Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

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Complete Data on Missing Data Points in the Outcome Variable

This section of the supplement provides data on missing data points over 8 time periods analyzed in the outcome variable using mixed-effects regression models (main analysis and sensitivity analyses). Two sub-sections on missingness are included. First, we present level of missingness of data points, by year and by comparative groups, in the outcome variable (a score on the Diabetes Complication Severity Index). Note that patients in our cohort were enrolled in and eligible for health care throughout the entire study (i.e., no enrollment gaps). Many patients had outcome data points (e.g., in Years 3-7 after new diabetes diagnosis) after having a missing data point during an earlier year of their outcome data (e.g., missing in Year 2). Therefore, second, we present data using an indicator of completeness in our outcome variable over time: the number of outcome data points analyzed per patient.

As described in the Method section of the manuscript, we coded data as missing for either of two reasons:

1. Mortality – data were coded as missing for each year after a patient’s date of death.
2. Patient who were alive but did not receive health care at Veterans Health Administration (VHA) during a given time period. Note that patients could have received VHA care in a subsequent year, if data were coded as missing due to no VHA care received.

Main Analysis: Bar Charts Displaying Missingness in the Outcome Variable by Year and by Comparative Group

eFigure 1 displays overall missingness in the main analysis (see also Table 3, manuscript). Patients in the No MH or SU group had the most missing data, followed by patients in the SU Only group. Patient with MH had similar levels of missingness, with or without co-occurring SU disorders.

eFigure 1. Overall Missingness for Outcome Data Points in the Main Analysis
eFigure 2 displays the amount of missingness due to mortality among patients included in the main analysis. Patients in the SU Only group had the highest rates of mortality in every time period, starting in Year 2. Note that only patients alive into year 1 were included in analyses.

**eFigure 2. Missingness for Outcome Data Points Due to Mortality in the Main Analysis**

![Bar chart showing missingness for outcome data points due to mortality in the main analysis](chart.png)

| Years Since New Diabetes Diagnosis | No MH or SU | MH Only | SU Only | Both MH and SU |
|----------------------------------|------------|---------|---------|----------------|
| Index                            | 0.0%       | 0.0%    | 0.0%    | 0.0%           |
| Year 1                           | 0.0%       | 0.0%    | 0.0%    | 0.0%           |
| Year 2                           | 2.5%       | 2.2%    | 2.9%    | 2.4%           |
| Year 3                           | 4.9%       | 4.3%    | 5.7%    | 5.1%           |
| Year 4                           | 7.2%       | 6.7%    | 9.1%    | 7.3%           |
| Year 5                           | 9.5%       | 8.9%    | 12.6%   | 9.8%           |
| Year 6                           | 11.9%      | 11.1%   | 15.5%   | 12.3%          |
| Year 7                           | 14.3%      | 13.2%   | 18.1%   | 14.9%          |
Sensitivity Analysis 1: Missingness of Outcome Data Points Among Patients Who Were Alive into Year 7

eFigure 3 displays missingness in the sensitivity analysis limited to patients who were alive into year 7 (see also eTable 6 in the Supplement). That is, missingness in eFigure 3 represents the proportion of patients who did not use VHA care during a given year, among patients who remained alive throughout the study. Patients in the No MH or SU group had higher rates of missingness due to not using VHA care during every time period, compare to patients in any MH or SU group.

**eFigure 3. Missingness for Outcome Data Points Due to Not Using VHA Health Care in a Given Time Period, Among Patients Who Were Alive Into Year 7 After Diabetes Onset (Sensitivity Analysis 1)**

| Years Since New Diabetes Diagnosis | Years | % Missing Data |
|-----------------------------------|-------|----------------|
|                                   | Index | 39.2%          |
|                                   | Year 1| 0.0%           |
|                                   | Year 2| 11.9%          |
|                                   | Year 3| 13.9%          |
|                                   | Year 4| 15.3%          |
|                                   | Year 5| 16.5%          |
|                                   | Year 6| 17.4%          |
|                                   | Year 7| 18.4%          |

