

EARLY LIFE EXPOSURE TO RECESSIONS AND
ADULT MENTAL HEALTH

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ABSTRACT

Mental illness has increasingly become a problem throughout the world and is believed to cost the global economy \$16 trillion by 2030. Consequently, a growing body of literature investigates the possible causes of mental illness and more specifically, possible early life circumstances which may affect adult mental health. Limited research exists though in terms of exposure to recessions in utero and early life and adult mental health. Thus, the purpose of this study is to investigate this relationship. By using data from the World Health Survey and recession data from the Barro-Ursua Macroeconomic Dataset, which covers more than 26 000 individuals in 20 countries, three dimensions of exposure are taken into consideration. These dimensions comprise of in utero exposure, early life (0-4 years) exposure and the number of years living through a recession. A fixed effects model controlling for country-, year-of-birth as well as survey-year effects is used. The results suggest that no significant relationship between in utero and early life exposure to recessions and adult mental health can be found. Neither does there exist a significant relationship between the number of years living through a recession and adult mental health. The results remain stable throughout several heterogeneity- and robustness checks. The results suggest that either no actual relationship exists or that recession data is too diffuse in terms of timing to capture any effects that may be present. Future research should therefore further investigate this relationship using elaborate measures and to a greater extent sample developed countries, to capture any underlying mechanisms that may play an important role.

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I INTRODUCTION

Mental illness and its causes have increasingly gained interest as a research field as it has become an increasingly growing problem throughout the world (Drydakis, 2015; Latif, 2015; Ruhm, 2000; Gerdtham and Ruhm, 2006). It is believed to cost the global economy \$16 trillion by 2030 (Vikram *et al.*, 2018) and approximately a third of the population in most countries are believed to have met the criteria (using DSM-III-R and DSM-IV framework, which are the Diagnostic and Statistical Manuals for mental disorders) for mental illness at some point in life (WHO, 2000). Recent prevalence estimates have shown that mental illness is often chronic even though the number is higher for anxiety disorders and lower for substance-use disorders. Differences in prevalence is as well present between genders (WHO, 2000). As mental, neurological and substance use disorders are major contributors to morbidity and premature mortality throughout the world it is of importance to gain more understanding of the causes and implement policies that will restrain it from increasing (WHO, 2003).

Given the high costs of mental illness, a growing body of research in Economics investigates the causes of mental illness. One strand of research analyses the impacts of recessions and contemporary mental illness. (Drydakis, 2015; Latif, 2015; Ruhm, 2000; Gerdtham and Ruhm, 2006) and findings within this strand suggest that there is a positive relationship. However, limited research exists which investigates the relationship between *early life* exposure to recessions or economic shocks and *adult* mental health. As suggested by research, recessions may cause maternal stress which in turn can have long-lasting effects on the child's development and post-natal depression and anxiety (O'Donnell *et al.*, 2014). Some research in Development Economics has already been made, estimating the impact of temperature or rainfall shocks (as a proxy for economic shocks) exposure in utero and early life on morbidity and adult mental health (Adhvaryu *et al.*, 2015; Dinkelman, 2017). However, research which investigates early life exposure to milder economic shocks or recessions using macroeconomic measures in other than developing countries is scarce. Thus, there is a need to bridge this knowledge gap in order to fully understand which factors affect mental health.

In this study, I estimate the impact of exposure to recessions in utero and early life on adult mental health. Thus, the research question to be answered is: *Is there a significant relationship between exposure to recessions in utero or early life and adult mental health?*. 20 countries are included in the sample (Austria, Belgium, Brazil, China, Denmark, Finland, France, Germany, Greece, India, Italy, Mexico, Netherlands, Portugal, Russia, South Africa, Spain, Sri Lanka, Sweden and Uruguay) and data has been collected from the World Health Survey (conducted

by the World Health Organization) and the Barro-Ursua dataset, which measures aggregate macroeconomic data. The outcome variable is an aggregate measure of mental health which combines individual survey questions from the World Health Survey into a single measure. Furthermore, this paper uses three treatment variables: exposure to recessions in utero, exposure to recessions in early life and number of years living through a recession from in utero to age four. For the purpose of this paper, I define early life as starting at birth and ending at age four. The identification strategy used for my estimations includes year-of-birth, country fixed effects and survey-year fixed effects. Thus, any unobserved factors that may remain fixed over time within the group of observation or factors that vary similarly across groups over time are accounted for.

The results suggest that no significant relationship between in utero and early life exposure to recessions and adult mental health is present. Neither does there exist a significant relationship between the number of years spent living through a recession in early life and adult mental health. Several heterogeneity checks are performed to control for any variability that may be present in terms of gender, age groups and individual health measures. Furthermore, robustness checks are performed which exclude migrants and the World War II years as well as performing estimations with different degrees of recessions. The results remain stable for most checks, confirming the validity of the results.

This study makes multiple new contributions to the existing literature. First, it investigates the relationship between exposure to recessions in early life and adult mental health which has, to my knowledge, never been performed before. Second, it extends on previous research and performs the analysis on a greater share of developed countries and does not solely focus on developing countries. Third, it takes several treatment measures into consideration, covering several dimensions of exposure to recessions in early life. Thus, this paper provides decision-makers with more extensive information on early life exposure to recessions and the relationship to mental health in adulthood.

This paper is organized as follows: Chapter II reviews the current body of literature within and close to the field of early life exposure to shocks and adult health outcomes. Chapter III goes through the empirical strategy of this study and Chapter IV describes the data and data sources used. Chapter V reports the estimation results from the main analysis as well as the results from the heterogeneity- and robustness checks. Chapter VI reviews the main results and recommendations for future research. Finally, Chapter VII summarizes the study and its results.

II LITERATURE REVIEW

To get a good understanding of the knowledge gaps within the field of early life exposure to shocks and adult mental health, I review the current body of literature starting from the fetal origins hypothesis. This research is divided into several important branches, each of them reviewed in subsequent sections: (1) the impacts of in utero and early life shocks to later life health outcomes, (2) the impacts of exposure to recessions or economic shocks in early life and later life health outcomes, (3) recessions' impact on contemporary mental health and (4) early life shocks and adult mental health.

