

The Costs and Benefits of Mental Healthcare

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Studies conclude that mild mental health conditions, such as mood disorders, affective disorders, and anxiety disorders, have negative effects on employment outcomes and family dynamics. However, government involvement in the treatment of these mild mental health conditions is justified only if the benefits of treatment exceed the cost. To determine the relationship between the costs of mental health and its benefits, we used existing literature to estimate efficacy of treatment, cost of treatment, and benefits to improved mental health.

Literature Review

To determine the likelihood that a patient receiving mental healthcare will experience a positive health effect, we looked at Seligman (1995), Rupke, Blecke, and Renfrow (2006), McNeilly and Howard (1991), and Howard et. al (1986). These papers agreed that psychotherapy and/or medication produce positive effects on patients' outcomes. Rupke, Blecke, and Renfrow (2006) stated that medication alone is effective 66% of the time. McNeilly and Howard (1991) found that psychotherapy is effective 50% of the time. Meanwhile, Howard et. al (1986) found that long-term treatment is 75% effective, while short-term treatment is only 50% effective. Seligman (1995) found that psychotherapy alone is just as effective as psychotherapy paired with medication, and that psychotherapy is only about 30% effective.

Cost of treating a mental health condition varies widely; however, Croghan, Obenshain, and Crown (1998), Kessler et. al (1999) and Greenberg et. al (2003) provide estimates. Greenberg et. al (2003) noted that total expenditures on pharmaceuticals have increased ten fold between 1990 and 2000, indicating that either the cost or the usage rates of pharmaceuticals have gone up. For this reason, we assumed treatment costs were likely to include cost of medication. Kessler et. al (1999) estimated that a 30-day prescription of nortriptyline hydrochloride (Aventyl) costs \$402. Psychotherapy costs roughly \$100 per hour, though Charlottesville does currently offer free and sliding scale counseling services (cms.psychologytoday.com). Croghan, Obenshain, and Crown (1998) estimated that full treatment of one average mental health episode costs \$2000.

Literature was rich with measures of how having a mental health problem negatively affects work and family-life and, concurrently, what benefits can be expected by improving mental health. Bibou-Nikou (2004), Leinonen, Solantaus, and Punamaki (2003), Smith (2004), Hay et. al (2001), and Goodman et. al (2007) showed that effects of parental depression include negative effects on the child's socio-emotional and behavioral development and IQ scores, leading to difficulties in school, trouble with self-control, poor peer relationships, and aggression. However, these studies did not attempt to quantify the monetary effects of compensating for these difficulties.

Poor mental health imposes economic costs due to increased likelihood of unemployment, decreased wages, decreased time at work, and decreased productivity at work. In fact, depression is one of the most costly of all mental health problems in this respect. Alexandre and French (2001), Baldwin (1999), Berndt et. al (1998), Chatterji et. al (2005), Frank and Gertler (2007), Greenberg et. al (1993), Greenberg et. al (2003), Kessler and Frank (1997), Kessler et. al (1999), Kouzis and Eaton (1994), and Marcotte, Wilcox-Gok, and Redmon (2000) shaped our understanding of the labor effects of mental health. Some articles, such as Greenberg et. al (1993), focused on the aggregate costs of mental health. These costs included the cost of treatment, morbidity costs, and mortality costs. However, these aggregate cost estimates are not directly relevant to us because we want to compare cost of treatment to benefits of treatment from reduced morbidity costs, such as lost productivity. We chose not to include mortality costs, such as the cost of suicide. Perhaps future iterations of this study should include this cost.

It was Baldwin (2005) that provided the disaggregated estimates that we used in our analysis. Baldwin analyzed the probability of employment and the wage effects for three categories of mental disorder: mood (ICD-9 311), anxiety (ICD-9 300), and adjustment (ICD-9 308, 309). We used this data to determine income forgone by people with each category of mental disorder and the potential benefit of curing the mental disorder.

Methodology

After reviewing literature, we needed to compute the effects on productivity for a person with a mood, anxiety, or adjustment disorder respectively. To do so, we used Baldwin (2005). Her paper looked at the effect of mental health on two main indicators of productivity: likelihood of employment and relative wage.

To determine the effect of mental disorders on the probability of employment, we used Baldwin, Table A1 for estimates of means of control variables in the employment function by disability group, and Baldwin, Table A2 for estimates of the effects of control variables on the employment function by disability group. The first order of business was to compute marginal effects of a mental disorder on employment probabilities and wages. In particular, it is important not to include the effect of other variables that might be correlated with moderate mental disorders. For the employment rate, we computed average effects of each control variable for those people with moderate mental disorders excluding the constant (see appendix for estimates). Next, we computed the predicted sum of effects for each type of person (first row of Table 1). The second row of Table 1 reports average employment rates for each group. Since Baldwin uses probit analysis, we next take the inverse normal distribution function and then compute a differential. This allows us to adjust for the constant and compute employment probability differentials.

Table 1: Calculating Employment Differentials

| | no disorder | mood disorder | anxiety disorder | adjustment disorder |
|------------------------|--------------|---------------|------------------|---------------------|
| sum of effects | 0.403 | -0.212 | 1.667 | 3.565 |
| employment rate | 0.910 | 0.77 | 0.81 | 0.9 |
| phi-inv | 1.340 | 0.74 | 0.88 | 1.29 |
| constant | 0.937 | 0.952 | -0.787 | -2.275 |
| differential | | 0.015 | -1.724 | -3.212 |
| new index | | -0.197 | -0.057 | 0.353 |
| new probability | | 0.422 | 0.477 | 0.638 |
| change in probability | | -0.348 | -0.333 | -0.262 |

We repeated this process using Baldwin, Table A3 and Table A4 to determine the differentials in wage rate that result from mental disorder.

