

Effect of Medicare Expansion on Mental Health Outcomes for the Elderly

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**MEDICARE
IMPROVEMENTS FOR
PATIENTS AND
PROVIDERS
ACT OF 2008**



Introduction

As a society, we are becoming more and more aware of the importance of mental health as an important factor for a decent quality of life. Mental health is becoming increasingly recognized as a growing concern not just by individuals, but by governmental agencies as well. Nevertheless, elderly adults tend to be overlooked in terms of mental health, despite suffering from social and physical isolation in later life. A 2010 AARP study showed that 33 percent of adults over 45 are lonely, coining the term “epidemic of loneliness” (AARP, 2010). It is evident that mental health is critical for older adults. The conditions of retirement, loss of active income, and loss of family and friends can increase mental health issues for older adults (CDC, 2008).

We seek to investigate the effect of the implementation of the Medical Improvements for Patients and Providers Act of 2008 (MIPPA), an expansion of Medicare Part B, which covers non-inpatient services such as preventative screening. This is a meaningful investigation because the elderly are a rarely-studied group with regards to mental health, and we believe it is important to study a policy change that could affect their ability to access mental health and their mental health outcomes. Our research examines a sample of 52,015 adults from ages 60 to 69.

Background

MIPPA was implemented between 2010 and 2014 and increased government coverage of mental health support payments in Medicare Part B, which helps people pay for several mental health services, such as one depression screening per year, individual and group psychotherapy, family counseling, lab and diagnostic tests, psychiatric evaluations, certain prescription drugs, and partial hospitalization. Medicare coverage for each individual varies based on federal, state, and local implementation of Medicare legislation. To qualify for Medicare, beneficiaries must be at least 65 years old.

The MIPPA expansion is the product of many decades of evolving Medicare policy. In 1965, Medicare and Medicaid became formally established, where Medicare would support people 65 and older and Medicaid would support low-income families. In 1972, the Social Security Amendments of 1972 expanded Medicare benefits to people under 65 with long-term disabilities and those with end-stage renal disease. Between 1982 and 1997, Medicare was expanded to cover some private insurance, limit costs for hospitals, and limit beneficiary out-of-pocket payments (Blumenthal et. al, 2015). We are investigating the Medicare Improvements for Patients and Providers Act of 2008 (MIPPA), which incrementally lowered costs for mental health service premiums and deductibles from 2010 to 2014 by increasing government coverage from 50 percent to 80 percent.

Previous Literature

As concern over elder mental health and awareness of the “epidemic of loneliness” in older generations is a fairly recent development, it is unsurprising that there is relatively little literature directly addressing the effect of access to Medicare on mental health outcomes and access in older populations. That said, we focus on two relevant national studies that analyze the impact of MIPPA.

Le Cook et. al study the effect of MIPPA using longitudinal data from the Medical Expenditure Panel Survey from 2006 to 2015. Their control group consists of individuals covered by employer-sponsored health insurance, and their treatment group consists of individuals with household incomes 200 percent of the federal poverty line. This model ensures that beneficiaries would not have previously been covered by Medicaid cost parity laws. Furthermore, Le Cook et. al limit their study to adults with probable mental health illnesses, using the Kessler K6 Psychological Distress Scale. Using a differences-in-differences model and controlling for demographic factors, self-reported physical and mental health, and education

level, they find that, while overall use of mental health treatment increases by 6.03 percentage points and psychotropic medication fillings increase by 8.16 percentage points, both significant at the 5% level, outpatient mental health visits decreased by 0.54 percentage points and specialty mental health visits decreased by 3.12 percentage points, with neither being statistically significant (Le Cook et. al, 2020). These findings are intriguing, as they suggest that the form of mental health treatment that MIPPA should have affected, outpatient mental health visits, was not affected by the policy change while medication refills, which were not the intended target of the policy change, were significantly boosted in their 2011-2015 post-implementation period.

In a similar study, Vung et. al study the effect of MIPPA using Medicare claims data from 2007 to 2016 on individuals with severe mental illnesses, including schizophrenia, bipolar disorder, and major depressive disorder, to determine whether or not the policy had an effect on mental health care visits and spending. Their study uses a differences-in-differences model comparing low-income beneficiaries who had already previously qualified for free behavioral health care with beneficiaries just above the income cut-off in order to reduce bias associated with income differences and access to behavioral health care. Those in the latter group thus were subject to the new insurance copayment reduction. Because they used Medicare insurance claims data, Vung et. al also control for state-fixed effects. As with Le Cook et al., Vung et. al find that there are no statistically significant changes in either mental health visits or spending on mental health visits during and following the implementation of MIPPA (Vung et. al., 2020).