The fetal origins hypothesis was first introduced by Barker (1990), a physician and epidemiologist who argued that the effect of fetal conditions are persistent and that health effects can stay latent for many years. The hypothesis suggests that fetal shocks have significant impacts on the developmental health for individuals from infancy to adulthood. It has spawned a growing literature within the field of Economics where many contributions have been made since its introduction. More precisely, research has found that adult outcomes such as marital status shocks, neighbourhood characteristics and welfare dependency may all be related to fetal shocks (Almond *et al.*, 2010; Almond, 2006; Brandt *et al.*, 2008). Furthermore, a considerable amount of research has focused on exposure to disasters in early life and later life outcomes, and which found significant effects on adult outcomes (Almond, 2006; Almond *et al.*, 2010). However, Almond and Currie (2011) review relevant literature and argue that research within the field needs to become more policy relevant, such as exposure to milder shocks as opposed to disasters. Almond *et al.* (2017) further identify gaps in the current literature in terms of whether at which point intervention should be made and if it would be feasible for affected individuals.

Other research has investigated the effects of recessions or economic shocks on fetal health and where health in adulthood is the research focus. van den Berg *et al.* (2006) found that those born during recessions in the Netherlands lived shorter than those born during a boom. However, research on recessions or economic shocks and fetal health tend to be less consistent and as opposed to the results found by van den Berg *et al.*, estimations by Cutler *et al.* (2007) found no significant effects of the long-term impact on health of cohorts born during the Dust Bowl era. Further literature investigates how variation in grain prices in the decade of birth may affect adult numeracy (Baten *et al.*, 2007). They found that children who were born in decades with high grain prices were less numerate by index.

There exists a rich body of empirical literature on the impact of recessions on contemporary mental health. Hamilton *et al.* (1997) analysed the relationship between mental health and employment for Montreal residents. The findings suggest a beneficial effect of mental health on employability as well as improved mental health as a result of employment. Research by Latif (2015) found a positive significant effect of unemployment to depression for individuals in Canada which is consistent with other research in the field (Drydakis, 2015; Gili *et al.*, 2013). Cooper (2011) provides an overview of the available literature within the field of medicine. The study suggests that stresses associated with rising unemployment, poverty and social insecurity will lead to upward trends in suicide rates and increase in the prevalence of psychiatric illnesses.

More recently, literature has turned its focus on milder shocks in utero and early life and the impact on adult mental health. Economists have found significant positive effects of individuals born in cocoa-growing regions in Ghana and psychological distress in adulthood if they were born in years of lower cocoa prices (Adhvaryu *et al.*, 2015). Furthermore, research by Dinkelman (2017) suggests that droughts in early childhood has a significant long-run impact on adult mental and physical disabilities. Other literature investigates how the death of maternal relative in early childhood increases the take-up of medications which treat mental illness (Persson and Rossin-Slater, 2018). Significant results for the impact of fetal exposure to Ramadan-related fasting for an Arab population in Michigan on mental disabilities were as well reported by Almond and Mazumder (2011). The underlying mechanisms which may lead to physical and mental health risks in adulthood by early life circumstances has further long been of interest in the field of medicine. Taylor (2010) reviews the literature within the field and which were characterized by complex multivariate models that focus on underlying mechanisms over time. Early environment and genetic predispositions, with recurring stress responses were found to be determinants to mental and physical health risks. These findings are further supported by more recent literature (Clara *et al.*, 2013).

Current literature identifies several strands of early life circumstances and adult health outcomes. However, no research to my knowledge, investigates the relationship between in utero and early life exposure to recessions and adult mental health. Thus, this study contributes to the vast body of empirical work in the field by filling the gaps currently present in the literature.

III EMPIRICAL STRATEGY

The purpose of this study is to estimate the impact of in utero and early life exposure to recessions on adult mental health. As the research question is causal, a model which investigates causal relationships must be specified. The first-best model design for a study such as this one is a randomized controlled trial where individuals are randomly assigned to two or more groups in order to overcome selection bias. One or more groups receive treatment (such as worse economic conditions) while another group stays untreated (control group). The responses of the treatment are then investigated relative to the untreated group. A model design such as the randomized controlled trial is however not a viable option in practical or ethical terms for the purpose of this study. Another method for identifying causal relationships and the second-best option for this study is the use of natural experiments in observational data. That is using natural occurrences which are not controlled for by observers such as recessions. These natural experiments may then be exploited by fixed effects estimation.

The strength of the fixed effects model is that it can mimic the design of randomized controlled trials and control for both observed as well as unobserved factors in order to capture any causal effects that might be present. Factors that the fixed effect model can account for are those that remain fixed over time within the group of observation. Additionally, the time fixed effect accounts for factors that vary similarly across countries over time. This leads to greater credibility to the assumption necessary to estimate the unbiased causal effect. The fixed effects model has been extensively used in previous literature (for example Ahvaryu *et al.*, 2017) and following the current body of research, a model such as this one is used to estimate in utero and early life exposure to recessions and adult mental health. The primary regression specification is given by:

$$Mentalhealth_{i,c,t} = \beta \cdot Recession_{c,t} + x'_{i,c,t} \cdot \gamma + \mu_c + \delta_t + \epsilon_{i,c,t}$$

where $Mentalhealth_{i,c,t}$ is an aggregate measure for mental illness for individual i in country c at time t . $Recession_{c,t}$ is a dummy for being exposed to a recession from in utero to age four, μ_c is a vector of country fixed effects and δ_t is a vector of time fixed effects. $x'_{i,c,t}$ is a vector of individual control variables, which includes dummies for female, marital status, if the individual lives in an urbanized area and age squared, for all specifications. By including country fixed effects, the model accounts for any differences in mental health across countries

that are constant over time. Furthermore, with the inclusion of survey year and year-of-birth fixed effects, the model accounts for trends in mental health that are common across countries. Following previous literature, clustered standard errors are used to account for any correlation that may be present within the countries of observation. However, as clustered standard errors are asymptotic results, the number of clusters must go to infinity in order to obtain valid inference. As researchers have not agreed upon how many clusters are infinitely many it is not clear whether the asymptotic will come through for the results in this study. However, not using clustered standard errors may as well bias the results due to within-group correlation over time. I therefore use wild bootstrapped clustered standard errors as suggested by Cameron *et al.* (2008). The key element of the wild bootstrapped standard errors is that it resamples cluster and thus provides asymptotic refinement. This method has been widely used in previous research in the field and is thus an established method when accounting for small number of clusters (for example Adhvaryu *et al.*, 2015 and Dinkelman, 2017).

One possible issue of investigating the long-run impact of recessions on adult mental health is that recessions are diffuse in terms of timing. More precisely, recessions usually do not act like for example rainfall or temperature shocks. Consequently, the diffusion of timing may lead to inconsistent estimations and influences the results of this study. An additional problem is that recessions may affect fetal health both directly and indirectly through different pathways. The pathways may include behavioral mechanisms such as smoking, drinking and stress-related diseases. It is thus not clear whether recessions may directly trigger mental illness in adulthood or if it is caused by indirect factors such as the ones mentioned above. Presumably, there exist a combination of both, which is shown by the inconsistency in the body of current empirical work in the field (see Chapter II). Another problem is the assumption that all individuals in the population are non-movers and thus have not moved to another country since birth or early life. Presumably, this is not true for the entire population and if for example the country of birth is a country not sampled in this study, the main results may become biased. To ensure that possible migrants do not influence the main results, a robustness check is performed where all migrants are excluded from the estimations.

