OREGON HEALTH INSURANCE EXPERIMENT: DEPRESSION AND THE IMPACT OF MEDICAID

Sarah Taubman
Amy Finkelstein
Heidi Allen
Bill Wright
Katherine Baicker

Analysis Plan
December 15, 2014

We are grateful to Alisa Busch for her helpful comments and advice, and to Innessa Colaiacovo, Daniel Prinz, Allyson Barnett, and Belinda Tang for expert research assistance, to the Oregon Association of Hospital and Health Systems and Mark Callan for his invaluable expertise in collecting and processing the emergency department data, to the survey research team at CORE, to numerous Oregon state employees for help acquiring the necessary data and for answering our many questions about the administration of state programs, and to our generous funders.

We gratefully acknowledge funding for the Oregon Health Insurance Experiment from the Assistant Secretary for Planning and Evaluation in the Department of Health and Human Services, the California HealthCare Foundation, the John D. and Catherine T. MacArthur Foundation, the National Institute on Aging (P30AG012810, RC2AGO36631 and R01AG0345151), the Robert Wood Johnson Foundation, the Sloan Foundation, the Smith Richardson Foundation, and the U.S. Social Security Administration (through grant 5 RRC 08098400-03-00 to the National Bureau of Economic Research as part of the SSA Retirement Research Consortium). We also gratefully acknowledge Centers for Medicare and Medicaid Services' matching funds for this evaluation. The findings and conclusions expressed are solely those of the authors and do not represent the views of SSA, the National Institute on Aging, the National Institutes of Health, any agency of the Federal Government, any of our funders, or the NBER.

Introduction

The goal of the analysis described here is to use the Oregon Health Insurance Experiment and the data we collected through in-person interviews to estimate the effects of expanding Medicaid availability to a population of low-income adults. This analysis examines in some detail the effects of Medicaid coverage on depression, mental-health-related quality of life, and mental health treatment. It also considers whether the effects of Medicaid on health care use, finances, and health differ by history of depression.

This analysis plan aims to pre-specify the analysis before comparing outcomes for treatment and control groups. By creating this analysis plan, which serves as a record of our ex ante planned analysis, we hope to minimize issues of data mining and specification searching. In constructing this analysis plan, we did use the control distributions for all the outcomes and we did perform treatment-control comparisons that explore the validity of our analysis (such as balance on pre-randomization characteristics and uptake of insurance). This plan was also constructed after viewing the findings from a mail survey and administrative data collected approximately one year after the lottery (1), in-person interview data collected approximately two years after the lottery (2), social security administrative data (3), and administrative emergency department data collected approximately eighteen months after the lottery (4).

Unlike most of the previous analysis plans we have written for the Oregon Health Insurance Experiment, this plan relies only on data sources we have previously analyzed. The plans for many of the analyses presented here are thus heavily dependent on those prior results. Most importantly for these analyses, we have previously reported that Medicaid coverage decreased the probability of screening positive for depression by 9.15 percentage points (95% CI: -16.70 to -1.60; P=0.018), a relative reduction of 30 percent (2). These analyses explore this observed decrease in depression in greater detail, and examine heterogeneity of treatment effects on many other outcomes with respect to previous diagnosis of depression (based on reporting having been diagnosed with depression before the lottery). Throughout results that have been previously reported are marked in the tables with an asterisk (*).

Methods

Randomization and Intervention

Oregon opened a waiting list for a previously closed Medicaid program (OHP Standard) in early 2008 and then conducted eight lottery drawings from the waiting list between March and September 2008. Those selected were enrolled in Medicaid if they completed the application and met eligibility requirements.

OHP Standard (the lotteried Medicaid program) provides benefits to low-income adults who are not categorically eligible for Oregon's traditional Medicaid program. To be eligible, individuals

must have been aged 19 to 64, Oregon residents, U.S. citizens or legal immigrants, without health insurance for 6 months, and not otherwise eligible for Medicaid or other public insurance. They must have income below the federal poverty level and have less than $2000 in assets. OHP Standard provides relatively comprehensive medical benefits (including prescription drug coverage) with no consumer cost sharing and low monthly premiums (between $0 and $20, based on income), provided mostly through managed care organizations. The lottery process and OHP Standard are described in more detail elsewhere (1).

Data Sources

Lottery and Medicaid Enrollment

The state provided us with the initial lottery list and with detailed data on Medicaid enrollment for every individual on the list. We use these data to construct our primary measure of insurance coverage during the study period. These data are described in detail elsewhere (1).

In-Person Interviews and Clinical Assessments

Between September 2009 and December 2010, we conducted a large in-person data collection effort to assess a wide variety of outcomes. The 20,745-person sample for the in-person data collection included almost all of the individuals selected in the lottery living in the Portland area and a roughly equal number of unselected controls. The collected data includes answers to a detailed questionnaire, a catalog of medications in participants' possession, anthropometric measurements, blood pressure measurements, and assays from dried blood spots. We use these data for almost all of our outcome measures as well as to classify individuals on the basis of pre-lottery diagnosis of depression. These data are described in detail elsewhere (2).

Hospital Discharge Records

We obtained standard hospital discharge data for the entire state of Oregon from January 2008 through September 2009. We probabilistically matched these data to the Oregon Health Insurance Experiment Study population based on information provided at the time of lottery sign-up. We use these data to measure a subset of outcomes (hospital use overall and for mood disorders specifically). These data are described in detail elsewhere (1).

Emergency Department Records

We obtained standard emergency department visit data for twelve hospitals in the Portland-metro area from January 2007 through December 2010. We probabilistically matched these data to the Oregon Health Insurance Experiment Study population based on information provided at the time of lottery sign-up. We use these data to measure a subset of outcomes (emergency department use overall and for mood disorders specifically). These data are described in detail elsewhere (4).

Credit Reports

We obtained the complete credit records for a subset of our lottery list from one of the three national credit-reporting companies. The credit bureau matched the list of lottery participants to their credit report from February 2008 (i.e. right after the January – February 2008 lottery sign up but *before* any lottery drawings began in March) on the basis of their full name, gender and date of birth as the individuals reported it in signing up for the lottery. We use these data to measure a subset of outcomes (bills sent to collection). These data are descripted in detail elsewhere (1).

Statistical Analysis

Intent-to-Treat Effect of the Lottery (ITT)

Our analytic approach begins with an intent-to-treat (ITT) model comparing outcomes for all those who were selected in the lottery (the study treatment group) to all those who were on the list but not selected (the study control group), or the effect of winning the lottery. We estimate the ITT by fitting the following OLS equation:

$$y_{ih} = \beta_0 + \beta_1 LOTTERY_h + X_{ih}\beta_2 + V_{ih}\beta_3 + \varepsilon_{ih} \quad (1)$$

Here *i* denotes an individual and *h* denotes a household. LOTTERY is an indicator variable for whether or not household *h* was selected by the lottery. The coefficient on LOTTERY (β_1) is the main coefficient of interest, and gives the average difference in (adjusted) means between the treatment group (the lottery winners) and the control group (those not selected by the lottery); it is interpreted as the impact of being able to apply for OHP Standard through the Oregon lottery.

We denote by X_{ih} the set of covariates that are correlated with treatment probability (and potentially with the outcome) and therefore must be controlled for so that estimates of β_1 give an unbiased estimate of the relationship between winning the lottery and the outcome. In all of our analyses, X_{ih} includes indicator variables for the number of household members on the lottery list; although the state randomly sampled from individuals on the list, the entire household of any selected individual was considered selected and eligible to apply for insurance. As a result, selected (treatment) individuals are disproportionately drawn from households of larger household size.

We denote by V_{ih} a second set of covariates that can be included to potentially improve power by accounting for chance differences between treatment and control groups in variables that may be important determinants of outcomes. These covariates are not needed for β_1 to give an unbiased estimate of the relationship between winning the lottery and the outcome, however, as they are not related to treatment status. Following our previous work, our primary specification includes the pre-randomization version of the outcome for data from administrative data sets (hospitalizations, ED visits, and collections). For the analysis of the blood pressure measures, we

also adjust for age (in decile bins) and sex. As a secondary analysis, we explore whether our results are sensitive to inclusion of V_{ih} covariates.

In all of our ITT estimates and in our subsequent instrumental variable estimates (see below), we estimate linear models even though a number of our outcomes are binary. Because we are interested in the difference in conditional means for the treatments and controls, linear probability models would pose no concerns in the absence of covariates or in fully saturated models (5, 6). Our models are not fully saturated, however, so it is possible that results could be affected by this functional form choice, especially for outcomes with very low or very high mean probability. We therefore explore the sensitivity of our results to an alternate specification using logistic regression and calculating average marginal effects for all binary outcomes.

