

SUPPLEMENTARY MATERIALS

The Economic Burden of Adults with Major Depressive Disorder in the United States (2019)

Paul Greenberg, MBA¹, Abhishek Chitnis, M. Pharm and PhD², Derek Louie, PharmD³, Ellison Suthoff, MBA³, Shih-Yin Chen, PhD², Jessica Maitland, MScPH⁴, Patrick Gagnon-Sanschagrin, MSc⁴, Andree-Anne Fournier, MA¹, Ronald C Kessler, PhD⁵

¹ Analysis Group Inc., 111 Huntington Ave., Boston, MA, 02199, USA

² Biogen Inc., 225 Binney St, Cambridge, MA, 02142, USA

³ Sage Therapeutics Inc., 215 First St, Cambridge, MA, 02142, USA

⁴Analysis Group Inc., 1190 Ave. des Canadiens-de-Montréal, Montreal, QC, H3C 1B3, Canada

⁵ Harvard Medical School, 180 Longwood Avenue, Boston, MA, 02115, USA

Corresponding author

Jessica Maitland, MScPH

Associate, Analysis Group Inc.

1190 Ave. des Canadiens-de-Montréal, Montreal, QC, H3C 1B3, Canada Phone: 514-871-4239; email:

jessica.maitland@analysisgroup.com

Table S1. Incremental healthcare costs – by payer type¹

Variable	2019				
	Commercial	Medicare	Medicaid	Uninsured ²	Weighted average ³
Female					
Incremental average all-cause healthcare costs of a female adult with MDD^{4,5}	\$7,505	\$12,742	\$5,658	\$1,606	\$7,948
MDD-related healthcare costs⁶	\$2,627	\$3,463	\$1,819	\$516	\$2,527
Incremental average all-cause healthcare costs per female adult with MDD – Moderate ⁷	\$5,323	\$12,841	\$3,689	\$1,047	\$6,489
MDD-related healthcare costs ⁶	\$2,331	\$3,264	\$1,768	\$502	\$2,307
Incremental average all-cause healthcare costs per female adult with MDD – Severe ⁷	\$7,926	\$14,617	\$4,370	\$1,241	\$8,461
MDD-related healthcare costs ⁶	\$3,430	\$4,573	\$2,243	\$637	\$3,295
Male					
Incremental average all-cause healthcare costs of a female adult with MDD^{4,5}	\$9,015	\$15,422	\$7,248	\$1,439	\$9,568
MDD-related healthcare costs⁶	\$2,779	\$4,001	\$2,140	\$425	\$2,762
Incremental average all-cause healthcare costs per female adult with MDD – Moderate ⁷	\$6,037	\$18,410	\$4,455	\$884	\$8,260
MDD-related healthcare costs ⁶	\$2,390	\$3,106	\$2,010	\$399	\$2,317
Incremental average all-cause healthcare costs per female adult with MDD – Severe ⁷	\$8,315	\$17,590	\$4,259	\$845	\$9,327
MDD-related healthcare costs ⁶	\$3,723	\$6,173	\$2,611	\$518	\$3,860

ICD-10-CM: International Classification of Diseases, Tenth Revision, Clinical Modification; MDD: major depressive disorder; US: United States

¹ Stratified costs for gender and severity were obtained based on previous claims-based studies comparing MDD vs non-MDD cohorts (matched 1:1 on age, sex, race, and Charlson Comorbidity Index) among commercial, Medicare, and Medicaid beneficiaries, respectively.[1-3]

² Uncompensated healthcare cost is estimated at \$2,247 per uninsured individual per year.[4] Based on the ratio of the total annual healthcare costs incurred by the Medicaid-insured MDD cohort vs. the non-MDD cohort, the total average costs per uninsured patient were estimated as ratio x \$2,247, and the incremental average costs per uninsured adult was estimated as ((ratio x \$2,247) - \$2,247). This was done separately by gender for each level of severity.