Table 2: Calculating Wage Differentials

| | no disorder | mood disorder | anxiety disorder | adjustment disorder |
|--------------------|----------------|------------------|---------------------|------------------------|
| sum of effects | 0.218 | 0.371 | 0.371 | 0.430 |
| mean wage | 14.850 | 13.71 | 14.58 | 14.74 |
| log (mean wage) | 2.698 | 2.618 | 2.680 | 2.691 |
| constant | 2.480 | 2.247 | 2.308 | 2.261 |
| differential | | -0.233 | -0.172 | -0.219 |

Next, we used these differentials in employment and wage to construct an estimate of the effects of mood, anxiety, and adjustment disorders on productivity. We defined the marginal effect on productivity as the estimated productivity for a person with no mental disorder minus the productivity of a person with a mental disorder:

$$\Delta p = 2000e_h w_h - 2000e_h (1 + d_{eu}) w_h (1 + d_{wu})$$

where Δp is the gain in productivity, e_h is the employment rate for healthy people (from Table 1), w_h is the wage rate for healthy people (from Table 2), d_{eu} is the employment differential for “unhealthy” people (from Table 1), and d_{wu} is the wage differential for “unhealthy” people (from Table 2). We used the results of these calculations, along with a discount factor and the costs of treatment, to estimate the long-term benefits of treatment:

$$B = \frac{P(\Delta p + O)}{1 - \beta} - c$$

where B is the long-term benefit, P is the probability that treatment is successful, O is the value of other benefits associated with successful treatment, β is the discount factor, and c is the cost of treatment. We consider other benefits including effects on children of the adult with the mental health problem and reduced other medical expenses. Initially, we use a discount factor of $\beta = 0.6$ to account for possible relapses and possible improvements in mental health without treatment.

We calculated the long-term benefits for fourteen different scenarios. To construct these different scenarios, we drew on information collected during the literature review. We chose the estimates in Croghan, Obenshain, and Brown (1998) to estimate that the average cost of treatment is \$2000 as our baseline cost estimate, and analyzed what would happen to long-term benefits if costs increased. Following Howard et. al (1986), we considered a scenario where the cost of treatment would be higher because treatment would likely be longer-term and involve medication but the probability but would have a greater probability of success. Since there were no quantifiable estimates of the costs of parental depression, we allowed that perhaps there were no monetary effects: that the cost of depression on child development and family dynamics is zero. However, it is likely that a depressed parent may be more likely to hire help in raising children or that a child that develops under parental depression will require greater expenditures to correct developmental problems. Therefore, we analyzed the long-term benefits if effects on children cost \$2000 or \$4000. Likewise, since there was such

controversy over the relationship between effective treatment of a mental disorder and reduction in other medical expenditures, we allowed that the patient's other medical expenditures would remain the same (zero reduction) and analyzed what would happen if treatment actually caused a \$1000 or \$3000 reduction in these expenditures.

To summarize, the base scenario we constructed had the following parameters: reduction in effects on children was zero, cost of treatment was \$2000, reduction in other medical costs was zero, the probability of effective treatment was 0.5, the wage rate was \$14.85, and the discount factor was 0.6. We calculated long-term benefits when reduction in effects on children were valued instead at \$2000 and \$4000, when cost of treatment was \$3000 and \$4000, when reduction in other medical costs was \$1000 and \$3000, when the probability of effective treatment was 0.75 and 0.25, when the wage rate was \$7.43, and when the discount factor was 0.8. We also constructed a "worst-case" scenario when benefits were the smallest, probability of effective treatment was lowest, costs were the highest, wage was lowest, and the discount factor was highest. We constructed two "best-case" scenarios because we were originally unsure whether paying \$2000 for a 50% chance of recovery was better or worse than paying \$6000 for a 75% chance of recovery. The two best-case scenarios varied from each other only in this one dimension. Other than that, both best-case scenarios represented the greatest gains from treatment, the highest wage rate, and the lowest discount factor.

After creating a matrix of long-term benefits for each scenario and each mental disorder category, we divided these benefits by the cost of treatment that was used to compute that long-term benefit. For most scenarios, this cost was just \$2000. However, for the scenarios where we varied the cost of treatment, the cost we used to divide the benefits by the costs varied concurrently.

Results

When calculating differentials in the probability of employment, we found that mood disorders decrease the probability of employment by 34.8%, anxiety disorders decrease probability of employment by 33.3%, and adjustment disorders decrease the probability of employment by 26.2% (Table 1). When calculating wage differentials, we found that the average wage rate for a person without a mental disorder was \$14.85. For those with a mood disorder, the average wage dropped to \$13.71. For anxiety, average wage was \$14.58. For adjustment disorders, average wage was \$14.74. This results in differentials of -22.3%, -17.2%, and -21.9%. Using these wage and employment differentials, we estimated that annual productivity dropped by \$13,509 for those afflicted by a mood disorder, \$12,088 for anxiety disorders, and \$11,455 for adjustment disorders.

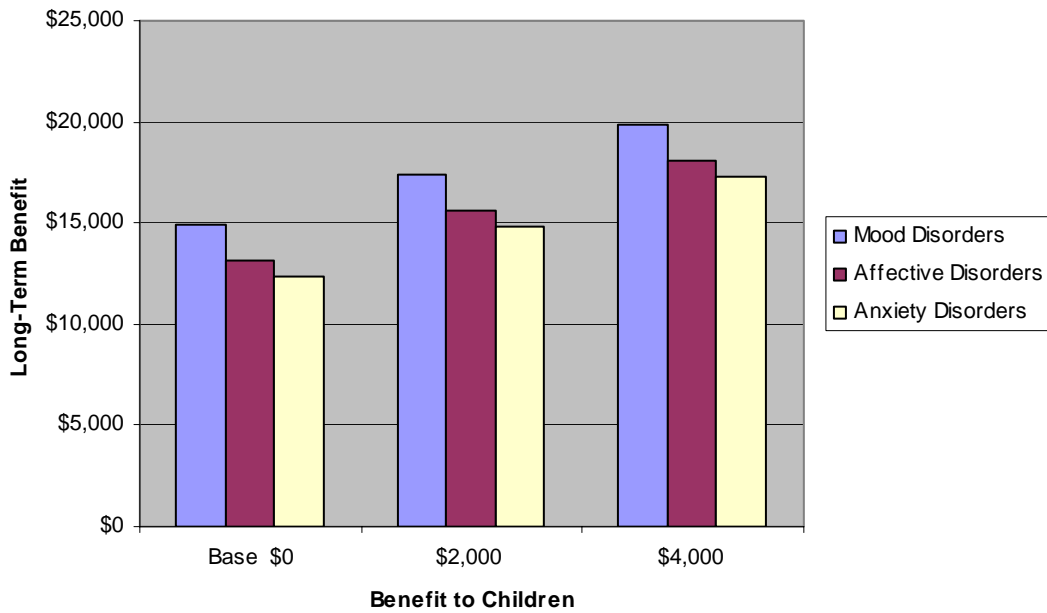
In the long-term, the benefits of treatment associated with the base scenario are \$14887 for those with mood disorders, \$13110 for anxiety disorders, and \$12318 for adjustment disorders. In all scenarios except the worst-case scenario, the long-term benefits of treatment exceeded the costs of treatment. For all three categories of disorders, the lowest benefit/cost ratio occurred when wage was lower. From there, the next costliest variations from the base were when treatment costs increased and when the ratio of cost to probability of effective treatment deviated from the base scenario of \$2000/0.5 to either \$2000/0.25 or \$6000/0.75. However, even in these cases the long-term benefits still exceeded costs roughly five to one.