In all of our analyses we cluster the standard errors on the household identifier since the treatment is at the household level. All analyses of outcomes from the survey data are weighted using survey weights to account for the sample releases into the field and intensive follow-up of initial non-responders; the weights are described in detail elsewhere (2).

Local Average Treatment Effect of Medicaid (LATE)

The intent-to-treat estimates from equation (1) provide an estimate of the causal effect of winning the lottery (i.e. winning the opportunity to apply for OHP Standard). This provides an estimate of the net impact of expanding access to public health insurance. We are also interested in the impact of insurance coverage itself. We model this as follows:

$$y_{ih} = \pi_0 + \pi_1 MEDICAID_{ih} + X_{ih}\pi_2 + V_{ih}\pi_3 + \nu_{ih} \qquad (2)$$

Here MEDICAID is a measure of insurance coverage and all other variables are as defined in equation (1).

We estimate equation (2) by two stage least squares (2SLS), using the following first stage equation:

$$MEDICAID_{ih} = \delta_0 + \delta_1 LOTTERY_{ih} + X_{ih}\delta_2 + V_{ih}\delta_3 + \mu_{ih} \qquad (3)$$

Here the excluded instrument is the variable LOTTERY.

We interpret the coefficient on insurance from instrumental variable estimation of equation (2) as the local average treatment effect of insurance, or LATE (7). In other words, our estimate of π_1 identifies the causal impact of insurance among the subset of individuals who obtain insurance upon winning the lottery but who would not obtain insurance without winning the lottery (i.e. the compliers).

The LATE interpretation requires the additional identifying assumption that the only mechanism through which winning the lottery affects the outcomes studied is the lottery's impact on insurance coverage. We believe this is a reasonable approximation; in earlier work we discussed potential violations; where we could explore them we did not find cause for concern (1).

Results

Study Population

This analysis focuses on respondents to the in-person interviews. A total of 12,229 individuals completed an interview by October 13, 2010 for an effective response rate of 73 percent. **Table P1** summarizes the demographic characteristics of the in-person interview respondents. Just over half the study participants are women, about a quarter are ages 50-64 (the oldest eligible age group), and about 70 percent are white.

In addition to the full sample of in-person respondents, the planned analyses also focus on those respondents who report a diagnosis of depression that was made prior to the lottery (34 percent of the sample). This restriction is based on the recollection of respondents at the time of the in-person interview. In theory, recollections about diagnoses made before the lottery could differ between those selected and those not selected (even though actual pre-lottery experiences should not, because of the random selection); these recollections are, however, balanced across treatments and controls (difference -0.80; 95% CI -2.67 to 1.07; P value 0.40).

The restriction to those with a pre-lottery diagnosis of depression captures both the individual having experienced a depressive episode in the past and the individual having had that depression recognized and diagnosed by a healthcare professional. Thus, given the recurrent nature of depression, this subgroup is one with a higher risk of depression during the study period. It is also, however, also likely a subgroup with more connection to the healthcare system (as evidenced by having received a diagnosis) and a greater willingness to discuss depressive symptoms with a healthcare provider.

Table P1 summarizes the demographic characteristics for the full set of in-person respondents, as well as the subgroups with and without a pre-lottery diagnosis of depression. Those with a pre-lottery diagnosis of depression are more likely to be female, which is consistent with the higher rates of depression in women in general (8). They are also slightly older, more likely to be of white race, and more likely to have been interviewed in English.

We did not see any significant differences between treatment and control groups on any of the examined characteristics individually or overall in a global test of balance. This is true of the full sample of survey respondents as well as both of the sub-groups.

Insurance Coverage

Table P2 reports the difference in insurance associated with being selected in the lottery for the full sample of survey respondents and those with and without a pre-lottery diagnosis of depression. In our analysis, we define Medicaid coverage as being covered at any point between March 10, 2008 (the date of the first lottery notifications) and the individual's interview date. This definition of Medicaid includes both the lotteried Medicaid program (OHP Standard) and

other non-lotteried Medicaid programs. The results indicate an increase of 24.1 percentage points in the probability of having Medicaid coverage. The lottery affected coverage through increasing enrollment in OHP Standard. Self-reports at the time of the interview show no change in private insurance coverage, suggesting the expanded Medicaid coverage did not "crowd-out" private insurance coverage. Insurance rates are higher overall in the subgroup with a pre-lottery diagnosis of depression. As discussed above, receiving a pre-lottery diagnosis of depression requires having had access to the healthcare system in the past, which may explain the higher insurance rates; alternatively, it may be that those with a history of depression seek insurance at higher rates in order to obtain care for depression. Our first stage estimate of the change in any Medicaid coverage does not differ for those with and without pre-lottery diagnosis of depression.

Detail on Depression

We examine in some detail our measures of depression, health-related quality of life, and medication use (Tables D1-D4). All these analyses are done for all in-person interview respondents, for those with a pre-lottery diagnosis of depression, and for those with no pre-lottery diagnosis of depression. We also report a formal test of whether the results are the same for the two groups. All previously reported analyses are marked in the tables with an asterisk (*).

Depression (PHQ-8)

We use the 8-question version of the Patient Health Questionnaire to assess depression (9). We have previously reported that Medicaid coverage decreased the probability of screening positive for depression by 9.15 percentage points (95% CI: -16.70 to -1.60; P=0.018), a relative reduction of 30 percent. (2) We explore this finding in more detail by considering the individual component questions in the PHQ-8. **Table D1** reports the impact of Medicaid coverage on the mean response to each item. We are interested in whether some depression symptoms are more responsive to Medicaid coverage than others, and if that differs by history of depression (as measured by pre-lottery diagnosis).

Figure 1 shows the distribution of responses for each question on the PHQ-8 in the control group, and the adjusted distribution in the treatment group. These figures show the changes throughout the distribution of responses, providing more detail than the changes in the mean response (Table D1).

In addition to the individual symptoms, at the bottom of Table D1 we include the composite PHQ-8 score. **Figure 2** shows the changes in probability of falling into different ranges of this composite PHQ-8 score. This graphical presentation of the changes in the PHQ-8 composite score illustrates where the reductions in depression symptoms fall in the distribution of depression severity.

At the bottom of Table D1, we also show the percent screening positive for depression (defined as a score of at least 10). Depressive symptoms are quite common in this population. Overall 30 percent of controls screen positive for depression, compared to less than 9 percent nationally (8).

The prevalence of depressive symptoms is substantially higher for individuals with a pre-lottery diagnosis of depression. Among controls with pre-lottery diagnosis of depression, 52 percent screen positive for depression, compared to 18 percent of controls with no pre-lottery diagnosis of depression. This strikingly higher prevalence of depressive symptoms suggests that the subgroup of those with a pre-lottery diagnosis is not just a group with a more prior contact with the medical system. The pre-lottery diagnosis restriction captures a group that is more likely to experience and discuss depressive symptoms.

The final row of Table D1 reports the results for impairment from depression, specifically whether the reported symptoms made daily life very or extremely difficult. Individuals were asked about impairment from depression if they reported experiencing any depressive symptoms regardless of the PHQ-8 total score. Impairment was uncommon among control individuals with some depressive symptoms; in those screening negative for depression (PHQ-8 score below 10), less than 5 percent reported impairment from depressive symptoms. Among control individuals screening positive for depression (PHQ-8 score of 10 or above), more than 40 percent reported impairment from depression.

Mental-health-related quality of life (SF-8)

We use the 8-question Medical Outcomes Study Short-Form (SF-8) to assess health-related quality of life (10). We have previously reported that Medicaid increased the average score on the mental component score (MCS) of the SF-8 (1.95 points; 95% CI, 0.028 to 3.88; P=0.047), an improvement of almost two-tenths of a standard deviation (2). We explore this finding in more detail by considering the individual components of the SF-8. **Table D2** reports the impact of Medicaid coverage on the mean response score for each item as well as the Mental Component Score (MCS). We are interested in whether some aspects of mental-health-related quality of life are more responsive to Medicaid coverage than others.

Figure 3 shows the distribution of responses for each question on the SF-8 in the control group, and the adjusted distribution in the treatment group. These figures show the changes throughout the distribution of responses, providing more detail than the changes in the mean response (Table D2).

Figure 4 shows the changes in probability in falling into different ranges of this composite score, with the ranges representing quartiles of the control distribution. This graphical presentation of the changes in the MCS illustrates where in the distribution the changes are concentrated.

