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Mansi Maini April 9, 2018

Health and Economy

Impact of the Great Recession on Physical and Mental Health Outcomes

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An abstract of
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Abstract

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By Mansi Maini

The Great Recession of 2007 was the largest economic downturn in recent history. As a result, nearly 15 million individuals were unemployed by the end of 2009 and unemployment rates skyrocketed to 10.0%. Due to the multiple concurrent crises and global nature of the recession, it is posited to distinctly impact physical and mental health outcomes. Past research has evidenced a link between stress induced by economic crises and health; this study builds on past work by conducting a longitudinal analysis investigating both clinically diagnosed and self-rated measures of health. The purpose of this study is to examine how changes in total household income, job loss, housing foreclosures, and marital status impact physical and mental health. This study utilizes longitudinal data from waves two and three (2005-2015) of the Mid-Life in the United States (MIDUS) national study of how behavioral, social, psychological and biological factors come together to impact health and well-being (n=3293). Results indicate that gain in total household income leads to better self-rated physical health but not better self-rated mental health. Furthermore, results show that loss of job and loss of home are both associated with worse perceptions of self-rated physical and self-rated mental health. Finally, results indicate that loss of job is a better predictor of self-rated health outcomes than loss of home. Findings from this study provide insight towards which factors of the Great Recession led to poorer health outcomes. This study provides evidence that can guide future policies and interventions geared towards attenuating the impacts of macroeconomic, financial crashes on health and well-being.

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INTRODUCTION

The Great Recession of 2007 was the most substantial economic decline in recent history. Consequently, approximately 15 million individuals were unemployed by the end of 2009 and unemployment rates had risen to 10.0% (Hipple, 2010). Due to the severity of this economic downturn including multiple concurrent crises and global nature, the Great Recession may have distinctly impacted physical and mental health outcomes. During the course of the recession, nearly one in four Americans lost at least 75% of their wealth, and more than 50% of families lost 25% of their wealth or even more (Pfeffer et al. 2013). Moreover, the average American household lost almost $50,000 in wealth (Pfeffer et al. 2013). Given the well-established correlation between wealth shock, socioeconomic status (SES), and health outcomes it is posited that the Great Recession has impacted the physical and mental health of individuals.

The consequences of the economic shocks of the Great Recession can be seen through stagnated wages and declined incomes in most households during the course of the recession (Levy and Kochan 2011). Income is significantly correlated with health outcomes (Benzeval et al. 2002). Specifically, greater household income is found to be related to greater self-rated health among both men and women (Mackenback et al. 2004). Literature establishes the positive correlation between income and health outcomes in working individuals (Deaton, 2002; Subramanian and Kawachi 2004). Literature thus far, however, has not investigated the longitudinal impact of total household income changes before and after the Great Recession on physical and mental health outcomes in the United States.

The 2007 Great Recession left millions unemployed. Job loss during recessions has been associated with increased mortality risk due to increase in psychological distress and stress

(Noelke et al. 2014). Job loss and unemployment that precipitate due to the recession are further linked to decreased self-rated health (Burgard et al. 2007). Being laid off has also found to be associated with lower biomarkers of health and can increase mortality rates by 10.3% in individuals (Michaud et al. 2016). However, literature has yet to evaluate how job loss, as an experience during the 2007-2009 Great Recession, mediates the impact of total household income on physical and mental health outcomes longitudinally.

The Great Recession is most notably interconnected with the housing market crash. The housing collapse at the start of the Great Recession led to a record high of 2.9 million home foreclosures in 2010 (Houle 2014). While studies have investigated the role of foreclosures in mental health, none have longitudinally investigated how foreclosure experience during the 2007-2009 Great Recession, mediates the impact of total household income on physical and mental health outcomes.

The present study fills the gap in research by investigating the impact of a change in income, before and after the Great Recession, on physical and mental health outcomes. Using longitudinal data from waves two and three of Midlife in the United States (MIDUS), A national longitudinal study of health and well-being, this study links changes in total household income to changes in physical and mental health before and after the Great Recession. This study controls for demographic factors such as age, education, ethnicity, gender and race and provides substantial evidence of the correlation between total household income and changes in health outcomes due to the recession. Physical health is investigated via the markers of self-rated physical health and multiple indicators of cardiovascular disease. Mental health is studied using the measure of self-rated mental health. This study provides a holistic analysis of health by investigating clinical measures of health, self-rated physical, and self-rated mental health.

RESEARCH QUESTIONS

1. How does change in total household income impact physical and mental health outcomes?
2. To what extent do job loss and housing foreclosures during the Great Recession mediate physical and mental health outcomes?
3. How do social relationships, such as marital status, mediate the influence of household income change and the Great Recession on physical and mental health?

This study is the one of the first to investigate the longitudinal impact of a change in total household income pre- and post- Great Recession on physical and mental health outcomes in midlife adults in the United States. Based on previous literature and theoretical framework, this study seeks to investigate the impact of sudden income shocks driven by the 2008 Great Recession on health. This research provides evidence towards a growing body of literature that examines the most recent recession and its adverse health outcomes across the population. This study and its research questions will provide insight towards the importance of why policymakers must keep in mind the long-lasting physical and mental health effects of large macroeconomic downtowns when implementing preventative measures for the future. Such research helps identify individuals who may be at risk based on their income, job status, housing status, and marital status.

LITERATURE REVIEW

Past research has shown the significant impact of financial shock on health and well-being. This section first reviews the literature investigating the impact of financial shocks and income change on physical health. Next it this section discusses past research on the impact financial shocks and changes in income have on mental health. And finally, this section reviews

previous literature that offers insight towards underlying mechanisms behind why financial shocks and income change impact physical and mental health.

Low socioeconomic status (SES) is often associated with worse health outcomes and increased morbidity and mortality (Marmot 1998; Smith 2004). SES influences health outcomes through several mechanisms. This section will review how income changes and the Great Recession influence both physical and mental health outcomes.

Impact on Physical Health

The multifaceted nature of the Great Recession has impacted a diverse set of health consequences. Financial burdens, job loss, and housing troubles were all indicators of decreased Self-rated health during the period of the Great Recession (Bugard et al. 2007; Cannuscio et al. 2012; Drydakis 2015; Tekin et al. 2013; Whitehead and Bergeman 2017). Although self-rated health is considered subjective, past research reveals that it predicts mortality better than health judged by a clinician (DeSalvo et al. 2006; Idler and Benyamini 1997). The diverse nature of the Great Recession also impacted employment and the housing market. Both unemployment and home foreclosures have been indicators of chronic health problems; home foreclosures have further been correlated to decline in physical health via weight gain (Astell-Burt and Feng 2013; Arcaya et al. 2013).

A retrospective analysis of financial strain and its impact on health outcomes finds that the persistence of financial hardship leads to declined health (Kahn and Pearlin, 2006). While this study investigates the persistence of financial hardship, it does not examine this relationship at the level of a large macroeconomic stressor, such as the Great Recession. The current study aims to fill the gap in research by examining the impact of financial strains, such as loss of total household income, loss of job, and loss of home on physical and mental health outcomes during

the 2007-2009 Great Recession. The long-lasting nature and impacts of the Great Recession qualify it as a possible cause of chronic financial burden, therefore making it likely to have influenced physical health.