The charts below illustrate the sensitivity of our estimates to the various assumptions used in the analysis. These provide the same information as in Table 3 but graphically instead.

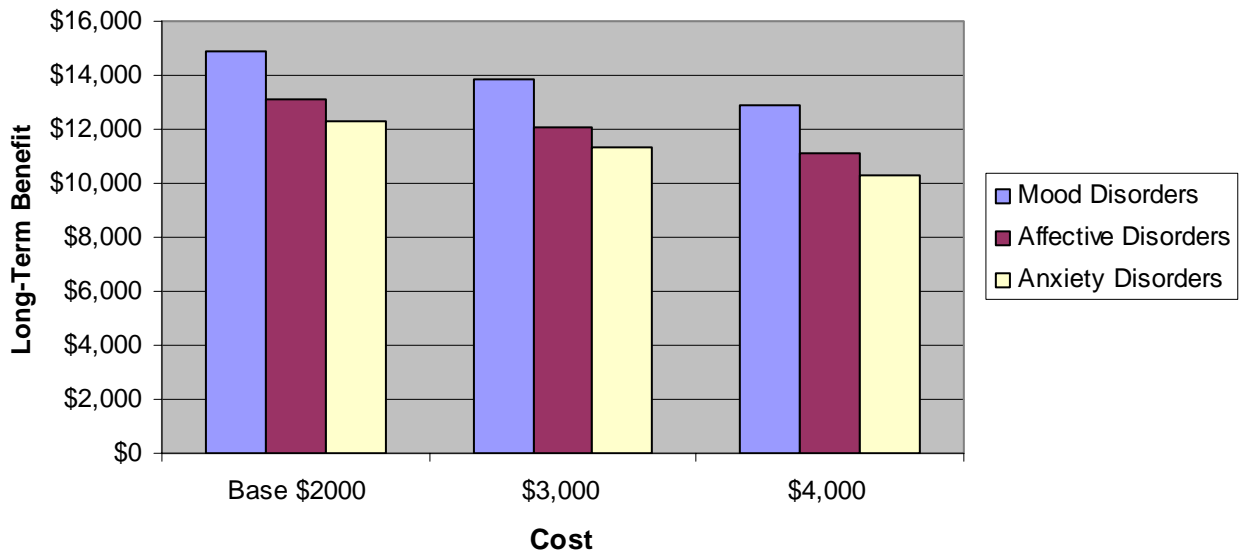
Table 3: Long-Term Benefits and Benefit Cost Ratios

| | | Long-Term Benefit | | | Benefit/Cost Ratio | | |
|---|------------------------|-------------------|----------|------------|--------------------|---------|------------|
| | | Mood | Anxiety | Adjustment | Mood | Anxiety | Adjustment |
| Effects on Children | Base \$0 | \$14,887 | \$13,110 | \$12,318 | 8.44 | 7.56 | 7.16 |
| | \$2,000 | \$17,387 | \$15,610 | \$14,818 | 9.69 | 8.81 | 8.41 |
| | \$4,000 | \$19,887 | \$18,110 | \$17,318 | 10.94 | 10.06 | 9.66 |
| Costs of Treatment | Base \$2000 | \$14,887 | \$13,110 | \$12,318 | 8.44 | 7.56 | 7.16 |
| | \$3,000 | \$13,887 | \$12,110 | \$11,318 | 5.30 | 4.70 | 4.44 |
| | \$4,000 | \$12,887 | \$11,110 | \$10,318 | 3.72 | 3.28 | 3.08 |
| Reduction in Other Med Costs | Base \$0 | \$14,887 | \$13,110 | \$12,318 | 8.44 | 7.56 | 7.16 |
| | \$1,000 | \$16,137 | \$14,360 | \$13,568 | 9.07 | 8.18 | 7.78 |
| | \$3,000 | \$18,637 | \$16,860 | \$16,068 | 10.32 | 9.43 | 9.03 |
| Cost/Prob of Effective Treatment | Base \$2000/0.5 | \$14,887 | \$13,110 | \$12,318 | 8.44 | 7.56 | 7.16 |
| | \$6000/0.75 | \$19,330 | \$16,665 | \$15,478 | 4.22 | 3.78 | 3.58 |
| | \$2000/0.25 | \$6,443 | \$5,555 | \$5,159 | 4.22 | 3.78 | 3.58 |
| Mean Healthy Wage | Base \$14.85 | \$14,887 | \$13,110 | \$12,318 | 8.44 | 7.56 | 7.16 |
| | \$7.43 | \$6,443 | \$5,555 | \$5,159 | 4.22 | 3.78 | 3.58 |
| Multiple Year Benefits | Base 0.6 | \$14,887 | \$13,110 | \$12,318 | 8.44 | 7.56 | 7.16 |
| | 0.8 | \$31,773 | \$28,220 | \$26,637 | 16.89 | 15.11 | 14.32 |
| <u>Worst-Case Scenario</u> : Children 0, Cost 4000, Med Red 0, Prob 4000/.25, wage 7.43, discount 0.6 | | \$222 | -\$222 | -\$420 | 1.06 | 0.94 | 0.89 |
| <u>Best-Case Scenario (1)</u> : children 4000, treatment 2000, med red 3000, prob 2000/0.5, wage 14.85, discount 0.8 | | \$49,273 | \$45,720 | \$44,137 | 25.64 | 23.86 | 23.07 |
| <u>Best-Case Scenario (2)</u> : children 4000, treatment 6000, med red 3000, prob 6000/0.75, wage 14.85, discount 0.8 | | \$70,910 | \$65,580 | \$63,205 | 12.82 | 11.93 | 11.53 |