- **No MH or SU**: 39.2% missing in the first year, increasing to 18.4% by year 7.
- **MH Only**: Minimal missingness, 0.0% in the first year, and 9.2% in year 7.
- **SU Only**: Starts at 0.0% and increases to 12.4% by year 7.
- **Both MH and SU**: Minimal missingness, 0.0% in the first year, and 8.0% in year 7.
Sensitivity Analysis 2: Missingness Among Patients Who Made at Least 2 Visits to Primary Care before their New Diabetes Diagnosis was Given

eFigure 4 displays missingness in the sensitivity analysis that only included patients who made at least 2 visits to primary care in the 2-year period preceding their new diabetes diagnosis (see also eTable 6 in this Supplement). In Sensitivity Analysis 2, patients in any MH or SU group had the highest rates of missingness, compared to patients in the No MH or SU group.

**eFigure 4.** Missingness for Outcome Data Points Due to Mortality or to Not Using VHA Health Care in a Given Time Period, Among Patients Who Made at Least 2 Visits to Primary Care Before New Onset Diabetes (Sensitivity Analysis 2)

|                  | Years Since New Diabetes Diagnosis |
|------------------|-----------------------------------|
|                  | Index | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 |
| No MH or SU      | 0.0%  | 0.0%   | 3.9%   | 5.8%   | 7.6%   | 9.4%   | 11.1%  | 12.7%  |
| MH Only          | 0.0%  | 0.0%   | 4.8%   | 8.3%   | 11.8%  | 15.1%  | 18.5%  | 21.2%  |
| SU Only          | 0.0%  | 0.0%   | 7.2%   | 12.5%  | 16.6%  | 20.7%  | 24.7%  | 27.8%  |
| Both MH and SU   | 0.0%  | 0.0%   | 5.0%   | 9.6%   | 12.6%  | 16.3%  | 19.6%  | 23.0%  |
Number of Outcome Data Points Analyzed per Patient (i.e., “Completeness” of Outcome Data)

The level of missing outcome data in our analysis should be interpreted in the context of the level of each patient’s data completeness as well. We used mixed-effects linear regression to run a longitudinal growth model with 8 total time points during which the outcome variable was calculated. That is, each patient’s medical record data could lead to a maximum of 8 outcome data points observed over time in our analyses. Among the cohort as a whole, a technical majority of patients had at least 1 missing outcome data point at during a time period in our analyses (median outcome data points per patients = 7). However, for the main analysis, an average of 6.5 (SD = 2.1) outcome data points were analyzed per patient, indicating that most patients had many outcome data points over time, even if that patient had missing data during any given year or years.

eTable 1 displays a percent distribution for the number of outcome values analyzed per patient, overall and by comparative MHSU groups. Consistent with figures above, there was a higher proportion of patients in the No MH or SU disorder group with 7 rather than 8 outcome values observed, notably as a result of no health care utilization prior to receiving their first diabetes diagnosis.

**eTable 1. Percent Distribution of Number of Outcome Data Points Analyzed per Patient Across Eight Total Time Periods Possible**

| Number of Outcome Data Points Analyzed | Mental Health Disorder Only (n = 20,032) | Substance Use Disorder Only (n = 2,800) | Mental Health and Substance Use Disorder (n = 5,801) | No Mental or Substance Use Disorder (n = 94,359) | Total (N = 122,992) |
|---------------------------------------|------------------------------------------|----------------------------------------|-----------------------------------------------|-----------------------------------------------|---------------------|
| 1 Data Point (minimum possible) (%)   | 0.0                                      | 0.0                                    | 0.0                                           | 4.6                                           | 3.5                 |
| 2 Data Points (%)                     | 3.6                                      | 4.9                                    | 3.1                                           | 6.4                                           | 5.8                 |
| 3 Data Points (%)                     | 3.6                                      | 5.2                                    | 3.9                                           | 5.4                                           | 5.0                 |
| 4 Data Points (%)                     | 3.9                                      | 5.5                                    | 3.8                                           | 5.2                                           | 5.0                 |
| 5 Data Points (%)                     | 3.8                                      | 5.7                                    | 4.3                                           | 5.8                                           | 5.4                 |
| 6 Data Points (%)                     | 4.6                                      | 6.0                                    | 4.8                                           | 7.2                                           | 6.7                 |
| 7 Data Points (%)                     | 6.1                                      | 9.0                                    | 6.9                                           | 26.3                                          | 21.7                |
| 8 Data Points (maximum possible) (%)  | 74.4                                     | 63.9                                   | 73.2                                          | 39.2                                          | 47.1                |