IV DATA

Two data sources are used in order to estimate the relationship between exposure to recessions in utero or early life and adult mental health. Individual survey data from the World Health Survey is used for the mental health variable and Barro-Ursua Macroeconomic Data is used for the recession variable. In the following chapter, the data is more carefully described.

IV.I MENTAL HEALTH

Data from the World Health Survey for the mental health variable is used in this study. The World Health Survey was conducted by WHO in 2002-2004 in partnership with 70 countries. The purpose is to generate information on the mental and physical health of the adult population and the total sample size includes more than 300 000 individuals. The questionnaire was translated into several languages and designed so that enumerators interviewed respondents in private of about 90 minutes. Households were selected using a random procedure without replacement and individuals were sampled from the population of each country. All respondents belonged to the adult population aged 18 or older.

The WHO data is available for a total of 69 countries but due to limited availability of recession data, only 20 countries of the WHO sample is used for the purpose of this study (Austria, Belgium, Brazil, China, Denmark, Finland, France, Germany, Greece, India, Italy, Mexico, Netherlands, Portugal, Russia, South Africa, Sri Lanka, Sweden and Uruguay)¹. Adults aged 18-70 and only those that responded to one or more of the mental health related questions used in this study are included in the sample. The base sample thus consists of 26 904 individuals. I use age 70 as the upper limit to include the full working population as retirement age may vary between countries. The survey provides questions where the individuals are to estimate their mental health. As only the short version of the World Health Study is available for most developed countries, the selection of survey questions which relates to mental health is limited. Consequently, six survey questions with the same time frame (last 12 months) are used for the mental health variable, and which are listed below:

- *Feeling of sadness, emptiness or depression:* Respondents could choose either “Yes”, “No” or “Don’t know” on the question “Have you had a period lasting several days when you felt sad, empty or depressed?”.

¹ Malaysia, Norway and Philippines were excluded due to missing data.

- *Period lasting several days of lost interest:* Respondents could choose either “Yes”, “No” or “Don’t know” on the question “Have you had a period lasting several days when you lost interest in most things you usually enjoy such as hobbies, personal relationships or work?”
- *Period lasting several days of feeling tired all the time or energy decreased:* Respondents could choose either “Yes”, “No” or “Don’t know” on the question “Have you had a period lasting several days when you have been feeling your energy decreased or that you are tired all the time?”
- *Depression more than 2 weeks:* Respondents could choose either “Yes” or “No” on the question “Was this period [of sadness/loss of interest/low energy] for more than 2 weeks?”
- *Depression most of the day everyday:* Respondents could choose either “Yes” or “No” on the question “Was this period [of sadness/loss of interest/low energy] most of the day, nearly every day?”
- *Loss of appetite:* Respondents could choose either “Yes” or “No” on the question “During this period, did you lose your appetite?”
- *Slowing down in thinking:* Respondents could choose either “Yes” or “No” on the question “During this period, did you notice any slowing down in your thinking?”.

One possible concern when analysing survey questions on mental health is whether they reflect the underlying preferences accurately. I follow Adhvaryu *et al.* (2015), which as well use WHO survey data in order to measure mental health and construct an aggregate measure of mental health. As discussed in the study, an aggregate measure for several individual components of mental health will smoothen measurement error at the individual level as well as measure general tendencies for several components of mental health. The study presents four summary measures where different weights are applied to different disaggregate measures. The results in the study by Adhvaryu *et al.* indicate that using different measures of mental health will not change the results. I thus construct the mental health variable following the same method as for one of these summary measures. I convert each individual measure (i.e. survey questions) into a standard normal variable with mean zero and standard deviation one. Then, for each respondent, I average over the non-missing measures and convert the average into a standard normal variable with mean zero and standard deviation one. The standardized value is lower if a respondent has answered “Yes” on a majority of the above questions and higher if the

respondent has answered “No” on most of the questions. Thus, a lower score defines a higher degree of mental illness.

I further investigate the relationship between the individual survey questions above and mental health as a heterogeneity check. The values are standardized with mean zero and standard deviation one in order to keep consistency through all regressions. As in the case with the aggregate measure of mental health, a lower value indicates that the individual has responded “Yes” to the survey question.

IV.II RECESSIONS

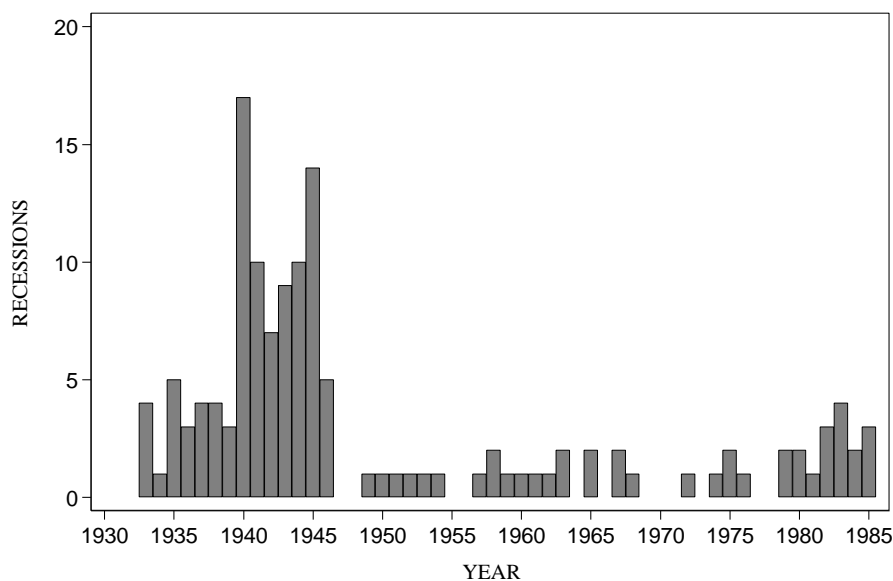
For the purpose of this study, the Barro & Ursua Macroeconomic dataset (2010) is used to construct the recession variable. The dataset covers recessions at the country level and has been widely used to measure macroeconomic fluctuations in previous literature (for example Giuliano and Spilimbergo, 2014). It thus serves well as data source in terms of macroeconomic shocks. The dataset includes more than 40 countries and includes years of 1800-2000, which few other macroeconomic data sources do.