Our study differs from existing work in a few areas. Due to time limitations, we forgo using national data on insurance coverage or income differences to differentiate between treatment and control groups. Instead, we use age, thus using eligibility for Medicare as our treatment and control differentiating factor. We assume that a significant portion of the

population switches from private insurance to Medicare after becoming eligible at 65. Our use of the Integrated Public Use Microdata Series (IPUMS) also limits our ability to control for state-fixed effects due to the location-blind data reporting. Furthermore, in lieu of limiting our study to those with existing severe mental illnesses, we look at a sample of the general population. We believe that the main mental health issues elderly populations face are low-grade anxiety and depression that warrant a mental health visit but not necessarily a diagnosis of severe mental illness. In limiting the study to severe mental illness, the existing work excludes the majority of the elderly population and thus ignores the epidemic of loneliness they face. As such, we chose to use self-reporting indicators of mental wellbeing as our primary dependent variable instead of spending and created our own index due to missing data that would have been required for the Kessler and CES-D 8 scales. However, in keeping with previous research, we do include two other dependent variables assessing behavioral or mental health visits in the past 12 months, with one general variable and one variable focusing on income barriers to care.

Data Collection

For our analysis, we use 2006 to 2018 data from IPUMS, a data resource which harmonizes data from the National Health Interview Survey (NHIS). The NHIS is a cross-sectional household interview survey of approximately 35,000 households per year. Since 1963, census interviewers have compiled data on topics such as health, health care access, and health behaviors. NHIS survey data is especially useful for our analysis as it includes variables such as age, demographics, mental wellbeing, and mental health care utilization. We also chose this dataset for its large sample size of 87,500 participants per year. Using our IPUMS data extract, we create a pooled cross-sectional dataset.

We limit our analysis of MIPPA to individuals aged 60 to 69 because only adults over the age of 65 are eligible for Medicare. By limiting our sample to those whose age falls within close proximity of the 65 age cutoff, we control for variation in characteristics across age groups. For example, an adult who is 80 years old may be more likely to face mental health challenges as a result of limited mobility and therefore has different characteristics than an individual who is 40. Though limiting our data is advantageous, we may also run into an external validity issue due to our inability to capture the impact of the policy on individuals above the age of 70.

Using our selected age groups, we can justify the parallel trends assumption in which we assume that our two age groups (60 to 64 and 65 to 69) would evolve similarly without the policy change. To measure the impact of MIPPA, we created three dependent variables: Mental Wellbeing Scale (0-24) based on the CES-D 8 scale, “needed but couldn't afford mental health care (past 12 months)”, “saw/talked to mental health professional (past 12 months.)” The first dependent variable, Mental Wellbeing Scale (0-24), measures the mental wellbeing of each individual, on a continuous scale of 0 to 24. To create this scale, we summed variables from the survey that measured if an individual felt everything was an effort, felt restless or had trouble sleeping, felt worthless, felt hopeless, felt sad, and felt nervous in the past 30 days. The zero indicates that an individual felt none of these negative emotions in the past 30 days. The 24 indicates that they felt all of these negative emotions ‘all of the time’ in the past 30 days. The average participant landed at a 2.514 on our 24 point scale, meaning that most of the older adults in our sample felt these emotions on average ‘a little or some of the time.’ We use this instead of the Kessler or CES-D 8 scale due to missing IPUMS data on some questions.

The second dependent variable, “needed but couldn't afford mental health care (past 12 months),” is set up as a dummy variable where DV=1 if the individual needed but couldn't afford

mental health care and DV=0 if this statement did not apply to the individual. This variable indicates whether or not reduction of mental health care cost due to MIPPA allows individuals to afford mental health services. However, because the mean is 0.016, few older adults fall under this category. Only 821 individuals from our sample ‘needed, but couldn’t afford mental health care,’ so our results may be limited with this dependent variable due to small sample size.

The third dependent variable, “saw/talked to mental health professional (past 12 months)”, is set up as a dummy variable where DV=1 if the individual saw or talked to a mental health professional and DV=0 if they did not. This variable is an important indicator of whether visits with mental health professionals changed due to MIPPA.

Table 1 (Appendix) lists all our descriptive statistics, including each dependent variable we describe above. Beyond these dependent variables, it is important to note that each demographic variable is set up as a dummy variable such that DV=1 if the demographic applies to the individual and DV=0 if it does not. Figures A-C (Appendix) illustrate average means over time for our dependent variables.