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Rates of Specific Mental Health or Substance Use Disorder Diagnoses Before Diabetes Onset

This section of supplemental material contains percentages of specific mental health (MH) or substance use (SU) disorder diagnoses made in the Index period of analyses. That is, MH or SU diagnoses displayed in eTable 2 were assigned by a provider in the 2-year period prior to the date a patient received his or her new diabetes diagnosis. Some patients had multiple diagnoses for MH disorders, SU disorders, or both, so column totals may not equal 100%. Note also, in eTable 2, we do not display a column for patients in the No MH or SU disorder group because, by definition, this group received zero MHSU diagnoses. Cells are left blank for not-applicable combinations of MH or SU group membership and specific diagnosis groups (e.g., Major Depressive Disorder for the SU Only group).

**eTable 2. Percent of Patients with Pre-Existing Mental Health or Substance Use Disorder Diagnoses**

| Diagnosis Group                        | Mental Health Disorder Only (n = 20,032) | Substance Use Disorder Only (n = 2,800) | Mental Health and Substance Use Disorder (n = 5,801) | Total Cohort (N = 122,992) |
|----------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------------------|---------------------------|
| Mental Health Disorders                |                                        |                                        |                                                     |                           |
| Major Depressive Disorders (%)         | 19.2                                   | 27.9                                   | 4.4                                                 |                           |
| Other Depressive Disorders (%)         | 57.2                                   | 64.1                                   | 12.4                                                |                           |
| Affective and Bipolar Disorders (%)    | 7.3                                    | 15.0                                   | 1.9                                                 |                           |
| Schizophrenia (%)                      | 7.0                                    | 11.7                                   | 1.7                                                 |                           |
| Other Psychoses (%)                    | 3.7                                    | 7.9                                    |                                                     |                           |
| Posttraumatic Stress Disorders (%)     | 36.9                                   | 44.0                                   | 8.1                                                 |                           |
| Generalized Anxiety Disorders (%)      | 5.6                                    | 5.9                                    | 1.2                                                 |                           |
| Other Anxiety Disorders (%)            | 20.2                                   | 19.9                                   | 4.2                                                 |                           |
| Personality Disorders (%)              | 3.0                                    | 8.6                                    | 0.9                                                 |                           |
| Substance Use Disorders                |                                        |                                        |                                                     |                           |
| Alcohol Use Disorders (%)              | 78.4                                   | 79.5                                   | 5.5                                                 |                           |
| Cocaine Use Disorders (%)              | 16.8                                   | 24.4                                   | 1.5                                                 |                           |
| Other Simulant Use Disorders (Amphetamines) (%) | 1.3                                   | 3.0                                    | 0.2                                                 |                           |
| Cannabis Use Disorders (%)             | 6.6                                    | 15.9                                   | 0.9                                                 |                           |
| Opioid Use Disorders (%)               | 7.1                                    | 10.6                                   | 0.7                                                 |                           |
| Barbiturate Use Disorders (%)          | 0.5                                    | 2.2                                    | 0.1                                                 |                           |
Rates of Specific Diabetes Complications and Severity Over Time

This section of supplemental material first provides illustrative examples of the specific diagnoses for diabetes complications that were grouped, and weighted, to calculate a patient’s score on the Diabetes Complication Severity Index (DCSI). Note that the method for calculating the DCSI was developed and described fully by Young et al.1 Briefly, we analyzed patient’s medical record to identify each diagnosis in the DCSI representing a medical abnormality consistent with diabetes complications (e.g., diabetic ophthalmologic disease). Each diagnosis we identified was assigned a weight of 1 or 2, per Young et al.’s specifications.1 Within a category of complications such as Retinopathy or Nephropathy (i.e., the italicized rows in eTable3), the sum of weighted scores was calculated for a within-category total. The maximum within-category total allowed was 2 points, except for the neuropathy category which was only weighted at 1 point maximum (per Young et al.’s specification1). The within-category totals were then summed across categories to calculate a patient’s total DCSI score, for a possible range of 0 to 13 points. Please consult Young and colleagues’ paper for full details about calculating the DCSI.1