Unemployment is shown to have a negative impact on physical health as well. Loss of jobs and loss of income associated with economic crashes have a negative impact on the health-related quality of life (HRQL) of an individual. The HRQL is a longitudinal measurement of the physical and mental health summary scores of individuals. A longitudinal study of middle-aged adults reveals that increased average state unemployment rates and loss of income are associated with a decline in physical health (Davalos and French 2011). While this study longitudinally investigates the impact of the Great Recession on self-rated physical and mental health, it does not investigate the impact on clinically diagnosed physical and mental health. The present study aims to fill this gap by longitudinally analyzing markers of both self-rated physical health and clinically diagnosed physical health before and after the Great Recession. Furthermore, a study of involuntary job loss among older workers in the United States reveals a statistically significant and causal relationship between involuntary job loss and morbidity (Gallo et al. 2000). Loss of job is often associated with financial strain, which in turn causes stress and induces a decline in physical health (Moen 1983; Voydanoff 1984). Further studies show that individuals with higher losses in earnings experience greater increases in mortality (Sullivan and Von Wachter 2009). These studies provide a foundational background in the critical role income and unemployment play in mediating physical health. While they establish such a relationship, these studies once again do not to investigate the longitudinal the impact of the 2007 Great Recession on clinically diagnosed physical health and self-rated physical health.

A decline in wealth is associated with declined health. In a longitudinal study, 1999 to 2005, investigating the relationship between wealth and the cardiovascular disease risk factors of hypertension, smoking, and obesity, participants with less wealth, were found to have a 40- 89% greater risk of becoming obese. Participants were also found to have a 40-89% greater risk for hypertension (Hajat et al. 2010). Furthermore, household wealth levels were shown to be independently connected with C-reactive protein (CRP) levels which are physiological markers of cardiovascular disease (McDade et al. 2011). High levels of CRP were associated with patients with lower income (McDade et al. 2011). Moreover, in a national sample, household financial debt is correlated with increased diastolic blood pressure, greater perceived stress, and an increase in depressive symptoms (Sweet et al. 2013). In addition, a longitudinal study explicitly looking at nationally representative data from the Great Recession reveals the impact of household-level wealth shocks on systolic blood pressure and CRP. The study finds that declines in household-level wealth yield increases in systolic blood pressure and CRP (Boen and Yang 2016). While this study investigates markers of cardiovascular health and how they changed before and after the Great Recession, it only investigates clinically diagnosed health and does not consider self-rated physical health. Overall, these studies establish a negative relationship between wealth and cardiovascular health. Past literature, however, does not investigate the impact of income loss on clinically diagnosed physical health as well as self-rated physical and self-rated mental health pre- and post-Great Recession. The present study fills this gap by analyzing both clinically diagnosed measures of physical health as well as self-rated physical health pre- and post- Great Recession.

Past literature has also found that a decline in perceived financial situation and thereby an increase in perceived stress predict poorer health outcomes (Whitehead and Bergeman 2017).

Using longitudinal data before and during the Great Recession, individual changes in perceived stress and subjective financial situation were investigated as predictors of health outcomes. Interestingly, the influence of changes in financial condition on health was only noted for individuals who experienced a decline in financial situation during the recession. Individuals who saw a decline in financial situation during the recession experienced worse health outcomes, whereas individuals who saw an increase did not see any improvements in health outcomes (Whitehead and Bergeman 2017). While this longitudinal study establishes the relationship between a decrease in financial situation and an increase in stress as predictors of health outcomes, it does not consider perceptions of self-rated health.

Impact on Mental Health

Few studies have investigated the role of wealth shocks and mental health (McInerney et al. 2013). In this sub-section, past research analyzing the impact on mental health is explained. The sudden loss of wealth due to the Great Recession has resulted in increased feelings of depression and increased use of antidepressant drugs. These results were the greatest in individuals with high levels of stock shares before the recession. An unexpected loss of wealth caused a decrease in subjective measures of mental health. When evaluating the impact of the recession on clinically diagnosed measures of depression, no significant evidence was found (McInerney et al. 2013). Finally, wealth has proven to mitigate the impact of unemployment on depression more in the United States than in Europe, further showing the significance of wealth shocks on mental health in the United States (Riumallo-Herl 2014). The current study adds to the literature by longitudinally investigating a form of wealth shock, loss of total household income, on self-rated mental health pre- and post- Great Recession.

Job loss has also shown to be a factor contributing to depression levels in several studies

conducted in the United States and across Europe. In a study investigating job loss and depression, men were found to have significant increases in depression levels due to being laid off work (Brand et al. 2008). Furthermore, a study conducted in Greece finds that unemployment is related to diminished mental health during the period of the Great Recession (Drydakis 2015). Results of the longitudinal study in Greece find the mental health of women to be more negatively impacted by unemployment than the mental health of men (Drydakis 2015). Loss of job has further been recognized as a risk factor for depression even in individuals without a prior disposition to depression (Montgomery et al. 1999). Research further finds that the perception of being laid off plays a significant role in the development of depressive symptoms. A chaotic and sudden situation in which an individual is laid off is associated with greater chances of depressive symptoms when compared to a well-planned and fair process of being laid off (Brenner et al. 2014).

Furthermore, a cross-sectional study assessing the differences in mental health pre- and post-recession explores why the differences change based on gender, age, and SES. Using a nationally representative sample in England, the study finds that population mental health in men worsened within two years of the recession (Katikireddi et al. 2012).

The Great Recession followed as risky and unregulated borrowing practices led to an economic crash. The housing collapse led to a record high of 2.9 million home foreclosures in 2010. Home foreclosures due to the Great Recession have found to be positively correlated with a decline in mental health. Countries that have a high percentage of residents in low SES and minority groups display greater levels of mental health disorders. These results indicate the foreclosures may exacerbate the prevailing social disparities in mental health and further show how individuals of low SES and minority groups are disproportionately affected by economic

downturns (Houle 2014). Neighborhood-level foreclosures are also associated with mental health. Increase in neighborhood-level foreclosure is a significant risk factor contributing to depression in adults (Cagney et al. 2014).

Literature also supports an increase in clinically diagnosed psychiatric disorders during times of economic downfall. Clinically diagnosed depression and anxiety increased in East Asia, Europe, and the United States directly after the recession (Economou et al. 2013; Lee et al. 2010; Mehta et al. 2015). In Hong Kong, for example, the prevalence of Diagnostic and Statistical Manual of Mental Disorders (DSM) IV was significantly higher in 2009 than in 2007 by 4% (Lee et al. 2010). The increase in incidences of diagnosed psychiatric disorders during the Great Recession is due to increased unemployment, difficulties paying housing mortgages, and economic shock (Economou et al. 2013, Gili et al. 2013, Lee et al. 2010).

Interestingly, the influence of mental health works both ways and is shown to exacerbate the recession experience. In a longitudinal survey study, midlife parents whose child was diagnosed to have a mental health illness seem to have experienced greater impacts of the recession than their sociodemographic counterparts who did not have a child experiencing a mental health illness (Song et al. 2016).

