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## **Supplementary Material**

**Article Title:** The Economic Burden of Adults With Major Depressive Disorder in the United States (2005 and 2010)

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#### **Disclaimer**

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Supplementary eTable 1. Framework for evaluation of the economic burden of adults with MDD in the United States (2005 and 2010)

MDD population employment/treatment status	Indirect costs			
	Direct costs	Suicide-related costs	Workplace costs	
			Absenteeism/disability costs	Presenteeism costs
Employed	<ul style="list-style-type: none"> <li>• Annual MDD costs, other depression costs, and non-depression costs per individual with MDD estimated based on medical and pharmaceutical claims data in privately insured population (OptumHealth Reporting and Insights)</li> <li>• Societal costs extrapolated using prevalence estimate from National Survey on Drug Use and Health (NSDUH)</li> </ul>	<ul style="list-style-type: none"> <li>• Total number of suicides based on national death statistics in National Center for Injury Prevention and Control, CDC</li> </ul>	<ul style="list-style-type: none"> <li>• Days missed due to illness/injury estimated based on medical services utilized on work days using claims data in privately insured population; associated costs per individual with MDD per year estimated based on salary information in the database (OptumHealth Reporting and Insights)</li> <li>• Annual days missed due to reasons other than illness/injury per individual with MDD estimated based on NSDUH; associated costs inferred based on estimate of cost per missed day due to illness/injury (OptumHealth Reporting and Insights)</li> <li>• Disability costs per individual with MDD per year estimated based on OptumHealth Reporting and Insights claims data</li> <li>• Societal costs extrapolated using prevalence estimate from NSDUH</li> </ul>	<ul style="list-style-type: none"> <li>• Societal costs inferred based on ratio of presenteeism to absenteeism costs estimated in Stewart et al., 2003 (See Supplementary eTable 6)</li> </ul>
	<ul style="list-style-type: none"> <li>• MDD costs set equal to zero</li> <li>• Other depression and non-depression costs per individual with MDD per year set equal to those incurred by employed and treated patients</li> <li>• Societal costs extrapolated using prevalence estimate from NSDUH</li> </ul>	<ul style="list-style-type: none"> <li>• MDD-related suicides assumed to account for 50% of all suicides based on literature</li> <li>• Present value of lifetime earnings estimated based on mortality rates and life expectancies from National Vital Statistics Reports as well as national wage data from Bureau of Labor Statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Days missed and associated costs inferred based on estimates for treated population and ratio of days missed for not treated to treated individual with MDD based on NSDUH (See Supplementary eTable 6)</li> <li>• Societal costs extrapolated using prevalence estimate from NSDUH</li> </ul>	
Not employed	<ul style="list-style-type: none"> <li>• Annual MDD costs, other depression costs, and non-depression costs per individual with MDD inferred based on cost estimates for employed MDD individuals and ratio of Medicaid to privately insured cost estimates from Ivanova et al., 2011 (See Supplementary eTable 6)</li> </ul>			
	<ul style="list-style-type: none"> <li>• Societal costs extrapolated using prevalence estimate from NSDUH</li> </ul>			

Original estimates  
 Inferred estimates

Supplementary eTable 2. Comparison of MDD patients and controls in administrative claims data before patient matching, 2005<sup>a</sup>

Characteristics	MDD patients (N=37,791)		Controls (N=1,038,655)		P-value <sup>b</sup>
<b>Demographics</b>					
Age, mean (SD)	44.4	(11.44)	43.3	(12.63)	<0.001 *
Gender, n (%) male	12,106	(32.0%)	538,438	(51.8%)	<0.001 *
Region, n (%)					
South	15,451	(40.9%)	438,513	(42.2%)	<0.001 *
Midwest	8,759	(23.2%)	242,179	(23.3%)	0.530
West	5,504	(14.6%)	153,013	(14.7%)	0.367
Northeast	7,952	(21.0%)	201,121	(19.4%)	<0.001 *
Other	125	(0.3%)	3,829	(0.4%)	0.232
Insurance type, n (%)					
PPO	21,002	(55.6%)	613,732	(59.1%)	<0.001 *
POS	11,366	(30.1%)	281,238	(27.1%)	<0.001 *
Indemnity	3,799	(10.1%)	89,166	(8.6%)	<0.001 *
Other	1,624	(4.3%)	54,519	(5.2%)	<0.001 *
Employment status, n (%)					
Actively employed	28,026	(74.2%)	828,841	(79.8%)	<0.001 *
Retired	2,736	(7.2%)	71,246	(6.9%)	0.004 *
Other	7,029	(18.6%)	138,568	(13.3%)	<0.001 *
Relationship to primary beneficiary, n (%)					
Self	22,225	(58.8%)	631,065	(60.8%)	<0.001 *
Spouse	13,195	(34.9%)	329,353	(31.7%)	<0.001 *
Child	2,260	(6.0%)	75,970	(7.3%)	<0.001 *
Other	111	(0.3%)	2,267	(0.2%)	0.002 *
<b>Charlson Comorbidity Index (CCI), mean (SD)<sup>c</sup></b>	0.53	(1.13)	0.27	(0.73)	<0.001 *
<b>General physical comorbidities,<sup>e</sup> n (%)</b>					
Hypertension	8,996	(23.8%)	201,655	(19.4%)	<0.001 *
Hypothyroidism	3,854	(10.2%)	50,568	(4.9%)	<0.001 *
Deficiency anemias	2,371	(6.3%)	30,006	(2.9%)	<0.001 *
Rheumatoid arthritis	1,393	(3.7%)	14,575	(1.4%)	<0.001 *
Neurological disorders	1,612	(4.3%)	10,444	(1.0%)	<0.001 *
Cardiac arrhythmias	1,263	(3.3%)	20,301	(2.0%)	<0.001 *
Valvular disease	1,262	(3.3%)	20,003	(1.9%)	<0.001 *
Fluid and electrolyte disorders	1,473	(3.9%)	11,823	(1.1%)	<0.001 *
<b>Mental comorbidities,<sup>d</sup> n (%)</b>					
Anxiety disorders	10,464	(27.7%)	13,913	(1.3%)	<0.001 *
Adjustment disorders	3,751	(9.9%)	13,350	(1.3%)	<0.001 *
Sleep disorders	3,662	(9.7%)	20,053	(1.9%)	<0.001 *
Mood disorders	3,697	(9.8%)	940	(0.1%)	<0.001 *
Miscellaneous other mental disorders	1,942	(5.1%)	8,065	(0.8%)	<0.001 *
ADD	1,425	(3.8%)	3,965	(0.4%)	<0.001 *
Alcohol abuse	1,479	(3.9%)	2,710	(0.3%)	<0.001 *
Screening for disorders	1,217	(3.2%)	10,050	(1.0%)	<0.001 *
Drug abuse	1,253	(3.3%)	1,197	(0.1%)	<0.001 *
Schizophrenia	1,003	(2.7%)	586	(0.1%)	<0.001 *
Sexual and gender identity disorders	999	(2.6%)	17,603	(1.7%)	<0.001 *
<b>Drug use,<sup>e</sup> n (%)</b>					
Antidepressants	30,441	(80.6%)	0	(0.0%)	<0.001 *
Antipsychotics	6,288	(16.6%)	0	(0.0%)	<0.001 *
Antimanics	915	(2.4%)	0	(0.0%)	<0.001 *
<b>Medical resource use, mean (SD)</b>					
Inpatient visits	0.44	(1.56)	0.09	(0.40)	<0.001 *
Inpatient days	1.98	(8.93)	0.33	(2.70)	<0.001 *
Rehab facility visits	0.07	(0.83)	0.00	(0.19)	<0.001 *
Rehab facility days	0.33	(3.68)	0.02	(1.07)	<0.001 *
Emergency department visits	0.74	(2.46)	0.27	(0.89)	<0.001 *
Outpatient visits	23.41	(18.15)	6.98	(8.54)	<0.001 *
Other visits	2.88	(6.39)	1.29	(3.26)	<0.001 *
<b>Total direct costs,<sup>f</sup> mean (SD)</b>					
Medical service costs	\$12,701	(\$27,637)	\$3,813	(\$12,587)	<0.001 *
Inpatient	\$9,273	(\$26,261)	\$3,087	(\$12,093)	<0.001 *
Emergency department	\$3,591	(\$21,298)	\$1,024	(\$9,085)	<0.001 *
Outpatient	\$426	(\$1,819)	\$133	(\$802)	<0.001 *
Other	\$4,621	(\$9,230)	\$1,764	(\$5,866)	<0.001 *
Prescription drug	\$635	(\$3,858)	\$166	(\$2,139)	<0.001 *
	\$3,428	(\$5,535)	\$726	(\$2,333)	<0.001 *