³ The weighted average annual incremental healthcare costs per adult with MDD were calculated by weighting the average incremental healthcare costs per health plan type by the population in each respective plan type based on data from the US Census Bureau.[5]

⁴ Incremental healthcare costs for an adult with MDD as compared to an adult without MDD based on previous claims-based studies.[1-3]

⁵ Costs estimates are presented in 2019 US dollars and were adjusted using the US Bureau of Labor Statistics Consumer Price Index inflation factor.

⁶ MDD-related direct annual incremental healthcare costs were defined as all medical costs incurred on the same day and in the same location as a medical claim with a diagnosis for MDD, as well as pharmaceutical costs for antidepressant, antipsychotic, and antimanic drugs (GPI class 58 and 59).

⁷ MDD of moderate and severe severity were defined as patients with an International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) code of F33.0, F33.1, and F33.2 or F33.3, respectively. MDD in remission was defined as patients with an ICD-10-CM code of F33.40-F33.42. Patients with mild MDD or MDD in remission were not considered to be adults with MDD in this study.

Table S2. Incremental healthcare costs – overall

Variable	2019		
	Value ¹	Calculated number ²	
Female			
US female population (≥ 18 years old) ³	[A]	129,471,858	-
Prevalence of MDD in the US female population ⁴	[B]	9.6%	-
Moderate ^{5,6}	[C]	67.1%	-
Severe ^{5,6}	[D]	32.9%	-
Number of adults with MDD in the US female population	[E]	-	12,413,804
Moderate	[F]	-	8,324,551
Severe	[G]	-	4,089,253
Proportion of adults with MDD treated with any mental health treatment (pharmacologic or not) in the US population ⁷			
Moderate	[H]	45.4%	-
Severe	[I]	64.2%	-
Incremental average healthcare costs per female adult with MDD who seeks any treatment			
Moderate	[J]	\$6,489	-
Severe	[K]	\$8,461	-
Incremental average healthcare costs per female adult with MDD who does not seek any treatment			
Moderate	[L]	\$4,182	-
Severe	[M]	\$5,167	-
Incremental healthcare costs due to MDD in the US female population	[N]	-	\$73,314,269,493
Male			
US male population (≥ 18 years old) ³	[O]	120,874,131	-
Prevalence of MDD in the US male population ⁴	[P]	6.1%	-
Moderate ⁵	[Q]	67.1%	-
Severe ⁵	[R]	32.9%	-
Number of adults with MDD in the US male population	[S]	-	7,385,179
Moderate	[T]	-	4,952,414
Severe	[U]	-	2,432,765
Proportion of adults with MDD who seek any treatment in the US population ⁶			
Moderate	[V]	45.4%	-
Severe	[W]	64.2%	-
Incremental average healthcare costs per male adult with MDD who seeks any treatment			
Moderate	[X]	\$8,260	-
Severe	[Y]	\$9,327	-
Incremental average healthcare costs per male adult with MDD who does not seek any treatment			
Moderate	[Z]	\$5,943	-
Severe	[AA]	\$5,467	-
Incremental healthcare costs due to MDD in the US male population	[BB]	-	\$53,972,800,879
Incremental healthcare costs due to MDD in the US population	[CC]	-	\$127,287,070,372

MDD: major depressive disorder; MDE: major depressive episode; NHANES: National Health and Nutrition Examination Survey; NSDUH: National Survey on Drug Use and Health; PHQ-9: Patient Health Questionnaire-9; US: United States

¹ Value taken from the literature or from public databases.

² Calculated number, see below for calculation details.

³ Population estimates were computed from the Vintage 2020 Monthly Postcensal Civilian Population census data.[6]

⁴ Prevalence of MDD in the US population stratified by gender was computed among those who reported an MDE in the past year.[7]

⁵ Severity of MDD was based on the proportion of patients with moderate to severe depression symptoms, which was defined using the PHQ-9 categories of moderate (score, 10-14) and severe (score, ≥15). Of note, the severity proportions are applied to the population of adults with MDD under the assumption that patients with at least 1 MDE in the past year (NSDUH) is represented by patients with PHQ-9 score of ≥10 (NHANES).[8] Therefore, it is assumed that no patients with mild depressive symptoms would qualify for MDD but those with moderate to severe (PHQ-9 score of ≥10) would.