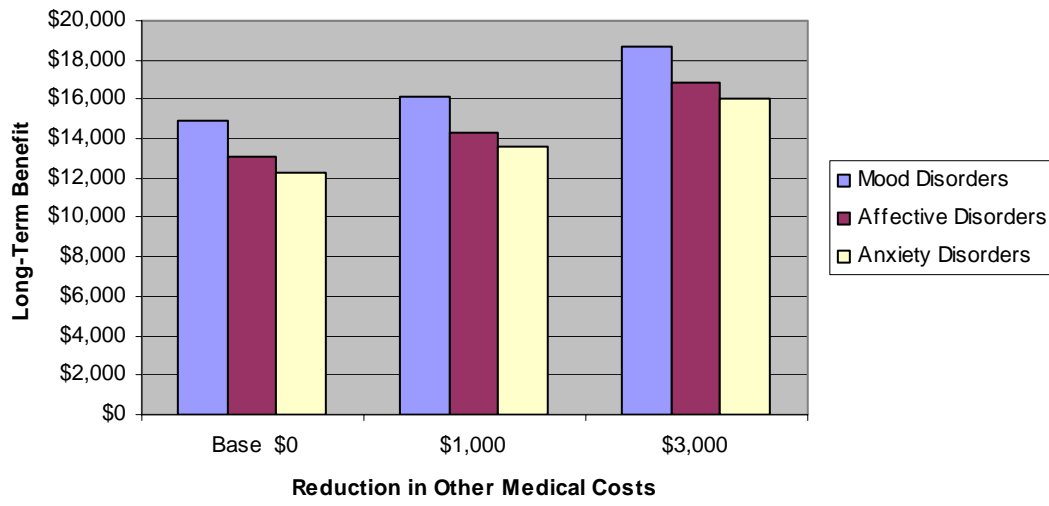
Sensitivity Analysis for Effects of Treatment on Children



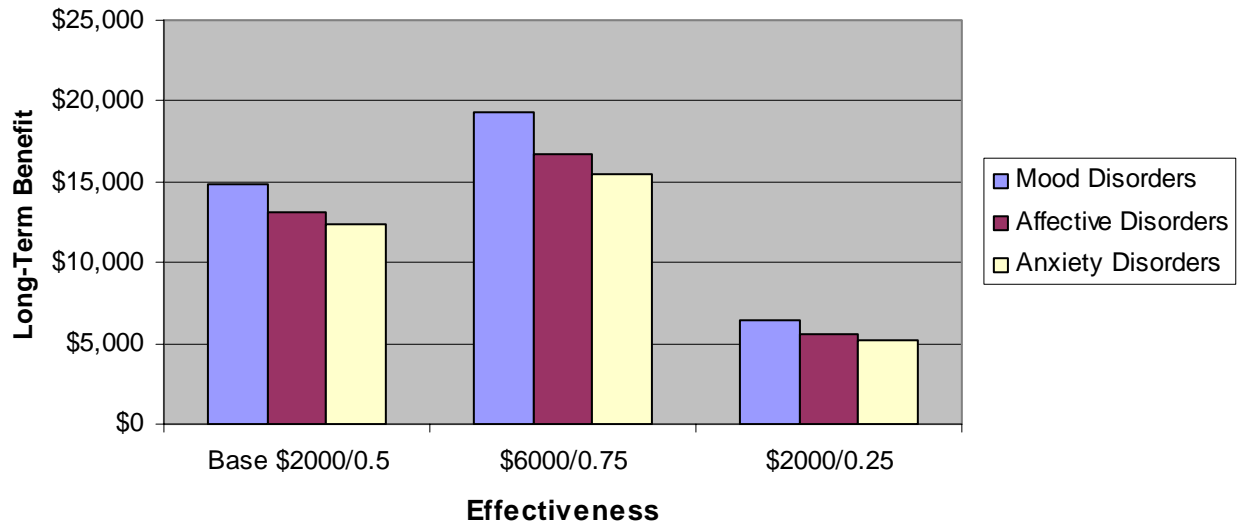
Sensitivity Analysis for Costs of Treatment