Diagnosis of depression and treatment for mental health conditions

In addition to the significant reduction in screening positive for depression (-9.15 percentage points; 95% CI: -16.70 to -1.60; P=0.018), we have previously reported a significant increase in diagnosis of depression following the lottery (3.81 percentage points; 95% CI 0.15 to 7.46; P=0.04) and a non-significant increase in the use of anti-depressant medication with Medicaid (5.49 percentage points; 95% CI −0.46 to 11.45; P=0.07). We are interested in a more detailed

examination of both the diagnosis and treatment of depression. For treatment, we also examine medications for other mental health conditions, and how the impacts of Medicaid differ by pre-lottery diagnosis of depression.

Table D3 reports the impacts of Medicaid on being diagnosed of depression following the lottery and on having undiagnosed depression (defined as having a PHQ-8 score greater than 9 and reporting no diagnosis of depression). We are interested in how Medicaid impacts the recognition and diagnosis of depression. Our measure of diagnosis only captures first diagnosis of depression, so an individual with a first diagnosis of depression prior to the lottery (the pre-lottery dx subgroup) cannot have either undiagnosed depression or a first diagnosis post-lottery.

Table D4 reports the impacts of Medicaid on medication for various mental health conditions, including anti-depressants, anxiolytics, bipolar medications, sedatives, and anti-psychotics. We use data from our medication inventory to classify medication for mental health conditions. The specific medications included in each of these categories are listed in Appendix Table A1.

For treatment of depression, we consider both talk therapy and antidepressant mediation. Only those with a pre-lottery diagnosis of depression were asked about use of talk therapy, so the analysis is only available for this group. Of controls with a pre-lottery diagnosis of depression, 37.4 percent report receiving talk therapy in the last year. This suggests that even in absence of expanded Medicaid access, those with a pre-lottery diagnosis of depression are able to access talk therapy; the lotteried Medicaid program (OHS Standard) does provide some coverage for talk therapy as well.

Anti-depressant use is also quite common, with 16.8 percent of control respondents and 37.5 percent of control respondents with a pre-lottery diagnosis of depression currently taking one. We separate anti-depressants into three groups. SSRIs (selective serotonin reuptake inhibitors) are the most commonly prescribed class of anti-depressants, and are generally recommended as the first-line therapy. We group tricyclic, MAOI, and other antidepressants, all of which are older therapies and which may be recommended for depression that does not respond to SSRIs. Use of these antidepressants may reflect refinement of treatment (providing an individual not responding to SSRIs with a second-line treatment), but could also reflect the use of an outdated treatment. We separately report trazodone (and branded equivalents), which is commonly prescribed as a sleep aid even in the absence of depression.

Because depression is often comorbid with other mental health conditions (8), we examine the use of medications for anxiety, bipolar disorder, and psychosis, as well as the use of sedatives. All of these types of medications are used less commonly than anti-depressants, but they are used more by controls with a pre-lottery diagnosis of depression than those with no pre-lottery diagnosis of depression. For example, 14.1 percent of controls with a pre-lottery diagnosis of depression are using an anxiolytic (anti-anxiety medication) compared to 2.0 percent of controls with no pre-lottery diagnosis.

We also examine whether a respondent is currently taking any mental health medications (anti-depressants, anxiolytics, bipolar medications, sedatives, and anti-psychotics) and the number of current medications.[1]

Heterogeneity by Pre-lottery Diagnosis of Depression

We examine whether some of the effects of Medicaid reported previously (1, 2, 4) differ by whether an individual had a pre-lottery diagnosis of depression. Depression has been found to be correlated with worse health and increased healthcare use (11-14), so we might expect different effects on a range of outcomes based on history of depression. For the following analyses (H1-H4), we report results for those individuals with a pre-lottery diagnosis of depression and those without, and a formal test of whether those estimates are the same. For reference, we also show the results for the overall sample of respondents; many of these have been previously reported and are thus marked with an asterisk (*) in the tables.

Healthcare use

Table H1 reports the effect of Medicaid on healthcare use for those with and without a pre-lottery diagnosis of depression. We use self-reports from the in-person interview to measure outpatient visits in the 12-months prior to the interview. We use classification from the in-person medication inventory to measure prescription drug use at the time of the interview. We use administrative records to measure ED visits[2] and hospitalizations occurring between March 10, 2008 and September 30, 2009. For both of those, we consider visits overall, as well as visits for mood disorders specifically. We do a back-of-the-envelope summary of the total resource use associated with the observed level of healthcare use.[3]

Use of healthcare services is higher in the controls with a pre-lottery diagnosis of depression than those without, and this is true across all types of services. We estimate that the annual cost of the services used by those with a pre-lottery diagnosis of depression is $3,937 compared to $2,101 for those without a pre-lottery diagnosis of depression.

---

[1] For those summary measures, we do not include trazodone (and branded equivalents).

[2] The analysis of ED visits is limited to those in-person interview respondents who, at the time of the lottery, lived in a ZIP code where residents almost exclusively used the 12 hospitals in our ED data.

[3] To calculate the implied annual spending effects associated with the estimated utilization effects we use data from the 2002-2007 (pooled) Medical Expenditure Panel Survey (MEPS) on expenditures of all nonelderly (19-64) adults below 100 percent of poverty who are publicly insured. This gives us a total sample of over 7,500 individuals. We use their expenditures (all inflated with the CPI-U to 2007 dollars) to calculate average expenditures per outpatient visit, average expenditures per ED visit, average expenditures per inpatient visit (for visits not related to childbirth). For medications, we calculate average spending per prescription drug by dividing total annual prescription drug costs by the total number of prescription drugs taken over the course of the year. All spending numbers are based on total expenditures (i.e. not just expenditures among the insured or covered by insurance). The underlying costs are $150 per outpatient visit, $435 per ED visit, $7,523 per inpatient visit, and $312 per prescription drug. For each type of use (office visit, ED visit, inpatient visit and prescription drug), we multiply the estimated annual change in number by the cost estimated in the MEPS.

Access and quality

Table H2 reports the effect of Medicaid on perceived access to and quality of healthcare for those with and without a pre-lottery diagnosis of depression. We use self-reports from the in-person interview to define these measures.

Controls with a pre-lottery diagnosis of depression are more likely to report having a usual place of care (52.9 percent compared to 42.4 percent of controls with no pre-lottery diagnosis of depression). This may reflect that those with depression seek out a regular source of care, or that having a regular source of care makes it more likely that your depression has been diagnosed.

In contrast, controls with a pre-lottery diagnosis of depression are less likely to report receiving all the care they needed. This difference is particularly pronounced for mental health care where 54.2 percent of controls with a pre-lottery diagnosis receive getting all needed care compared to 87.1 percent of controls with no pre-lottery diagnosis. This is mostly due to the fact that 80.1 percent of controls with no pre-lottery diagnosis report not needing any mental health care, and thus, by definition, received all the care they needed (none).

Financial hardship

Table H3 reports the effect of Medicaid on financial hardship for those with and without a pre-lottery diagnosis of depression. We use both self-reports from the in-person interview and credit records[4] to define these measures. Consistent with the greater use of healthcare services, controls with a pre-lottery diagnosis of depression report greater financial strain associated with healthcare use. Compared to controls with no pre-lottery diagnosis of depression, those with a pre-lottery diagnosis report higher levels of out-of-pocket spending, higher likelihood of catastrophic out-of-pocket spending, and higher likelihood of having to borrow to pay medical bills. The credit report data paint a similar picture; controls with a pre-lottery diagnosis of depression are more likely to have any collection and any medical collection and to have higher dollar amounts. For example, those with a pre-lottery diagnosis of depression have, on average, $5,221 in total collections compared to $3,352 for those with no pre-lottery diagnosis of depression.

Clinical measures of health

Table H4 reports the effect of Medicaid on measures of blood pressure, cholesterol, and diabetes. We use clinical measures taken as part of the in-person interviews. Controls with a pre-lottery diagnosis of depression have similar measurements to controls with no pre-lottery diagnosis of depression on all these physical outcomes.

[4] The analysis of credit report measures is limited to those in-person interview respondents who were matched to credit reports.

References

1. Finkelstein A, Taubman S, Wright B, et al. The Oregon Health Insurance Experiment: Evidence from the First Year. *Quarterly Journal of Economics* 2012;127(3):1057-106.

2. Baicker K, Taubman SL, Allen HL, et al. The Oregon Experiment – Effects of Medicaid on Clinical Outcomes. *New England Journal of Medicine* 2013;368(18):1713-22.

3. Baicker K, Finkelstein A, Song J, et al. The Impact of Medicaid on Labor Market Activity and Program Participation: Evidence from the Oregon Health Insurance Experiment. *American Economic Review* 2014;104(5):322-28.