⁶ Computed as the proportion of adults who reported a MDE in the past year who reported receiving any mental health treatment in the past year stratified by MDD with or without severe impairment.[7]

Calculations:

$$[E] = [A] \times [B]$$

$$[F] = [C] \times [E]$$

$$[G] = [D] \times [E]$$

$$[N] = ([F] \times [H] \times [J]) + ([G] \times [I] \times [K]) + ([F] \times (1 - [H]) \times [M]) + ([G] \times (1 - [I]) \times [M])$$

$$[S] = [O] \times [P]$$

$$[T] = [Q] \times [S]$$

$$[U] = [R] \times [S]$$

$$[BB] = ([T] \times [V] \times [X]) + ([U] \times [W] \times [Y]) + ([T] \times (1 - [V]) \times [Z]) + ([U] \times (1 - [W]) \times [AA])$$

$$[CC] = [N] + [BB]$$

Table S3. Incremental costs related to unemployment

Variable	2019	
	Value ¹	Calculated number ²
Female		
US female population (≥ 18 years old) ³	[A]	129,471,858
Prevalence of MDD in females ⁴	[B]	9.6%
Number of female adults with MDD	[C]	-
		12,413,804
Proportion of female adults <u>with</u> MDD who are employed ⁵	[D]	59.9%
Full-time	[E]	70.5%
Part-time	[F]	29.5%
Proportion of female adults <u>with</u> MDD who are unemployed	[G]	-
		40.1%
Proportion of female adults <u>without</u> MDD who are employed ⁵	[H]	57.5%
Full-time	[I]	73.3%
Part-time	[J]	26.7%
Proportion of female adults <u>without</u> MDD who are unemployed	[K]	-
		42.5%
Incremental proportion of part-time employment due to MDD among females	[L]	-
		2.3%
Incremental proportion of unemployment due to MDD among females	[M]	-
		-2.4%
Incremental number of part-time employed female adults with MDD	[N]	-
		288,469
Incremental number of unemployed female adults with MDD	[O]	-
		-295,512
Median annual earnings of employed female adults ^{6,7}	[P]	\$35,826
Full-time ^{6,7}	[Q]	\$44,618
Part-time ^{6,7}	[R]	\$11,913
Incremental costs of unemployment due to MDD in the US female population⁷	[S]	-
		-\$1,152,630,456
Male		
US male population (≥ 18 years old) ³	[T]	120,874,131
Prevalence of MDD in males ⁴	[U]	6.1%
Number of male adults with MDD	[V]	-
		7,385,179
Proportion of male adults <u>with</u> MDD who are employed ⁵	[W]	63.5%
Full-time	[X]	77.3%
Part-time	[Y]	22.7%
Proportion of male adults <u>with</u> MDD who are unemployed	[Z]	-
		36.5%
Proportion of male adults <u>without</u> MDD who are employed ⁵	[AA]	68.3%
Full-time	[BB]	85.6%
Part-time	[CC]	14.4%
Proportion of male adults <u>without</u> MDD who are unemployed	[DD]	-
		31.7%
Incremental proportion of part-time employment due to MDD among males	[EE]	-
		4.5%
Incremental proportion of unemployment due to MDD among males	[FF]	-
		4.9%
Incremental number of part-time employed male adults with MDD	[GG]	-
		334,837
Incremental number of unemployed male adults with MDD	[HH]	-
		360,814
Median annual earnings of employed male adults ^{6,7}	[II]	\$48,769
Full-time ^{6,7}	[JJ]	\$53,213
Part-time ^{6,7}	[KK]	\$11,831
Incremental costs of unemployment due to MDD in the US male population⁷	[LL]	-
		\$31,452,755,437
Incremental costs of unemployment and under employment due to MDD in the US population	[MM]	-
		\$30,300,124,981

MDD: major depressive disorder; MDE: major depressive episode; NSDUH: National Survey on Drug Use and Health; US: United States

¹ Value taken from the literature or from public databases.