Underlying Mechanisms

Three primary mechanisms have been cited in literature as to why changes in economic well-being influence health outcomes. These three mechanisms include stress, shifts in the use of time, and changes in health-related spending and health behaviors (Boen and Yang 2016).

Leonard Pearlin's stress process model explains how major life events, chronic life strains, self-concepts, coping mechanisms, and social support work in tandem in the processing of stress. This multifaceted pathway shows how economic wealth shocks correlate to physical

health outcomes. Major life events such as involuntary job loss caused by the Great Recession impact role strain and economic strain. Increase in role and economic strain due to income loss diminish positive self-concepts which thereby leave individuals susceptible to stress and depression. Coping mechanisms and social support mediate the effects of stress in the case of wealth shocks due to job loss (Pearlin et al. 1981). A study conducted by Drentea and Reynolds in 2014 finds that wealth declines impact physical health through stress by decreasing an individual's coping skills and increasing feelings of anxiety, frustration, and hopelessness (Drentea and Reynolds 2014). Job loss and a decrease in finances further instigate a stress response due to the direct change in social role. Furthermore, decreased income as a result of job loss and decreased ability to support one's living expenses unveil chronic stress that has long-term social and economic impacts (Burgard et al. 2007). Based on Selye's general adaptation theory physiological response to stress, such as that from wealth shocks in the Great Recession, stems from the activation of the sympathetic nervous system and the hypothalamic-pituitary-adrenal (HPA) axis (Baffy 2017). Short term activation of the sympathetic nervous system and the HPA axis is critical for maintaining proper physiological function however extended activation due to chronic stress leads to inflammation and elevated blood pressure (Miller et al. 2009; Cohen et al. 2012; Hawkley et al. 2006).

A shift in the use of time can also be a possible explanatory mechanism that ties together the relationship between economic crises and health outcomes. Economic crises push those undergoing wealth decline to spend time dealing and coping with the shock. Thus, the time individuals would otherwise spend investing into relationships, physical health, and self-care is now spent coping with newfound challenges associated with financial loss, including searching for new job positions, and creating new financial budgets (Mani et al., 2013). This shift in the

use of time due to wealth shock may be an underlying explanation for the decline of health outcomes in individuals.

Finally, changes in health-related spending and in health behaviors may also account for how economic well-being influences health outcomes. Negative wealth shocks and decreased employment are greatly correlated with declines in routine medical care. The bigger the reported loss in wealth, the greater the net reduction in routine care. In comparison to individuals who described no change in wealth since the economic crisis, individuals who lost 50% of their wealth were nearly 25% more likely to have decreased usage of routine medical care (Lusardi et al. 2010). Data from the Great Recession further shows that physician and inpatient visits, as well as, prescription drug fills were significantly lower during the recession than before (Mortensen and Chen 2013). Furthermore, food insecurity became a significant issue during the Great Recession. In a study conducted in Minnesota, nearly 39% of caregivers reported household level food insecurity. Among the individuals suffering from food insecurity, nearly 40% reported the inability to purchase fresh fruits and vegetables. Furthermore, 22% of individuals suffering from food-insecurity report serving sugar-sweetened drinks daily (Bruening et al. 2012). These shifts in diets caused by wealth declines due to the Great Recession have altered the daily nutritional intake of individuals. A decrease in the ability to afford healthy food options is thereby an underlying factor leading to poor health outcomes due to the Great Recession. These changes in health behaviors, in addition to increased alcohol consumption and smoking can be potential explanations towards the link between changes in economic well-being and health outcomes.

Health and Marital Status

Marriage has long been established as a protective factor for health. Overall, married individuals have the least physical and mental health problems, and marriage proves to be a protective factor against morbidity and mortality (Joung 1997). Married individuals have lower health issues than unmarried individuals living with a partner and even fewer health issues than individuals who are divorced (Joung 1997). Being widowed further leads to a decrease in self-rated health in the short- run as there is a causal relationship between self-rated health and decreased emotional support from immediate friends and family (Craigs et al. 2014). For these reasons, marital status may also be a strong mediator of physical and mental well-being during times of a widespread macroeconomic distress.

HYPOTHESES

Literature has shown that wealth and income shocks impact physical and mental health. Thus, based on past research this study makes several hypotheses. The first hypotheses deal with loss of income:

1A: Loss of total household income between 2005 and 2015 will have a negative impact on self-rated physical health.

1B: Loss of income between 2005 and 2015 will be associated with worse perceptions of self-rated mental health.

1C: Loss of income between 2005 and 2015 will be associated with the presence of any heart conditions.

This study further hypothesizes that both the loss of job and the loss of home will cause a decline in both physical and mental health:

2A: The loss of job and the loss of home will be associated with worse perceptions of self-rated physical health.

2B: the loss of job and the loss of home will be associated with worse perceptions of self-rated mental health.

2C: The loss of job and the loss of home will be associated with the presence of any heart conditions

Finally, this study hypothesizes that getting married will yield better physical and mental health outcomes.

3A: Marital status will moderate the relationship between recession impacts and self-rated physical health

3B: Marital status will moderate the relationship between recession impacts and self-rated mental Health

3C: Marital status will moderate the relationship between recession impacts and any heart conditions.

RESEARCH DESIGN AND METHODOLOGY

Sample

The data in this study was collected from adults recruited in the Midlife in the United States (MIDUS) study. MIDUS is a national longitudinal study of how behavioral, social, psychological, biological, and neurological factors come together to impact health and well-being. MIDUS originally began in 1995 to understand health and well-being as individuals age from early adulthood, midlife, to old age (http://midus.wisc.edu). This study utilizes waves two and three of the MIDUS dataset which reflects data from 2005 and 2015 respectively. MIDUS 2 expands on the 1995 MIDUS 1 by including biomarkers, neurological, and cognitive measures. MIDUS 2 (n=4963) data was collected via 30-minute telephone interviews, two extensive self-

administered survey questionnaires approximately 55 pages each, and a modified telephone version of the mailed questionnaire administered to respondents who did not complete the self-administered questionnaire. MIDUS 3 (n=3294) reflects longitudinal data from 2015 for MIDUS respondents. Data collection for MIDUS 3 also included phone interview and survey questionnaires. Additional questions were added to MIDUS 3 to assess recession experiences, coping, stress, stressful life events, and caregiving. The MIDUS dataset allows for a unique evaluation of cardiovascular, physical, and mental health effects of income change before the recession (2005) and a few years after the recession (2015).

For this study, a new data set was created which combined the respondent codes from wave two and wave three, this allowed for a longitudinal analysis of data. Dataset one, aggregate data, was used for both waves. The data for this study (n=3293) included all respondents present in both waves two and three. The age range of respondents was 39-93 in this data set. Analyses were conducted using SPSS statistics software.

Analyses investigate cardiovascular disease diagnosis via the change in the number of heart conditions; analyses also evaluate self-rated physical and self-rated mental health. The sample analyzed for cardiovascular disease diagnosis includes all respondents who have answered the questions regarding a diagnosis of heart trouble in 2005 and in 2015 (n=727). Analyses also include all individuals who answered the questions regarding self-rated physical and mental health (n=3292).