4. Taubman SL, Allen HL, Wright BJ, et al. Medicaid Increases Emergency-Department Use: Evidence from Oregon's Health Insurance Experiment. *Science* 2014;343(6168):263-8.

5. Angrist JD. Estimation of Limited Dependent Variable Models with Dummy Endogenous Regressors: Simple Strategies for Empirical Practice. *Journal of Business & Economic Statistics* 2001;19(1):2-16.

6. Angrist JD, Pischke J-S. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton, NJ: Princeton University Press; 2009.

7. Imbens GW, Angrist JD. Identification and Estimation of Local Average Treatment Effects. *Econometrica* 1994;62(2):467-75.

8. Kessler RC, Berglund P, Demler O, et al. The Epidemiology of Major Depressive Disorder: Results From the National Comorbidity Survey Replication (NCS-R). *Journal of the American Medical Association* 2003;289(23):3095-105.

9. Kroenke K, Strine TW, Spitzer RL, et al. The PHQ-8 as a Measure of Current Depression in the General Population. *Journal of Affective Disorders* 2009;114(1-3):163-73.

10. Ware JE, Kosinki M, Dewey J, et al. How to Score and Interpret Single-Item Health Status Measures: A Manual for Users of the SF-8 Health Survey. Lincoln, RI: QualityMetric Inc., 2001.

11. Chapman D, Perry G, Strine T. The Vital Link Between Chronic Disease and Depressive Disorders. *Preventing Chronic Disease* 2005;2(1):1-10.

12. Unützer J, Schoenbaum M, Katon WJ, et al. Healthcare Costs Associated With Depression in Medically Ill Fee-for-service Medicare Participants. *Journal of the American Geriatrics Society* 2009;57(3):506-10.

13. Dismuke CE, Egede LE. Association of Serious Psychological Distress With Health Services Expenditures and Utilization in a National Sample of US Adults. *General Hospital Psychiatry* 2011;33(4):311-7.

14. Egede LE, Zheng D, Simpson K. Comorbid Depression is Associated With Increased Health Care Use and Expenditures in Individuals With Diabetes. *Diabetes Care* 2002;25(3):464-70.

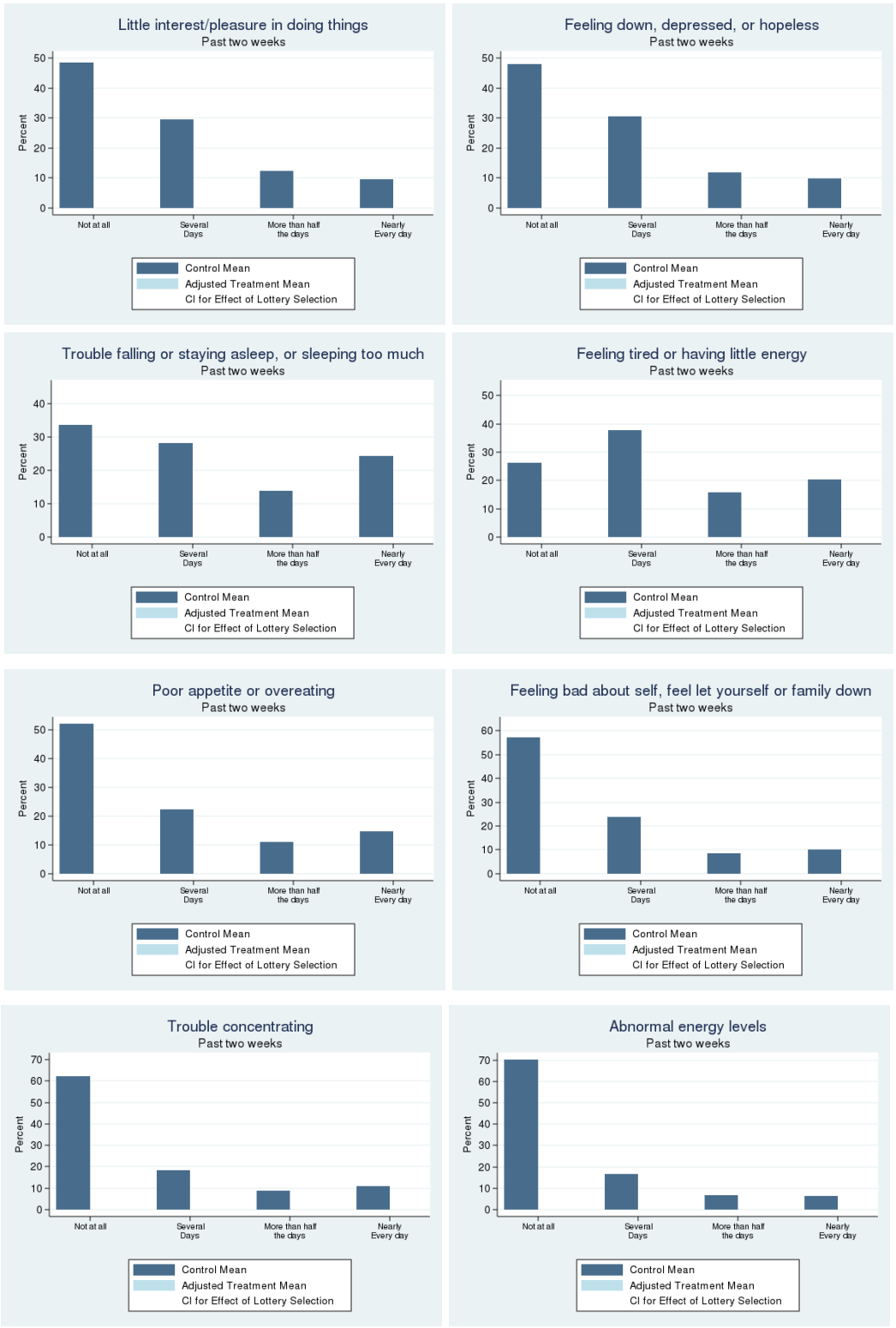

Figure 1: Figure shows, for each PHQ8 component question, the average response in the control group, and the average control response plus the estimated effect of lottery selection. Control means and treatment effects were calculated using survey weights. Treatment effects were estimated including controls for the number of household members on the lottery list and adjusting standard errors for household clusters. Sample includes all in-person survey respondents (N=12229).

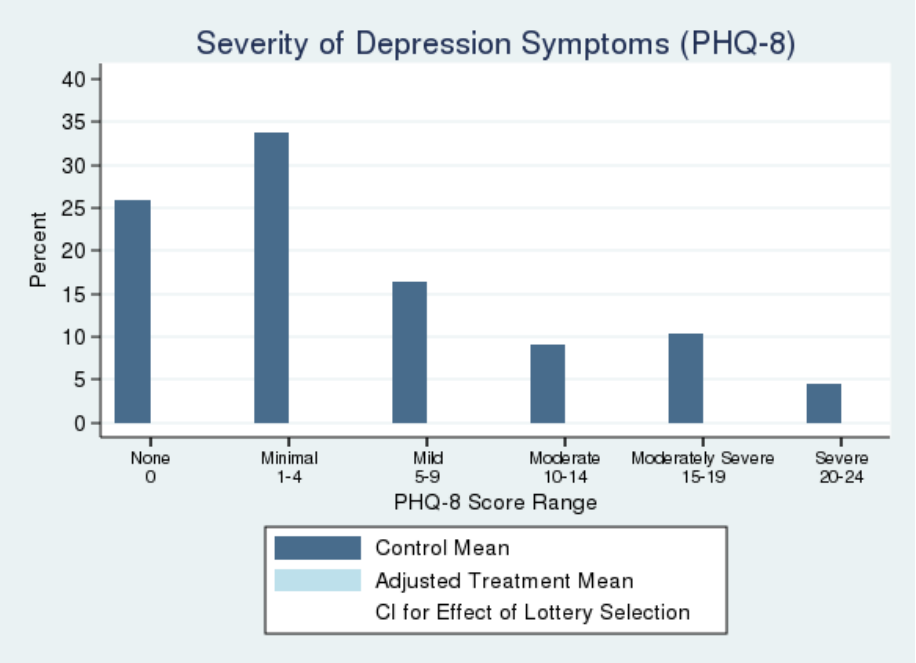

Figure 2: Figure shows the average percentage of in-person survey respondents in each severity group. Control means and treatment effects were calculated using survey weights. Treatment effects were estimated including controls for the number of household members on the lottery list and adjusting standard errors for household clusters. Sample includes all in-person survey respondents (N=12229).