I follow the same method as Giuliano and Spilimbergo (2014), which measures the relationship between growing up in a recession and beliefs in adulthood. I thus define recessions as when the GDP growth is less than the lowest 10th percentile of the GDP growth for the countries included in the sample. Given the sample of this paper, the threshold becomes -2.511 percent. I create a dummy variable which takes value one if the growth is less than the threshold level while in utero and during early life (birth to age four) of an individual and zero otherwise. As a robustness check, the threshold value is changed and the values used in the check represents a GDP growth of 0, -2.511, -5.022 and -10.044 respectively.

Figure 1 displays the number of countries which experienced a recession, using the threshold of -2.511 percent, during the period 1933-1985. The period is the same as used for estimation in this paper. Thus, 1985 is the year-of-birth for the youngest individuals in the sample (18 years old when the survey took place). As observed in Figure I, the number of countries which experienced a recession during given years varies greatly throughout the period. Most countries were exposed to a recession in 1940 which may have several explanations. Presumably, World War II (WWII) is the most important one. As war may affect health and more importantly mental health (see for example Kesternich *et al.*, 2014 and Singhal, 2018), a robustness check is performed to validate that the main estimations do not capture any effects of the war.

FIGURE I

NUMBER OF COUNTRIES WHICH EXPERIENCED A RECESSION 1933-1985



NOTE: Recessions in the figure are defined as when GDP growth equals or is less than -2.511 percent.

Recession prevalence data is merged with the WHO survey data by year and country. For the purpose of this paper, several dimensions of recessions are investigated. First, a dummy variable for whether an individual was exposed to a recession in utero is constructed and used as the treatment variable. The dummy variable takes value one if the individuals were exposed to a recession in utero and zero otherwise. Second, a measure which captures the number of years living through a recession in early life is constructed as the treatment variable. I follow Almond & Currie (2011), which summarize previous and current research on the effects of early childhood influences on later life outcomes, and define early life as starting at birth and ending at age four. Thus, an individual may be exposed to a maximum of four recession periods and a minimum of zero recession periods. Third, I investigate whether the timing of exposure to recessions in early life is related to adult mental health. Six different dummy variables are constructed (for each year from in utero up to age four), each taking value one if the individual were exposed to a recession in the year of observation and zero otherwise. The three measures give a better understanding of the different dimensions of exposure which an individual may be affected by.

V RESULTS

In the following chapter, the results of the regression analyses are reported. First, the results for exposure to recessions in utero and the number of years living through a recession are reported. Second, heterogeneity checks of the main results are performed to investigate whether any variability is present. Third, robustness checks under different assumptions are performed to validate the main results.

V.I MAIN RESULTS

Table II reports the results for exposure to recessions in utero and number of years living through a recession in several specifications. For all specifications, country-, year-of-birth- and year fixed effects are implemented. Column (1) reports the estimations made for in utero exposure to recessions and where no control variables are used (except for the treatment variable). Column (2) includes control variables for the individual's gender, marital status, if the individual lives in an urbanized area and age squared. Column (3) and (4) estimate the relationship between years spent living through a recession in early life and adult mental health and follow the same structure as the first two columns.

TABLE I
MAIN RESULTS

	(1) In utero exposure	(2) In utero exposure	(3) Years living through	(4) Years living through
Recession	0.0123 (0.0213)	0.0002 (0.00817)	0.0203 (0.0217)	0.0115 (0.0206)
Female		-0.2050** (0.0907)		-0.2050** (0.0907)
Married		0.1300*** (7.67e-20)		0.1300*** (7.67e-20)
Urban		0.0722*** (7.67e-20)		0.0719*** (7.67e-20)
Age ²		-0.0001** (0.0000418)		-0.0002** (0.0000410)
Intercept	-0.1530 (0.0812)	0.4150*** (7.67e-20)	-0.0263 (0.0536)	0.3080*** (7.67e-20)
Country FE	Yes	Yes	Yes	Yes
Year-of-Birth FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

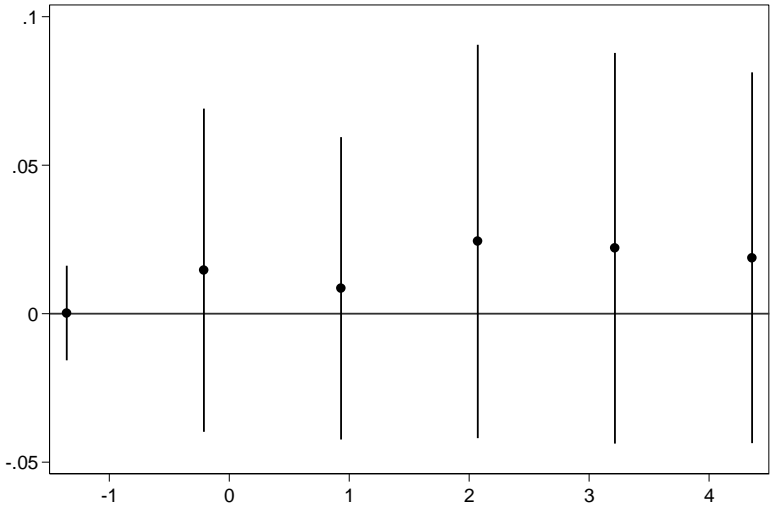
NOTE: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

As reported in Table I, no significant relationship between recessions in utero and adult mental health can be found. The results remain the same if control variables such as marital status,

gender, if the individuals live in an urbanized area and age squared are included. The results further suggest that there is no significant relationship between the number of years spent living through a recession in early life and adult mental health. Adding control variables do not change these results.

Figure II reports the point estimates for the regression analyses made when investigating the timing of exposure to recessions, using the 95 percent confidence interval. The horizontal axis displays the year of exposure starting from in utero (-1) up to age four (4) and the vertical axis displays the coefficient values of the treatment variable. Similar to previous results, no significant relationship between early life exposure to recessions and adult mental health can be found regardless of the year of exposure (see also Table A1). The results do neither change for the alternative specifications (when the control variables are excluded) except for being exposed to a recession at age four (see Table A2).

FIGURE II
RESULTS: TIMING OF EXPOSURE



NOTE: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The x axis displays the year of timing where the year-of-birth takes value 0. The y axis displays the coefficient values from the regression analyses.

V.II HETEROGENEITY CHECK

Heterogeneity may be present due to variability in the data and which may give rise to variability in the presented results. Significant variability in the data may lead to inconsistent results. To investigate whether any heterogeneity is present, heterogeneity checks must

therefore be completed. For the purpose of this paper, three heterogeneity checks are performed, which investigate variability between gender, age groups and individual mental health measures. The results for each heterogeneity check are presented below.