Economic Model

For our analysis, we use a difference-in-difference model to analyze the impact of the policy, MIPPA, on adults over the age of 65, as this method helps us compare two similar groups during the time periods with MIPPA and without MIPPA. Our two variables of interest are *treatphasein* and *treatpost*. Our *treatphasein* variable indicates the additional effect of the policy for those age 65 plus during the MIPPA phase-in period (2010-2013). Our *treatpost* variable indicates the additional effect of the policy for those age 65 plus starting in 2014. Our key assumption is the parallel trends assumption, which states that the both the treatment and control

groups, over 65 and under 65, would have had the same mental health trends if not for the implementation of MIPPA. We include year fixed effects to control for variation over time.

We used three dependent variables to measure mental health outcomes: *mhvar*, a continuous scale measuring mental health issues, *ybarmentalservice*, and *mentalhealthprof*. These variables help us quantify the extent of mental health problems during the phase-in period and the post 2014 period, examine changes in financial barriers to mental health access, as MIPPA reduced costs of copays and deductibles, and examine changes in whether people have taken advantage of mental health support due to lower costs. We believe it is important to include all these variables in order to fully grasp the impact of MIPPA on mental health for the elderly.

The expected *treatphasein* and *treatpost* coefficients for *mhvar* (Appendix, Models 1 and 2) are negative, as it would be expected that when the law is entering and in effect when the person is over 65, they would be experiencing mental health issues less frequently. The expected *treatphasein* for the *ybarmentalservice* (Appendix, Models 3 and 4) coefficients are negative, as costs are reduced between 2010 and 2013, and as a result individuals are more likely to be able to see a mental health professional. The expected *treatpost* coefficient for *ybarmentalservice* is negative, because the law is fully passed and the costs should be lower. The expected *treatphasein* coefficient is positive for *mentalhealthprof* (Appendix, Models 5 and 6), as we expect accessibility to increase. The expected *treatpost* coefficient is positive for the same reason.

We control for race, ethnicity, gender, education, cohabitation, and income, as these variables can affect mental health outcomes. If we did not include these as control variables, we would have omitted variable bias, where the coefficient for the *treatpost* variable would be too large to properly explain the relationship between MIPPA and mental health outcomes. These

variables are categorical variables which we set up as dummy variables in our regression. Our variables for race are Black, Asian, Native, White, other, and our variable for ethnicity is Hispanic. Our variables for education are: did not graduate from high school, graduated from high school or received a high school diploma equivalent, did not graduate from college, graduated from college, and obtained a graduate degree. Our variable for gender is DV=1 for female. Our variable for cohabitation is DV=1 for cohabitation. Our variables for household income are: under \$35,000 a year, between \$35,000 and \$74,999 a year, between \$75,000 a year to \$99,000 a year, and over \$100,000 a year. We compare these variable coefficients to our constant — an individual who is white, under the age of 65, male, has less than high school education, lives alone, and earns under \$35,000 a year.

The expected sign of the education coefficient would be more negative for mhvar, ybarmentalservice, and more positive for mentalhealthprof when level of education is higher. More highly educated people have a greater understanding of mental illness and how to get help. The expected sign of the income variable would be more negative for mhvar and ybarmentalservice, and more positive for mentalhealthprof because as incomes rise, individuals are more likely to be able to see and afford a mental health professional. The expected signs of gender, race, and ethnicity would be positive relative to our constant for mhvar and ybarmental service and more negative for mentalhealthprof, due to discrimination and lack of trust in mental health services. The expected sign of cohabitation would be negative for mhvar, more positive for ybarmentalservice, and more negative for mentalhealthprof, as living with people can reduce mental health problems and reduce the need to see a mental health professional.

We produced six total regressions for mhvar, ybarmental, and mentalhealthprof. We produced two regressions for each dependent variable: one without controlling for demographic

factors and one controlling for demographic factors because we want to avoid omitted variable bias. All three regressions follow this pattern:

Model 1, 3, & 5: Multiple Regression with Y, phase-in, treatment, and post-treatment groups

$$Y_i = \beta_0 + \beta_1 Treat_i + \beta_2 Post2014_t + \beta_3 Treat_i * Post2014_t + \beta_4 Phasein_i + \beta_5 Phasein * Treat_i + e_{it}$$

Model 2, 4, & 6: Multiple Regression with Y and phase-in, treatment, post-treatment groups with race, gender, education, cohabitation, income, and year fixed effects

$$Y_i = \beta_0 + \beta_1 Treat_i + \beta_2 Post2014_t + \beta_3 Treat_i * Post2014_t + \beta_4 Phasein_i + \beta_5 Phasein * Treat_i + \beta_6 Education + \dots + e_{it}$$

$Y_i =$ mhvar, ybarmental, or mentalhealthprof

Empirical Results

Our results (detailed in Table 2 of the Appendix) from Models 1-4 are inconsistent with our expectations, and our results from Models 5-6 are consistent with our expectations. Models 1-4 yield results that are not statistically significant at the one percent level of significance. Models 5-6 yield results that are statistically significant at the one percent level of significance.