Measures

Demographics:

Demographic characteristics analyzed in this study include measures such as sex, education, race, age, and ethnicity.

Sex was coded as 1=male 2=female. Education was measured by the highest level of education completed, this measure was asked via the question "What is the highest grade of school or year of college you completed?" 1= no school/ some grade school 2=eighth grade/ junior high school 3= some high school no diploma 4= GED 5=graduated from high school 6= 1 to 2 years of college, no degree yet 7= 3 or more years of college, no degree yet 8= grad from 2-year college, vocational school, or associates degree 9= graduated from a 4 or 5 year college of bachelor's degree 10= some graduate school 11= master's degree 12= PhD., ED.D., MD, DDS, LLB, LLD, JD, or other professional degree.

Race was originally coded as 1=White 2= Black and/or African American 3= Native American or Alaska Aleutian Island/ Eskimo 4= Asian 5= Native Hawaiian or Pacific Islander 6= Other. For race, multiple dummy variables were created for each race category because there is no option to specify factor variables when doing linear regression. Whites were labeled as the base category and treated as the reference group.

Age was coded as a continuous variable ranging from 39- 93. The ethnicity variable used in this study was the first ethnic group that the respondent identifies with, meaning the ethnic group the respondent most identifies with. The question used to identify ethnicity was, "[In addition to being American] What is your main ethnic background or origin? First group" Ethnicity was recoded from originally including the values of 1=not Spanish/Hispanic, 2=Mexican, 3=Mexican American 4=Chicano 5=Puerto Rican 6= Cuban 7= Other Spanish to the recode of 0=not Spanish/Hispanic and 1= Spanish/Hispanic.

Outcomes:

The three main dependent variables in this study are the outcomes of cardiovascular disease, self-rated physical health, and self-rated mental health.

Self-rated physical health (n=3292) was investigated as it is a well-established measure of health (DeSalvo et al. 2006; Idler and Benyamini 1997). To measure self-rated physical health the following question was answered: “In general, would you say your physical health is excellent, very good, good, fair, or poor?” Self-rated physical health was coded as 1=excellent 2= very good 3= good 4=fair and 5=poor. To provide a holistic measure of health outcomes, self-rated mental health was also evaluated. To measure self-rated mental health, the following question was answered: “What about your mental or emotional health? or would you say your mental or emotional health is excellent, very good, good, fair or poor?” The same coding scheme of 1=excellent 2= very good 3= good 4=fair and 5=poor was also used for this variable.

To study cardiovascular disease those who answered the question of “have you ever had heart trouble suspected or confirmed by a doctor?” were studied (n=727). Subsequently these individuals answered the question of “what was the diagnosis?” with the options of choosing one or more of the following: heart attack, angina, high blood pressure, valve disease/ mitral-valve prolapse, hole in heart, blocked coronary artery, irregular heartbeat/ arrhythmia, heart murmur, heart failure, and other. To study cardiovascular disease, two count variables were created for the number of heart condition diagnoses. The count variables provide a robust variable measuring a wide variety of cardiovascular disease diagnoses. The counts for each individual included diagnoses of: heart attack, angina, high blood pressure, valve disease, hole in heart, blocked artery, irregular heartbeat, heart murmur, heart failure, and other. Individuals had 0, meaning none, to multiple diagnoses of cardiovascular disease. This variable allowed for the evaluation of whether more diagnoses are correlated with any of the independent variables. First, the total number of heart conditions each respondent was diagnosed with was summed (min = 0, max=4) for each wave respectively. Then a recoded variable was created for wave two (2005) in which

0= no conditions and 1= at least one condition. A second variable was created and recoded to measure number of heart conditions in wave 3 (2015) in which 0=no conditions 1= at least one condition.

Change in household total income was used as the one of the main independent variables in this study. Literature has shown the significance of household income on health outcomes (Davalos and French 2011). Household total income from wage, pension, social security, and other sources was utilized in this study. First a change variable was created to find the change in income between 2005 and 2015. Next, the change variable was used to create two new variables: income loss and income gain. The variable for income loss was created by using the income change of 0 through the number for highest income gain = 0, else =copy into income loss. The variable for income gain was created by using the income change of 0 through the number for greatest income lost = 0, else =copy into income loss. The reference group for this variable were individuals who did not lose of gain any income between 2005 and 2015.

Based on past literature, two of the most significant recession experiences that have been tied with health outcomes are loss of job/ unemployment and housing foreclosures (Moen 1983; Voydanoff 1984; Gallo et al. 2000; Brand et al. 2008; Davalos and French 2011; Houle 2014; Cagney et al. 2014). Therefore, both of these variables were used to evaluate if recession experience mediates change in health outcomes. To measure job loss during the recession the following question was asked “The first questions are about your experience with the Recession. For each of the following, please tell me whether or not it is something that has happened to you since the recession began in 2008." Since the recession began in 2008 have you - Lost a job?” This variable was originally coded as 1=yes 2=no. For simplicity sake, in this study it was recoded as 0=no 1=yes. The recession experience of foreclosure was measured via the question,

"Since the recession began in 2008 have you - Lost a home due to foreclosure?" Responses were originally coded as 1=yes 2=no. In this study, the responses were recoded to 0=no 1=yes. Those who never owned a home (n=4) were coded as missing and were not evaluated.

Marriage has been widely accepted to mediate health outcomes, as such it was also investigated in this study to see whether marital status mediates the impact of recession experiences on health outcomes. Marital status was measured using the following question, "Are you married, separated, divorced, widowed, or never married?" A change variable was created to evaluate change in marital status between 2005 and 2015. Marital status was originally coded as 1=married 2= separated 3=divorced 4=widowed and 5=never married. The first new variable created for change in marital status measured whether individuals went from being married in 2005 to being divorced, separated, or widowed in 2015 (n=308). The first new variable created was for individuals who got married between 2005 to 2015 (n=117). For the new variables 0= no 1=yes. The reference category were individuals who saw no change in status (n=2860).

Data Analysis

Linear regression was conducted for self-rated physical health in each model. Linear regression was also conducted for self-rated mental health in each model. Binary logistic regression was conducted for the dependent variable of number of cardiovascular health diagnoses in wave 3 (2015) in each model.

Model 1

Model one is the baseline model which analyzes the first research question of how change in total household income impacts physical and mental health outcomes. In model one dependent variable regression is conducted on demographic variables and total household gain or loss. In one version of model 1, the dependent variable of number of cardiovascular health

diagnoses in wave 3 (2015) was used and binary logistic regression was performed. Covariates included sex, race, ethnicity, loss of income, gain of income, age, number of cardiovascular health diagnoses in wave 2 (2005) and education. In another version of model 1, the dependent variable was self-rated physical health in wave 3 (2015) and ordinary least squared regression was performed. Independent variables in this version also included sex, race, ethnicity, age, education, self-rated physical health in wave 2 (2005) loss of income, gain of income. The same analysis was done for self-rated mental health in this model.