² Calculated number, see below for calculation details.

³ Population estimates were computed from the Vintage 2020 Monthly Postcensal Civilian Population census data. [6]

⁴ Prevalence of MDD in the US population stratified by gender was computed among those who reported an MDE in the past year. [7]

⁵ Employment rate by gender was computed as the proportion of adults with MDD who were full- or part-time employed based on the 2019 NSDUH data. [7] Adults with unknown MDD status were excluded from the analysis.

⁶ The median annual earnings of adults ≥ 18 years old was estimated through the ≥ 15 year old population data provided by the US Census Bureau under the assumption that the ≥ 15 population data accurately approximates the ≥ 18 population. [9]

⁷ Costs estimates are presented in 2019 US dollars and were adjusted using the US Bureau of Labor Statistics Consumer Price Index inflation factor.

Calculations:

$$[C] = [A] \times [B]$$

$$[G] = 1 - [D]$$

$$[K] = 1 - [H]$$

$$[L] = [D] \times [F] - [H] \times [J]$$

$$[M] = [G] - [K]$$

$$[N] = [C] \times [L]$$

$$[O] = [C] \times [M]$$

$$[S] = ([N] \times ([Q] - [R])) + ([O] \times [P])$$

$$[V] = [T] \times [U]$$

$$[Z] = 1 - [W]$$

$$[DD] = 1 - [AA]$$

$$[EE] = [W] \times [Y] - [AA] \times [CC]$$

$$[FF] = [Z] - [DD]$$

$$[GG] = [V] \times [EE]$$

$$[HH] = [V] \times [FF]$$

$$[LL] = ([GG] \times ([JJ] - [KK])) + ([HH] \times [II])$$

$$[MM] = [S] + [LL]$$

Table S4. Incremental costs related to absenteeism

Variable	2019		
	Value ¹	Calculated number ²	
Female			
US female population (≥ 18 years old) ³	[A]	129,471,858	-
Prevalence of MDD in females ⁴	[B]	9.6%	-
Number of female adults with MDD	[C]	-	12,413,804
Proportion of female adults <u>with</u> MDD who are employed ⁵	[D]	59.9%	-
Number of female adults with MDD who are employed	[E]	-	7,437,872
Average number of workdays missed per year for illness/injury ⁶			
Per female adult <u>with</u> MDD	[F]	23.4	-
Per female adult <u>without</u> MDD	[G]	9.8	-
Incremental number of days missed per year for illness/injury due to MDD in females	[H]	-	13.6
Average number of workdays missed per year for not wanting to be at work ⁷			
Per female adult <u>with</u> MDD	[I]	11.0	-
Per female adult <u>without</u> MDD	[J]	3.6	-
Incremental number of days missed per year for not wanting to be at work due to MDD in females	[K]	-	7.5
Median daily earnings of employed female adults ^{8,9}	[L]	\$138	-
Incremental costs of absenteeism due to illness/injury due to MDD in the US female population	[M]	-	\$13,934,455,126
Incremental costs of absenteeism due to not wanting to be at work due to MDD in the US female population	[N]	-	\$7,648,568,587
Incremental costs of absenteeism due to MDD in the US female population⁹	[O]	-	\$21,583,023,713
Male			
US male population (≥ 18 years old) ³	[P]	120,874,131	-
Prevalence of MDD in males ⁴	[Q]	6.1%	-
Number of male adults with MDD	[R]	-	7,385,179
Proportion of male adults <u>with</u> MDD who are employed ⁵	[S]	63.5%	-
Number of male adults with MDD who are employed	[T]	-	4,686,307
Average number of workdays missed per year for illness/injury ⁶			
Per male adult <u>with</u> MDD	[U]	19.4	-
Per male adult <u>without</u> MDD	[V]	10.2	-
Incremental number of days missed per year for illness/injury due to MDD in males	[W]	-	9.2
Average number of workdays missed per year for not wanting to be at work ⁷			
Per male adult <u>with</u> MDD	[X]	13.1	-
Per male adult <u>without</u> MDD	[Y]	3.1	-
Incremental number of days missed per year for not wanting to be at work due to MDD in males	[Z]	-	10.0
Median daily earnings of employed male adults ^{8,9}	[AA]	\$188	-
Incremental costs of absenteeism due to illness/injury due to MDD in the US male population	[BB]	-	\$8,048,135,285
Incremental costs of absenteeism due to not wanting to be at work due to MDD in the US male population	[CC]	-	\$8,787,605,093
Incremental costs of absenteeism due to MDD in the US male population⁹	[DD]	-	\$16,835,740,378
Incremental costs of absenteeism due to MDD in the US population⁹	[EE]	-	\$38,418,764,091