Supplementary eTable 2. Comparison of MDD patients and controls in administrative claims data before patient matching, 2005<sup>a</sup>

Characteristics	MDD patients (N=37,791)		Controls (N=1,038,655)		P-value <sup>b</sup>
<b>MDD costs,<sup>f</sup> mean (SD)</b>	\$2,480	(\$4,812)	\$0	(\$0)	<0.001 *
Medical service costs	\$1,399	(\$4,324)	\$0	(\$0)	<0.001 *
Inpatient	\$478	(\$3,251)	\$0	(\$0)	<0.001 *
Emergency department	\$10	(\$169)	\$0	(\$0)	<0.001 *
Outpatient	\$810	(\$1,838)	\$0	(\$0)	<0.001 *
Other	\$101	(\$1,407)	\$0	(\$0)	<0.001 *
Prescription drug	\$1,081	(\$1,631)	\$0	(\$0)	<0.001 *
GPI 58 (Antidepressants)	\$805	(\$993)	\$0	(\$0)	<0.001 *
GPI 59 (Antipsychotics/Antimanic Agents)	\$276	(\$1,122)	\$0	(\$0)	<0.001 *
<b>Other depression costs,<sup>f</sup> mean (SD)</b>	\$773	(\$2,751)	\$23	(\$730)	<0.001 *
Medical service costs	\$468	(\$2,531)	\$11	(\$696)	<0.001 *
Inpatient	\$191	(\$1,920)	\$2	(\$674)	<0.001 *
Emergency department	\$26	(\$296)	\$0	(\$20)	<0.001 *
Outpatient	\$210	(\$980)	\$9	(\$163)	<0.001 *
Other	\$41	(\$807)	\$0	(\$30)	<0.001 *
Prescription drug	\$305	(\$897)	\$13	(\$213)	<0.001 *
GPI 57 (Antianxiety Agents)	\$54	(\$269)	\$1	(\$27)	<0.001 *
GPI 72 (Anticonvulsants)	\$250	(\$833)	\$11	(\$210)	<0.001 *
<b>Non-depression costs,<sup>f</sup> mean (SD)</b>	\$9,448	(\$26,116)	\$3,789	(\$12,550)	<0.001 *
Other mental health disorders	\$573	(\$3,973)	\$46	(\$1,259)	<0.001 *
Outpatient	\$158	(\$825)	\$17	(\$271)	<0.001 *
Inpatient	\$272	(\$3,245)	\$22	(\$1,179)	<0.001 *
Emergency department	\$44	(\$409)	\$4	(\$120)	<0.001 *
Rehab	\$71	(\$1,140)	\$2	(\$149)	<0.001 *
Other	\$29	(\$670)	\$1	(\$250)	<0.001 *
Non-mental health disorders	\$6,833	(\$24,411)	\$3,030	(\$11,912)	<0.001 *
Outpatient	\$3,443	(\$8,613)	\$1,739	(\$5,848)	<0.001 *
Inpatient	\$2,650	(\$20,022)	\$1,000	(\$8,904)	<0.001 *
Emergency department	\$347	(\$1,617)	\$128	(\$789)	<0.001 *
Rehab	\$7	(\$201)	\$2	(\$122)	<0.001 *
Other	\$386	(\$3,081)	\$161	(\$2,068)	<0.001 *
Prescription drug	\$2,042	(\$4,673)	\$713	(\$2,315)	<0.001 *
GPI 65 (Analgesics - Opioid)	\$189	(\$1,881)	\$7	(\$271)	<0.001 *
GPI 49 (Ulcer Drugs)	\$194	(\$519)	\$57	(\$265)	<0.001 *
GPI 60 (Hypnotics)	\$96	(\$288)	\$4	(\$46)	<0.001 *
GPI 61 (Adhd/Anti-Narcolepsy/Anti-Obesity/Anorexiant)	\$127	(\$559)	\$4	(\$83)	<0.001 *
Other non-depression related prescription drugs	\$1,436	(\$3,816)	\$641	(\$2,239)	<0.001 *
<b>Workloss data</b>					
	(N=9,644)		(N=343,002)		
<b>Days of missed work, mean (SD)</b>					
Total missed days	24.28	(50.71)	4.74	(13.01)	<0.001 *
Absenteeism days	11.87	(10.18)	3.86	(4.70)	<0.001 *
MDD absenteeism days	4.29	(5.14)	0.00	(0.00)	<0.001 *
Other depression absenteeism days	1.03	(3.00)	0.07	(0.89)	<0.001 *
Non-depression absenteeism days	6.55	(7.63)	3.79	(4.60)	<0.001 *
Disability days	12.41	(52.11)	0.88	(12.18)	<0.001 *
<b>Costs of missed work, mean (SD)</b>					
Total indirect costs	\$4,350	(\$6,836)	\$1,166	(\$2,212)	<0.001 *
Absenteeism costs	\$2,989	(\$3,356)	\$1,069	(\$1,715)	<0.001 *
MDD absenteeism costs	\$1,126	(\$1,899)	\$0	(\$0)	<0.001 *
Other depression absenteeism costs	\$270	(\$952)	\$21	(\$336)	<0.001 *
Non-depression absenteeism costs	\$1,593	(\$2,100)	\$1,048	(\$1,670)	<0.001 *
Disability costs	\$1,361	(\$6,461)	\$97	(\$1,396)	<0.001 *

**Notes:**

<sup>a</sup> Data source: OptumHealth Reporting and Insights<sup>19,20</sup>.

<sup>b</sup> P-values were calculated using chi-squared tests for categorical variables and Wilcoxon rank sum tests for continuous variables. P-values <0.05 are indicated with an asterisk ("\*").

<sup>c</sup> The 17 conditions included in the CCI were identified using ICD-9-CM diagnosis codes reported by Quan et al., 2005<sup>21</sup>.

<sup>d</sup> Mental comorbidities were identified using ICD-9-CM diagnosis codes.

<sup>e</sup> Drugs were identified using the first two digits of the Generic Product Identifier (GPI).

<sup>f</sup> Costs reflect all costs paid for the service including patient out-of-pocket costs. Costs were inflated to 2012 USD using the medical care component of the Consumer Price Index.

Supplementary eTable 3. Comparison of MDD patients and controls in administrative claims data before patient matching, 2010<sup>a</sup>