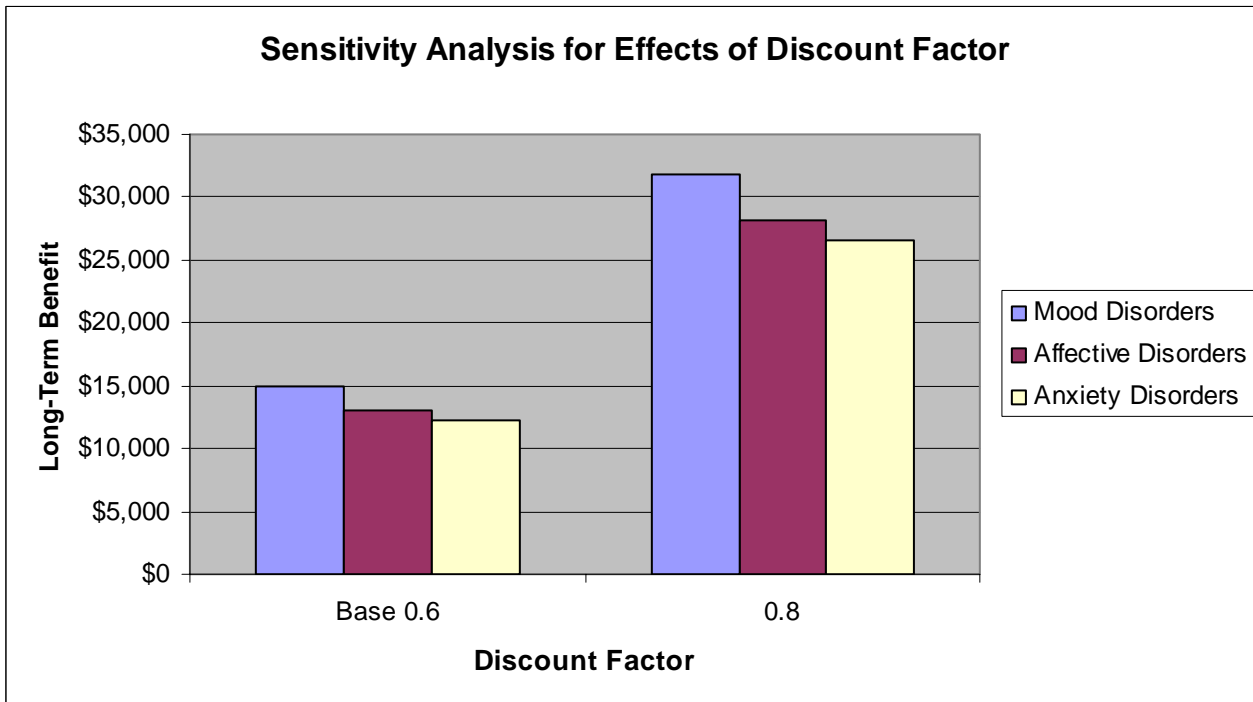
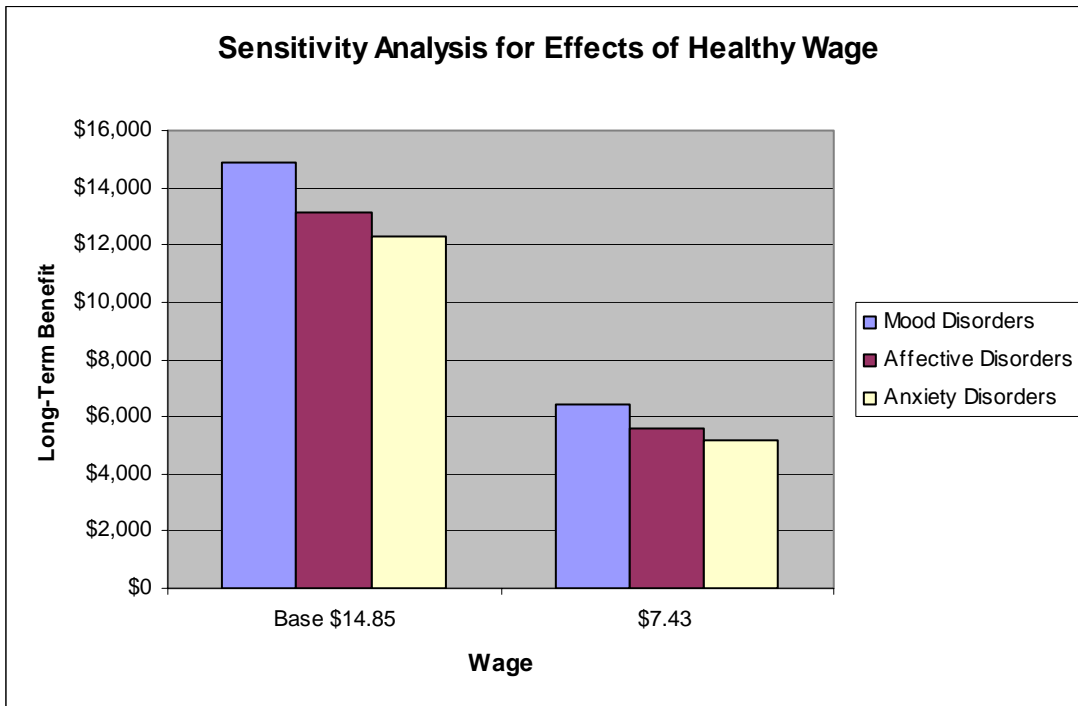


Sensitivity Analysis for Effects of Treatment on Reduction in Other Medical Costs



Sensitivity Analysis for Effectiveness of Treatment





Conclusion

Our calculations showed that, except for quite unlikely scenarios, the benefits of treatment significantly exceed the costs. This is a strong indicator that investing in mental healthcare yields high returns.