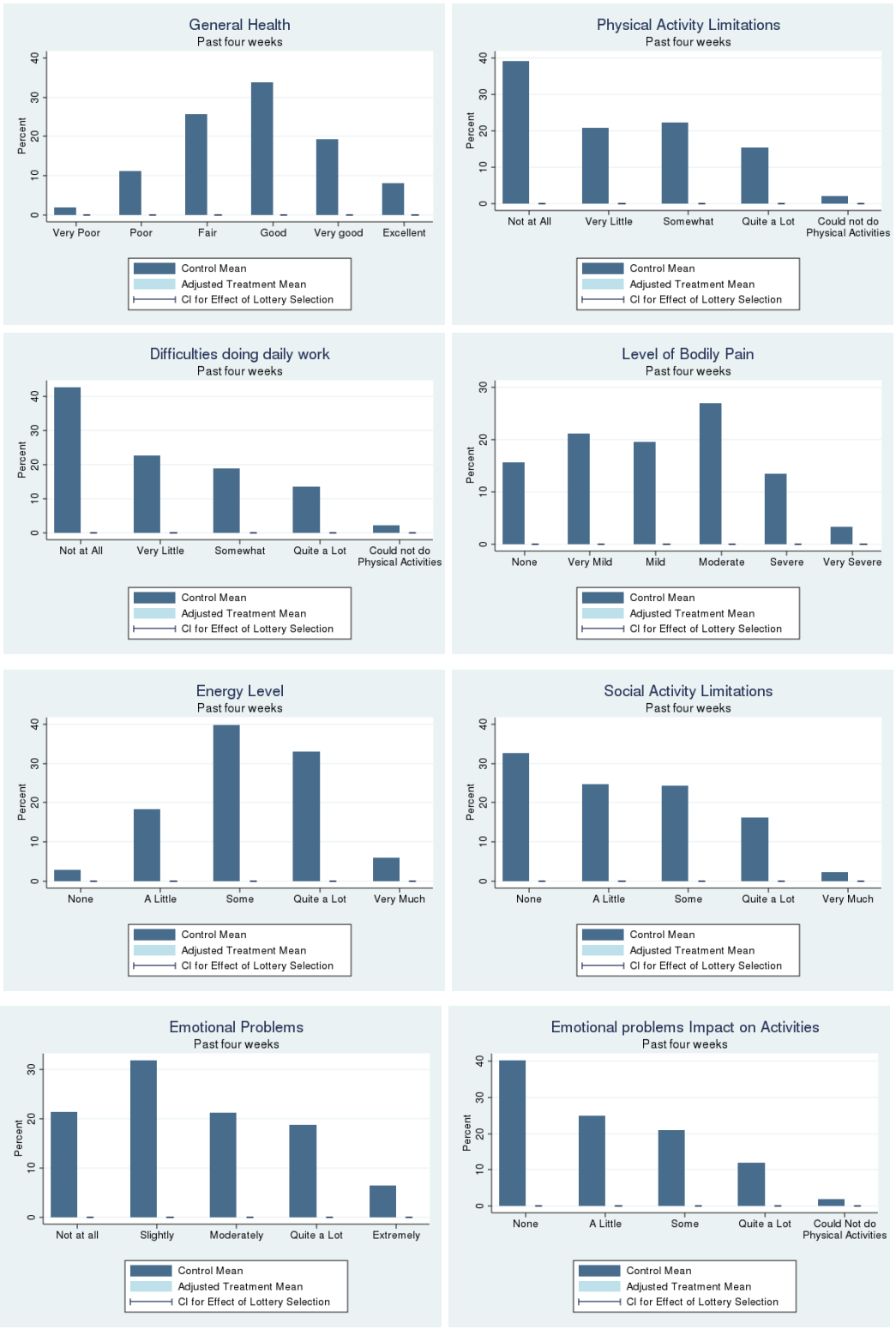

Figure 3: Figure shows, for each SF8 component question, the average response in the control group, and the average control response plus the estimated effect of lottery selection. Control means and treatment effects were calculated using survey weights. Treatment effects were estimated including controls for the number of household members on the lottery list and adjusting standard errors for household clusters. Sample includes all in-person survey respondents (N=12229).

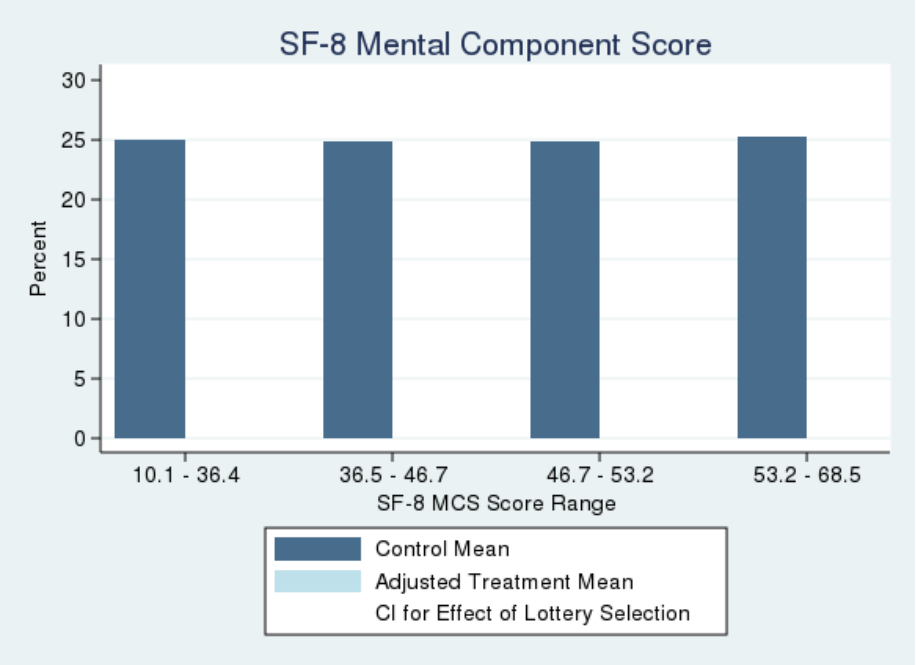

Figure 4: Figure shows the average percentage of in-person survey respondents in each quartile of the total SF-8 MCS scores for both the treatment and control groups. Quartiles are calculated based on the controls. Control means and treatment effects were calculated using survey weights. Treatment effects were estimated including controls for the number of household members on the lottery list and adjusting standard errors for household clusters. Sample includes all in-person survey respondents (N=12229).

Table P1: Characteristics of Different Samples

	All survey respondents		Pre-lottery diagnosis of depression		No pre-lottery diagnosis of depression	
	Control Mean	Treament Control Difference	Control Mean	Treament Control Difference	Control Mean	Treament Control Difference
	(1)	(2)	(3)	(4)	(5)	(6)
Female*	56.9	-0.44	66.8	2.49	51.6	-1.74
		(0.87)		(1.58)		(1.08)
Age 19-34*	36.0	-0.90	31.8	-1.95	38.3	-0.38
		(1.03)		(1.64)		(1.27)
Age 35-49*	36.4	0.16	36.4	1.44	36.4	-0.53
		(1.02)		(1.67)		(1.24)
Age 50-64*	27.6	0.73	31.9	0.51	25.3	0.90
		(0.94)		(1.61)		(1.11)
White*	68.8	0.42	81.1	0.01	62.2	0.88
		(1.01)		(1.38)		(1.30)
Black*	10.5	0.14	8.0	-0.26	11.9	0.32
		(0.61)		(0.92)		(0.78)
Other race*	14.8	0.03	12.9	2.18	15.8	-1.13
		(0.80)		(1.23)		(1.03)
Hispanic*	17.2	-0.19	10.0	0.11	21.1	-0.53
		(0.84)		(1.01)		(1.12)
Interviewed in English*	88.2	0.25	96.6	-0.91	83.7	1.07
		(0.76)		(0.62)		(1.05)
Global test of balance		0.20		1.49		0.55
		0.99		0.15		0.83

Notes: For each sample, the first column reports the control mean of the variable (with standard deviation for continuous outcomes in parentheses). The second column reports estimated differences between treatments and controls for the dependent variable (shown in the left hand column), specifically the coefficient (with standard error in parentheses) on LOTTERY based on estimating equation (1). The global test of balance rows report the pooled F statistics and p values from testing treatment-control balance on all the above variables jointly. All regressions include indicators for the number of household members on the list and adjust standard errors for household clusters. All analysis is weighted using survey weights.

Samples consists of all in-person interview respondents (N=12229), those with a pre-lottery diagnosis of depression (N=4166) and without (N=8063).