For Models 1 and 2 we expected a negative sign for the treatpost and treatphasein coefficients because, after the policy is implemented, we expected mental wellbeing to improve. Model 1 contains omitted variable bias in that it fails to control for demographic variables and year fixed effects. In Model 2, after controlling for demographics and year fixed effects, we notice an even higher positive coefficient for treatpost and treatphasein which may indicate that despite the policy change, mental wellbeing for adults 65 plus actually declined. To understand if this coefficient is economically meaningful, we compare the coefficients to the mean of our mental wellbeing 24 point scale variable. In Model 1, for the age 65 plus group, during the phase in period, we see a 3.9 percent decline in mental wellbeing. For the age 65 plus group, after the policy is fully implemented, we see a 2.3 percent decline in mental wellbeing. When controlling for demographics and year fixed effects in Model 2, these percentages jump up to 6.2 percent and 8.5 percent, respectively. Only Model 2, treatpost is statistically significant at the 5 percent

significance level. Though a decline in mental health as a result of the policy is unexpected, our results may be limited due to our inability to include individual fixed effects such as personal hardships.

In Figure A, the general trend of average mental wellbeing over time shows that the 60 to 64 age group has worse overall mental wellbeing on our scale than the 65 to 69 age group. This could be due to stresses associated with working, as many in this group may not have retired. Unfortunately, we were unable to control for occupation in our analysis as that data was not available in IPUMS. We note that both age groups saw a sudden improvement in mental wellbeing in 2012. Economic stability could help explain this, but we cannot be certain regarding which variable could explain this uptick in mental wellbeing. However, Figure A provides evidence that our parallel trends assumption for under 65 and over 65 holds, due to similar mental wellbeing trends over time. For Models 3 and 4, we expected a negative coefficient for *treatpost* and *treatphasein*, but instead see a positive coefficient in our results. This indicates that those who needed, but could not afford mental health services after the policy was implemented actually increased. As mentioned earlier, we may have a low sample size (821) of adults who needed, but could not afford mental health services. In Model 3, we see a 1.25 percent increase in probability of being an adult who needs, but cannot afford mental health services during the phase-in period. After the policy is implemented, we see an even higher percent increase of 3.75. In model 4, after controlling for demographics and year fixed effects, these percentage changes increase to 1.88 and 4.38, respectively. We also note that neither of the *treatpost* or *treatphasein* coefficients are statistically significant, except for Model 3 *treatpost* which is statistically significant at the 10 percent level of significance. We believe both Models 3 and 4 have omitted

variable bias issues or that MIPPA itself was not able to reach the 60 to 69 year olds who needed the mental health care cost reduction the most.

Figure B depicts an overall trend which shows that adults 60 to 64 tend to have a higher probability of needing, but not being able to afford mental health care. This is an important indication that most adults, after becoming eligible for Medicare at 65 have a higher general probability of being able to afford mental health care. For the 65 plus group there is an increase in probability of not being able to afford mental health care from 2010 to 2018, excluding 2015.

For Models 5 and 6, we expected a positive coefficient because the probability of seeing a mental health professional should have increased after the policy was implemented. It is important to note a low sample size of 4,021 individuals. In Model 5, we see a 2.47 percent change in the probability of seeing a mental health professional during the phase in period and a 2.73 percent increase after the policy is completely implemented in 2014. In Model 6, after adding control variables, the phase in period stays about the same and the post period sees a slight shift in percentage change, decreasing to 2.60 percent. The 2.73 percent to 2.60 percent indicates that we attributed too much of the probability in seeing a mental health professional to the impact of the policy itself. All these results are statistically significant at the one percent significance level. Despite our small sample size, we believe there is a general trend which shows that reducing cost improves the ability to see a mental health professional for those who could already afford it.

Figure C depicts a fairly steady uptick in average probability of seeing or talking to a mental health professional over time, for both age groups. This could be due to MIPPA, or decrease in stigma around seeking mental health support. We also note very similar trends over time for both age groups, which again indicates that our parallel trends assumption holds.