Models 2-4

The research question investigating the extent to which job loss and housing foreclosures during the great Recession mediate physical and mental health outcomes is answered via models two, three, and four. Model two adds loss of job as a covariate, model three investigates the experience of foreclosure as a covariate, and model four analyses the influence of both loss of home and foreclosure.

Model 2

In model two, dependent variable regression is conducted on demographics, dependent variable in wave 2 (2005), loss of income, gain of income, and the recession experience of job loss. In one version of model 2, the dependent variable of change in number of cardiovascular health diagnoses was used and binary logistic regression was performed. Covariates included were sex, race, ethnicity, loss of income, gain of income, age, education, number of cardiovascular health diagnoses in wave 2 (2005), and job loss. In another version of model 2, the dependent variable was self-rated physical health and ordinary least squared regression was performed. Independent variables in this version also included sex, race, ethnicity, loss of income, gain of income, age, education, self-rated physical health in wave 2 (2005) and job loss.

The same analysis, as self-rated physical health, was done for self-rated mental health in this model.

Model 3

In model three, dependent variable regression is conducted on demographics, loss of income, gain of income, dependent variable in wave 2 (2005), and the recession experience of loss of home due to foreclosure. Model three was structured the same as model two, however model three incorporates the recession experience of loss of home due to foreclosures instead of job loss. This was done in order to see which recession experience, if either, mediated the results more or less than the other.

Model 4

In model four, dependent variable regression is conducted on demographics, loss of income, gain of income, dependent variable in wave 2 (2005), and both the recession experiences of job loss and loss of home due to foreclosure. Model four is constructed the same as models two and three however in model four both job loss and foreclosures are incorporated rather than just one or the other.

Model 5

Finally, model five addresses research question three of how social relationships, such as marital status, mediate the influence of household income change and the Great Recession on physical and mental health. In model five, dependent variable regression is conducted on demographics, loss of income, gain of income, dependent variable in wave 2 (2005), and both the recession experiences of job loss and loss of home due to foreclosure, and marital status. Model five is constructed the same as model four with the addition of both marital status variables. One of the two marital status variables added accounted for those who got divorced

during the period of 2005 to 2015 and the other accounted for those who got married during this period. In analysis of change in number of cardiovascular disease outcomes using binomial regression, marital status was added as a covariate. In the ordinary least squared regression analyses of self-rated physical and self- rated mental health, both marital status variables were added as independent variables.

RESULTS

This study evaluates longitudinal data from 3293 respondents aged 39-93 who participated in both the second and third wave of the MIDUS study. The mean and standard deviations for all variables are presented in table 1. The prevalence of cardiovascular disease diagnosis in 2005 was 16% for the sample, whereas the prevalence jumped to 24% in 2015. This represents an increase of 8% in the average prevalence of cardiovascular disease diagnoses between 2005 and 2015. The mean Self-Rated Physical Health (SRPH) in 2005 was 2.33 while in 2015 the SRPH was poorer as indicated by the 2.57 mean. Self-Rated Mental Health (SRMH) also worsened in the population between 2005 and 2015: the mean SRMH was 2.11 in 2005 and 2.37 in 2015. Average gain in total household income between 2005 and 2015 was $25,361.55, while the average loss in total household income was $-14,527.55. The baseline descriptive statistics were also conducted for recession experiences of loss of job and loss of home.

The prevalence of job loss due to the recession was 14%, and the prevalence of loss of home due to foreclosure was 2%. Approximately 9% of the population reported getting divorced, separated, or widowed between 2005 and 2015. About 4% of the population got married from 2005 to 2015. The average age of the sample in 2005 was 54.54, in 2015 the average age was 63.64 indicating a 9.1-year increase in average age. Furthermore, in 2015 about 55% of the sample is reported to be female while 45% of the sample is male, this is consistent with percentages from 2005. The average highest level of education in the sample in 2005 was 7.48

which indicates having completed at least three or more years of college. A similar, 7.51, average highest level of education was found in 2015 once again indicating having completed at least three or more years of college. Approximately 3% of the sample reported being Hispanic in both waves. When analyzing race in 2005, 92.1% of the population reported White as their primary race, 3.8% reported being Black or African American, 1% as Native American or Alaska Aleutian/ Eskimo, 1% as Asian, less than 1% as Native Hawaiian or Pacific Islander, and 2% as other. A similar distribution of race was reported in 2015, 89% of individuals identified as White, 4% reported being Black or African American, 1% as Native American or Alaska Aleutian/ Eskimo, less than 1% as Asian, less than 1% as Native Hawaiian or Pacific Islander, and 6% as other.

Self-rated Physical Health

Linear regressions were run on the key hypothesized dependent variables. The first dependent variable examined was SRPH in 2015 (see table 2). Model 1 looked at the SRPH with standard demographic controls. Model 2 examined the DV adding Loss of Job during the Great Recession. Model 3 was set up similarly to Model 2 except the variable Loss of Job was replaced by a separate measure of Great Recession impact, Foreclosure. Model 4 examined SRPH investigating both Great Recession experiences (Loss of Job and Foreclosure) in tandem. Model 5 added to Model 4 by also including Marital Status.

Gain and loss of income were both expected to influence SRPH but results varied. Gain in Income was significantly associated with better SRPH across all models (Model 1: -.059, Model 2: -.054 Model 3: -.057. Model 4: -.054, $p<0.01$) but there was a significant increase in better SRPH once Marital Status was included (Model 5: .062; $p<0.001$). Therefore, as supported by Model 5, the more income gained the better SRPH. Although expected to be, Loss in Income

was not significant in any of the models, but was found to be in the expected direction in all models, being related to worse SRPH.

Standard demographic controls were examined in all models related to SRPH. While Age was not significant in Model 1 (0.027, NS), in every model where Loss of Job was included (Model 2: 0.044, Model 4: 0.046; $p<.05$ and Model 5: 0.047 $p<.001$) Age became associated with poorer perceptions of SRPH. Thus, indicating a relationship between the two. The highest level of education completed was strongly and significantly associated with better perceptions of SRPH across all models with very little variation in the standardized coefficients.

While being Black/ African American relative to being White was not significant in Model 1 (0.032, NS) and Model 2 (0.032, NS), whenever the recession variable of Foreclosure was included (Model 3: 0.034, Model 4: 0.034, Model 5: 0.035; $p<.05$), being Black/African American was significantly associated with poorer SRPH. Being Native American or an Alaska Native Aleutian/ Eskimo only became associated with worse SRPH when the recession experience of Foreclosure alone was included in Model 3 (.034; $p<.05$). Being Asian was associated with poorer SRPH when only loss of job was included in Model 2 (.035; $p<.05$). Being Native Hawaiian or Pacific Islander as compared to being White was only significantly associated with worse SRPH in the baseline Model 1 (.035 $p<.05$).

Poor SRPH in 2005 was strongly and significantly associated with poor SRPH in 2015 across all models with little variation in standard coefficients across all five models (Model 1: 0.511, Model 2: 0.505, Model 3: 0.506, Model 4: 0.502, Model 5: 0.019; $p<.001$).