*Balance results for all survey respondents were previously reported in Baicker et al. 2013.

Table P2. Insurance Coverage (First Stage Estimates)

	All survey respondents		Pre-lottery diagnosis of depression		No pre-lottery diagnosis of depression	
	Control mean	Estimated first stage	Control mean	Estimated first stage	Control mean	Estimated first stage
	(1)	(2)	(1)	(2)	(3)	(4)
Measured in state Medicaid records						
Ever on Medicaid during study period*	18.5	24.14	22.8	24.10	16.1	24.23
		(0.90)		(1.58)		(1.09)
Ever on OHP Standard during study period*	3.3	26.49	4.3	29.52	2.8	24.95
		(0.70)		(1.22)		(0.85)
# of months on Medicaid during study period*	2.6	4.16	3.4	4.22	2.1	4.15
		(0.16)		(0.30)		(0.19)
On Medicaid at interview date*	13.3	11.35	16.9	12.55	11.4	10.80
		(0.79)		(1.40)		(0.93)
Measured through interview self-reports						
Have any insurance at interview date*	35.8	11.13	42.6	8.76	32.1	12.47
		(1.02)		(1.72)		(1.22)
Have Medicaid at interview date*	12.8	12.32	16.2	13.12	11.0	11.98
		(0.77)		(1.37)		(0.92)
Have private insurance at interview date*	14.7	-0.40	13.8	-1.53	15.2	0.17
		(0.73)		(1.13)		(0.92)

Notes: For each sample, the first column reports the control mean for alternate definitions of "MEDICAID." The second column reports the coefficient (with standard error in parentheses) on LOTTERY from estimating the first stage equation (2) using the specified definition of "MEDICAID." All regressions include indicators for the number of household members on the lottery list and adjust standard errors for household clusters. All analysis is weighted using survey weights. The study period starts on March 10, 2008 and ends on the individual's interview date. In all our analyses of the local-average-treatment effect of Medicaid in the paper, we use the definition in the first row: "Ever on Medicaid at any point in the study period."

Samples consist of all in-person interview respondents (N=12229), those with a pre-lottery diagnosis of depression (N=4166) and without (N=8063).

*Result for all survey respondents previously reported in Baicker et al. 2013.

Table D1: Depression (PHQ-8)

	All survey respondents				Pre-lottery diagnosis of depression				No Pre-lottery diagnosis of depression				
	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	p-value for heterogeneity
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Little interest/pleasure	0.832				1.229				0.618				
	(0.983)				(1.071)				(0.859)				
Feeling depressed	0.833				1.279				0.593				
	(0.980)				(1.058)				(0.843)				
Trouble sleeping, or oversleeping	1.286				1.772				1.024				
	(1.168)				(1.145)				(1.094)				
Feeling tired	1.306				1.753				1.065				
	(1.069)				(1.065)				(0.991)				
Poor appetite or overeating	0.882				1.283				0.665				
	(1.096)				(1.191)				(0.976)				
Feeling bad about self	0.716				1.157				0.479				
	(0.995)				(1.130)				(0.821)				
Trouble concentrating	0.682				1.103				0.454				
	(1.020)				(1.167)				(0.848)				
Abnormal energy level	0.489				0.788				0.328				
	(0.874)				(1.025)				(0.731)				
Total PHQ-8 Score	7.016				10.360				5.212				
	(6.011)				(6.304)				(4.990)				
*Positive depression screen (%)**	30.0				52.1				18.1				
Daily life very/extremely difficult (%)	14.9				28.0				7.8				

Notes: For each sample, the first column reports the control mean of the dependent variable (with standard deviation for continuous outcomes in parentheses). The second column reports the estimated intent-to-treat effect of lottery selection, specifically the coefficient (with standard error in parentheses) on LOTTERY from estimating equation (1) by OLS. The third column reports the estimated local-average-treatment effect of Medicaid coverage, specifically the coefficient (with standard error in parentheses) on MEDICAID from estimating equation (3) by IV. The fourth column reports the p-value of the estimated effects. All regressions include indicators for the number of household members on the lottery list and adjust standard errors for household clusters. The final column in the table reports the p-value for a test for treatment effect heterogeneity by pre-lottery diagnosis of depression, specifically whether the coefficient on the interaction of LOTTERY and pre-lottery diagnosis of diagnosis of depression is zero. All analysis is weighted using survey weights. PHQ-8 scoring: 0 is no days of symptoms, 1 is several days, 2 is more than half the days, and 3 is nearly every day. Samples consist of all in-person interview respondents (N=12229), those with a pre-lottery diagnosis of depression (N=4166), and those without (N=8063).

*Result for all survey respondents previously reported in Baicker et al. 2013.

Table D2: Mental-Health-Related Quality of Life

	All survey respondents				Pre-lottery diagnosis of depression				No Pre-lottery diagnosis of depression				p-value for heterogeneity
	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Question Scores													
General health	44.618				42.558				45.729				
	(8.201)				(8.500)				(7.813)				
Physical activity limitations	45.387				42.634				46.873				
	(9.205)				(9.649)				(8.599)				
Difficulties doing daily work	45.292				42.301				46.903				
	(9.571)				(10.129)				(8.847)				
Level of bodily pain	45.968				42.799				47.678				
	(9.888)				(9.621)				(9.606)				
Energy level	47.418				44.669				48.901				
	(8.469)				(8.270)				(8.200)				
Social activity limitations	45.352				40.780				47.820				
	(9.658)				(9.876)				(8.580)				
Emotional problems	44.198				38.853				47.084				
	(10.414)				(10.380)				(9.225)				
Emotional problem impact on activities	44.396				40.512				46.492				
	(8.458)				(8.798)				(7.474)				
*Mental Component Scale**	44.387				38.430				47.600				
	(11.380)				(11.422)				(9.977)				

Notes: For each sample, the first column reports the control mean of the dependent variable (with standard deviation for continuous outcomes in parentheses). The second column reports the estimated intent-to-treat effect of lottery selection, specifically the coefficient (with standard error in parentheses) on LOTTERY from estimating equation (1) by OLS. The third column reports the estimated local-average-treatment effect of Medicaid coverage, specifically the coefficient (with standard error in parentheses) on MEDICAID from estimating equation (3) by IV. The fourth column reports the p-value of the estimated effects. All regressions include indicators for the number of household members on the lottery list and adjust standard errors for household clusters. The final column in the table reports the p-value for a test for treatment effect heterogeneity by pre-lottery diagnosis of depression, specifically whether the coefficient on the interaction of LOTTERY and pre-lottery diagnosis of diagnosis of depression is zero. All analysis is weighted using survey weights.

Samples consist of all in-person interview respondents (N=12229), those with a pre-lottery diagnosis of depression (N=4166), and those without (N=8063).

*Result for all survey respondents previously reported in Baicker et al. 2013.

Table D3: Diagnosis of Depression

	All survey respondents				Pre-lottery diagnosis of depression				No Pre-lottery diagnosis of depression			
	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Post-lottery diagnosis of depression (%)*	4.8				N/A				7.4			
Undiagnosed depression (%)	6.6				N/A				14.0			

Notes: For each sample, the first column reports the control mean of the dependent variable (with standard deviation for continuous outcomes in parentheses). The second column reports the estimated intent-to-treat effect of lottery selection, specifically the coefficient (with standard error in parentheses) on LOTTERY from estimating equation (1) by OLS. The third column reports the estimated local-average-treatment effect of Medicaid coverage, specifically the coefficient (with standard error in parentheses) on MEDICAID from estimating equation (3) by IV. All regressions include indicators for the number of household members on the lottery list and adjust standard errors for household clusters. All analysis is weighted using survey weights.

Samples consist of all in-person interview respondents (N=12229), those with a pre-lottery diagnosis of depression (N=4166), and those without (N=8063).

*Result for all survey respondents previously reported in Baicker et al. 2013.