We also found it important to note that the female, cohabitation, and income variables are statistically significant. For Model 2, 4, and 6, our analysis shows positive female coefficients. This indicates that women, compared to men, have worse mental wellbeing, are more likely to need, but not be able to afford mental health care, and are more likely to see or talk to a mental health professional. Due to societal pressures, men may be less likely to seek support or may rate their mental wellbeing inaccurately. Women who do not work or are impacted by the wage gap may not be able to afford mental health care. Again, individual fixed effects may be impacting our analysis.

For Model 2, 4, and 6, our analysis shows negative cohabitation coefficients. This indicates that those who live with a partner or spouse, compared to those who do not, have better mental wellbeing, are less likely to need, but not be able to afford mental health care, and are less likely to talk to a mental health professional. These results indicate how valuable partnership is in improving an individual's quality of life and ability to afford mental health care when needed.

For Model 2, 4, and 6, our analysis shows negative income coefficients. All our income coefficients are listed relative to households with incomes that make under \$35,000 a year. This indicates that those who live in a household with an income above \$35,000 a year, have better mental wellbeing, are less likely to need, but not be able to afford mental health care, and are less likely to talk to a mental health professional. Financial stability seems to improve an individual's mental wellbeing and access to mental health care. In this model, 2012 is a notable year in that both age groups have a very similar probability of seeing or talking to a mental health professional. Due to extremely low sample size of non-white and non-Hispanic groups in our sample, we did not report these coefficients. Despite this low sample size, we believe it is important to note that, unlike our expectation, in Model 2, Black, Hispanic, and Asian

individuals saw an improvement in mental wellbeing, relative to white individuals. This could be a result of a difference in cultural backgrounds such as a more community based living situation where elders stay with their children. In Model 4, Asian and Black individuals were more likely to be able to afford mental health care, compared to white individuals. This is unexpected, but we also have extremely small sample sizes for racial groups. Hispanic individuals, compared to white individuals, were less likely to be able to afford mental health care. In Model 6, Black, Hispanic, and Asian groups were less likely to see or talk to a mental health professional, compared to white people. This could be a result of stigma around seeking mental health professionals, lack of diversity amongst mental health professionals, or a lack of trust in the health care system.

Conclusion

Our coefficients from Appendix, Table 2 indicate that MIPPA worsened self-reported mental health outcomes and increased the likelihood that respondents would be unable to afford necessary mental health. However, we also see contradictory results from Model 6, which indicates an increase in the likelihood of having seen a mental health professional regardless of affordability. This suggests that, for those who had previously already been able to afford mental health services, utilization of mental health services increased, though not to the benefit of their mental health. For those who had previously already been unable to afford mental health services, their access decreased, also to the detriment of their mental health. However, we should keep in mind that the results for Model 4 did not see any statistically significant coefficients, which is difficult to explain in context of the intended effects of MIPPA. Nevertheless, we can conclude that MIPPA did not lower barriers to accessing mental health services enough to increase accessibility for low-income Medicare beneficiaries. With regards to explaining Model 2 and 6, it is also possible that the worsened mental health indicators are linked to increased

probability of having used mental health services in the last year. It is not out of reason that worsened mental health may have prompted an increase in use of mental health services.

Looking at the implications of the treatphasein coefficients, we can see that they are closer to zero but signed in the same direction as the coefficients for the treatpost coefficients. While the coefficients for Model 2 and Model 4 are not in the expected direction, the general predisposition of the coefficients for Models 2, 4, and 6 are as expected — we would expect the gradually increasing government coverage, from 50 percent to 80 percent, during the phase-in period to be reflected in how our treatphasein coefficients are closer to zero than the treatpost coefficients are. The link between worsened mental health outcomes and increased use of mental health services would apply here as well. As with the treatpost variable, it is difficult to find an explanation for the increase in the likelihood that one would be unable to afford necessary mental health services in Model 6.

For future experiments, we would look to expand our sample size, which is currently at 52,015 after cleaning to account for inconsistencies in survey questions and limiting our age range. Given the amount of statistical insignificance we see in our regression models, increasing the sample size would reduce the standard errors on all our coefficients and thus increase probability of being able to reject the null hypothesis by reducing variance. Given that there are approximately 46 million adults aged 60 to 69, a larger sample size reduces model line variation from sample to sample. Expanding our age range is another possibility, especially when we consider that seniors above the age of 69 are more likely to use Medicare due to retirement and are more likely to be affected by loneliness when faced with family and friend loss. We would also look for panel datasets similar to that used in the Le Book et. al study, as following the same individual over time would enable us to include individual fixed effects that control for

predisposition to mental illness, aversion to seeking help due to cultural stigma or political factors, and other factors that would affect mental health outcomes.