Appendix

Employment Effects

| | Disability Group | Sample Population | Mean | (N)(μ) | Average | Coefficient Estimate (Table A2) | Average Marginal Effect |
|-------------------|---------------------|-------------------|-------------|----------------|---------------|---------------------------------|-------------------------|
| Age | No Mental Disorder | 9675 | 37.7 | 364747.5 | | 0.009 | 0.362 |
| | Mood Disorder | 703 | 40.1 | 28190.3 | | -0.012 | -0.482 |
| | Anxiety Disorder | 294 | 40.8 | 11995.2 | | 0.026 | 1.045 |
| | Adjustment Disorder | 238 | 39.7 | 9448.6 | | 0.028 | 1.125 |
| | | | Sum= | 49634.1 | 40.190 | | |
| Male | No Mental Disorder | 9675 | 0.52 | 5031 | | 1.401 | 0.472 |
| | Mood Disorder | 703 | 0.31 | 217.93 | | 0.949 | 0.320 |
| | Anxiety Disorder | 294 | 0.35 | 102.9 | | 1.018 | 0.343 |
| | Adjustment Disorder | 238 | 0.4 | 95.2 | | 1.111 | 0.374 |
| | | | Sum= | 416.03 | 0.337 | | |
| Black | No Mental Disorder | 9675 | 0.14 | 1354.5 | | -0.309 | -0.025 |
| | Mood Disorder | 703 | 0.09 | 63.27 | | -0.573 | -0.046 |
| | Anxiety Disorder | 294 | 0.04 | 11.76 | | -1.102 | -0.088 |
| | Adjustment Disorder | 238 | 0.1 | 23.8 | | -1.114 | -0.089 |
| | | | Sum= | 98.83 | 0.080 | | |
| Hispanic | No Mental Disorder | 9675 | 0.12 | 1161 | | -0.355 | -0.028 |
| | Mood Disorder | 703 | 0.08 | 56.24 | | -0.558 | -0.043 |
| | Anxiety Disorder | 294 | 0.07 | 20.58 | | -0.341 | -0.026 |
| | Adjustment Disorder | 238 | 0.08 | 19.04 | | 0.108 | 0.008 |
| | | | Sum= | 95.86 | 0.078 | | |
| Other Race | No Mental Disorder | 9675 | 0.05 | 483.75 | | -0.418 | -0.011 |
| | Mood Disorder | 703 | 0.02 | 14.06 | | -0.727 | -0.019 |
| | Anxiety Disorder | 294 | 0.02 | 5.88 | | 0.565 | 0.015 |
| | Adjustment Disorder | 238 | 0.05 | 11.9 | | -2.317 | -0.060 |
| | | | | | | | |

| | | | | | | | |
|--------------------------------|---------------------|------|-------------|---------------|--------------|---------------|---------------|
| | | | Sum= | 31.84 | 0.026 | | |
| | No Mental Disorder | 9675 | 0.23 | 2225.25 | | 0.252 | 0.065 |
| Midwest | Mood Disorder | 703 | 0.24 | 168.72 | | 0.437 | 0.112 |
| | Anxiety Disorder | 294 | 0.27 | 79.38 | | 1.046 | 0.269 |
| | Adjustment Disorder | 238 | 0.29 | 69.02 | | 2.737 | 0.703 |
| | | | Sum= | 317.12 | 0.257 | | |
| | No Mental Disorder | 9675 | 0.36 | 3483 | | 0.144 | 0.046 |
| South | Mood Disorder | 703 | 0.34 | 239.02 | | 0.428 | 0.136 |
| | Anxiety Disorder | 294 | 0.27 | 79.38 | | 0.582 | 0.185 |
| | Adjustment Disorder | 238 | 0.31 | 73.78 | | 4.316 | 1.371 |
| | | | Sum= | 392.18 | 0.318 | | |
| | No Mental Disorder | 9675 | 0.22 | 2128.5 | | 0.199 | 0.051 |
| West | Mood Disorder | 703 | 0.24 | 168.72 | | 0.508 | 0.130 |
| | Anxiety Disorder | 294 | 0.27 | 79.38 | | 0.079 | 0.020 |
| | Adjustment Disorder | 238 | 0.29 | 69.02 | | 2.078 | 0.534 |
| | | | Sum= | 317.12 | 0.257 | | |
| | No Mental Disorder | 9675 | 0.02 | 193.5 | | -0.024 | -0.001 |
| Widowed | Mood Disorder | 703 | 0.04 | 28.12 | | -0.077 | -0.002 |
| | Anxiety Disorder | 294 | 0.02 | 5.88 | | 2.239 | 0.070 |
| | Adjustment Disorder | 238 | 0.02 | 4.76 | | -0.492 | -0.015 |
| | | | Sum= | 38.76 | 0.031 | | |
| | No Mental Disorder | 9675 | 0.13 | 1257.75 | | 0.188 | 0.045 |
| Divorced/ Separated | Mood Disorder | 703 | 0.25 | 175.75 | | -0.121 | -0.029 |
| | Anxiety Disorder | 294 | 0.23 | 67.62 | | -0.173 | -0.041 |
| | Adjustment Disorder | 238 | 0.21 | 49.98 | | 0.787 | 0.187 |
| | | | Sum= | 293.35 | 0.238 | | |
| | No Mental Disorder | 9675 | 0.33 | 3192.75 | | -0.125 | -0.036 |
| Never Married | Mood Disorder | 703 | 0.3 | 210.9 | | -0.040 | -0.012 |
| | Anxiety Disorder | 294 | 0.28 | 82.32 | | 0.812 | 0.235 |
| | Adjustment Disorder | 238 | 0.27 | 64.26 | | 0.804 | 0.233 |
| | | | Sum= | 357.48 | 0.289 | | |

| | | | | | | |
|--------------------------------|---------------------|------|-------|-----------------|---------------|---------------|
| Children | No Mental Disorder | 9675 | 0.24 | 2322 | 0.566 | 0.150 |
| | Mood Disorder | 703 | 0.25 | 175.75 | 1.278 | 0.340 |
| | Anxiety Disorder | 294 | 0.26 | 76.44 | 1.345 | 0.358 |
| | Adjustment Disorder | 238 | 0.32 | 76.16 | 2.183 | 0.580 |
| | Sum= | | | 328.35 | 0.266 | |
| Non-wage Income | No Mental Disorder | 9675 | 2173 | 21023775 | -0.021 | -0.197 |
| | Mood Disorder | 703 | 3867 | 2718501 | -0.011 | -0.103 |
| | Anxiety Disorder | 294 | 3395 | 998130 | -0.009 | -0.084 |
| | Adjustment Disorder | 238 | 33051 | 7866138 | -0.051 | -0.478 |
| | Sum= | | | 11582769 | 9.379 | |
| Work-restriction Income | No Mental Disorder | 9675 | 0.08 | 774 | -0.154 | -0.021 |
| | Mood Disorder | 703 | 0.13 | 91.39 | 0.008 | 0.001 |
| | Anxiety Disorder | 294 | 0.15 | 44.1 | 0.615 | 0.083 |
| | Adjustment Disorder | 238 | 0.13 | 30.94 | 1.284 | 0.173 |
| | Sum= | | | 166.43 | 0.135 | |
| IADL Help | No Mental Disorder | 9675 | 0.02 | 193.5 | -0.266 | -0.027 |
| | Mood Disorder | 703 | 0.12 | 84.36 | -0.657 | -0.067 |
| | Anxiety Disorder | 294 | 0.12 | 35.28 | -0.445 | -0.046 |
| | Adjustment Disorder | 238 | 0.03 | 7.14 | 0.277 | 0.028 |
| | Sum= | | | 126.78 | 0.103 | |
| ADL Help | No Mental Disorder | 9675 | 0.01 | 96.75 | 0.161 | 0.007 |
| | Mood Disorder | 703 | 0.05 | 35.15 | 0.677 | 0.028 |
| | Anxiety Disorder | 294 | 0.04 | 11.76 | 1.037 | 0.043 |
| | Adjustment Disorder | 238 | 0.02 | 4.76 | -1.294 | -0.054 |
| | Sum= | | | 51.67 | 0.042 | |
| Physical Limitations | No Mental Disorder | 9675 | 0.07 | 677.25 | -0.132 | -0.031 |
| | Mood Disorder | 703 | 0.25 | 175.75 | -0.046 | -0.011 |
| | Anxiety Disorder | 294 | 0.22 | 64.68 | -0.105 | -0.024 |
| | Adjustment Disorder | 238 | 0.19 | 45.22 | 1.186 | 0.274 |
| | Sum= | | | 285.65 | 0.231 | |