Characteristics	MDD patients (N=50,197)		Controls (N=1,411,443)		P-value <sup>b</sup>
<b>Demographics</b>					
Age, mean (SD)	45.0	(12.15)	43.2	(12.99)	<0.001 *
Gender, n (%) male	17,261	(34.4%)	734,628	(52.0%)	<0.001 *
Region, n (%)					
South	12,403	(24.7%)	436,067	(30.9%)	<0.001 *
Midwest	12,637	(25.2%)	371,907	(26.3%)	<0.001 *
West	7,621	(15.2%)	238,079	(16.9%)	<0.001 *
Northeast	15,803	(31.5%)	342,568	(24.3%)	<0.001 *
Other	1,733	(3.5%)	22,822	(1.6%)	<0.001 *
Insurance type, n (%)					
PPO	33,276	(66.3%)	944,185	(66.9%)	0.005 *
POS	9,463	(18.9%)	286,164	(20.3%)	<0.001 *
Indemnity	5,919	(11.8%)	130,545	(9.2%)	<0.001 *
Other	1,539	(3.1%)	50,549	(3.6%)	<0.001 *
Employment status, n (%)					
Actively employed	40,284	(80.3%)	1,223,802	(86.7%)	<0.001 *
Retired	4,307	(8.6%)	87,859	(6.2%)	<0.001 *
Other	5,606	(11.2%)	99,782	(7.1%)	<0.001 *
Relationship to primary beneficiary, n (%)					
Self	28,599	(57.0%)	874,316	(61.9%)	<0.001 *
Spouse	17,800	(35.5%)	418,408	(29.6%)	<0.001 *
Child	3,670	(7.3%)	116,013	(8.2%)	<0.001 *
Other	128	(0.3%)	2,706	(0.2%)	0.002 *
<b>Charlson Comorbidity Index (CCI), mean (SD)<sup>c</sup></b>	0.90	(2.25)	0.41	(1.28)	<0.001 *
<b>General physical comorbidities,<sup>c</sup> n (%)</b>					
Hypertension	13,826	(27.5%)	295,285	(20.9%)	<0.001 *
Hypothyroidism	6,481	(12.9%)	87,561	(6.2%)	<0.001 *
Deficiency anemias	4,708	(9.4%)	61,551	(4.4%)	<0.001 *
Rheumatoid arthritis	2,586	(5.2%)	28,132	(2.0%)	<0.001 *
Neurological disorders	4,200	(8.4%)	27,582	(2.0%)	<0.001 *
Cardiac arrhythmias	3,240	(6.5%)	43,273	(3.1%)	<0.001 *
Valvular disease	2,037	(4.1%)	30,331	(2.1%)	<0.001 *
Fluid and electrolyte disorders	2,742	(5.5%)	23,595	(1.7%)	<0.001 *
<b>Mental comorbidities,<sup>d</sup> n (%)</b>					
Anxiety disorders	18,637	(37.1%)	29,615	(2.1%)	<0.001 *
Adjustment disorders	7,269	(14.5%)	21,646	(1.5%)	<0.001 *
Sleep disorders	5,134	(10.2%)	24,463	(1.7%)	<0.001 *
Mood disorders	7,367	(14.7%)	3,444	(0.2%)	<0.001 *
Miscellaneous other mental disorders	3,614	(7.2%)	11,811	(0.8%)	<0.001 *
ADD	4,865	(9.7%)	11,222	(0.8%)	<0.001 *
Alcohol abuse	3,588	(7.1%)	6,208	(0.4%)	<0.001 *
Screening for disorders	2,484	(4.9%)	21,667	(1.5%)	<0.001 *
Drug abuse	3,253	(6.5%)	5,151	(0.4%)	<0.001 *
Schizophrenia	2,359	(4.7%)	2,003	(0.1%)	<0.001 *
Sexual and gender identity disorders	1,783	(3.6%)	28,214	(2.0%)	<0.001 *
<b>Drug use,<sup>e</sup> n (%)</b>					
Antidepressants	38,401	(76.5%)	0	(0.0%)	<0.001 *
Antipsychotics	9,347	(18.6%)	0	(0.0%)	<0.001 *
Antimanics	1,037	(2.1%)	0	(0.0%)	<0.001 *
<b>Medical resource use, mean (SD)</b>					
Inpatient visits	0.49	(1.67)	0.12	(0.58)	<0.001 *
Inpatient days	2.65	(11.62)	0.48	(3.51)	<0.001 *
Emergency department visits	0.69	(2.00)	0.31	(1.02)	<0.001 *
Outpatient visits	24.49	(19.28)	7.64	(9.50)	<0.001 *
Other visits	2.74	(6.12)	1.06	(2.85)	<0.001 *
<b>Total direct costs,<sup>f</sup> mean (SD)</b>					
Medical service costs	\$13,884	(\$54,123)	\$3,913	(\$13,295)	<0.001 *
Inpatient	\$4,442	(\$49,702)	\$1,015	(\$9,174)	<0.001 *
Emergency department	\$520	(\$2,397)	\$165	(\$840)	<0.001 *
Outpatient	\$5,111	(\$13,719)	\$1,843	(\$6,392)	<0.001 *
Other	\$659	(\$4,512)	\$134	(\$2,129)	<0.001 *
Prescription drug	\$3,151	(\$5,698)	\$756	(\$3,310)	<0.001 *

Supplementary eTable 3. Comparison of MDD patients and controls in administrative claims data before patient matching, 2010<sup>a</sup>

Characteristics	MDD patients (N=50,197)		Controls (N=1,411,443)		P-value <sup>b</sup>
<b>MDD costs,<sup>f</sup> mean (SD)</b>	\$2,586	(\$7,387)	\$0	(\$0)	<0.001 *
Medical service costs	\$1,584	(\$7,047)	\$0	(\$0)	<0.001 *
Inpatient	\$557	(\$5,856)	\$0	(\$0)	<0.001 *
Emergency department	\$16	(\$273)	\$0	(\$0)	<0.001 *
Outpatient	\$887	(\$2,434)	\$0	(\$0)	<0.001 *
Other	\$124	(\$2,345)	\$0	(\$0)	<0.001 *
Prescription drug	\$1,002	(\$1,868)	\$0	(\$0)	<0.001 *
GPI 58 (Antidepressants)	\$597	(\$983)	\$0	(\$0)	<0.001 *
GPI 59 (Antipsychotics/Antimanic Agents)	\$405	(\$1,421)	\$0	(\$0)	<0.001 *
<b>Other depression costs,<sup>f</sup> mean (SD)</b>	\$781	(\$6,289)	\$25	(\$408)	<0.001 *
Medical service costs	\$606	(\$6,241)	\$13	(\$315)	<0.001 *
Inpatient	\$275	(\$5,938)	\$2	(\$216)	<0.001 *
Emergency department	\$40	(\$404)	\$0	(\$36)	<0.001 *
Outpatient	\$239	(\$1,035)	\$10	(\$193)	<0.001 *
Other	\$52	(\$908)	\$0	(\$91)	<0.001 *
Prescription drug	\$175	(\$652)	\$13	(\$258)	<0.001 *
GPI 57 (Antianxiety Agents)	\$28	(\$161)	\$1	(\$27)	<0.001 *
GPI 72 (Anticonvulsants)	\$147	(\$621)	\$12	(\$257)	<0.001 *
<b>Non-depression costs,<sup>f</sup> mean (SD)</b>	\$10,517	(\$46,436)	\$3,887	(\$13,253)	<0.001 *
Mental health disorders	\$877	(\$12,241)	\$60	(\$1,133)	<0.001 *
Outpatient	\$254	(\$1,647)	\$24	(\$365)	<0.001 *
Inpatient	\$412	(\$11,722)	\$25	(\$976)	<0.001 *
Emergency department	\$68	(\$766)	\$7	(\$153)	<0.001 *
Rehab	\$99	(\$1,804)	\$2	(\$201)	<0.001 *
Other	\$44	(\$613)	\$2	(\$292)	<0.001 *
Non-mental health disorders	\$7,667	(\$37,775)	\$3,084	(\$12,331)	<0.001 *
Outpatient	\$3,731	(\$12,855)	\$1,809	(\$6,355)	<0.001 *
Inpatient	\$3,199	(\$33,669)	\$988	(\$9,012)	<0.001 *
Emergency department	\$396	(\$1,834)	\$157	(\$810)	<0.001 *
Rehab	\$14	(\$324)	\$6	(\$148)	<0.001 *
Other	\$327	(\$2,918)	\$124	(\$2,007)	<0.001 *
Prescription drug	\$1,974	(\$4,944)	\$743	(\$3,294)	<0.001 *
GPI 65 (Analgesics - Opioid)	\$162	(\$1,489)	\$10	(\$464)	<0.001 *
GPI 49 (Ulcer Drugs)	\$129	(\$440)	\$40	(\$231)	<0.001 *
GPI 60 (Hypnotics)	\$61	(\$278)	\$4	(\$58)	<0.001 *
GPI 61 (Adhd/Anti-Narcolepsy/Anti-Obesity/Anorexiant)	\$181	(\$886)	\$10	(\$179)	<0.001 *
Other non-depression related prescription drugs	\$1,441	(\$4,309)	\$679	(\$3,216)	<0.001 *
<b>Workloss data</b>					
	(N=10,576)		(N=464,067)		
<b>Days of missed work, mean (SD)</b>					
Total missed days	23.05	(46.41)	5.25	(16.74)	<0.001 *
Absenteeism days	11.46	(10.16)	3.76	(4.72)	<0.001 *
MDD absenteeism days	4.25	(5.53)	0.00	(0.00)	<0.001 *
Other depression absenteeism days	0.93	(3.12)	0.07	(0.84)	<0.001 *
Non-depression absenteeism days	6.28	(7.50)	3.70	(4.63)	<0.001 *
Disability days	11.59	(47.31)	1.49	(16.13)	<0.001 *
<b>Costs of missed work, mean (SD)</b>					
Total indirect costs	\$4,296	(\$8,160)	\$1,219	(\$2,823)	<0.001 *
Absenteeism costs	\$3,297	(\$7,107)	\$1,094	(\$2,449)	<0.001 *
MDD absenteeism costs	\$1,256	(\$4,228)	\$0	(\$0)	<0.001 *
Other depression absenteeism costs	\$291	(\$1,501)	\$27	(\$521)	<0.001 *
Non-depression absenteeism costs	\$1,750	(\$4,524)	\$1,067	(\$2,357)	<0.001 *
Disability costs	\$1,000	(\$4,393)	\$125	(\$1,366)	<0.001 *