MDD: major depressive disorder; MDE: major depressive episode; NSDUH: National Survey on Drug Use and Health; US: United States

¹ Value taken from the literature or from public databases.

² Calculated number, see below for calculation details.

³ Population estimates were computed from the Vintage 2020 Monthly Postcensal Civilian Population census data.[6]

⁴ Prevalence of MDD in the US population stratified by gender was computed among those who reported an MDE in the past year.[7]

⁵ Employment rate by gender was computed as the proportion of adults with MDD who were full- or part-time employed based on the 2019 NSDUH data.[7] Adults with unknown MDD status were excluded from the analysis.

⁶ Number of workdays missed for injury/illness' among patients with or without MDD in the past month.[7] The reported numbers were annualized by applying a factor of 12.

⁷ Number of workdays missed for not wanting to be at work among patients with or without MDD in the past month. [7] The reported numbers were annualized by applying a factor of 12.

⁸ The median annual earnings of adults ≥ 18 years old was estimated through the ≥ 15 year old population data provided by the US Census Bureau under the assumption that the ≥ 15 population data accurately approximates the ≥ 18 population. [9]

⁹ Costs estimates are presented in 2019 US dollars and were adjusted using the US Bureau of Labor Statistics Consumer Price Index inflation factor.

Calculations:

$$[C] = [A] \times [B]$$

$$[E] = [C] \times [D]$$

$$[H] = [F] - [G]$$

$$[K] = [I] - [J]$$

$$[M] = [E] \times [H] \times [L]$$

$$[N] = [E] \times [K] \times [L]$$

$$[O] = [M] + [N]$$

$$[R] = [P] \times [Q]$$

$$[T] = [R] \times [S]$$

$$[W] = [U] - [V]$$

$$[Z] = [X] - [Y]$$

$$[BB] = [T] \times [W] \times [AA]$$

$$[CC] = [T] \times [Z] \times [AA]$$

$$[DD] = [BB] + [CC]$$

$$[EE] = [O] + [DD]$$

Table S5. Incremental costs related to presenteeism

Variable	2019	
	Value ¹	Calculated number ²
Female		
US female population (≥ 18 years old) ³	[A] 129,471,858	-
Prevalence of MDD in females ⁴	[B] 9.6%	-
Number of female adults with MDD	[C] -	12,413,804
Proportion of female adults <u>with</u> MDD who are employed ⁵	[D] 59.9%	-
Number of female adults with MDD who are employed	[E] -	7,437,872
Incremental number of days missed per year due to presenteeism ⁶	[F] 23	-
Median daily earnings of employed female adults ^{7,8}	[G] \$138	-
Incremental costs of presenteeism due to MDD in the US female population⁸	[H] -	\$23,316,056,290
Male		
US male population (≥ 18 years old) ³	[I] 120,874,131	-
Prevalence of MDD in males ⁴	[J] 6.1%	-
Number of male adults with MDD	[K] -	7,385,179
Proportion of male adults <u>with</u> MDD who are employed ⁵	[L] 63.5%	-
Number of male adults with MDD who are employed	[M] -	4,686,307
Incremental number of days missed per year due to presenteeism ⁶	[N] 23	-
Median daily earnings of employed male adults ^{7,8}	[O] \$188	-
Incremental costs of presenteeism due to MDD in the US male population⁸	[P] -	\$19,997,818,911
Incremental costs of presenteeism due to MDD in the US population⁸	[Q] -	\$43,313,875,201