| | | | | | | |
|-------------------------------|---------------------|------|-------|---------------|--------------|--------|
| Activity Limitations | No Mental Disorder | 9675 | 0.05 | 483.75 | -1.145 | -0.266 |
| | Mood Disorder | 703 | 0.26 | 182.78 | -1.314 | -0.305 |
| | Anxiety Disorder | 294 | 0.24 | 70.56 | -1.680 | -0.390 |
| | Adjustment Disorder | 238 | 0.14 | 33.32 | -1.830 | -0.425 |
| | Sum= | | | 286.66 | 0.232 | |
| Social Limitations | No Mental Disorder | 9675 | 0.04 | 387 | -0.212 | -0.035 |
| | Mood Disorder | 703 | 0.18 | 126.54 | -0.135 | -0.023 |
| | Anxiety Disorder | 294 | 0.19 | 55.86 | -0.217 | -0.036 |
| | Adjustment Disorder | 238 | 0.1 | 23.8 | -2.388 | -0.399 |
| | Sum= | | | 206.2 | 0.167 | |
| Cognitive Limitations | No Mental Disorder | 9675 | 0.02 | 193.5 | -0.514 | -0.075 |
| | Mood Disorder | 703 | 0.15 | 105.45 | -0.739 | -0.107 |
| | Anxiety Disorder | 294 | 0.17 | 49.98 | -0.646 | -0.094 |
| | Adjustment Disorder | 238 | 0.1 | 23.8 | -0.245 | -0.036 |
| | Sum= | | | 179.23 | 0.145 | |
| Any Physical Disorder | No Mental Disorder | 9675 | 0.21 | 2031.75 | -0.093 | -0.039 |
| | Mood Disorder | 703 | 0.44 | 309.32 | -0.083 | -0.035 |
| | Anxiety Disorder | 294 | 0.41 | 120.54 | -0.426 | -0.179 |
| | Adjustment Disorder | 238 | 0.38 | 90.44 | -1.441 | -0.607 |
| | Sum= | | | 520.3 | 0.421 | |
| Substance Use Disorder | No Mental Disorder | 9675 | 0.004 | 38.7 | -0.142 | -0.003 |
| | Mood Disorder | 703 | 0.03 | 21.09 | 0.202 | 0.005 |
| | Anxiety Disorder | 294 | 0.02 | 5.88 | 0.485 | 0.012 |
| | Adjustment Disorder | 238 | 0.01 | 2.38 | 5.784 | 0.137 |
| | Sum= | | | 29.35 | 0.024 | |

Wage Effects

| | Disability Group | Sample Population | Mean | (N)(μ) | Average | Coefficient Estimate | Average Marginal Effect |
|-------------------|---------------------|-------------------|-------------|----------------|---------------|----------------------|-------------------------|
| Age | No Mental Disorder | 8203 | 37.8 | 310073.4 | | 0.010 | 0.394 |
| | Mood Disorder | 496 | 39 | 19344 | | 0.010 | 0.394 |
| | Anxiety Disorder | 219 | 40.2 | 8803.8 | | 0.010 | 0.394 |
| | Adjustment Disorder | 203 | 39.3 | 7977.9 | | 0.010 | 0.394 |
| | | 9121 | Sum= | 36125.7 | 39.353 | | |
| Male | No Mental Disorder | 8203 | 0.52 | 4265.56 | | -0.180 | -0.059 |
| | Mood Disorder | 496 | 0.29 | 143.84 | | -0.130 | -0.042 |
| | Anxiety Disorder | 219 | 0.33 | 72.27 | | -0.070 | -0.023 |
| | Adjustment Disorder | 203 | 0.41 | 83.23 | | -0.040 | -0.013 |
| | | | Sum= | 299.34 | 0.326 | | |
| Black | No Mental Disorder | 8203 | 0.13 | 1066.39 | | -0.040 | -0.003 |
| | Mood Disorder | 496 | 0.08 | 39.68 | | 0.030 | 0.002 |
| | Anxiety Disorder | 219 | 0.04 | 8.76 | | -0.020 | -0.001 |
| | Adjustment Disorder | 203 | 0.1 | 20.3 | | -0.120 | -0.009 |
| | | | Sum= | 68.74 | 0.075 | | |
| Hispanic | No Mental Disorder | 8203 | 0.11 | 902.33 | | -0.060 | -0.004 |
| | Mood Disorder | 496 | 0.06 | 29.76 | | -0.320 | -0.021 |
| | Anxiety Disorder | 219 | 0.06 | 13.14 | | 0.070 | 0.005 |
| | Adjustment Disorder | 203 | 0.08 | 16.24 | | -0.080 | -0.005 |
| | | | Sum= | 59.14 | 0.064 | | |
| Other Race | No Mental Disorder | 8203 | 0.04 | 328.12 | | -0.010 | 0.000 |
| | Mood Disorder | 496 | 0.02 | 9.92 | | 0.330 | 0.008 |
| | Anxiety Disorder | 219 | 0.03 | 6.57 | | 0.310 | 0.008 |
| | Adjustment Disorder | 203 | 0.03 | 6.09 | | -0.020 | 0.000 |
| | | | Sum= | 22.58 | 0.025 | | |
| Midwest | No Mental Disorder | 8203 | 0.24 | 1968.72 | | -0.080 | -0.022 |
| | Mood Disorder | 496 | 0.27 | 133.92 | | 0.110 | 0.030 |