Those who lost their job and lost their home resulted in poorer self-rated health. Interestingly, losing a job is more strongly predictive of negative health outcomes than losing a home. Loss of job was significantly associated with worse SRPH in all models that it was

included in (Model 2: .093, Model 4: .088; Model 5: .089 p<.001). Loss of home was also significantly associated with worse SRPH in all models that it was included in (Model 3: .058, Model 4: .048; Model 5: .047 p<.001). When both loss of job and loss of home are included, loss of job (Model 4: .088; p<.001) is nearly two times a better predictor of self-rated health than loss of home as can be seen when comparing the standardized coefficients in Model 4 (Model 4: .048; p<.001).

Marital status was expected to moderate SRPH however results varied. Getting divorced, separated, or widowed between 2005 to 2015 was not significantly associated with self-rated health, although it was in the expected direction of being related to worse SRPH. Getting married between 2005 and 2015, surprisingly, was associated with poorer SRPH (Model 5: .047; p<.01). Sex, ethnicity, and the other race category were not significantly associated with SRPH in any of the models.

Self-rated Mental Health

The second dependent variable on which linear regressions were done was SRMH in 2015 (see table 3). All five models were structured the same as previously described models in SRPH.

Gain and loss of income were both expected to influence SRMH but results did not support this prediction. Gain of income was not significantly associated with better SRMH across all models, however it was still in the expected direction of increasing SRMH (Model 1: -.032, Model 2: -.029, Model 3: -.030, Model 4: -.028, Model 5: -.024). Similarly, loss of income was not significantly associated with worse SRMH but was still in the expected direction in all models, being related to worse SRMH.

Standard demographic controls were examined in all models related to SRMH. Higher levels of education are associated with better SRMH across all models (Model 1: -0.104, Model 2: -0.101, Model 3: -0.102, Model 4: -0.100, Model 5: -0.101; $p<.001$) with very little variation in the standardized coefficients.

Blacks/African Americans and Native Americans both display significant association with decreased SRMH across all five models. In Blacks/African Americans there is little to no variation in the standardized coefficients (Model 1: 0.043, Model 2: 0.043, Model 3: 0.043, Model 4: 0.043, Model 5: 0.042; $p<.05$). Native Americans as compared to Whites display poorer self-rated health, as can be seen through all five models, there is also little to no variation in the standardized coefficients (Model 1: 0.041, Model2: 0.040, Model3: 0.040, Model 4: 0.039, Model 5: 0.039; $p<.05$). Results for Asians, Native Hawaiian or Pacific Islander, and Other were not significant, but as compared to Whites they also displayed a general trend of decreased SRMH.

SRMH in 2005 was controlled for in the regression analyses. Poor SRMH in 2005 was significantly associated with poor SRMH in 2015 (Model 1: 0.449, Model 2: 0.023, Model 3: 0.445, Model 4: 0.439, Model 5: 0..438; $p<.001$).

Those who lost their job and lost their home indicated poorer SRMH. In Model 2, those who lost their job display a .074 decrease in mental health (Model 2: .074; $p<.001$). In Model 3, those who lost their homes display a .067 decrease in mental health (Model 3: .067; $p<.001$). When both recession experiences are accounted for in Model 4 job loss (Model 4: .068; $p<.001$) prevails as a better predictor of SRMH than loss of home (Model 4: .060; $p<.01$).

Marital status was expected to moderate SRMH however results were not significant. Additionally, sex, age, and ethnicity were also not significantly associated with SRMH in any of the models.

Cardiovascular Health

Binary Logistic Regression was run to analyze cardiovascular health in 2015 (see table 4). A robust dependent count variable of number of cardiovascular diagnoses in 2015 was utilized for these analyses. All five of the previously described models stayed the same in this logistic regression analysis.

Age is significant in determining the likelihood of having heart conditions in 2015 in all models ($p<.001$). Across all the models, a one unit increase in age is associated with a 4.3% increase in the likelihood of having any cardiovascular disease diagnoses in 2015.

Sex was also found to be significant in determining the likelihood of having heart conditions ($p<.001$). Across all five models being female is associated with a decrease in the likelihood of having any heart conditions in 2015. In model 1, females are associated with a 42% decrease in likelihood of having any heart conditions. As job loss is added in model 2, females are associated with a 42.5% decrease in likelihood of having any heart conditions. As home loss is added into the model, females are associated with a 43.1% decrease in likelihood of having heart conditions. When both job loss and home loss are added in together in model 4 females are associated with a 43.5% decrease in likelihood of having heart conditions. And finally, in model five when marital status is also added females have a 44.3% decrease in likelihood of having heart conditions.

Education is also significantly associated with a decreased likelihood of having heart conditions in 2015 ($p<.05$). In all models an increase in one education level decreases likelihood

of having a cardiovascular disease diagnosis in 2015 by 6%. And finally, having one or more heart conditions in 2005 increases the likelihood of having a heart condition in 2015 by eighteen times ($p<.001$). The findings for gain in income, loss in income, ethnicity, race, loss of job, foreclosure experience, getting divorced/separated/widowed, and getting married were all insignificant.

DISCUSSION

The findings in this study provide an examination of what influences physical and mental health during times of macroeconomic distress. First, I looked at how change in total household income, job loss, home loss, and marital status impact SRPH. Results most notably indicated that only a gain in income, not the loss of income significantly impacts SRPH. On the other hand, these changes do not have a significant impact on SRMH. Second, I found that the loss of job and loss of home are associated with worse perceptions of SRPH and mental health. Third, I found that while marital status does moderate the relationship between recession impacts of self-rated physical and mental health, getting married during 2005 to 2015 decreased perceptions of SRPH, with no significant effect on SRMH. Finally, results evaluating the impact of a loss of total household income, job loss, loss of home, and marital status on having any heart condition were not significant. Consistent with past literature, the characteristics of age, sex, and education were significant predictors of the likelihood of having a heart condition in 2015. This study adds to a growing body of literature on the health impacts of macroeconomic downturns by longitudinally evaluating clinical and self-rated health outcomes. My analysis is consistent with and builds on past research by providing new insight towards the importance of total household income, loss of job, loss of home, and marital status.

Analysis from this study indicates no significant relationship between loss of total household income and self-rated physical, self-rated mental, and cardiovascular health outcomes. Hypotheses 1A which stated that loss of total household income between 2005 and 2015 would have a negative impact on SRPH was primarily disproven by the results of the study. Loss of total household income was not significant in any of the models; however, it was in the expected direction, being related to worse SRPH. Loss of total household income was not found to impact SRPH possibly due to the grouping of all individuals who lost income as one group. Notably, however, gain in income was significantly associated with better SRPH across all models with a significant increase in Model 5 when marital status was added. These results make sense as individuals who are doing better during times of economic hardship will have greater self-esteem and thereby indicate better self-rated health (Pearlin, 1981). Furthermore, individuals who gain income may have had the luxury to invest time and money into their physical health leading to increased SRPH (Mani et al., 2013; Bruening et al. 2012).