GENDER. Gender is a critical determinant of mental illness and differences occur predominantly in disorders such as depression, anxiety and somatic complaints (WHO, 2019). As gender differences in depression may cause variability in the data, it is of importance to investigate whether these differences as well cause variability in the main estimations. Thus, estimations are performed separately for each gender to check for any heterogeneity.

TABLE II
HETEROGENEITY CHECK: GENDER

	(1)	(2)	(3)	(4)
	In utero exposure	In utero exposure	Years living through	Years living through
			Female	
Recession	-0.0054	-0.0158	0.0222	0.0107
	(0.0315)	(0.0265)	(0.0219)	(0.0187)
R^2	0.0106	0.0147	0.0106	0.0147
			Male	
Recession	0.0346	0.0282	0.0266	0.0167
	(0.0440)	(0.0423)	(0.0274)	(0.0232)
R^2	0.0209	0.0280	0.0212	0.0282

NOTE: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table II reports the results of the regression analyses for females and males separately. The table follows the same structure as Table I, where the first two columns investigate the relationship between in utero exposure to recessions and adult mental health and the last two investigate the number of years spent living through a recession in early life and adult mental health. The results suggest that no significant relationship can be found between the treatment variable and the dependent variable regardless of gender. Thus, heterogeneity does not affect the results in terms of gender.

AGE GROUPS. Globally, depression is one of the leading causes of disability among young adults (WHO, 2018) and seniors are as well prone for depression (Alexopoulos, 2005). Thus, variability may be present in terms of different age groups. In order to investigate the differences between the age groups, regression analyses are performed for each of them.

TABLE III
HETEROGENEITY CHECK: AGE GROUPS

	(1)	(2)	(3)	(4)
	In utero exposure	In utero exposure	Years living through	Years living through
			18-30	
Recession	0.0145	0.0124	-0.0018	0.0011
	(0.0438)	(0.0373)	(0.1190)	(0.0247)
R^2	0.0081	0.0170	0.0081	0.0170
			30-40	
Recession	0.0005	-0.0027	0.0444***	0.0362***
	(0.0109)	(0.534)	(7.67e-20)	(7.67e-20)
R^2	0.0121	0.0263	0.0122	0.0263
			40-50	
Recession	0.0355	0.0448	-0.0065	-0.0007
	(0.0401)	(0.0378)	(0.0227)	(0.0333)
R^2	0.0121	0.0263	0.0122	0.0263
			50-60	
Recession	0.0122	-0.0055	0.0436	0.0377
	(0.0868)	(0.1220)	(0.0541)	(0.0533)
R^2	0.021	0.0263	0.0122	0.0263
			60-70	
Recession	-0.0162	-0.0328	0.0163	0.0246
	(0.124)	(0.105)	(0.0255)	(0.0295)
R^2	0.0121	0.0263	0.0122	0.0263

NOTE: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table III presents the results for when performing a heterogeneity check for different age groups (18-30, 30-40, 40-50, 50-60 and 60-70 years). The table follows the same structure as Table I and investigates the relationship between in utero exposure to recessions and adult mental health as well as the number of years living through a recession and adult mental health. As observed in Table III, no significant relationship between the treatment variables and adult mental health can be found in any of the observed age groups except for age group 30-40 years. The effect in this age group is significant at the one percent significance level for the number of years living through a recession. The results in model (3) states that mental illness decreases by 4.44 percentage points and model (4) states that mental illness decreases by 3.62 percentage points. Consequently, the more years spent living through a recession in early life, the lower degree of mental illness in adulthood.

INDIVIDUAL MENTAL HEALTH MEASURES. Variability may exist in the dependent variable as it is an aggregate measure of several individual mental health components (described in Chapter III). In order to ensure that no such variability exists (which may cause variability in

the main results) several estimations are performed with these individual components as the dependent variable. Table IV reports the results from these estimations. First estimation identifies the survey question “*Feeling of sadness, emptiness or depression*”, second identifies “*Period lasting several days of lost interest*”, third identifies “*Period lasting several days of feeling tired all the time or energy decreased*”, fourth estimation identifies “*Depression more than two weeks*”, fifth identifies “*Depression most of the day everyday*”, sixth identifies “*Loss of appetite*” and the seventh estimation identifies “*Slowing down in thinking*”.

TABLE IV
HETEROGENEITY CHECK: INDIVIDUAL MENTAL HEALTH MEASURES

	(1) In utero exposure	(2) In utero exposure	(3) Years living through	(4) Years living through
		Feeling of sadness, emptiness or depression		
Recession	0.0151 (0.0196)	0.0115 (0.0185)	0.0122 (0.0068)	0.0107 (0.0082)
R^2	0.0038	0.0128	0.0039	0.0128
		Period lasting several days of lost interest		
Recession	0.0094 (0.0180)	0.0031 (0.0186)	0.0157 (0.0176)	0.0117 (0.0163)
R^2	0.0033	0.0093	0.0033	0.0093
		Period lasting several days of feeling tired all the time or energy decreased		
Recession	-0.0011 (0.0547)	-0.0137 (0.0328)	0.0077 (0.0229)	-0.0007 (0.0278)
R^2	0.0065	0.0105	0.0065	0.0105
		Depression more than two weeks		
Recession	-0.0056 (0.0591)	-0.0133 (0.0365)	0.0164 (0.0140)	0.0099 (0.0127)
R^2	0.0202	0.0245	0.0202	0.0245
		Depression most of the day everyday		
Recession	0.0092 (0.0241)	0.0034 (0.0247)	0.0048 (0.0185)	-0.0022 (0.0341)
R^2	0.0061	0.0112	0.0061	0.0112
		Loss of appetite		
Recession	0.0117 (0.0184)	-0.0011 (0.0448)	0.0063 (0.0189)	-0.0005 (1.30438e ⁺¹⁹)
R^2	0.0029	0.0102	0.0030	0.0103
		Slowing down in thinking		
Recession	-0.0231 (0.0229)	-0.0272 (0.0237)	-0.0028 (0.0188)	-0.0065 (0.0246)
R^2	0.0051	0.0107	0.0050	0.0106

NOTE: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table IV presents the results from the heterogeneity check in terms of individual mental health measures. As observed, none of the individual health measures are significant which suggests that the main results are not driven by any of the individual measures alone. Thus, there is no variability in the health data which may cause variability in the aggregate dependent measure used in the main specifications.