**Notes:**

- <sup>a</sup> Data source: OptumHealth Reporting and Insights<sup>19,20</sup>.
- <sup>b</sup> P-values were calculated using chi-squared tests for categorical variables and Wilcoxon rank sum tests for continuous variables. P-values <0.05 are indicated with an asterisk ("\*").
- <sup>c</sup> The 17 conditions included in the CCI were identified using ICD-9-CM diagnosis codes reported by Quan et al., 2005<sup>21</sup>.
- <sup>d</sup> Mental comorbidities were identified using ICD-9-CM diagnosis codes.
- <sup>e</sup> Drugs were identified using the first two digits of the Generic Product Identifier (GPI).
- <sup>f</sup> Costs reflect all costs paid for the service including patient out-of-pocket costs. Costs were inflated to 2012 USD using the medical care component of the Consumer Price Index.

Supplementary eTable 4. Comparison of MDD patients and controls in administrative claims data after patient matching, 2005<sup>a</sup>

Characteristics	MDD patients (N=33,375)		Controls (N=33,375)		P-value <sup>b</sup>
<b>Demographics</b>					
Age, mean (SD)	43.9	(11.50)	43.9	(11.50)	1.000
Gender, n (%) male	10,884	(32.6%)	10,884	(32.6%)	1.000
Region, n (%)					
South	13,848	(41.5%)	13,848	(41.5%)	1.000
Midwest	7,668	(23.0%)	7,668	(23.0%)	1.000
West	4,825	(14.5%)	4,825	(14.5%)	1.000
Northeast	6,955	(20.8%)	6,955	(20.8%)	1.000
Other	79	(0.2%)	79	(0.2%)	1.000
Insurance type, n (%)					
PPO	19,065	(57.1%)	19,065	(57.1%)	1.000
POS	10,112	(30.3%)	10,112	(30.3%)	1.000
Indemnity	2,921	(8.8%)	2,921	(8.8%)	1.000
Other	1,277	(3.8%)	1,277	(3.8%)	1.000
Employment status, n (%)					
Actively employed	25,512	(76.4%)	25,512	(76.4%)	1.000
Retired	2,171	(6.5%)	2,389	(7.2%)	<0.001 *
Other	5,692	(17.1%)	5,474	(16.4%)	<0.001 *
Relationship to primary beneficiary, n (%)					
Self	19,536	(58.5%)	19,536	(58.5%)	1.000
Spouse	11,633	(34.9%)	11,718	(35.1%)	<0.001 *
Child	2,118	(6.3%)	2,049	(6.1%)	<0.001 *
Other	88	(0.3%)	72	(0.2%)	0.197
<b>Charlson Comorbidity Index (CCI), mean (SD)<sup>c</sup></b>	0.33	(0.72)	0.33	(0.72)	1.000
<b>General physical comorbidities,<sup>e</sup> n (%)</b>					
Hypertension	7,026	(21.1%)	6,885	(20.6%)	<0.001 *
Hypothyroidism	2,633	(7.9%)	2,623	(7.9%)	0.685
Deficiency anemias	1,218	(3.6%)	1,212	(3.6%)	0.783
Rheumatoid arthritis	629	(1.9%)	706	(2.1%)	<0.001 *
Neurological disorders	544	(1.6%)	535	(1.6%)	0.496
Cardiac arrhythmias	694	(2.1%)	549	(1.6%)	<0.001 *
Valvular disease	640	(1.9%)	609	(1.8%)	0.151
Fluid and electrolyte disorders	483	(1.4%)	485	(1.5%)	0.907
<b>Mental comorbidities,<sup>d</sup> n (%)</b>					
Anxiety disorders	9,054	(27.1%)	515	(1.5%)	<0.001 *
Adjustment disorders	3,339	(10.0%)	467	(1.4%)	<0.001 *
Sleep disorders	2,953	(8.8%)	638	(1.9%)	<0.001 *
Mood disorders	3,103	(9.3%)	34	(0.1%)	<0.001 *
Miscellaneous other mental disorders	1,582	(4.7%)	240	(0.7%)	<0.001 *
ADD	1,278	(3.8%)	117	(0.4%)	<0.001 *
Alcohol abuse	1,233	(3.7%)	68	(0.2%)	<0.001 *
Screening for disorders	993	(3.0%)	323	(1.0%)	<0.001 *
Drug abuse	1,002	(3.0%)	41	(0.1%)	<0.001 *
Schizophrenia	733	(2.2%)	22	(0.1%)	<0.001 *
Sexual and gender identity disorders	846	(2.5%)	490	(1.5%)	<0.001 *
<b>Drug use,<sup>e</sup> n (%)</b>					
Antidepressants	26,665	(79.9%)	0	(0.0%)	1.000
Antipsychotics	5,094	(15.3%)	0	(0.0%)	1.000
Antimanics	763	(2.3%)	0	(0.0%)	1.000
<b>Medical resource use, mean (SD)</b>					
Inpatient visits	0.32	(1.18)	0.09	(0.36)	<0.001 *
Inpatient days	1.27	(5.90)	0.34	(2.47)	<0.001 *
Rehab facility visits	0.06	(0.79)	0.00	(0.08)	<0.001 *
Rehab facility days	0.29	(3.52)	0.02	(0.70)	<0.001 *
Emergency department visits	0.64	(2.00)	0.28	(0.94)	<0.001 *
Outpatient visits	21.87	(16.95)	7.69	(8.98)	<0.001 *
Other visits	2.47	(5.67)	1.44	(3.34)	<0.001 *
<b>Total direct costs,<sup>f</sup> mean (SD)</b>					
Medical service costs	\$9,648	(\$14,504)	\$3,941	(\$9,405)	<0.001 *
Inpatient	\$6,707	(\$13,046)	\$3,132	(\$8,893)	<0.001 *
Emergency department	\$2,038	(\$9,243)	\$968	(\$6,021)	<0.001 *
Outpatient	\$333	(\$1,211)	\$135	(\$714)	<0.001 *
Other	\$3,824	(\$6,099)	\$1,867	(\$5,483)	<0.001 *
Prescription drug	\$512	(\$3,343)	\$163	(\$1,033)	<0.001 *
Other	\$2,941	(\$4,524)	\$809	(\$2,146)	<0.001 *

Supplementary eTable 4. Comparison of MDD patients and controls in administrative claims data after patient matching, 2005<sup>a</sup>