MDD: major depressive disorder; MDE: major depressive episode; NSDUH: National Survey on Drug Use and Health; US: United States

¹ Value taken from the literature or from public databases.

² Calculated number, see below for calculation details.

³ Population estimates were computed from the Vintage 2020 Monthly Postcensal Civilian Population census data.[6]

⁴ Prevalence of MDD in the US population stratified by gender was computed among those who reported an MDE in the past year.[7]

⁵ Employment rate by gender was computed as the proportion of adults with MDD who were full- or part-time employed based on the 2019 NSDUH data.[7] Adults with unknown MDD status were excluded from the analysis.

⁶ Calculated as the incremental number of hours per worker per week lost due to presenteeism between "Any Depression" and "Expected Total Cost in the Absence of Depression" (presenteeism: 4.6 - 1.1 = 3.5) converted into a days per year value (3.5 incremental hours per worker per week * (260 working days per year / 5 working days per week) / 8 hours in a working day = 23 days of lost productivity). Values for "Any Depression" were used due to the availability of the corresponding counterfactual population (i.e., the absence of any depression).[10]

⁷ The median annual earnings of adults ≥18 years old was estimated through the ≥15 year old population data provided by the US Census Bureau under the assumption that the ≥15 population data accurately approximates the ≥18 population.[9]

⁸ Costs estimates are presented in 2019 US dollars and were adjusted using the US Bureau of Labor Statistics Consumer Price Index inflation factor.

Calculations:

$$[C] = [A] \times [B]$$

$$[E] = [C] \times [D]$$

$$[H] = [E] \times [F] \times [G]$$

$$[K] = [I] \times [J]$$

$$[M] = [K] \times [L]$$

$$[P] = [M] \times [N] \times [O]$$

$$[Q] = [H] + [P]$$

Table S6. Incremental costs related to disability

Variable	2019	
	Value ¹	Calculated number ²
Female		
US female population (≥ 18 years old) ³	[A]	129,471,858
Prevalence of MDD in females ⁴	[B]	9.6%
Number of female adults with MDD	[C]	-
Proportion of female adults <u>with</u> MDD who are employed ⁵	[D]	59.9%
Number of female adults with MDD who are employed	[E]	-
Incremental disability payment for employed individuals due to MDD ⁶	[F]	\$381
Incremental costs of disability due to MDD in the US female population	[G]	-
Male		
US male population (≥ 18 years old) ³	[H]	120,874,131
Prevalence of MDD in males ⁴	[I]	6.1%
Number of male adults with MDD	[J]	-
Proportion of male adults <u>with</u> MDD who are employed ⁵	[K]	63.5%
Number of male adults with MDD who are employed	[L]	-
Incremental annual disability payment for employed individuals due to MDD ⁶	[M]	\$381
Incremental costs of disability due to MDD in the US male population	[N]	-
Incremental costs of disability due to MDD in the US population	[O]	-

MDD: major depressive disorder; MDE: major depressive episode; NSDUH: National Survey on Drug Use and Health; US: United States

¹ Value taken from the literature or from public databases.

² Calculated number, see below for calculation details.