Hypothesis 2A which stated that loss of job and loss of home would be associated with worse perceptions of SRPH was proven to be correct. Consistent with past literature this study finds that loss of job and loss of home, lead to decreased SRPH (Davlos and French 2011; Arcaya et al. 2013). Job loss during the Great Recession can be considered a measure of involuntary unemployment. Individuals who lose their jobs and homes are unable to support themselves and their families financially. Therefore, the results of this study make sense as involuntary job loss has shown to decrease positive self-concepts and leave individuals susceptible to stress, and depression (Pearlin, 1981). Furthermore, decreased ability to support one's living expenses, as a result of job loss, unveils chronic stress which has long-term social and economic impacts (Burgard et al. 2007). Based on Selye's general adaptation theory

physiological response to stress, for instance the stress from losing one's job, stems from the activation of the sympathetic nervous system and the hypothalamic-pituitary-adrenal (HPA) axis (Baffy 2017). Short-term activation of the sympathetic nervous system and the HPA axis is critical for maintaining proper physiological function. However, extended activation due to chronic stress leads to inflammation and elevated blood pressure (Miller et al. 2009; Cohen et al. 2012; Hawkley et al. 2006). These underlying mechanisms may be the reasoning behind why loss of job and loss of home are associated with poorer perceptions of SRPH. Also, individuals who experience job loss and loss of home may experience changes in health-related spending due to the inability to pay for adequate healthcare or shelter (Lusardi et al. 2010; Mortensen and Chen 2013). Interestingly, this study finds that loss of job is more strongly predictive of negative SRPH than loss of home. A possible explanation for this finding could be that loss of job most directly results in declined ability to pay for healthy food options and to finance daily expenses (Bruening et al. 2012). Whereas loss of home, while also a strong predictor of physical health may not be as immediate of a cause of diminished self-concept and self-esteem in relation to physical health.

Hypothesis 3A which stated that marital status would moderate the relationship between recession impacts and SRPH was proven to be partially true. Getting divorced, separated, or widowed between 2005 and 2015 was not significantly associated with self-rated health. However, getting married surprisingly was associated with poorer SRPH. Marital status and being married is considered to be a protective factor when it comes to health outcomes (Joung 1997; Craigs et al. 2014). However, in this study, it was shown to be an indicator of poorer self-rated health. It can be posited that this relationship is seen due to the distressful time of getting married during the course of the Great Recession. A possible explanation for this finding is that

individuals who get married during the recession may experience role strain between providing for their family while also maintaining a healthy relationship with their husband or wife. While marriage is generally a protective factor, in this case getting married during the recession would exacerbate issues related to role strain and role conflict. Role strain and the struggle between providing for the family and maintaining a healthy relationship during times of economic distress may potentially lead to decreased self-concept thereby decreasing SRPH. An added relationship during a time of immense stress may also lead to role conflict between responsibilities towards maintaining a job as an employee and towards flourishing a relationship as a husband or wife.

Findings from this study are in line with past literature, job loss and loss of home cause a decline in self-rated physical, self-rated mental, and cardiovascular health outcomes. This study contributes to the literature by presenting an interesting finding when comparing the influence of job loss versus the influence of loss of home on health outcomes. Hypothesis 1B which investigated whether the loss of income between 2005 and 2015 will be associated with worse perceptions of SRMH was not proven to be correct. Neither gain nor loss of income was associated with worse perceptions of SRMH. This result was surprising as wealth shocks generally lead to a deterioration of mental health (McInerney et al. 2013). The underlying reasoning behind this finding may be the use of the two variables: loss of income and gain of income. As opposed to total household income, wealth may be a more robust and all-encompassing measure of the financial status of an individual.

Hypothesis 2B, which studied whether the loss of job and loss of home will cause a decline in SRMH was supported by the results. Consistent with past research, this job loss was a significant factor contributing to poor SRMH. This makes sense as unemployment is associated with increased depression levels (Brand et al. 2008; Brenner et al. 2014). The recession

experience of foreclosure was also found to be associated with poorer SRMH. This also makes sense as losing one's home may cause distress and changes in self-efficacy in the ability pay for a home which could lead to depressive symptoms. When comparing both job loss and foreclosure, job loss was shown to be a better predictor of poorer self-rated health, based on standardized coefficients. In comparing foreclosure and job loss, this study adds to the literature by showing that while both unemployment and foreclosure predict poorer SRMH outcomes, job loss is a better predictor of self-rated health than foreclosure.

Hypothesis 3B which investigated whether marital status will moderate the relationship between recession impacts and SRMH was proven not to be true as results were not significant. Getting married was expected to moderate the relationship between recession impacts and self-rated health by increasing SRMH. Past research has shown that individuals who become married report less depression and fewer alcohol problems (Horwitz et al. 1996). However, since no significant results were seen perhaps including a more representative sample will provide more insight. Furthermore, as previously posited, getting married during a recession may cause mixed results in populations. Further studies specifically looking at cases of individuals who got married during a time of economic stress should be conducted to evaluate the impact of marital status on health.

Marital status partially moderated the relationship between recession impacts and SRPH. However, marital status did not moderate the relationship between recession impacts with SRPH nor with SRMH.

Hypothesis 1C, 2C, and 3C were all not supported by the findings of this study. Hypothesis 1C analyzed the impact of loss income between 2005 and 2015 on the presence of any heart conditions, 2C studied whether the loss of job and loss of home is associated with the

presence of any heart conditions, and finally, 3C investigated if marital status moderates the relationship between recession impacts and any heart conditions. While the results were not statistically significant, they represent a similar trend that has been established in the literature (Hajat et al. 2010; McDade et al. 2011; Boen and Yang 2016). To further study cardiovascular health, a more representative sample of the population can be used with even more robust measures of cardiovascular disease.

This study has three main findings. The first main finding is that gain in total household income leads to better SRPH but not better SRMH. The second main finding is that loss of job and loss of home are both associated with worse perceptions of SRPH as well with worse perceptions of SRMH. Finally, the most novel finding in this study is that loss of job is a better predictor of self-rated health outcomes than loss of home. These findings are significant and therefore should guide future policies and interventions aimed at mitigating the health and well-being consequences of macroeconomic downfalls.

Understanding the impact of the Great Recession on physical and mental health outcomes is critically important to prepare our society for health consequences that precipitate from large macroeconomic crashes. Although recessions are macro-level societal occurrences, findings from this study display that recessions also impact individual-level health. Since job loss was shown to be a stronger indicator of self-rated health, future policy measures can be directed towards developing providing financial support to attenuate the financial burden experienced when an individual is laid-off.

Few limitations and areas for future direction exist. While MIDUS is a national sample, it does not account for the diversity in race that exists within the United States, nearly 90% of the respondents in the dataset were White. A future direction would be to include a more racially

diverse sample to extend the external validity of this study. Another limitation of this study was the use of total household income as a measure of financial strain. While total household income included income from wage, pension, social security, and other sources, a more robust measure of financial strain can be used. Future studies may use aggregate wealth loss which includes wealth from assets as well. While many of the variables in this study were run as fix-effects models, age, sex, and education were not. Another future direction would be to run all variables as fixed-effects models; to model change in both financial situation and health over time while again controlling for baseline characteristics. Finally, another future direction would be to investigate a greater variety of independent variables of both physical and mental health to see which are impacted by financial changes, job loss, foreclosure, and marital status.