Characteristics	MDD patients (N=33,375)		Controls (N=33,375)		P-value <sup>b</sup>
<b>MDD costs,<sup>f</sup> mean (SD)</b>	\$2,294	(\$4,357)	\$0	(\$0)	<0.001 *
Medical service costs	\$1,264	(\$3,891)	\$0	(\$0)	<0.001 *
Inpatient	\$387	(\$2,846)	\$0	(\$0)	<0.001 *
Emergency department	\$8	(\$134)	\$0	(\$0)	<0.001 *
Outpatient	\$773	(\$1,689)	\$0	(\$0)	<0.001 *
Other	\$96	(\$1,422)	\$0	(\$0)	<0.001 *
Prescription drug	\$1,030	(\$1,538)	\$0	(\$0)	<0.001 *
GPI 58 (Antidepressants)	\$783	(\$966)	\$0	(\$0)	<0.001 *
GPI 59 (Antipsychotics/Antimanic Agents)	\$248	(\$1,044)	\$0	(\$0)	<0.001 *
<b>Other depression costs,<sup>f</sup> mean (SD)</b>	\$675	(\$2,426)	\$30	(\$374)	<0.001 *
Medical service costs	\$412	(\$2,224)	\$12	(\$283)	<0.001 *
Inpatient	\$159	(\$1,744)	\$1	(\$204)	<0.001 *
Emergency department	\$22	(\$276)	\$0	(\$34)	<0.001 *
Outpatient	\$197	(\$872)	\$10	(\$181)	<0.001 *
Other	\$35	(\$619)	\$0	(\$29)	<0.001 *
Prescription drug	\$263	(\$806)	\$18	(\$244)	<0.001 *
GPI 57 (Antianxiety Agents)	\$49	(\$247)	\$1	(\$19)	<0.001 *
GPI 72 (Anticonvulsants)	\$214	(\$749)	\$16	(\$244)	<0.001 *
<b>Non-depression costs,<sup>f</sup> mean (SD)</b>	\$6,679	(\$12,749)	\$3,911	(\$9,387)	<0.001 *
Mental health disorders	\$436	(\$3,071)	\$37	(\$651)	<0.001 *
Outpatient	\$140	(\$744)	\$17	(\$287)	<0.001 *
Inpatient	\$171	(\$2,412)	\$15	(\$565)	<0.001 *
Emergency department	\$32	(\$319)	\$3	(\$106)	<0.001 *
Rehab	\$67	(\$1,039)	\$0	(\$27)	<0.001 *
Other	\$25	(\$653)	\$1	(\$31)	<0.001 *
Non-mental health disorders	\$4,595	(\$11,082)	\$3,083	(\$8,824)	<0.001 *
Outpatient	\$2,714	(\$5,496)	\$1,839	(\$5,457)	<0.001 *
Inpatient	\$1,322	(\$7,831)	\$951	(\$5,961)	<0.001 *
Emergency department	\$271	(\$1,059)	\$131	(\$702)	<0.001 *
Rehab	\$3	(\$113)	\$3	(\$137)	0.010 *
Other	\$285	(\$2,572)	\$159	(\$1,001)	<0.001 *
Prescription drug	\$1,647	(\$3,677)	\$792	(\$2,124)	<0.001 *
GPI 65 (Analgesics - Opioid)	\$151	(\$1,731)	\$7	(\$148)	<0.001 *
GPI 49 (Ulcer Drugs)	\$169	(\$478)	\$62	(\$278)	<0.001 *
GPI 60 (Hypnotics)	\$87	(\$272)	\$4	(\$47)	<0.001 *
GPI 61 (Adhd/Anti-Narcolepsy/Anti-Obesity/Anorexiant)	\$119	(\$531)	\$4	(\$84)	<0.001 *
Other non-depression related prescription drugs	\$1,121	(\$2,827)	\$714	(\$2,052)	<0.001 *
<b>Workloss data</b>					
	(N=8,933)		(N=8,933)		
<b>Days of missed work, mean (SD)</b>					
Total missed days	21.42	(45.63)	5.23	(13.70)	<0.001 *
Absenteeism days	11.44	(9.63)	4.26	(4.69)	<0.001 *
MDD absenteeism days	4.26	(5.04)	0.00	(0.00)	<0.001 *
Other depression absenteeism days	1.03	(3.01)	0.07	(0.79)	<0.001 *
Non-depression absenteeism days	6.16	(7.09)	4.18	(4.61)	<0.001 *
Disability days	9.98	(46.70)	0.97	(12.96)	<0.001 *
<b>Costs of missed work, mean (SD)</b>					
Total indirect costs	\$3,973	(\$6,044)	\$1,263	(\$2,354)	<0.001 *
Absenteeism costs	\$2,895	(\$3,242)	\$1,157	(\$1,871)	<0.001 *
MDD absenteeism costs	\$1,123	(\$1,890)	\$0	(\$0)	<0.001 *
Other depression absenteeism costs	\$271	(\$963)	\$22	(\$318)	<0.001 *
Non-depression absenteeism costs	\$1,502	(\$1,955)	\$1,135	(\$1,808)	<0.001 *
Disability costs	\$1,078	(\$5,559)	\$106	(\$1,434)	<0.001 *

**Notes:**

<sup>a</sup> Data source: OptumHealth Reporting and Insights<sup>19,20</sup>.

<sup>b</sup> P-values were calculated using chi-squared tests for categorical variables and Wilcoxon rank sum tests for continuous variables. P-values <0.05 are indicated with an asterisk ("\*").

<sup>c</sup> The 17 conditions included in the CCI were identified using ICD-9-CM diagnosis codes reported by Quan et al. , 2005<sup>21</sup>.

<sup>d</sup> Mental comorbidities were identified using ICD-9-CM diagnosis codes.

<sup>e</sup> Drugs were identified using the first two digits of the Generic Product Identifier (GPI).

<sup>f</sup> Costs reflect all costs paid for the service including patient out-of-pocket costs. Costs were inflated to 2012 USD using the medical care component of the Consumer Price Index.



Supplementary eTable 5. Comparison of MDD patients and controls in administrative claims data after patient matching, 2010<sup>a</sup>