V.III ROBUSTNESS CHECK

To validate the results, several robustness checks are performed. First, migration is controlled for as it has in previous sections been assumed that all individuals are non-movers. Second, I investigate whether the World War II influences the results by excluding the years prior to 1945. Third, different alternative definitions of recessions are used to verify that the main results are not dependent by the baseline definition (GDP growth of less than -2.511 percent).

MIGRATION. For all specifications, I have assumed that all individuals are non-movers which presumably may not be true. Therefore, in order to validate the main results, a robustness check controlling for non-movers is performed. Since the WHO data does not contain information regarding migration, mother tongue is used as a proxy for non-movers. Mother tongue is used as a proxy since it is presumably more likely that an individual born in a certain country has one of the official languages as mother tongue than an individual born outside that country. Using mother tongue as a proxy may not be ideal as for example individuals may speak the same language even though they are born in different countries such as in the case for Portugal and Brazil. However, these cases may be few and because it is the best proxy available for the data used in this study, the results are estimated using this proxy. Migration is controlled for by simply excluding the observations where the mother tongue of the individual is not one of the official languages of the country.

TABLE V
ROBUSTNESS CHECK: MIGRATION

	(1)	(2)	(3)	(4)
	In utero exposure	In utero exposure	Years living through	Years living through
Recession	0.0371 (0.0220)	0.0256 (0.0220)	0.0201 (0.0234)	0.0102 (0.0208)
Female		-0.2110*** (0.0734)		-0.2110*** (0.0735)
Married		0.139*** (7.67e-20)		0.1390*** (7.67e-20)
Urban		0.0759 (0.0566)		0.0759 (0.0555)
Age ²		-0.0001*** (0.0000449)		-0.0001*** (0.0000451)
Intercept	-0.2400***	0.5190***	-0.0571	0.5910***
Country FE	Yes	Yes	Yes	Yes
Year-of-Birth FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

NOTE: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table V reports the results of the robustness check when migrants are excluded. The table follows the same structure as Table I. As Table V reports, no significant relationship between exposure to recessions in utero and early life and adult mental health in any of the specified models. Thus, the results from the robustness check are consistent with the main results of this study, which indicates that the main results are not driven by migrants.

WORLD WAR II. The period of observation ranges from 1933-1985. Thus, individuals born in the years of WWII and in countries that were affected by the war are included in the sample. Previous research suggests that exposure to war in early years may affect adult health outcomes (Kesternich *et al.*, 2014; Singhal, 2017) and thus a robustness check which excludes the years prior to 1946 is performed. A robustness check investigates if the main results do not capture the effects of the war years on adult mental health.

TABLE VI
ROBUSTNESS CHECK: WORLD WAR II

	(1)	(2)	(3)	(4)
	In utero exposure	In utero exposure	Years living through	Years living through
Recession	0.0153 (0.0217)	0.0107 (0.0211)	0.0063 (0.0290)	0.0041 (0.0228)
Female		-0.2140** (0.108)		-0.2140** (0.108)
Married		0.1230*** (7.67e-20)		0.1230*** (7.67e-20)
Urban		0.0747*** (7.67e-20)		0.0748*** (7.67e-20)
Age ²		-0.002*** (0.0000504)		-0.0002*** (0.0000503)
Intercept	-0.1900*** (0.0661)	0.2850*** (7.67e-20)	-0.2090*** (0.0726)	0.5300*** (7.67e-20)
Country FE	Yes	Yes	Yes	Yes
Year-of-Birth FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

NOTE: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table VI reports the results of the robustness check when the war years prior to 1946 are excluded. The table follows the same structure as the main results in Table I. As observed, no significant relationship between in utero or early life exposure to recessions and adult mental health can be found. Furthermore, no significant relationship can neither be found for the number of years spent living through a recession and adult mental health. The robustness check thus confirms that the main results in Table I do not capture any effects that WWII may have on adult mental health.

ALTERNATIVE DEFINITIONS OF RECESSION. For all previous specifications, it has been assumed that a recession is present when the GDP growth goes below -2.511 percent for a given year. This percentage is estimated from the lowest 10th percentile of GDP growth for all countries in the study sample during the years 1933-1985. As researchers have not agreed upon a general definition of recessions, the results may vary depending on the definition of recession in this study and across other studies. Several regression analyses are thus performed where different definitions of recession are used to investigate the correctness of the main results in this study. For the purpose of this study, four different levels of recessions are defined: when GDP growth goes below 0, -2.511, -5.022 and -10.044 percent respectively. Table VII reports these estimation results of in utero exposure to different levels of recessions as well as the number of years living through a recession and the effect on adult mental health. Table VII follows the same structure as Table I.

TABLE VII
ROBUSTNESS CHECK: ALTERNATIVE DEFINITIONS OF RECESSION

	(1) In utero exposure	(2) In utero exposure	(3) Years living through	(4) Years living through
Growth less than 0				
Recession	-0.0071 (0.00833)	-0.0046 (0.0078)	-0.0062 (0.0109)	-0.0104 (0.00992)
R^2	0.0121	0.0263	0.0121	0.0263
Growth less than -2.511				
Recession	0.0123 (0.0213)	0.0002 (0.00817)	0.0203 (0.0217)	0.0115 (0.0206)
R^2	0.0121	0.0263	0.0123	0.0263
Growth less than -5.022				
Recession	-0.0025 (0.0190)	0.0061 (0.0308)	0.0407 (0.0344)	0.0310 (0.0336)
R^2	0.0121	0.0263	0.0124	0.0264
Growth less than -10.044				
Recession	-0.0478 (0.0414)	-0.0396 (0.0354)	0.0772 (0.0657)	0.0564 (0.0637)
R^2	0.0121	0.0263	0.0124	0.0264

NOTE: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

As reported in Table VII, no significant relationship between in utero exposure to recessions and adult mental health can be found. Neither does there exist a significant relationship between the number of years living through a recession and adult mental health, regardless of the definition. The robustness check confirms that the degree of recession does not affect the main results of this study and that more severe recessions do not play a significant role in terms of mental health.

As the main results suggest (which also remains stable throughout all robustness checks), no significant relationship between in utero or early life exposure to recessions as well as the number of years living through a recession and adult mental health is present. The heterogeneity checks confirm that no variability in the data may cause variability (except for age group 30-40 years) in the main results in terms of gender, age groups and individual health measures. The robustness checks further confirm that that results remain stable when migrants and WWII years are excluded as well as using other definitions of recessions than the one used in the main specification.

VI DISCUSSION

To fully get a good understanding of the results, a discussion is brought forward about the results presented in previous chapter.