Table D4: Treatment of Depression and Mental Health Conditions

	All survey respondents				Pre-lottery diagnosis of depression				No Pre-lottery diagnosis of depression				p-value for heterogeneity
	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Talk Therapy (%)	N/A				37.4				N/A				
Anti-depressant Rx (%)*	16.8				37.5				5.7				
SSRI Rx (%)	9.8				22.6				2.9				
Tricyclic, MAOI, or Other Rx (%)	7.0				15.8				2.3				
Trazedone Rx (%)	3.4				7.4				1.2				
Anxiolytic Rx (%)	6.2				14.1				2.0				
Bipolar Rx (%)	5.5				12.8				1.5				
Sedative Rx (%)	2.9				6.1				1.2				
Anti-psychotic Rx (%)	4.0				9.8				0.8				
Any mental-health medication	20.7				44.8				7.7				
Num. of mental-health medications	0.335				0.771				0.099				
	(0.772)				(1.066)				(0.382)				

Notes: For each sample, the first column reports the control mean of the dependent variable (with standard deviation for continuous outcomes in parentheses). The second column reports the estimated intent-to-treat effect of lottery selection, specifically the coefficient (with standard error in parentheses) on LOTTERY from estimating equation (1) by OLS. The third column reports the estimated local-average-treatment effect of Medicaid coverage, specifically the coefficient (with standard error in parentheses) on MEDICAID from estimating equation (3) by IV. All regressions include indicators for the number of household members on the lottery list and adjust standard errors for household clusters. The final column in the table reports the p-value for a test for treatment effect heterogeneity by pre-lottery diagnosis of depression, specifically whether the coefficient on the interaction of LOTTERY and pre-lottery diagnosis of diagnosis of depression is zero. All analysis is weighted using survey weights.

Samples consist of all in-person interview respondents (N=12229), those with a pre-lottery diagnosis of depression (N=4166), and those without (N=8063).

*Result for all survey respondents previously reported in Baicker et al. 2013.

Table H1: Healthcare Use

	All survey respondents				Pre-lottery diagnosis of depression				No pre-lottery diagnosis of depression				
	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	p-value for heterogeneity
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Prescription drugs (current at time of interview)													
Any prescription drugs	53.9				73.3				43.4				
Number of prescription drugs*	1.832				2.964				1.225				
	(2.807)				(3.396)				(2.204)				
Doctor visits (12 months prior to interview)													
Any doctor visit	64.6				76.4				58.2				
Number of doctor's visits*	5.544				8.132				4.155				
	(11.583)				(14.328)				(9.514)				

Notes: For each sample, the first column reports the control mean of the dependent variable (with standard deviation for continuous outcomes in parentheses). The second column reports the estimated intent-to-treat effect of lottery selection, specifically the coefficient (with standard error in parentheses) on LOTTERY from estimating equation (1) by OLS. The third column reports the estimated local-average-treatment effect of Medicaid coverage, specifically the coefficient (with standard error in parentheses) on MEDICAID from estimating equation (3) by IV. The fourth column reports the p-value of the estimated effects. All regressions include indicators for the number of household members on the lottery list and adjust standard errors for household clusters. The analyses of ED visits and hospitalizations also control for the pre-randomization version of the outcome. The final column in the table reports the p-value for a test for treatment effect heterogeneity by pre-lottery diagnosis of depression, specifically whether the coefficient on the interaction of LOTTERY and pre-lottery diagnosis of diagnosis of depression is zero. All analysis is weighted using survey weights.

Samples for all measures except ED consist of all in-person interview respondents (N=12229), those with a pre-lottery diagnosis of depression (N=4166), and those without (N=8063). Samples for ED visits consist of the overlap between the ED sample and interview respondents (N=10178), and those in the overlap with a pre-lottery diagnosis of depression (N=3438) and without (N=6740).

*Result for all survey respondents previously reported in Baicker et al. 2013.

**An analysis of this outcome for the full ED sample (N= 24646) was previously reported in Taubman et al. 2014. Here we report the results limiting to the overlap of the ED sample and interview respondents (N=10178).

[+] An analysis of this outcome for the full Oregon Health Insurance Experiment sample (N=74922) was previously reported in Finkelstein et al. 2012. Here we report the results limiting to survey respondents (N=12229).

Table H1, Continued

	All survey respondents				Pre-lottery diagnosis of depression				No pre-lottery diagnosis of depression				p-value for heterogeneity
	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
ED visits (by September 2009)													
Any ED visit**	35.8				45.3				30.9				
Number of ED visits**	0.981				1.378				0.773				
	(2.415)				(3.040)				(1.980)				
Any ED visits for mood disorders	1.5				3.505				0.4				
Number of ED visits for mood disorders	0.026				0.066				0.005				
	(0.323)				(0.531)				(0.098)				
Hospitalizations (by September 2009)													
Any hospitalization+	6.9				9.3				5.6				
Number of hospitalizations+	0.121				0.159				0.101				
	(0.720)				(0.701)				(0.729)				
Any hospitalizations for mood disorders	0.8				1.9				0.2				
Num. of hospitalizations for mood disorde	0.013				0.031				0.002				
	(0.166)				(0.270)				(0.054)				
Panel E: Overall Resource Use													
Total resource use ($)+	2835				3937				2101				
	(5870)				(6872)				(5134)				

Table H2: Access to and Quality of Healthcare

	All survey respondents				Pre-lottery diagnosis of depression				No pre-lottery diagnosis of depression				
	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	p-value for heterogeneity
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Access to Care													
Have usual place of care*	46.1				52.9				42.4				
Got all needed physical health care*	61.0				51.1				66.3				
Got all needed mental health care	75.6				54.2				87.1				
Got all needed prescription medications	72.4				60.0				79.1				
Quality of Care (conditional on receiving any care)													
Good, very good, or excellent quality*	78.4				75.3				80.4				

Notes: For each sample, the first column reports the control mean of the dependent variable (with standard deviation for continuous outcomes in parentheses). The second column reports the estimated intent-to-treat effect of lottery selection, specifically the coefficient (with standard error in parentheses) on LOTTERY from estimating equation (1) by OLS. The third column reports the estimated local-average-treatment effect of Medicaid coverage, specifically the coefficient (with standard error in parentheses) on MEDICAID from estimating equation (3) by IV. The fourth column reports the p-value of the estimated effects. All regressions include indicators for the number of household members on the lottery list and adjust standard errors for household clusters. The final column in the table reports the p-value for a test for treatment effect heterogeneity by pre-lottery diagnosis of depression, specifically whether the coefficient on the interaction of LOTTERY and pre-lottery diagnosis of diagnosis of depression is zero. All analysis is weighted using survey weights.

Samples for access measures consist of all in-person interview respondents (N=12229), those with a pre-lottery diagnosis of depression (N=4166), and those without (N=8063). Samples for quality measure consist of in-person interview respondents reporting receiving any care (N= 9694) with a pre-lottery diagnosis of depression (N=3781) and without (N= 5913).

*Result for all survey respondents previously reported in Baicker et al. 2013.

Table H3: Financial Hardship

	All survey respondents				Pre-lottery diagnosis of depression				No pre-lottery diagnosis of depression				p-value for heterogeneity
	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Self-Reported in Inperson Interviews													
Total out-of-pocket spending ($)*	553				738				453				
	(1219)				(1319)				(1151)				
Any catastrophic out-of-pocket spending*	5.5				8.3				4.0				
Any borrowing*	24.4				32.4				20.1				
Adminstrative Credit Report Records (by September 2009)													
Any collection[+]	49.7				56.3				46.2				
Total collections ($)[+]	3999				5221				3352				
	(11605)				(12837)				(10843)				
Any medical collection[+]	25.2				29.0				23.1				
Total medical collections ($)[+]	1207				1612				993				
	(3871)				(4394)				(3544)				

Notes: For each sample, the first column reports the control mean of the dependent variable (with standard deviation for continuous outcomes in parentheses). The second column reports the estimated intent-to-treat effect of lottery selection, specifically the coefficient (with standard error in parentheses) on LOTTERY from estimating equation (1) by OLS. The third column reports the estimated local-average-treatment effect of Medicaid coverage, specifically the coefficient (with standard error in parentheses) on MEDICAID from estimating equation (3) by IV. The fourth column reports the p-value of the estimated effects. All regressions include indicators for the number of household members on the lottery list and adjust standard errors for household clusters. The analyses of credit report data also control for the February 2008 (pre-randomization) version of the outcome. The final column in the table reports the p-value for a test for treatment effect heterogeneity by pre-lottery diagnosis of depression, specifically whether the coefficient on the interaction of LOTTERY and pre-lottery diagnosis of diagnosis of depression is zero. All analysis is weighted using survey weights.

Samples for self-reported measures consist of in-person interview respondents (N=12229), those with a pre-lottery diagnosis of depression (N=4166) and those without (N=8063). Samples for administrative measures consist of the overlap between the credit report sample and interview respondents (N=8500), and those with a pre-lottery diagnosis of depression (N=2905) and without (N=5595).

*Result for all survey respondents previously reported in Baicker et al. 2013.

[+]An analysis of this outcome for the credit report sample (N=49980) was previously reported in Finkelstein et al. 2012. Here we report the results limiting to the overlap between that sample and survey respondents (N=8500).