Characteristics	MDD patients (N=44,241)		Controls (N=44,241)		P-value <sup>b</sup>
<b>Demographics</b>					
Age, mean (SD)	44.5	(12.23)	44.5	(12.23)	1.000
Gender, n (%) male	15,380	(34.8%)	15,380	(34.8%)	1.000
Region, n (%)					
South	11,230	(25.4%)	11,230	(25.4%)	1.000
Midwest	11,452	(25.9%)	11,452	(25.9%)	1.000
West	6,927	(15.7%)	6,927	(15.7%)	1.000
Northeast	13,486	(30.5%)	13,486	(30.5%)	1.000
Other	1,146	(2.6%)	1,146	(2.6%)	1.000
Insurance type, n (%)					
PPO	30,037	(67.9%)	30,037	(67.9%)	1.000
POS	8,482	(19.2%)	8,482	(19.2%)	1.000
Indemnity	4,485	(10.1%)	4,485	(10.1%)	1.000
Other	1,237	(2.8%)	1,237	(2.8%)	1.000
Employment status, n (%)					
Actively employed	36,304	(82.1%)	36,304	(82.1%)	1.000
Retired	3,370	(7.6%)	3,659	(8.3%)	<0.001 *
Other	4,567	(10.3%)	4,278	(9.7%)	<0.001 *
Relationship to primary beneficiary, n (%)					
Self	25,188	(56.9%)	25,188	(56.9%)	1.000
Spouse	15,550	(35.1%)	15,669	(35.4%)	<0.001 *
Child	3,404	(7.7%)	3,307	(7.5%)	<0.001 *
Other	99	(0.2%)	77	(0.2%)	0.095
<b>Charlson Comorbidity Index (CCI), mean (SD)<sup>c</sup></b>	0.46	(1.10)	0.46	(1.10)	1.000
<b>General physical comorbidities,<sup>c</sup> n (%)</b>					
Hypertension	10,193	(23.0%)	10,256	(23.2%)	0.102
Hypothyroidism	4,071	(9.2%)	4,227	(9.6%)	<0.001 *
Deficiency anemias	2,425	(5.5%)	2,297	(5.2%)	<0.001 *
Rheumatoid arthritis	1,192	(2.7%)	1,142	(2.6%)	0.092
Neurological disorders	1,338	(3.0%)	1,317	(3.0%)	0.112
Cardiac arrhythmias	1,652	(3.7%)	1,230	(2.8%)	<0.001 *
Valvular disease	1,101	(2.5%)	835	(1.9%)	<0.001 *
Fluid and electrolyte disorders	1,002	(2.3%)	964	(2.2%)	0.161
<b>Mental comorbidities,<sup>d</sup> n (%)</b>					
Anxiety disorders	16,205	(36.6%)	934	(2.1%)	<0.001 *
Adjustment disorders	6,466	(14.6%)	711	(1.6%)	<0.001 *
Sleep disorders	4,199	(9.5%)	773	(1.7%)	<0.001 *
Mood disorders	6,080	(13.7%)	103	(0.2%)	<0.001 *
Miscellaneous other mental disorders	2,965	(6.7%)	373	(0.8%)	<0.001 *
ADD	4,318	(9.8%)	245	(0.6%)	<0.001 *
Alcohol abuse	2,822	(6.4%)	176	(0.4%)	<0.001 *
Screening for disorders	1,775	(4.0%)	638	(1.4%)	<0.001 *
Drug abuse	2,414	(5.5%)	141	(0.3%)	<0.001 *
Schizophrenia	1,683	(3.8%)	48	(0.1%)	<0.001 *
Sexual and gender identity disorders	1,373	(3.1%)	666	(1.5%)	<0.001 *
<b>Drug use,<sup>e</sup> n (%)</b>					
Antidepressants	33,727	(76.2%)	0	(0.0%)	1.000
Antipsychotics	7,696	(17.4%)	0	(0.0%)	1.000
Antimaniacs	848	(1.9%)	0	(0.0%)	1.000
<b>Medical resource use, mean (SD)</b>					
Inpatient visits	0.30	(1.12)	0.11	(0.48)	<0.001 *
Inpatient days	1.33	(6.08)	0.45	(2.94)	<0.001 *
Rehab facility visits	0.10	(0.96)	0.03	(0.48)	<0.001 *
Rehab facility days	0.51	(6.05)	0.05	(0.99)	<0.001 *
Emergency department visits	0.58	(1.71)	0.32	(1.02)	<0.001 *
Outpatient visits	23.12	(18.22)	8.37	(9.51)	<0.001 *
Other visits	2.11	(4.69)	1.14	(2.66)	<0.001 *
<b>Total direct costs,<sup>f</sup> mean (SD)</b>					
Medical service costs	\$10,379	(\$20,450)	\$4,391	(\$11,596)	<0.001 *
Medical service costs					
Inpatient	\$7,604	(\$19,144)	\$3,465	(\$10,786)	<0.001 *
Emergency department	\$2,305	(\$13,935)	\$1,093	(\$7,541)	<0.001 *
Outpatient	\$415	(\$1,631)	\$178	(\$877)	<0.001 *
Other	\$4,359	(\$9,810)	\$2,051	(\$5,998)	<0.001 *
Prescription drug	\$524	(\$3,696)	\$143	(\$1,511)	<0.001 *
Prescription drug	\$2,776	(\$4,985)	\$926	(\$3,288)	<0.001 *

Supplementary eTable 5. Comparison of MDD patients and controls in administrative claims data after patient matching, 2010<sup>a</sup>

Characteristics	MDD patients (N=44,241)		Controls (N=44,241)		P-value <sup>b</sup>
<b>MDD costs,<sup>f</sup> mean (SD)</b>	\$2,366	(\$5,611)	\$0	(\$0)	<0.001 *
Medical service costs	\$1,410	(\$5,184)	\$0	(\$0)	<0.001 *
Inpatient	\$411	(\$3,574)	\$0	(\$0)	<0.001 *
Emergency department	\$14	(\$227)	\$0	(\$0)	<0.001 *
Outpatient	\$865	(\$2,057)	\$0	(\$0)	<0.001 *
Other	\$121	(\$2,461)	\$0	(\$0)	<0.001 *
Prescription drug	\$955	(\$1,791)	\$0	(\$0)	<0.001 *
GPI 58 (Antidepressants)	\$584	(\$969)	\$0	(\$0)	<0.001 *
GPI 59 (Antipsychotics/Antimanic Agents)	\$371	(\$1,342)	\$0	(\$0)	<0.001 *
<b>Other depression costs,<sup>f</sup> mean (SD)</b>	\$620	(\$2,737)	\$35	(\$483)	<0.001 *
Medical service costs	\$470	(\$2,652)	\$14	(\$386)	<0.001 *
Inpatient	\$160	(\$2,065)	\$4	(\$359)	<0.001 *
Emergency department	\$35	(\$317)	\$1	(\$36)	<0.001 *
Outpatient <sup>7</sup>	\$231	(\$919)	\$9	(\$131)	<0.001 *
General practitioners	\$25	(\$108)	\$1	(\$32)	<0.001 *
Mental health specialists	\$86	(\$440)	\$4	(\$87)	<0.001 *
Other outpatient	\$120	(\$727)	\$4	(\$81)	<0.001 *
Other	\$44	(\$856)	\$0	(\$21)	<0.001 *
Prescription drug	\$150	(\$572)	\$21	(\$291)	<0.001 *
GPI 57 (Antianxiety Agents)	\$25	(\$151)	\$1	(\$34)	<0.001 *
GPI 72 (Anticonvulsants)	\$124	(\$543)	\$20	(\$288)	<0.001 *
<b>Non-depression costs,<sup>f</sup> mean (SD)</b>	\$7,394	(\$18,372)	\$4,356	(\$11,509)	<0.001 *
Mental health disorders	\$594	(\$4,121)	\$70	(\$1,382)	<0.001 *
Outpatient	\$234	(\$1,518)	\$25	(\$341)	<0.001 *
Inpatient	\$183	(\$2,759)	\$37	(\$1,315)	<0.001 *
Emergency department	\$51	(\$487)	\$7	(\$131)	<0.001 *
Rehab	\$89	(\$1,756)	\$1	(\$70)	<0.001 *
Other	\$37	(\$543)	\$1	(\$24)	<0.001 *
Non-mental health disorders	\$5,130	(\$16,170)	\$3,382	(\$10,426)	<0.001 *
Outpatient	\$3,029	(\$9,073)	\$2,017	(\$5,955)	<0.001 *
Inpatient	\$1,552	(\$11,683)	\$1,053	(\$7,093)	<0.001 *
Emergency department	\$316	(\$1,338)	\$171	(\$853)	<0.001 *
Rehab	\$10	(\$294)	\$6	(\$129)	0.017 *
Other	\$223	(\$1,436)	\$135	(\$1,487)	<0.001 *
Prescription drug	\$1,671	(\$4,227)	\$904	(\$3,268)	<0.001 *
GPI 65 (Analgesics - Opioid)	\$137	(\$1,449)	\$13	(\$416)	<0.001 *
GPI 49 (Ulcer Drugs)	\$115	(\$412)	\$45	(\$246)	<0.001 *
GPI 60 (Hypnotics)	\$57	(\$269)	\$4	(\$56)	<0.001 *
GPI 61 (Adhd/Anti-Narcolepsy/Anti-Obesity/Anorexiants)	\$171	(\$840)	\$9	(\$191)	<0.001 *
Other non-depression related prescription drugs	\$1,189	(\$3,581)	\$833	(\$3,194)	<0.001 *
<b>Workloss data</b>					
	(N=9,990)		(N=9,990)		
<b>Days of missed work, mean (SD)</b>					
Total missed days	21.17	(42.84)	6.20	(20.03)	<0.001 *
Absenteeism days	11.19	(9.77)	4.15	(4.72)	<0.001 *
MDD absenteeism days	4.25	(5.40)	0.00	(0.00)	<0.001 *
Other depression absenteeism days	0.93	(3.16)	0.08	(0.83)	<0.001 *
Non-depression absenteeism days	6.00	(7.12)	4.08	(4.60)	<0.001 *
Disability days	9.98	(43.49)	2.05	(19.67)	<0.001 *
<b>Costs of missed work, mean (SD)</b>					
Total indirect costs	\$4,084	(\$7,395)	\$1,353	(\$2,882)	<0.001 *
Absenteeism costs	\$3,219	(\$6,587)	\$1,191	(\$2,391)	<0.001 *
MDD absenteeism costs	\$1,265	(\$4,304)	\$0	(\$0)	<0.001 *
Other depression absenteeism costs	\$292	(\$1,519)	\$28	(\$436)	<0.001 *
Non-depression absenteeism costs	\$1,662	(\$3,587)	\$1,163	(\$2,315)	<0.001 *
Disability costs	\$865	(\$3,801)	\$161	(\$1,621)	<0.001 *

**Notes:**

<sup>a</sup> Data source: OptumHealth Reporting and Insights<sup>19,20</sup>.

