

Appendix 1. Average hourly wage by age group and sex.

	Average hourly wage in 2019 USD
Overall	
	27.9
By Age	
18-34	16.9
35-44	32.2
45-54	34.7
55-64	32.4
By Sex	
Male	31.7
Female	20.9

Appendix 2. Characteristics of study population by HPM data availability and T2D status

	T2D		No Diabetes		p
	n	%	n	%	
Those with absences data	26,161		367,283		
Age, mean (SD)	53 (8)		44 (12)		<0.001
Age group					<0.001
18-34	674	2.6	95,472	26.0	
35-44	3,048	11.7	86,259	23.5	
45-54	8,952	34.2	97,082	26.4	
55-64	13,487	51.6	88,470	24.1	
Male	20,578	78.7	275,339	75.0	<0.001
Census Region					<0.001
North East	3,396	13.0	49,231	13.4	
North Central	5,017	19.2	77,488	21.1	
South	11,683	44.7	142,744	38.9	
West	6,061	23.2	97,567	26.6	
Unknown	4	0.0	253	0.1	
Industry					<0.001
Manufacturing	11,050	42.2	168,553	45.9	
Transportation, communications, utilities	13,374	51.1	163,980	44.7	
Finance, insurance, real estate	0	0.0	0	0.0	
Services	924	3.5	19,831	5.4	
Others	813	3.1	14,919	4.1	
Missing	0	0.0	0	0.0	
Charlson Comorbidity Index, mean (SD)	0.10 (0.47)		0.02 (0.22)		<0.001
Those with STD data	177,283		2,607,927		
Age, mean (SD)	52 (8)		43 (11)		<0.001
Age group					<0.001
18-34	6,040	3.4	697,801	26.8	
35-44	24,449	13.8	667,523	25.6	
45-54	62,892	35.5	694,687	26.6	
55-64	83,902	47.3	547,916	21.0	
Male	116,186	65.5	1,609,128	61.7	<0.001
Census Region					<0.001
North East	24,353	13.7	418,094	16.0	
North Central	42,297	23.9	628,374	24.1	
South	84,970	47.9	1,075,313	41.2	
West	25,308	14.3	481,912	18.5	
Unknown	355	0.2	4,234	0.2	
Industry					<0.001
Manufacturing	70,969	40.0	1,006,442	38.6	
Transportation, communications, utilities	37,309	21.0	470,084	18.0	
Finance, insurance, real estate	26,730	15.1	475,209	18.2	
Services	27,229	15.4	417,929	16.0	
Others	11,552	6.5	174,108	6.7	
Missing	3,494	2.0	64,155	2.5	
Charlson Comorbidity Index, mean (SD)	0.11 (0.48)		0.02 (0.23)		<0.001
Those with LTD data	172,652		2,576,885		
Age, mean (SD)	52 (8)		43 (11)		<0.001
Age group					<0.001

18-34	5,878	3.4	688,308	26.7	
35-44	23,456	13.6	655,560	25.4	
45-54	61,910	35.9	695,410	27.0	
55-64	81,408	47.2	537,607	20.9	
Male	112,870	65.4	1,572,097	61.0	<0.001
Census Region					<0.001
North East	23,728	13.7	428,420	16.6	
North Central	42,623	24.7	623,323	24.2	
South	80,470	46.6	1,021,943	39.7	
West	25,471	14.8	498,835	19.4	
Unknown	360	0.2	4,364	0.2	
Industry					<0.001
Manufacturing	63,467	36.8	899,816	34.9	
Transportation, communications, utilities	36,038	20.9	465,992	18.1	
Finance, insurance, real estate	23,011	13.3	408,172	15.8	
Services	32,517	18.8	526,260	20.4	
Others	13,929	8.1	210,079	8.2	
Missing	3,690	2.1	66,566	2.6	
Charlson Comorbidity Index, mean (SD)	0.11 (0.49)		0.02 (0.23)		<0.001

P values are based on t tests for age and Charlson Comorbidity Index and chi-squared tests for all else, comparing the mean or proportions between those with T2D and without diabetes.

HPM, health and productivity management; T2D, type 2 diabetes; SD, standard deviation; STD, short-term disability; LTD, long-term disability

Appendix 3. Estimates of per capita annual productivity loss among those with T2D and without diabetes.