We expect that our current model is primarily impacted by omitted variable bias.¹ Ideally, we would include state fixed effects to account for differences in mental health across different regions of the United States. This, however, would require using a different dataset, as the IPUMS dataset does not provide regional data on an individual level. An improved model would also control for existing mental health issues, as that may address the unexpected signage of the coefficients in Models 1-4. Our model also combines all insurance holders into one group and thus fails to account for the disparities we would see between private insurance and Medicare. Those on private coverage would be unaffected by MIPPA and their inclusion likely introduced bias into our model. We would also look into adjusting our Y variable to account for the actual frequency of mental health office visits. This would be useful in identifying if respondents had initially sought help but decided the cost outweighed the possible benefits from the visit.

Based on our study, we can conclude that MIPPA was ineffective at improving mental health outcomes as a whole. Given that Le Book et. al and Vung et. al have similar findings for the statistically insignificant of the effect of MIPPA on mental health and behavioral health visits alone, it is not possible to definitively determine the magnitude of MIPPA's impact on mental health related office visits. This suggests that MIPPA's expansion of Medicare was either inadequate or incorrectly targeted in order to increase utilization of in-office mental and behavioral health services. Further research would likely clarify if there is a true impact of MIPPA on mental health outcomes and service use and pave the way for more effective and targeted elder mental health care policy making in the future.

¹ While we likely see measurement error in our mental health outcomes dependent variable due to the use of a Likert scale, that error is definitionally absorbed into the error term and gives us higher standard errors but does not bias our coefficients.

Appendix

Table 1: Descriptive Statistics

	Variable	Observations	Mean	Standard Deviation	Min.	Max .
Y variables	Mental Wellbeing Scale (0-24)	52,015	2.514	4.017	0	24
	Needed but couldn't afford mental health care (past 12 months)	52,015	.016	.125	0	1
	Saw/talked to mental health professional (past 12 months)	52,015	.077	.267	0	1
X variables	Treatment: Age 65-69 group	52,015	.469	.499	0	1
	Policy phase in time period: 2010-2013	52,015	.334	.472	0	1
	Policy implemented time period: 2014	52,015	.469	.499	0	1
	Cohabit: Lives with a partner	52,015	.512	.500	0	1
	Hispanic dummy	52,015	.103	.305	0	1
	White race dummy	52,015	.803	.398	0	1
	Black race dummy	52,015	.140	.346	0	1
	Native race dummy	52,015	.010	.101	0	1
	Asian race dummy	52,015	.044	.205	0	1
	Other racial background dummy	52,015	.003	.057	0	1
	High school dropout or less education level	52,015	.152	.359	0	1

High school graduate	52,015	.265	.442	0	1
Some college, GED or equivalent, technical, and vocational	52,015	.293	.455	0	1
College graduate	52,015	.167	.373	0	1
Total Combined Family Income: Under 35k	52,015	.403	.490	0	1
Total Combined Family Income: 35k to 75k	52,015	.321	.467	0	1
Total Combined Family Income: 75k to 100k	52,015	.105	.307	0	1
Total Combined Family Income: Over 100k	52,015	.171	.376	0	1

Table 2: Effect of Medicare Improvements for Patients and Providers Act of 2008 mental health services policy, using six different regression models

	Mental wellbeing Scale (1)	Mental wellbeing Scale (2)	Couldn't afford mental health care (3)	Couldn't afford mental health care (4)	Saw/talked to mental health professional (5)	Saw/talked to mental health professional (6)
treat	-.449* (.080)	-.674* (.077)	-.013* (.003)	-.016* (.003)	-.033* (.005)	-.034* (.005)
post	.120*** (.065)	.643* (.119)	-.006** (.002)	.006 (.004)	.009** (.004)	.030* (.008)
phasein	.020 (.068)	.323* (.118)	-.004 (.003)	.001 (.004)	.004 (.005)	.016** (.008)
treatpost	.057 (.095)	.213** (.091)	.006*** (.003)	.007 (.003)	.021* (.006)	.020* (.006)
treatphasein	.097 (.100)	.156 (.097)	.002 (.003)	.003 (.003)	.019* (.006)	.019* (.006)
female	—	.484* (.035)	—	.005* (.001)	—	.004*** (.002)
cohabit	—	-.262* (.039)	—	-.005* (.001)	—	-.035* (.003)
income 35to75	—	-1.300* (0.044)	—	-0.020* (0.002)	—	-0.036* (0.003)
income 75to100	—	-1.744* (0.064)	—	-0.027* (0.002)	—	-0.040* (0.004)
Income 100over	—	-1.862* (0.060)	—	-0.028* (0.002)	—	-0.044* (0.004)
Observations	52,015	52,015	52,015	52,015	52,015	52,015
R-squared	0.0024	0.0719	0.0018	0.0134	0.0019	0.0170