By taking different dimensions of exposure to recessions into consideration, this study has taken a unique approach to investigate the relationship between in utero or early life exposure to recessions and adult mental health. The main results suggest that no significant relationship between in utero or early life (birth to age four) exposure to recessions and adult mental health can be found. Neither does there exist a significant relationship between the number of years living through a recession in early life and adult mental health.

The results contradict the findings of previous research in similar strands (for example Adharyu *et al.*, 2015 and Dinkelman, 2017) which suggests that there is a negative relationship between exposure to income shocks in early life and adult mental health. Given that income shock serves well as a proxy for recession, there may be two reasons for the discrepancy between this study and the ones above: (1) the recession data in this study is too diffuse in terms of timing and severity or (2) significant effects are only present in developing countries.

First (1), recessions are characterized by an economic downturn which affects the whole economy in terms of real GDP, real income, employment and industrial production. Thus, there exist more than one pathway for which recessions may affect individuals' mental health. Adharyu *et al.* (2015) used for example shocks in coca-prices as proxies for income shocks in developing countries. Income shocks may be caused by recessions or adversely, maybe eventually cause a recession. Given the results by Adharyu *et al.*, it is possible that variations in real GDP (as opposed to income shocks) may not be precise enough in terms of timing to capture any effects of recessions on adult mental health that may be present.

Second (2), previous research in similar strands includes mostly developing countries in the sample. That is an important difference to this study which includes both developed and developing countries in the sample. Developed and developing countries may respond differently to recessions and thus give rise to different results to the research question.

The results of this study cannot preclude whether one or both options are true, but only that any of these options are possible given the non-significant results. However, as the studies (for example Adharyu *et al.*, 2015 and Dinkelman, 2017) eventually rely on different samples and assumptions to this study, it is a reasonable assumption to make that the studies are not directly

comparable. Thus, the measure for recessions in this study may be considered as reliable until further research has been performed. Furthermore, given the contradiction to previous research which usually includes only developing countries, this study forms a basis for future research within the field to further investigate any differences between developing and developed countries.

The results of this study are consistent throughout all heterogeneity- and robustness checks except for one important case. The heterogeneity check of age groups suggests that there is a significant relationship (at the one percent significance level) between living through a recession in early life and adult mental health in age group 30-40 years old. It is an important deviation, as it indicates that more years spent in a recession in early life is related to less mental illness in adulthood. The results thus indicate that the data is sensitive and that studies within the field should make sure to include enough age groups in the samples. Furthermore, as the deviation is only present for one age group in this study, the main results may be considered consistent.

As pointed out by Almond and Currie (2011) there is yet a need to investigate exposure to milder shocks in early life and adult outcomes. More precisely, there is a need to extend on this study and further investigate recessions' or economic shocks' impact in early life and adult mental health. The heterogeneity check suggests that the relationship may be estimated in terms of age groups. Furthermore, as the results indicate, future research of developed countries needs to be performed within the field to a greater extent as well as using more elaborate measures of recessions. This study supplements the tools currently available to perform more research and if performed, more conclusions can be made regarding exposure to recessions in utero or early life and adult mental health.

VII CONCLUSION

In this study, I have estimated the relationship between exposure to recessions in utero and early life and adult mental health. Survey data from the World Health Survey and macroeconomic data from the Barro-Ursua dataset for 20 countries were used to estimate these effects. Three dimensions of exposure were investigated: (1) exposure to recessions in utero, (2) exposure to recessions in early life and (3) the number of years spent living through a recession. The main results suggest that no significant relationship between in utero or early life exposure and adult mental health is present. Neither does there exist a significant relationship between the number

of years living through a recession in early life and adult mental health for most specifications (age group 30-40 serving as the exception). The results remain stable for all robustness checks.

The results of this study give an important implication of the characteristics of the relationship between in utero or early life exposure to recessions and adult mental health. The relationship remains non-significant throughout most checks which may have several explanations. Most likely, no true relationship is present, or the data used is too diffuse in terms of timing to capture any effects. Thus, further research should be performed using more elaborate measures to investigate the possible underlying mechanisms that may affect adult mental health from early life circumstances. Possible discrepancies between developed and developing may as well give clues about these mechanisms.

This study contributes to a growing body of empirical work in the field and may improve the consistency of this work. The study is, to my knowledge, the first to specifically investigate the relationship between in utero or early life exposure to recessions and adult mental health. It thus provides an important foundation for future research and to policy holders in order to reduce the growing problems related to mental health.

REFERENCE LIST

Adhvaryu, A. Fenske, J. & Nyshadham, A. (2015) Fetal Origins of Mental Health: Evidence from Africa. CSAE Working Paper Series 2015-15, Centre for the Study of African Economies, University of Oxford.

Alexopoulos, G. S. (2005) Depression in the elderly. *The Lancet*, vol. 365(9475), pp. 1961-1970.

Almond, D., Currie, J. & Duque, V. Childhood Circumstances and Adult Outcomes: Act II. NBER Working Paper No. 23017, Issued Jan 2017

Almond, D. (2006) Is the 1918 Influenza Pandemic Over? Long-Term Effects of in utero Influenza Exposure in the Post-1940 U.S. Population. *Journal of Political Economy*, vol. 114(4) pp. 672–712.

Almond, D., Edlund, L., Li, H. & Zhang, J. (2010) Long-Term Effects of the 1959–61 China Famine: Mainland China and Hong Kong. In *The Economic Consequences of Demographic Change in East Asia*, NBER-EASE vol. 19, ed. T. Ito and A. Ro

Almond, D & Currie, J. (2011) Killing Me Softly: The Fetal Origins Hypothesis. *Journal of Economic Perspective*, vol. 25(3), pp. 153-172.

Almond, D. & Mazumder, B. A. (2011) Health capital and the prenatal environment: the effect of Ramadan observance during pregnancy. *American Economic Journal: Applied Economics*, vol 3(4), pp. 56–85.

Barker, D. J. (1990) The Fetal and Infant Origins of Adult Disease. *BMJ*, vol. 301(6761), p. 1111.

Baten, J., Crayen, D. & Voth, J. (2007) Poor, Hungry and Stupid: Numeracy and the Impact of High Food Prices in Industrializing Britain, 1780–1850. Economics and Business Working Paper 1120, Department of Economics and Business, Universitat Pompeu Fabra. <http://ideas.repec.org/p/upf/upfgen/1120.html>.

Brandt, L., Siow, A. & Vogel, C. (2008) Large Shocks and Small Changes in the Marriage Market for Famine Born Cohorts in China. University of Toronto, Dept. of Economics Working Paper 2008-09-08

Cameron, C, Gelbach, J. B. & Miller, D. L. (2008) Bootstrap-Based Improvements for Inference with Clustered Errors. *The Review of Economics and Statistics*, MIT Press, vol. 90(3), pp. 414-427.