	T2D (n=202,123)		No Diabetes (n=3,012,694)		Difference	SE	<i>P</i>
	n or Mean	% or SE	n or Mean	% or SE			
Persons with absences data							
Total sample, n	26,161	12.9%	367,283	12.2%	-	-	
Persons reporting absences, n	17,639	67.4%	247,462	67.4%	-	-	0.872
Days lost due to absences							
Unadjusted mean	22.2	0.12	20.2	0.03	2.0	0.1	<0.001
Persons with STD data							
Total sample, n	177,283	87.7%	2,607,927	86.6%	-	-	
Persons reporting STD, n	25,779	14.5%	183,129	7.0%	-	-	<0.001
Days lost due to STD							
Unadjusted mean	7.7	0.07	3.2	0.01	4.5	0.1	<0.001
Persons with LTD data							
Total sample, n	172,652	85.4%	2,576,885	85.5%	-	-	
Persons reporting LTD, n	1,461	0.80%	6,739	0.30%	-	-	<0.001
Days lost due to LTD							
Unadjusted mean	1.7	0.08	0.5	0.01	1.2	0.1	<0.001

T2D, type 2 diabetes; SE, standard error; STD, short-term disability; LTD, long-term disability

Appendix 4. Unadjusted estimates of productivity and medical costs among those with T2D and without diabetes.

	T2D (n=202,123)		No Diabetes (n=3,012,694)		Difference	SE	P
	Mean	SE	Mean	SE			
Productivity Cost (2019\$)							
Absences	4,977	26.6	4,557	6.5	420	27.4	<0.001
STD	1,201	10.3	506	1.7	695	10.5	<0.001
LTD	199	6.6	52	0.8	147	6.6	<0.001
Medical Cost (2019\$)							
Total	15,731	86.8	4,969	12.3	10,762	87.7	<0.001
Outpatient	6,131	45.8	2,624	6.6	3,507	46.3	<0.001
Inpatient	4,955	55.6	1,258	7.5	3,697	56.1	<0.001
Outpatient Rx drugs	4,654	24.3	1,088	4.7	3,565	24.7	<0.001

T2D, type 2 diabetes; SE, standard error; STD, short-term disability; LTD, long-term disability; Rx, prescription

Appendix 5. Sensitivity analyses for productivity and medical costs

	T2D		No Diabetes		Difference	SE
	Mean	SE	Mean	SE		
SA 1. Adding Depression, Arthritis, and Epilepsy as Covariates						
Productivity Cost (\$)						
Total	5,776		5,148		628	
Absences	4,691	18.3	4,577	5.0	114*	19.0
STD	960	6	516	1	444*	5.8
LTD	125	4.5	55	0.9	70*	4.6
Medical Cost (\$)						
Total	11,118	73.7	5,105	13.4	6,013*	76.4
Outpatient	4,470	38.1	2,687	7.2	1,783*	39.6
Inpatient	3,028	34.7	1,351	8.1	1,677*	35.7
Outpatient Rx drugs	4,231	64.8	1,161	11.1	3,070*	62.3
Total Cost (\$)†	16,894		10,253		6,642	
SA 2. Excluding Those with Cancer**						
Productivity Cost (\$)						
Total	5,722		5,095		627	
Absences	4,669	18.6	4,563	5.0	106	19.3
STD	937	5.9	484	1.1	453	6.1
LTD	116	4.6	48	0.9	68	4.7
Medical Cost (\$)						
Total	10,362	61.9	4,339	11.9	6,024	65.4
Outpatient	4,023	29.6	2,241	5.4	1,782	30.8
Inpatient	2,725	33.0	1,119	7.2	1,606	34.0
Outpatient Rx drugs	3,935	57.1	1,034	7.6	2,897	56.3
Total Cost (\$)†	16,084		9,434		6,650	

Productivity losses and costs were estimated from two-part models, and medical costs were estimated from two-part models or generalized linear models. SA1 controlled for age group, sex, Charlson Comorbidity Index, state of residency, individuals' employer industry type, depression, arthritis, and epilepsy. SA2 excluded those with cancer and controlled for age group, sex, Charlson Comorbidity Index, state of residency, and individuals' employer industry type. All costs are expressed in 2019 USD.

*Statistically significant at an alpha level of 0.001.

** A total of 77,271 patients with cancer (2.4% of the total) were excluded; of those, 8,847 had T2D and 68,424 did not have diabetes.

†Total costs were estimated by summing the mean estimates of productivity costs associated with absences, STD, and LTD and total medical costs.

T2D, type 2 diabetes; SE, standard error; STD, short-term disability; LTD, long-term disability; Rx, prescription; SA, sensitivity analysis