³ Population estimates were computed from the Vintage 2020 Monthly Postcensal Civilian Population census data. [6]

⁴ Prevalence of MDD in the US population stratified by gender was computed among those who reported an MDE in the past year. [7]

⁵ Employment rate by gender was computed as the proportion of adults with MDD who were full- or part-time employed based on the 2019 NSDUH data. [7] Adults with unknown MDD status were excluded from the analysis.

⁶ The incremental disability payment for employed individuals due to MDD was estimated from disability claims in the OptumHealth Reporting and Insights administrative claims database among patients whose employers report disability claims. [11] The disability cost corresponded to the amount of salary replaced during the disability period for the time elapsed since the date of disability.

⁷ Costs estimates are presented in 2019 US dollars and were adjusted using the US Bureau of Labor Statistics Consumer Price Index inflation factor.

Calculations:

$$[C] = [A] \times [B]$$

$$[E] = [C] \times [D]$$

$$[G] = [E] \times [F]$$

$$[J] = [H] \times [I]$$

$$[L] = [J] \times [K]$$

$$[N] = [L] \times [M]$$

$$[O] = [G] + [N]$$

Table S7. Incremental costs related to mortality

Variable	2019	
	Value ¹	Calculated number ²
Female		
Increased odds of all-cause mortality due to MDD ³	[A] 2.0	-
Increased odds of suicide due to MDD ⁴	[B] 11.0	-
Incremental number of all-cause deaths due to MDD in the US female population	[C] -	21,306
Incremental all-cause mortality due to MDD in the US female population	[D] -	\$5,459,655,336
Male		
Increased odds of all-cause mortality due to MDD ³	[E] 1.4	-
Increased odds of suicide due to MDD ⁴	[F] 11.0	-
Incremental number of all-cause deaths due to MDD in the US male population	[G] -	9,593
Incremental all-cause mortality due to MDD in the US male population	[H] -	\$4,149,725,286
Overall		
Incremental number of all-cause deaths due to MDD in the US population	[I] -	30,899
Incremental number of suicides due to MDD in the US population	[J] -	15,272
Incremental all-cause mortality due to MDD in the US population	[K] -	\$9,609,380,622
Suicide-related costs due to MDD in the US population	[L] -	\$7,938,257,667

MDD: major depressive disorder; US: United States

¹ Value taken from the literature or from public databases.

² Calculated number, calculation details are available from the corresponding author upon reasonable request.

³ The increased odds of all-cause mortality due to MDD was computed using gender-specific odds ratios.[12]

⁴ The increased odds of suicide due to MDD was obtained from an analysis of the National Comorbidity Survey.[13]

Table S8. Incremental household-related costs

Variable		2019	
		Value ¹	Calculated number ²
US population (≥ 18 years old) ³	[A]	250,345,989	-
Prevalence of MDD in the US population ⁴	[B]	7.9%	-
Number of adults with MDD	[C]	-	19,798,983
Proportion of adults with MDD who live with someone without MDD ⁵	[D]	66.8%	-
Average number of adults without MDD living with an adult with MDD ⁵	[E]	1.3	-
Annual income			
Incremental average annual income lost per adult without MDD living with an adult with MDD ^{6,7}	[F]	\$4,662	-
Incremental costs due to annual income loss of adults without MDD living with an adult with MDD⁷	[G]	-	\$80,140,050,118

MDD: major depressive disorder; US: United States

¹ Value taken from the literature or from public databases.

² Calculated number, see below for calculation details.

³ Population estimates were computed from the Vintage 2020 Monthly Postcensal Civilian Population census data. [6]

⁴ Prevalence of MDD in the US population stratified by gender was computed among those who reported an MDE in the past year. [7]

⁵ Based on previous literature estimates. [14]

⁶ Average annual person-level income per adult not living and living with an adult with MDD. Source: Chitnis, A., O'Callaghan, L, Fournier, AA., et al. (2023) Impact of living with an adult with major depressive disorder among households in the United States. [15]

⁷ Costs estimates are presented in 2019 US dollars and were adjusted using the US Bureau of Labor Statistics Consumer Price Index inflation factor.