Constant	2.635*	4.113*	.025*	.033*	.079*	.095*
	(.054)	(.111)	(.002)	(.004)	(.004)	(.007)

CONTROLS

Cohabitation	N	Y	N	Y	N	Y
Hispanic	N	Y	N	Y	N	Y
Race	N	Y	N	Y	N	Y
Sex	N	Y	N	Y	N	Y
Education Level	N	Y	N	Y	N	Y
Income	N	Y	N	Y	N	Y
Year Fixed Effects	N	Y	N	Y	N	Y

Notes: Each cell in columns 1–6 presents the results from separate difference-in-difference regressions models. Control variables include cohabitation, Hispanic ethnicity, race, sex, education level, income, and year fixed effects. The sample includes observations on all targeted groups between the ages of 60 and 69, using the 2006–2018 IPUMS data. All targeted groups are restricted to those who are over the age of 65 and are impacted by the policy implemented over time between 2010-2013 and after implementation, in 2014. It's important to note that, for columns 3-6, we are using robust standard errors because these models are linear probability models and have Y as a dummy variable. We also use R-squared adjusted for Models 1 and 2 and R-squared for Models 3-6.

***Significant at the 10 percent level

**Significant at the 5 percent level

*Significant at the 1 percent level

Figure A: Average mental wellbeing of adults 60 to 69, from 2006 to 2018, on a scale of 0 to 24

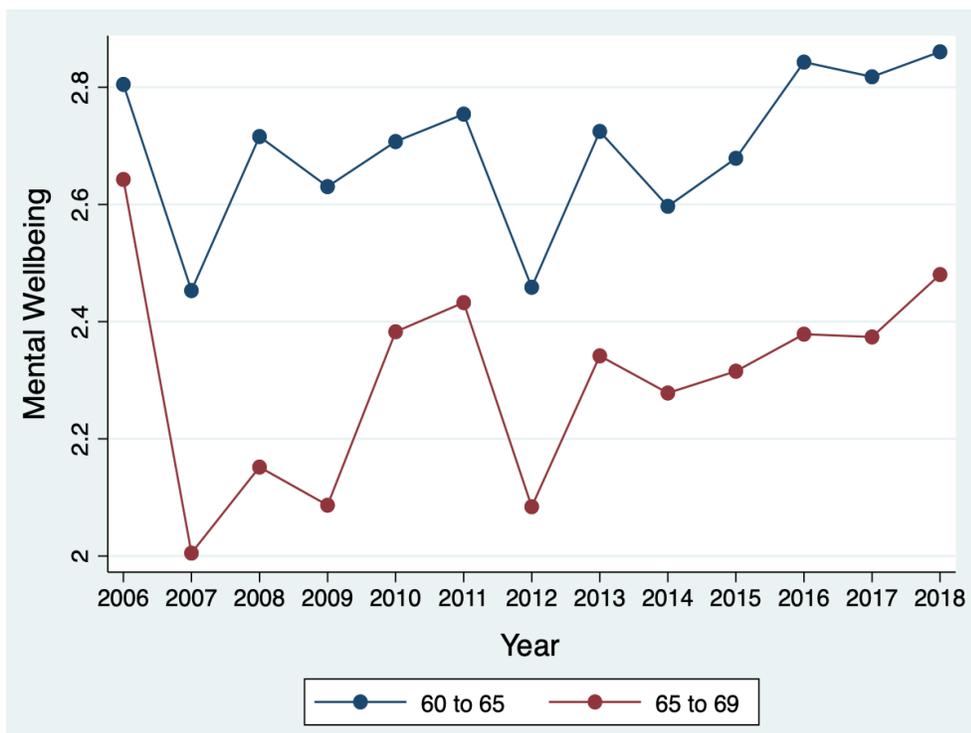


Figure B: Average probability of being an individual who needed but was not able to afford mental health care in the past 12 months for adults 60 to 69, from 2006 to 2018