This study adds to the literature by being one of the first to longitudinally analyze the impact of the Great Recession on both clinical and self-rated health in Midlife Adults in the United States. Findings from this study provide insight towards which factors of the Great Recession led to poorer health outcomes. Findings from this further provide evidence that may guide future policies and interventions geared towards attenuating the impacts of macroeconomic, financial crashes on health and well-being.

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Table 1
Descriptive Statistics, MIDUS 2005-2015 (n=3293)

	Wave 2 (2005)		Wave 3 (2015)	
	Mean	SD	Mean	SD
Demographics				
Age (yrs.)	54.5	11.35	63.64	11.35
Sex (Male= Ref)	.53	.482	.55	.498
Education (highest level completed)	7.48	2.49	7.51	2.51
Ethnicity				
Hispanic	.03	.169	.03	.173
Non- Hispanic	.97	.169	.97	.173
Race				
White	.921	.269	.89	.307
Black/ African American	.038	.191	.04	.190
Native American or Alaska Native Aleutian/Eskimo	.01	.119	.01	.094
Asian	.01	.072	.00	.094
Native Hawaiian or Pacific Islander	.00	.025	.00	.061
Other	.02	.141	.06	.228
Outcomes				
Cardiovascular Disease Diagnoses	.16	.406	.24	.495
Self-rated Physical Health	2.33	.942	2.57	1.035
Self-Rated Mental Health	2.11	.897	2.37	.953
Total Household Income				
Total Household Income Gain	--	--	25,361.55	31,565.00
Total Loss Household Income Loss	--	--	-14,527.55	31,565.00
Recession Experience				
Loss of Job	--	--	.14	.342
Foreclosure	--	--	.02	.144
Marital Status				
Got Divorced/Separated/Widowed	--	--	.09	.292
Got Married	--	--	.04	.185

Table 2
Self-rated Physical Health, 2015 (n=3293)

	Model 1	Model 2	Model 3	Model 4	Model 5
	std cofeff	std cofeff	std cofeff	std cofeff	std cofeff
Demographics					
Age (yrs.)	.027	.044*	.031	.046*	.047**
Sex (Male = Ref)	-.004	-.004	-.006	-.005	-.008
Education (highest level completed)	-.119***	-.115***	-.118***	-.114***	-.117***
Ethnicity					
Hispanic/Latino/ Spanish decent	.003	.004	.376	.008	.009
Race (White = Ref)					
Black/ African American	.032	.032	.034*	.034*	.035*
Native American or Alaska Native Aleutian/Eskimo	.023	.033	.034*	.033	.032
Asian	.033	.035*	.030	.033	.032
Native Hawaiian or Pacific Islander	.035*	.023	.023	.023	.032
Other	.017	.017	.020	.020	.024
Self-rated Physical Health 2005	.511***	.505***	.506 ***	.502***	.019***
Change in Total Household Income					
Gain in Income	-.059**	-.054**	-.057**	-.054**	-.062***
No Change in Income (Ref)	--	--	--	--	--
Loss in Income	.024	.027	.029	.031	.031
Recession Experience					
Loss of Job	--	.093***	--	.088***	.089***
Foreclosure	--	--	.058**	.048**	.047**
Marital Status					
Stayed Single (Ref)	--	--	--	--	--
Got Divorced/Separated/Widowed	--	--	--	--	.010
Got Married	--	--	--	--	.047**

Note: ***p<0.001, **p<0.01, *p<.05
Self-rated Physical Health: 1= Excellent 5= Poor

Table 3
Self-Rated Mental Health, 2015 (n=3293)

	Model 1	Model 2	Model 3	Model 4	Model 5
	std cofeff	std cofeff	std cofeff	std cofeff	std cofeff
Demographics					
Age (yrs.)	.004	.009	.001	.012	.008
Sex (Male=Ref)	.035	.035	.032	.033	.031
Education (highest level completed)	-.104***	-.101***	-.102***	-.100***	-.101***
Ethnicity					
Hispanic/Latino/ Spanish decent	.010	.010	.006	.006	.007
Race (White = Ref)					
Black/ African American	.043*	.043*	.043*	.043*	.042*
Native American or Alaska Native Aleutian/Eskimo	.041*	.040*	.040*	.039*	.039*
Asian	.003	.004	-.001	.001	.002
Native Hawaiian or Pacific Islander	.018	.018	.018	.018	.019
Other	.023	.023	.025	.025	.026
Self-Rated Mental Health 2005	.449***	.023***	.445***	.439***	.438***
Change in Total Household Income					
Gain in Income	-.032	-.029	-.030	-.028	-.024
No Change in Income (Ref)	--	--	--	--	--
Loss in Income	.015	.017	.020	.022	.025
Recession Experience					
Loss of Job	--	.074***	--	.068***	.068***
Foreclosure	--	--	.067***	.060**	.059**
Marital Status					
Stayed Single (Ref)	--	--	--	--	--
Got Divorced/Separated/Widowed	--	--	--	--	.027
Got Married	--	--	--	--	-.013

Note: ***p<0.001, **p<0.01, *p<.05
Self-rated Physical Health: 1= Excellent 5= Poor

Table 4
Cardiovascular Health: One or more Heart Condition in 2015
(Odds Ratios)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	P Value	OR	P Value	OR	P Value	OR	P Value	OR	P Value
Demographics										
Age (yrs.)	1.04	.000	1.04	.000	1.04	.000	1.04	.000	1.04	.000
Sex (Male=Ref)	.579	.000	.575	.000	.569	.000	.565	.000	.557	.000
Education (highest level completed)	.940	.016	.940	.017	.940	.016	.940	.016	.940	.017
Ethnicity										
Hispanic/Latino/ Spanish decent	.503	.116	.505	.118	.449	.081	.450	.082	.460	.090
Race (White= Ref)										
Black/ African American	.621	.240	.623	.244	.637	.268	.640	.273	.645	.282
Native American or Alaska Native Aleutian/Eskimo	1.97	.280	1.98	.277	1.97	.282	1.98	.279	1.96	.287
Asian	.980	.986	.985	.989	.960	.972	.963	.974	.930	.950
Native Hawaiian or Pacific Islander	288169974	1.00	287408669	1.00	290400031	1.00	289542653	1.00	293940513	1.00
Other	.907	.726	.910	.733	.919	.762	.922	.771	.911	.763
One or more Heart Condition in 2005	17.8	.000	17.9	.000	17.6	.000	17.7	.000	17.7	.000
Change in Total Household Income										
Gain in Income	1.00	.813	1.00	.835	1.00	.821	1.00	.843	1.00	.751
Loss in Income	1.00	.099	1.00	.099	1.00	.103	1.00	.104	1.00	.117
Recession Experience										
Loss of Job	--	--	1.01	.981	--	--	1.00	.988	1.00	.989
Foreclosure	--	--	--	--	1.22	.687	1.23	.680	1.21	.701
Marital Status (Stayed Single= Ref)										
Got Divorced/Separated/Widowed	--	--	--	--	--	--	--	--	1.18	.427
Got Married	--	--	--	--	--	--	--	--	1.49	.240