Table H4: Clinical Measures of Health

	All survey respondents				Pre-lottery diagnosis of depression				No pre-lottery diagnosis of depression				p-value for heterogeneity
	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	Control Mean	Effect of Lottery Selection	Effect of Medicaid Coverage	p-value	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Blood Pressure													
Systolic blood pressure (mmHg)*	119.3				118.2				119.9				
	(16.9)				(16.7)				(16.9)				
Diastolic blood pressure (mmHg)*	76.0				76.6				75.7				
	(12.1)				(12.0)				(12.2)				
Elevated blood pressure (%)*	16.3				16.9				16.0				
Cholesterol													
Total cholesterol (mg/dL)*	204.1				206.0				203.0				
	(34.0)				(36.2)				(32.7)				
High total cholesterol (%)*	14.1				17.0				12.6				
	(34.9)				(37.5)				(33.2)				
HDL cholesterol (mg/dL)*	47.6				47.7				47.5				
	(13.1)				(13.5)				(13.0)				
Low HDL cholesterol (%)*	28.0				28.3				27.8				
Gylcated Hemoglobin													
Percent gylcated*	5.3				5.4				5.3				
	(0.6)				(0.7)				(0.6)				
Elevated percent gylcated (%)*	5.1				6.3				4.5				

Notes: For each sample, the first column reports the control mean of the dependent variable (with standard deviation for continuous outcomes in parentheses). The second column reports the estimated intent-to-treat effect of lottery selection, specifically the coefficient (with standard error in parentheses) on LOTTERY from estimating equation (1) by OLS. The third column reports the estimated local-average-treatment effect of Medicaid coverage, specifically the coefficient (with standard error in parentheses) on MEDICAID from estimating equation (3) by IV. The fourth column reports the p-value of the estimated effects. All regressions include indicators for the number of household members on the lottery list and adjust standard errors for household clusters. The regressions for the blood pressure measures also include controls for sex and age in deciles. The final column in the table reports the p-value for a test for treatment effect heterogeneity by pre-lottery diagnosis of depression, specifically whether the coefficient on the interaction of LOTTERY and pre-lottery diagnosis of diagnosis of depression is zero. All analysis is weighted using survey weights.

Samples consist of all in-person interview respondents (N=12229), those with a pre-lottery diagnosis of depression (N=4166), and those without (N=8063).

*Result for all survey respondents previously reported in Baicker et al. 2013.

Appendix Table A1: Classification of Medications

Medication Name	Frequency	Percent	Cumulative Percent
Antidepressants			
Trazodone	430	14.8	14.8
Citalopram	384	13.2	28.1
Fluoxetine	258	8.9	37.0
Amitriptyline	215	7.4	44.4
Sertraline	200	6.9	51.3
Cymbalta	196	6.8	58.0
Bupropion Hcl	137	4.7	62.8
Paroxetine Hcl	121	4.2	66.9
Lexapro	113	3.9	70.8
Effexor Xr	96	3.3	74.1
Zoloft	95	3.3	77.4
Prozac	68	2.3	79.8
Celexa	63	2.2	81.9
Venlafaxine	52	1.8	83.7
Bupropion (Bulk)	49	1.7	85.4
Nortriptyline	49	1.7	87.1
Wellbutrin	46	1.6	88.7
Wellbutrin Sr	36	1.2	89.9
Mirtazapine	35	1.2	91.1
Doxepin	33	1.1	92.3
Paxil	32	1.1	93.4
Wellbutrin Xl	25	0.9	94.2
Pristiq	23	0.8	95.0
Effexor	20	0.7	95.7
Budeprion Xl	19	0.7	96.4
Fluoxetine Hcl	19	0.7	97.0
Budeprion Sr	18	0.6	97.7
Escitalopram	10	0.3	98.0
Other	58	2.0	100.0
SSRIs			
Citalopram	384	27.9	27.9
Fluoxetine	258	18.8	46.7
Sertraline	200	14.5	61.2
Paroxetine Hcl	121	8.8	70.0
Lexapro	113	8.2	78.3
Zoloft	95	6.9	85.2
Prozac	68	4.9	90.1
Celexa	63	4.6	94.7
Paxil	32	2.3	97.0
Fluoxetine Hcl	19	1.4	98.4
Escitalopram	10	0.7	99.1
Other	12	0.9	100.0

Appendix Table A1, Continued

Medication Name	Frequency	Percent	Cumulative Percent
Tricyclic, MAOI, and Other Antidepressants			
Cymbalta	196	25.4	25.4
Bupropion Hcl	137	17.8	43.2
Effexor Xr	96	12.5	55.6
Venlafaxine	52	6.7	62.4
Bupropion (Bulk)	49	6.4	68.7
Wellbutrin	46	6.0	74.7
Wellbutrin Sr	36	4.7	79.4
Mirtazapine	35	4.5	83.9
Wellbutrin Xl	25	3.2	87.2
Pristiq	23	3.0	90.1
Effexor	20	2.6	92.7
Budeprion Xl	19	2.5	95.2
Budeprion Sr	18	2.3	97.5
Other	19	2.5	100.0
Trazedone			
Trazodone	430	99.3	99.3
Trazodone-Dietary Supp #8	2	0.5	99.8
Desyrel	1	0.2	100.0
Anxiolytics (anti-anxiety)			
Clonazepam	195	21.2	21.2
Lorazepam	183	19.9	41.0
Alprazolam	98	10.6	51.7
Hydroxyzine Pamoate	97	10.5	62.2
Diazepam	83	9.0	71.2
Xanax	45	4.9	76.1
Buspirone	41	4.5	80.6
Hydroxyzine Hcl	36	3.9	84.5
Valium	36	3.9	88.4
Ativan	30	3.3	91.6
Klonopin	23	2.5	94.1
Vistaril	22	2.4	96.5
Other	32	3.5	100.0

Appendix Table A1, Continued

Medication Name	Frequency	Percent	Cumulative Percent
Bipolar medications			
Seroquel	155	18.2	18.2
Abilify	104	12.2	30.4
Lamotrigine	89	10.4	40.8
Lithium Carbonate	73	8.6	49.4
Lamictal	70	8.2	57.6
Divalproex	59	6.9	64.5
Risperidone	48	5.6	70.1
Zyprexa	48	5.6	75.7
Geodon	40	4.7	80.4
Depakote	27	3.2	83.6
Carbamazepine	26	3.0	86.6
Seroquel Xr	24	2.8	89.4
Risperdal	19	2.2	91.7
Quetiapine	12	1.4	93.1
Depakote Er	10	1.2	94.3
Others	49	5.7	100.0
Sedatives			
Lorazepam	183	37.7	37.7
Zolpidem	127	26.2	63.9
Ambien	33	6.8	70.7
Doxepin	33	6.8	77.5
Ativan	30	6.2	83.7
Temazepam	24	4.9	88.7
Phenobarbital	12	2.5	91.1
Other	55	8.9	100.0
Anti-psychotics			
Seroquel	155	28.4	28.4
Abilify	104	19.0	47.4
Risperidone	48	8.8	56.2
Zyprexa	48	8.8	65.0
Geodon	40	7.3	72.3
Invega	24	4.4	76.7
Seroquel Xr	24	4.4	81.1
Risperdal	19	3.5	84.6
Perphenazine	13	2.4	87.0
Quetiapine	12	2.2	89.2
Haloperidol	11	2.0	91.2
Other	48	8.8	100.0

Appendix Table A1, Continued

Medication Name	Frequency	Percent	Cumulative Percent
Any mental-health medication (top 25 medications)			
Citalopram	384	8.4	8.4
Fluoxetine	258	5.7	14.1
Amitriptyline	215	4.7	18.8
Sertraline	200	4.4	23.2
Cymbalta	196	4.3	27.5
Clonazepam	195	4.3	31.8
Lorazepam	183	4.0	35.8
Seroquel	155	3.4	39.2
Bupropion Hcl	137	3.0	42.2
Zolpidem	127	2.8	45.0
Paroxetine Hcl	121	2.7	47.6
Lexapro	113	2.5	50.1
Abilify	104	2.3	52.4
Alprazolam	98	2.2	54.6
Hydroxyzine Pamoate	97	2.1	56.7
Effexor Xr	96	2.1	58.8
Zoloft	95	2.1	60.9
Lamotrigine	89	2.0	62.8
Diazepam	83	1.8	64.6
Lithium Carbonate	73	1.6	66.2
Lamictal	70	1.5	67.8
Prozac	68	1.5	69.3
Celexa	63	1.4	70.7
Divalproex	59	1.3	72.0
Venlafaxine	52	1.1	73.1