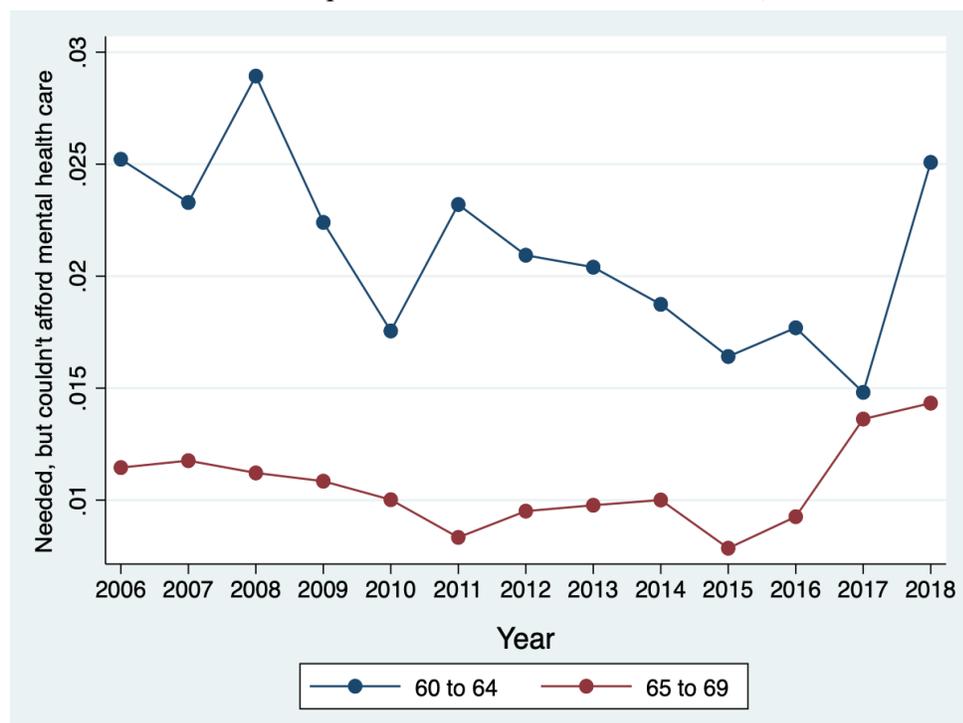
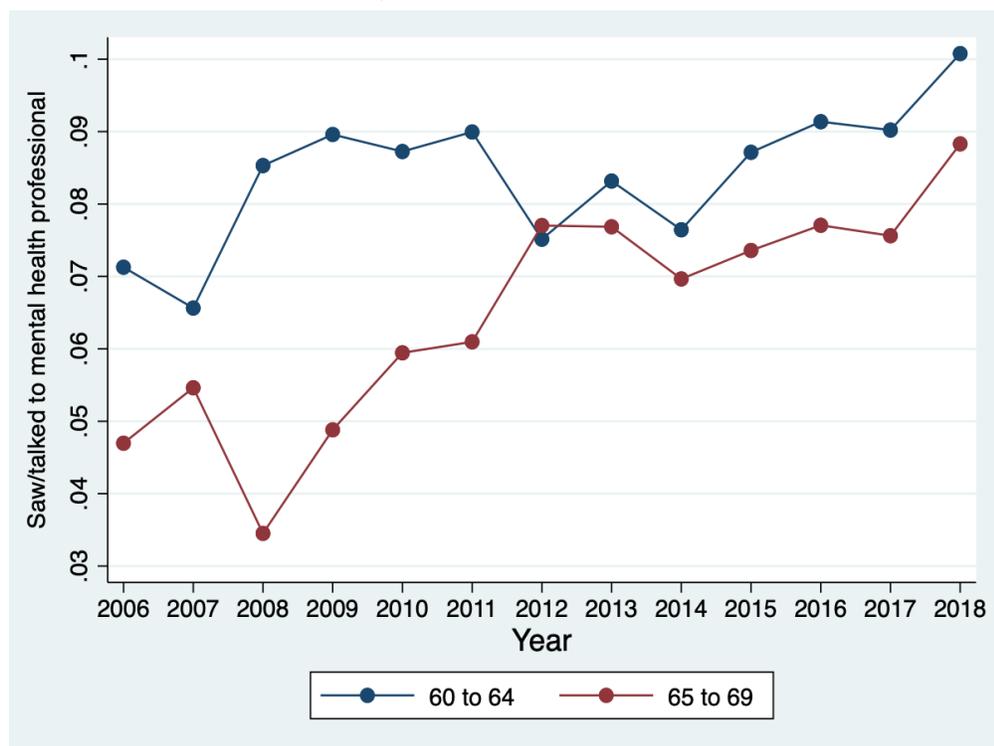


Figure C: Average probability of having seen or talked to a mental health professional in the last 12 months for adults 60 to 69, from 2006 to 2018



Works Cited

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