Clara, C., Martins, C., Stingel, A., Lemgruber, V. & Jurueña, M. (2013). The Role of Early Life Stress in Adult Psychiatric Disorders: A Systematic Review According to Childhood Trauma Subtypes. *The Journal of nervous and mental disease*, vol. 201, pp. 1007-1020.

- Cooper, B. (2011) Economic recession and mental health: an overview. *Neuropsychiatr*, vol. 25(3), pp. 113-7.
- Cutler, D. M., Miller, G. & Norton, D. M. (2007) Evidence on Early-Life Income and Late-Life Health from America's Dust Bowl Era. *PNAS: Proceedings of the National Academy of Sciences*, vol. 104(33), pp. 13244–13249.
- Dinkelman, T. (2017) Long run health repercussions of drought shocks: Evidence from South African homelands. *The Economic Journal*, vol. 127(604), pp. 1906–1939.
- Drydakis, N. (2015). The effect of unemployment on self-reported health and mental health in Greece from 2008 to 2013: A longitudinal study before and during the financial crisis. *Social Science & Medicine*, vol. 128, pp. 43-51.
- Gerdtham, U., & Ruhm, C. J. (2006). Deaths rise in good economic times: Evidence from the OECD. *Economics & Human Biology*, vol. 4(3), pp. 298-316.
- Gili, M., Roca, M., Stuckler, D., Basu, S., & Mckee, M. (2013). The mental health risks economic crisis in Spain: Evidence from primary care centres, 2006 and 2010. *European Psychiatry*, vol. 28, p. 1.
- Giuliano, P. & Spilimbergo, A. (2014) Growing up in a Recession. *Review of Economic Studies*, vol. 81, pp. 787–817.
- Hamilton, V. H., Merrigan, P., & Dufresne, É. (1997). Down and out: Estimating the relationship between mental health and unemployment. *Health Economics*, vol. 6(4), pp. 397-406.
- Kesternich, I., Siflinger, B., Smith, J. P. & Winter, J. K. (2014) The Effects of World War II on Economics and Health Outcomes across Europe. *The Review of Economics and Statistics*, vol. 96(1), pp. 103-118.
- Latif, E. (2015). The impact of economic downturn on mental health in Canada. *International Journal of Social Economics*, vol. 42(1), pp. 33-46.
- O'Donnell, K. J., Glover, V., Barker, E. D., & O'Connor, T. G. (2014) The persisting effect of maternal mood in pregnancy on childhood psychopathology. *Developmental Psychopathology*, vol. 26(2), pp. 393-403.
- Persson, P. & Rossin-Slater, M. (2018) Family Ruptures, Stress, and the Mental Health of the Next Generation. *American Economic Review*, vol. 108(4-5), pp. 1214–1252.
- Royer, H. (2009) Separated at Girth: US Twin Estimates of the Effects of Birth Weight. *American Economic Journal: Applied Economics*, vol. 1(1), pp. 49–85.
- Ruhm, C. J. (2000). Are Recessions Good for Your Health? *The Quarterly Journal of Economics*, vol. 115(2), pp. 617-650.

Singhal, S. (2018) Early life shocks and mental health: The long-term effect of war in Vietnam. In proof.

Taylor, E. S. (2010) Mechanisms linking early life stress to adult health outcomes. *Neuroscience, Psychological and Cognitive Sciences*, vol. 107(19), pp. 8507-8512.

van den Berg, G. J., Lindeboom, M. & Portrait, F. (2006) Economic Conditions Early in Life and Individual Mortality. *American Economic Review*, vol. 96(1), pp. 290–302.

Vikram *et al.* (2018) The Lancet Commission on global mental health and sustainable development. *The Lancet*, vol. 392(10157), pp. 1553-1598.

World Health Organization (2000) Cross-national comparisons of the prevalences and correlates of mental disorders. *Bulletin of the World Health Organization*, vol. 78(4), pp. 413-426.

World Health Organization (2003) Investing in Mental Health (pp. 1-52, Publication). Geneva: Department of Mental Health and Substance Dependence.

World Health Organization (2018) Adolescent Mental Health. [Collected 2019-08-05] <https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health>.

World Health Organization (2019) Gender Disparities in Mental Health (pp. 1-20, Publication). Geneva: Department of Mental Health and Substance Dependence.

APPENDIX

TABLE A1

RESULTS: TIMING OF EXPOSURE TO RECESSIONS (INCL. CONTROL VARIABLES)

	(1)	(2)	(3)	(4)	(5)	(6)
	-1	0	1	2	3	4
Recession	0.000205 (0.00817)	0.0146 (0.0278)	0.00850 (0.0260)	0.0243 (0.0338)	0.0220 (0.0336)	0.0188 (0.0319)
Female	-0.205** (0.0907)	-0.205** (0.0906)	-0.205** (0.0906)	-0.205** (0.0906)	-0.205** (0.0907)	-0.205** (0.0907)
Married	0.130*** (7.67e-20)	0.130*** (7.67e-20)	0.130*** (7.67e-20)	0.130*** (7.67e-20)	0.130*** (7.67e-20)	0.130*** (7.67e-20)
Urban	0.0722*** (7.67e-20)	0.0722*** (7.67e-20)	0.0722*** (7.67e-20)	0.0724*** (7.67e-20)	0.0722*** (7.67e-20)	0.0722*** (7.67e-20)
Age ²	-0.000120*** (0.0000418)	-0.000118*** (0.0000411)	-0.000119*** (0.0000413)	-0.000117*** (0.0000407)	-0.000117*** (0.0000408)	-0.000118*** (0.0000409)
Intercept	0.415*** (7.67e-20)	0.312*** (7.67e-20)	0.413*** (7.67e-20)	0.401*** (7.67e-20)	0.406*** (7.67e-20)	0.309*** (7.67e-20)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-of-Birth FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

NOTE: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

TABLE A2

RESULTS: TIMING OF EXPOSURE TO RECESSIONS (EXCL. CONTROL VARIABLES)

	(1)	(2)	(3)	(4)	(5)	(6)
	-1	0	+1	+2	+3	+4
Recession	0.0123 (0.0213)	0.0330 (0.0318)	0.0160 (0.0233)	-0.00482 (0.0400)	-0.0205 (0.0136)	0.0601*** (7.67e-20)
Intercept	-0.153 (0.0812)	0.0703 (0.0490)	0.0706 (0.0469)	0.0727 (0.0517)	-0.238** (0.0825)	-0.0258 (0.0533)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-of-Birth FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

NOTE: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$