instance consist of?**

Each instance consists of demographic and societal information, or information on beliefs and choices regarding mental health and mental health care. For example Age, income class, country, belief in mental health science.

5. **Is there a label or target associated with each instance?**

Yes, there is a unique case ID for every individual.

6. **Is any information missing from individual instances?**

There is a lot of missing information, particularly on the choice to seek mental health care. This is most likely because these questions were not asked to most respondents.

7. **Are relationships between individual instances made explicit (e.g. users' movie ratings, social network links)?**

Yes, through the unique ID.

8. **Are there recommended data splits (e.g. training, development/validation, testing)?**

No.

9. **Are there any errors, sources of noise, or redundancies in the dataset?**

There may be, if respondents answered untruthfully. It is difficult to tell.

10. **Is the dataset self-contained, or does it link to or otherwise rely on external resources (e.g. websites, tweets, other datasets)?**

It is self-contained.

11. **Does the dataset contain data that might be considered confidential (e.g. data that is protected by legal privilege or by doctor-patient confidentiality, data that includes the content of individuals' non-public communications)?**

Yes, the decision to seek mental health care, age, and the subjective income are examples of private information in the dataset.

12. **Does the dataset contain data that, if viewed directly, might be offensive, insulting, threatening, or might otherwise cause anxiety?**

No, the survey designers made sure to remove any potentially insensitive questions.

13. **Does the dataset relate to people?**

Yes.

14. **Does the dataset identify any subpopulations (e.g. by age, gender)?**

Yes. Age, gender, and country are examples.

15. **Is it possible to identify individuals (i.e., one or more natural persons), either directly or indirectly (i.e., in combination with other data) from the dataset?**

No.

16. **Does the dataset contain data that might be considered sensitive in any way (e.g. data that reveals racial or ethnic origins, sexual orientations, religious beliefs, political opinions or union memberships, or locations; financial or health data; biometric or genetic data; forms of government identification, such as social security numbers; criminal history)?**

Yes, it contains political information on if the government should fund mental health research.

17. **Any other comments?**

No.

7.1.3 Collection

1. **How was the data associated with each instance acquired?**

Through a telephone-based global survey in which the respondents were directly asked questions.

2. **What mechanisms or procedures were used to collect the data (e.g. hardware apparatus or sensor, manual human curation, software program, software API)?**

Manual Human curation, as each question was answered through speech and then manually recorded as a numeric observation.

3. **If the dataset is a sample from a larger set, what was the sampling strategy (e.g. deterministic, probabilistic with specific sampling probabilities)?**

Probability based random Sampling.

4. **Who was involved in the data collection process (e.g. students, crowdworkers, contractors) and how were they compensated (e.g. how much were crowdworkers paid)?**

Researchers, Surveyors and Volunteers with the Trust. Pay structure is unknown.

5. **Over what timeframe was the data collected?**

February 2020 to August 2021.

7. **Were any ethical review processes conducted (e.g. by an institutional review board)?**

Yes, questions were screened for sensitivity by Gallup's Institutional Review Board (IRB).

The process was Research and Literature Review -> Expert Interviews -> questionnaire first draft -> cognitive testing -> questionnaire refinement -> pilot testing -> Final questionnaire.

8. **Does the dataset relate to people?**

Yes.

9. **Did you collect the data from the individuals in question directly, or obtain it via third parties or other sources (e.g. websites)?**

Data was gotten directly from individuals.

10. **Were the individuals in question notified about the data collection?**

Yes, they were told that their answers would be recorded.

Link: https://cms.wellcome.org/sites/default/files/2021-10/wgm2020-methodology.pdf

11. **Did the individuals in question consent to the collection and use of their data?**

Yes, those who did not consent for their answers to be recorded had their observations stated as "Refused" in the dataset.

Link: https://cms.wellcome.org/sites/default/files/2021-10/wgm2020-methodology.pdf

12. **If consent was obtained, were the consenting individuals provided with a mechanism to revoke their consent in the future or for certain uses?**

No.

13. **Has an analysis of the potential impact of the dataset and its use on data subjects (e.g. a data protection impact analysis) been conducted?**

No.

14. **Any other comments?**

No.

7.1.4 Preprocessing / Cleaning / Labeling

1. **Was any preprocessing/cleaning/labeling of the data done (e.g. discretization or bucketing, tokenization, part-of-speech tagging, SIFT feature extraction, removal of instances, processing of missing values)?**

Yes, the data was cleaned but missing values were not processed.

2. **Was the "raw" data saved in addition to the preprocessed/cleaned/labeled data (e.g. to support unanticipated future uses)?**

No.

3. **Is the software used to preprocess/clean/label the instances available?**

No.

4. **Any other comments?**

No.

7.1.5 Uses

1. **Has the dataset been used for any tasks already?**

Yes, to provide background information on the most appropriate ways to form mental health treatments.

2. **Is there a repository that links to any or all papers or systems that use the dataset?**

No.

3. **What (other) tasks could the dataset be used for?**

It could also be used for predicting other variables, such as the probability that someone has felt anxious or depressed in the last 12 months.

4. **Is there anything about the composition of the dataset or the way it was collected and preprocessed/cleaned/labeled that might impact future uses?**

Yes, the data was collected during the COVID lockdown era, which might have had a heavy impact on perceptions and access to mental health care that may not normally be the case in the future.

5. **Are there tasks for which the dataset should not be used?**

No, none were stated.

6. **Any other comments?**

No.

7.1.6 Distribution

1. **Will the dataset be distributed to third parties outside of the entity (e.g. company, institution, organization) on behalf of which the dataset was created?**

No, the dataset is only available on the Wellcome Trust website.

2. **How will the dataset be distributed (e.g. tarball on website, API, GitHub)?**

On the Wellcome Global Monitor Website. There is no DOI or GitHub available.

3. **When will the dataset be distributed?**

The dataset is already available.

4. **Will the dataset be distributed under a copyright or other intellectual property (IP) license, and/or under applicable terms of use (ToU)?**

Intellectual property of the Wellcome Trust.

Link: https://wellcome.org/who-we-are/privacy-and-terms

5. **Have any third parties imposed IP-based or other restrictions on the data associated with the instances?**

No.

6. **Do any export controls or other regulatory restrictions apply to the dataset or to individual instances?**

No.

7. **Any other comments?**

No.

7.1.7   Maintenance

1. **Who is supporting/hosting/maintaining the dataset?**

Wellcome Trust supports, hosts, and maintains the dataset.

2. **How can the owner/curator/manager of the dataset be contacted (e.g. email address)?**

Email address, although not directly stated on Website

Telephone: +44(0)2076118888

3. **Is there an erratum?**

No.

4. **Will the dataset be updated (e.g. to correct labeling errors, add new instances, delete instances)?**

No, the dataset is final.

5. **If the dataset relates to people, are there applicable limits on the retention of the data associated with the instances (e.g. were individuals in question told that their data would be retained for a fixed period of time and then deleted)?**

No, there is no limit.

6. **Will older versions of the dataset continue to be supported/hosted/maintained?**

Older versions of the dataset, i.e datasets for previous years, are being hosted on their own web pages.

7. **If others want to extend/augment/build on/contribute to the dataset, is there a mechanism for them to do so?**

No. Only those employed by or partnered with Wellcome Trust or Gallup Polls are approved to add on to the dataset.

8. **Any other comments?**

No.

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