<sup>b</sup> P-values were calculated using chi-squared tests for categorical variables and Wilcoxon rank sum tests for continuous variables. P-values <0.05 are indicated with an asterisk ("\*").

<sup>c</sup> The 17 conditions included in the CCI were identified using ICD-9-CM diagnosis codes reported by Quan et al., 2005<sup>21</sup>.

<sup>d</sup> Mental comorbidities were identified using ICD-9-CM diagnosis codes.

<sup>e</sup> Drugs were identified using the first two digits of the Generic Product Identifier (GPI).

<sup>f</sup> Costs reflect all costs paid for the service including patient out-of-pocket costs. Costs were inflated to 2012 USD using the medical care component of the Consumer Price Index.

**Supplementary eTable 6. Calculation of ratios used to infer missing cost categories**

<b>Cost category</b>	<b>MDD population employment/treatment status</b>	<b>Source</b>	<b>Ratio</b>	<b>Calculation</b>	
Direct costs	Not employed/ treated and not treated	Literature (Ivanova et al., 2011)	Ratio of Medicaid to privately insured annual costs for MDD patients	Direct costs per patient per year for Medicaid patients with MDD	\$ 17,960 <sup>a</sup>
				Direct costs per patient per year for privately insured patients with MDD	\$ 10,442 <sup>a</sup>
				<b>Ratio</b>	<b>1.7</b>
Absenteeism/ disability costs	Employed/ not treated	Survey data (NSDUH)	Ratio of untreated to treated incremental days missed for illness/injury	Incremental days missed per month by individuals with MDD, not treated	0.54 <sup>b</sup>
				Incremental days missed per month by individuals with MDD, treated	1.13 <sup>b</sup>
				<b>Ratio</b>	<b>0.48</b>
Presenteeism costs	Employed/ treated and not treated	Literature (Stewart et al., 2003)	Ratio of presenteeism to absenteeism incremental cost	Incremental presenteeism costs (\$billion per year)	\$ 26.56 <sup>c</sup>
				Incremental absenteeism costs (\$billion per year)	\$ 4.37 <sup>c</sup>
				<b>Ratio</b>	<b>6.1</b>

**Notes:**

<sup>a</sup> Table 5 (p. 321) in Ivanova et al., 2011 <sup>26</sup>.

<sup>b</sup> Calculated as the difference between the average number of days missed for illness/injury by individuals with vs. without MDD from 2005 to 2010, based on the variable WORKDAYS (number of workdays missed for injury/illness) in NSDUH data. <sup>13,14</sup>

<sup>c</sup> Calculated as the difference between "Any Depression" and "Expected Total Cost in the Absence of Depression" presenteeism/absenteeism mean cost per year (presenteeism: \$35.73b - \$9.17b = \$26.56b; absenteeism: \$8.27b - \$3.90b = \$4.37b) reported in Table 4 (p. 3141) of Stewart et al., 2003 <sup>7</sup>.

**Supplementary eTable 7. Incremental direct costs of individuals with MDD by employment status, treatment status, and age group, 2005 and 2010**

	Total								
	2005			2010			Change		
	Annual Cost			Annual Cost			Cost per		
	No. of Cases	per Case (\$)	Total (\$m)	No. of Cases	per Case (\$)	Total (\$m)	No. of Cases	Case	Total Cost
<b>Total</b>	<b>13,798,399</b>	<b>\$5,618</b>	<b>\$77,517</b>	<b>15,446,771</b>	<b>\$6,400</b>	<b>\$98,854</b>	11.9%	13.9%	27.5%
<b>Employed</b>	8,494,171	\$4,060	\$34,483	8,545,749	\$4,521	\$38,636	0.6%	11.4%	12.0%
<b>Treated</b>	3,934,227	\$5,374	\$21,144	4,372,366	\$5,719	\$25,005	11.1%	6.4%	18.3%
<b>18-25</b>	734,326	\$4,693	\$3,446	670,092	\$5,667	\$3,797	-8.7%	20.8%	10.2%
<b>26-34</b>	782,668	\$3,869	\$3,028	1,009,520	\$4,207	\$4,247	29.0%	8.7%	40.3%
<b>35-49</b>	1,608,748	\$5,888	\$9,472	1,519,257	\$5,970	\$9,070	-5.6%	1.4%	-4.2%
<b>50+</b>	808,485	\$6,430	\$5,199	1,173,497	\$6,724	\$7,890	45.1%	4.6%	51.8%
<b>Not treated</b>	4,559,944	\$2,925	\$13,338	4,173,383	\$3,266	\$13,631	-8.5%	11.7%	2.2%
<b>18-25</b>	1,243,755	\$2,464	\$3,064	1,082,350	\$3,075	\$3,328	-13.0%	24.8%	8.6%
<b>26-34</b>	1,026,313	\$1,857	\$1,906	817,331	\$2,231	\$1,824	-20.4%	20.1%	-4.3%
<b>35-49</b>	1,409,259	\$3,474	\$4,896	1,365,536	\$3,426	\$4,678	-3.1%	-1.4%	-4.5%
<b>50+</b>	880,617	\$3,943	\$3,472	908,166	\$4,186	\$3,802	3.1%	6.2%	9.5%
<b>Not employed</b>	5,304,228	\$8,113	\$43,034	6,901,021	\$8,726	\$60,218	30.1%	7.6%	39.9%
<b>Treated</b>	3,273,266	\$9,741	\$31,886	4,310,542	\$10,404	\$44,846	31.7%	6.8%	40.6%
<b>18-25</b>	369,467	\$7,976	\$2,947	450,910	\$9,518	\$4,292	22.0%	19.3%	45.6%
<b>26-34</b>	421,078	\$6,553	\$2,760	427,741	\$7,126	\$3,048	1.6%	8.7%	10.5%
<b>35-49</b>	1,225,959	\$9,934	\$12,179	1,221,636	\$9,941	\$12,144	-0.4%	0.1%	-0.3%
<b>50+</b>	1,256,761	\$11,140	\$14,000	2,210,256	\$11,475	\$25,363	75.9%	3.0%	81.2%
<b>Not treated</b>	2,030,962	\$5,489	\$11,149	2,590,480	\$5,934	\$15,371	27.5%	8.1%	37.9%
<b>18-25</b>	479,996	\$4,232	\$2,031	617,783	\$5,159	\$3,187	28.7%	21.9%	56.9%
<b>26-34</b>	329,180	\$3,325	\$1,095	322,393	\$3,847	\$1,240	-2.1%	15.7%	13.3%
<b>35-49</b>	538,823	\$6,076	\$3,274	598,263	\$5,997	\$3,588	11.0%	-1.3%	9.6%
<b>50+</b>	682,963	\$6,953	\$4,749	1,052,041	\$6,992	\$7,356	54.0%	0.6%	54.9%

**Supplementary eTable 8. ICD-9-CM codes accounting for at least 1% of the incremental cost per patient for non-mental health medical services<sup>a</sup> in 2010 (in 2012 dollars)**