Calculations:

$$[C] = [A] \times [B]$$

$$[G] = [C] \times [D] \times [E] \times [F]$$

REFERENCES

1. Namjoshi M, Huang MY, Suthoff E, et al. Epidemiology and Economic Burden Associated With Major Depressive Disorder in a United States Medicaid Population. AMCP Nexus; October 11-14, 2022; National Harbor, MD.
2. Suthoff E, Huang MY, Namjoshi M, et al. Epidemiology and Economic Burden Associated With Major Depressive Disorder in a United States Medicare Population. AMCP Nexus; October 11-14, 2022; National Harbor, MD.
3. Zhu L, Ferries E, Suthoff E, et al. Economic burden and antidepressant treatment patterns among patients with major depressive disorder in the United States. J Manag Care Spec Pharm. 2022 Nov;28(11-a Suppl):S2-S13.
4. Agency for Healthcare Research and Quality. Mean Expenditure per Person with Expense by Insurance Coverage, United States, 2017 [cited 2020 May 13]. Available from: https://meps.ahrq.gov/mepstrends/hc_use/
5. United States Census Bureau. 2019 American Community Survey 2020 [cited 2022 April 22]. Available from: <https://www.census.gov/data/tables/time-series/demo/health-insurance/acs-hi.html>
6. United States Census Bureau. Monthly Postcensal Civilian Noninstitutionalized Population, July 2019 and July 2020 2020 [cited 2022 January 18]. Available from: <https://www.census.gov/programs-surveys/popest/technical-documentation/research/evaluation-estimates/2020-evaluation-estimates/2010s-national-detail.html>
7. Substance Abuse and Mental Health Services Administration (SAMHSA). National Survey on Drug Use and Health (NSDUH), 2019, Crosstab Creator from SAMHSA's

public online data analysis system (PDAS) Rockville, MD: Center for Behavioral Health Statistics and Quality; 2019 [cited 2022 January 18]. Available from:

https://pdas.samhsa.gov/#/survey/NSDUH-2019-DS0001/crosstab/?results_received=false&run_chisq=false&weight=ANALWTQ1Q4_C.

8. National Center for Health Statistics Division of Health and Nutrition Examination Surveys. National Health and Nutrition Examination Survey (NHANES), 2017-2018: Centers for Disease Control and Prevention; 2018 [cited 2022 January 18]. Available from:
<https://www.cdc.gov/nchs/nhanes/continuousnhanes/overview.aspx?BeginYear=2017>
9. United States Census Bureau. Work Experience-People 15 Years Old and Over, by Total Money Earnings, Age, Race, Hispanic Origin, Sex, and Disability Status [cited 2022 January 18]. Available from: https://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-05.html#par_textimage_0
10. Stewart WF, Ricci JA, Chee E, et al. Cost of lost productive work time among US workers with depression. *JAMA*. 2003 Jun 18;289(23):3135-44.
11. Greenberg PE, Fournier AA, Sisitsky T, et al. The economic burden of adults with major depressive disorder in the United States (2010 and 2018). *Pharmacoeconomics*. 2021 Jun;39(6):653-665.
12. Wicke FS, Ernst M, Otten D, et al. The association of depression and all-cause mortality: Explanatory factors and the influence of gender. *J Affect Disord*. 2022 Apr 15;303:315-322.

13. Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Arch Gen Psychiatry*. 1999 Jul;56(7):617 - 26.
14. Chitnis A, O'Callaghan L, Fournier AA, et al. Impact of Living with an Adult with Major Depressive Disorder Among Households in the United States. 2023;In press.
15. Chitnis A, O'Callaghan L, Fournier AA, et al. Impact of Living with an Adult with Major Depressive Disorder Among Households in the United States. AMCP 2023; March 21 - 24, 2023; San Antonio, TX.