| | | | | | | |
|-----------------------------|---------------------|------|-------|---------------|---------------|---------------|
| South | Anxiety Disorder | 219 | 0.28 | 61.32 | 0.160 | 0.044 |
| | Adjustment Disorder | 203 | 0.28 | 56.84 | 0.210 | 0.058 |
| | Sum= | | | 252.08 | 0.275 | |
| | No Mental Disorder | 8203 | 0.36 | 2953.08 | -0.100 | -0.031 |
| | Mood Disorder | 496 | 0.32 | 158.72 | 0.070 | 0.022 |
| | Anxiety Disorder | 219 | 0.27 | 59.13 | -0.030 | -0.009 |
| | Adjustment Disorder | 203 | 0.34 | 69.02 | 0.110 | 0.034 |
| | Sum= | | | 286.87 | 0.312 | |
| | No Mental Disorder | 8203 | 0.22 | 1804.66 | -0.010 | -0.003 |
| | Mood Disorder | 496 | 0.26 | 128.96 | 0.100 | 0.027 |
| West | Anxiety Disorder | 219 | 0.27 | 59.13 | -0.180 | -0.049 |
| | Adjustment Disorder | 203 | 0.3 | 60.9 | 0.120 | 0.033 |
| | Sum= | | | 248.99 | 0.271 | |
| | No Mental Disorder | 8203 | 0.01 | 82.03 | -0.130 | -0.005 |
| | Mood Disorder | 496 | 0.04 | 19.84 | -0.010 | 0.000 |
| IADL Help | Anxiety Disorder | 219 | 0.05 | 10.95 | 0.040 | 0.001 |
| | Adjustment Disorder | 203 | 0.01 | 2.03 | -0.070 | -0.003 |
| | Sum= | | | 32.82 | 0.036 | |
| | No Mental Disorder | 8203 | 0.004 | 32.812 | 0.190 | 0.003 |
| | Mood Disorder | 496 | 0.02 | 9.92 | -0.060 | -0.001 |
| ADL Help | Anxiety Disorder | 219 | 0.02 | 4.38 | -0.430 | -0.007 |
| | Adjustment Disorder | 203 | 0.005 | 1.015 | -0.620 | -0.010 |
| | Sum= | | | 15.315 | 0.017 | |
| | No Mental Disorder | 8203 | 0.05 | 410.15 | -0.110 | -0.016 |
| | Mood Disorder | 496 | 0.14 | 69.44 | -0.100 | -0.014 |
| Physical Limitations | Anxiety Disorder | 219 | 0.14 | 30.66 | 0.180 | 0.026 |
| | Adjustment Disorder | 203 | 0.15 | 30.45 | -0.170 | -0.024 |
| | Sum= | | | 130.55 | 0.142 | |
| | No Mental Disorder | 8203 | 0.03 | 246.09 | -0.140 | -0.015 |
| Activity Limitations | Mood Disorder | 496 | 0.11 | 54.56 | -0.100 | -0.011 |

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|-------------------------------|---------------------|------|-------|---------------|---------------|---------------|
| Social Limitations | Anxiety Disorder | 219 | 0.11 | 24.09 | -0.450 | -0.048 |
| | Adjustment Disorder | 203 | 0.09 | 18.27 | -0.110 | -0.012 |
| | Sum= | | | 96.92 | 0.106 | |
| | No Mental Disorder | 8203 | 0.02 | 164.06 | 0.010 | 0.001 |
| | Mood Disorder | 496 | 0.08 | 39.68 | 0.150 | 0.012 |
| | Anxiety Disorder | 219 | 0.1 | 21.9 | 0.190 | 0.015 |
| | Adjustment Disorder | 203 | 0.05 | 10.15 | 0.190 | 0.015 |
| | Sum= | | | 71.73 | 0.078 | |
| | No Mental Disorder | 8203 | 0.008 | 65.624 | -0.180 | -0.011 |
| | Mood Disorder | 496 | 0.06 | 29.76 | 0.180 | 0.011 |
| Cognitive Limitations | Anxiety Disorder | 219 | 0.07 | 15.33 | -0.070 | -0.004 |
| | Adjustment Disorder | 203 | 0.06 | 12.18 | -0.190 | -0.012 |
| | Sum= | | | 57.27 | 0.062 | |
| | No Mental Disorder | 8203 | 0.19 | 1558.57 | -0.020 | -0.007 |
| | Mood Disorder | 496 | 0.38 | 188.48 | -0.130 | -0.048 |
| Any Physical Disorder | Anxiety Disorder | 219 | 0.35 | 76.65 | 0.020 | 0.007 |
| | Adjustment Disorder | 203 | 0.35 | 71.05 | -0.060 | -0.022 |
| | Sum= | | | 336.18 | 0.366 | |
| | No Mental Disorder | 8203 | 0.004 | 32.812 | -0.170 | -0.004 |
| Substance Use Disorder | Mood Disorder | 496 | 0.03 | 14.88 | 0.060 | 0.002 |
| | Anxiety Disorder | 219 | 0.02 | 4.38 | 0.550 | 0.014 |
| | Adjustment Disorder | 203 | 0.02 | 4.06 | 0.270 | 0.007 |
| | Sum= | | | 23.32 | 0.025 | |

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