ICD-9-CM	ICD-9-CM description	Cost per patient with MDD	Cost per patient w/o MDD	Incremental cost per patient	% of total incremental cost
722	Intervertebral disc disorders	\$233	\$69	\$164	9.4%
724	Other and unspecified disorders of back (e.g., lumbago)	\$159	\$56	\$103	5.9%
789	Other symptoms involving abdomen and pelvis (e.g., abdominal pain)	\$124	\$57	\$67	3.9%
786	Symptoms involving respiratory system and other chest symptoms (e.g., chest pain)	\$145	\$81	\$64	3.7%
723	Other disorders of cervical region (e.g., cervicgia)	\$83	\$28	\$55	3.2%
780	General symptoms (e.g., sleep disturbances, malaise and fatigue)	\$97	\$47	\$50	2.9%
721	Spondylosis and allied disorders	\$68	\$21	\$47	2.7%
327	Organic sleep disorders	\$68	\$22	\$46	2.7%
278	Overweight, obesity and other hyperalimentation	\$62	\$31	\$31	1.8%
996	Complications peculiar to certain specified procedures	\$57	\$27	\$29	1.7%
719	Other and unspecified disorders of joint	\$75	\$46	\$29	1.7%
726	Peripheral enthesopathies and allied syndromes	\$63	\$34	\$29	1.6%
V58	Encounter for other and unspecified procedures and aftercare	\$65	\$36	\$28	1.6%
784	Symptoms involving head and neck (e.g., headache)	\$46	\$18	\$28	1.6%
787	Symptoms involving digestive system	\$44	\$18	\$26	1.5%
998	Other complications of procedures, NEC	\$32	\$9	\$23	1.3%
729	Other disorders of soft tissues (e.g., rheumatism, myalgia and myositis)	\$40	\$19	\$21	1.2%
530	Diseases of esophagus	\$37	\$16	\$21	1.2%
279	Disorders involving the immune mechanism	\$23	\$3	\$20	1.2%
346	Migraine	\$24	\$4	\$20	1.1%
715	Osteoarthritis and allied disorders	\$137	\$119	\$18	1.1%
473	Chronic sinusitis	\$29	\$11	\$17	1.0%
592	Calculus of kidney and ureter	\$50	\$33	\$17	1.0%
625	Pain and other symptoms associated with female genital organs	\$32	\$15	\$17	1.0%
738	Other acquired deformity	\$20	\$4	\$17	1.0%
338	Pain, not elsewhere classified	\$20	\$4	\$16	0.9%
All other diagnosis codes		\$3,295	\$2,550	\$744	42.6%
<b>Total</b>		<b>\$5,130</b>	<b>\$3,382</b>	<b>\$1,748</b>	<b>100.0%</b>

<sup>a</sup> Data source: OptumHealth Reporting and Insights<sup>19,20</sup>.

Supplementary eTable 9. Number of suicides and loss of lifetime earnings due to MDD, 2005 and 2010<sup>a</sup>

2005

Age (y)	Total number of suicides		Number of suicides related to MDD		Present value of lifetime earnings <sup>b</sup> (discounted at 3%)		Total earnings lost (in millions) (discounted at 3%)	
	Male	Female	Male	Female	Male	Female	Male	Female
	[A]	[B]	[C] = [A] x 0.5	[D] = [B] x 0.5	[E]	[F]	[G] = [C] x [E]	[H] = [D] x [F]
18-24	2,930	535	1,465	268	\$1,082,414	\$675,240	\$1,586	\$181
25-29	1,975	402	988	201	\$1,127,178	\$686,021	\$1,113	\$138
30-34	2,091	522	1,046	261	\$1,080,431	\$645,539	\$1,130	\$168
35-39	2,259	634	1,130	317	\$981,758	\$585,127	\$1,109	\$185
40-44	2,804	853	1,402	427	\$840,666	\$505,952	\$1,179	\$216
45-49	2,826	938	1,413	469	\$677,117	\$410,952	\$957	\$193
50-54	2,443	784	1,222	392	\$501,391	\$297,106	\$612	\$116
55-59	1,888	589	944	295	\$318,111	\$177,603	\$300	\$52
60-64	1,362	371	681	186	\$158,315	\$79,574	\$108	\$15
65+	4,550	854	2,275	427	\$31,688	\$12,019	\$72	\$5
<b>Total</b>	<b>25,128</b>	<b>6,482</b>	<b>12,564</b>	<b>3,241</b>			<b>\$8,165</b>	<b>\$1,270</b>
<b>Mortality costs</b>								<b>\$9,435</b>

2010

Age (y)	Total number of suicides		Number of suicides related to MDD		Present value of lifetime earnings <sup>b</sup> (discounted at 3%)		Total earnings lost (in millions) (discounted at 3%)	
	Male	Female	Male	Female	Male	Female	Male	Female
	[A]	[B]	[C] = [A] x 0.5	[D] = [B] x 0.5	[E]	[F]	[G] = [C] x [E]	[H] = [D] x [F]
18-24	3,213	652	1,607	326	\$931,237	\$622,439	\$1,496	\$203
25-29	2,459	541	1,230	271	\$982,404	\$639,317	\$1,208	\$173
30-34	2,184	551	1,092	276	\$952,597	\$607,087	\$1,040	\$167
35-39	2,372	712	1,186	356	\$870,462	\$550,716	\$1,032	\$196
40-44	2,661	826	1,331	413	\$751,243	\$479,929	\$1,000	\$198
45-49	3,375	997	1,688	499	\$612,887	\$392,283	\$1,034	\$196
50-54	3,358	1,069	1,679	535	\$460,817	\$293,880	\$774	\$157
55-59	2,859	901	1,430	451	\$305,794	\$186,749	\$437	\$84
60-64	2,010	614	1,005	307	\$164,915	\$91,378	\$166	\$28
65+	5,035	959	2,518	480	\$37,610	\$15,694	\$95	\$8
<b>Total</b>	<b>29,526</b>	<b>7,822</b>	<b>14,763</b>	<b>3,911</b>			<b>\$8,282</b>	<b>\$1,410</b>
<b>Mortality costs</b>								<b>\$9,691</b>

Notes:

<sup>a</sup> Data sources: Centers for Disease Control and Prevention, 2014<sup>27</sup>, Kung et al., 2008<sup>31</sup>, Murphy et al. 2012<sup>32</sup>, U.S. Bureau of Labor Statistics, 2006<sup>33</sup> and 2011<sup>34</sup>.

<sup>b</sup> Lifetime earnings are expressed in 2012 dollars.

**Supplementary eTable 10. Incremental workplace costs of individuals with MDD, 2005 and 2010 (in 2012 dollars)**

Cost category	2005		2010	
	Incremental missed days per individual	Incremental cost per individual	Incremental missed days per individual	Incremental cost per individual
<b>MDD costs</b>				
Absenteeism	2.6	\$1,483	2.9	\$1,680
Disability	2.5	\$628	2.5	\$439
Presenteeism <sup>a</sup>	12.0	\$6,849	13.3	\$7,715
<b>Other depression costs</b>				
Absenteeism	1.6	\$466	1.5	\$466
Disability	1.3	\$165	1.1	\$104
Presenteeism <sup>a</sup>	6.3	\$1,801	5.8	\$1,820
<b>Non-depression costs</b>				
Absenteeism	3.4	\$684	3.3	\$881
Disability	2.7	\$243	2.4	\$196
Presenteeism <sup>a</sup>	13.1	\$2,647	12.9	\$3,438
<b>Total</b>				
Absenteeism	7.6	\$1,837	7.7	\$2,206
Disability	6.5	\$699	5.9	\$524
Presenteeism <sup>a</sup>	31.5	\$7,621	31.9	\$9,206
<b>Total incremental cost per individual [A]</b>		<b>\$10,156</b>		<b>\$11,936</b>
<b>Total number of MDD employed individuals [B]</b>		<b>8,494,171</b>		<b>8,545,749</b>
<b>Societal workplace cost (in millions) [C]=[A]*[B]</b>		<b>\$86,268</b>		<b>\$102,003</b>

<sup>a</sup> Presenteeism costs are expressed here in terms of full-work day equivalents missed. These estimates were derived using the same cost per day underlying absenteeism calculations.