**eTable 3. Example Diagnoses Included in the Diabetes Complication Severity Index, by Category of Complications**

| Category of Complications (weighted score) in the Diabetes Complication Severity Index | Illustrative Examples of Diagnoses Included in Group |
|---|---|
| **Retinopathy** |  |
| Mild Retinopathy (weighted score = 1) | Diabetic ophthalmologic disease  
Background retinopathy  
Retinal edema |
| Severe Retinopathy (weighted score = 2) | Proliferative retinopathy  
Retinal detachment  
Blindness |
| **Nephropathy** |  |
| Mild Nephropathy (weighted score = 1) | Diabetic nephropathy  
Acute glomerulonephritis  
Nephritis/nephropathy |
| Severe Nephropathy (weighted score = 2) | Chronic renal failure  
Renal insufficiency |
| **Neuropathy** |  |
| Neuropathy (weighted score = 1 for all) | Diabetic neuropathy  
Mononeuropathy  
Gastroparesis |
| **Cerebrovascular** |  |
| Mild Cerebrovascular (weighted score = 1) | Transient Ischemic Attack |
| Severe Cerebrovascular (weighted score = 2) | Stroke |
| **Cardiovascular** |  |
| Mild Cardiovascular (weighted score = 1) | Atherosclerosis  
Other IHD  
Angina pectoris |
| Severe Cardiovascular (weighted score = 2) | Myocardial infarction  
Ventricular fibrillation, arrest  
Heart failure |
| **Peripheral Vascular Disease** |  |
| Mild Peripheral Vascular Disease (weighted score = 1) | Diabetic PVD  
Other aneurysm, Lower extremity  
Foot wound with complication |
| Severe Peripheral Vascular Disease (weighted score = 2) | Gangrene  
Gas Gangrene  
Ulcer of lower limbs |
| Category of Complications (weighted score) in the Diabetes Complication Severity Index | Illustrative Examples of Diagnoses Included in Group |
|-------------------------------------------------------------------------------------|--------------------------------------------------|
| Metabolic Complications                                                             | Ketoacidosis                                    |
| Metabolic Complications (weighted score = 2 for all)                                | Hyperosmolar                                    |
|                                                                                     | Other coma                                       |
eTable 4 contains the percent of patients who received a diagnosis for for each category of complications in the DCSI, by comparative MH or SU disorder groups. In a given time period, each patient could have had both a mild and a severe complication within a given category. As such, column totals in eTable 4 may not total to 100%, nor will a row total to the “any” complication data presented in Table 2 of the manuscript. Table 2 of the manuscript displays rates of patients’ highest-weighted within-category score on the DCSI across all 8 time periods. In eTable 4 of the Supplement, we present full data on event rates for the outcome variable, by comparative group, and by the 8 time periods analyzed in mixed-effects regressions.

Note also that we provide percentages in eTable 4 based on the number of patients who were alive in each time period (denominators are provided in the top rows of each respective section of the table).

**eTable 4. Percent of Patients Diagnosed With a Specific Category of Diabetes Complications, by Severity of Complication, by Time Period, and by Comparative MHSU Groups**

| Group of Complications | Index (n=122992) | Year 1 (n=122992) | Year 2 (n=119991) | Year 3 (n=117056) | Year 4 (n=114159) | Year 5 (n=111290) | Year 6 (n=108377) | Year 7 (n=105466) |
|------------------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Mild Retinopathy       | 0.9%            | 8.7%             | 6.5%             | 6.7%             | 6.7%             | 6.8%             | 7.1%             | 7.1%             |
| Severe Retinopathy     | 1.9%            | 3.6%             | 2.8%             | 3.0%             | 3.1%             | 3.4%             | 3.4%             | 3.5%             |
| Mild Nephropathy       | 0.1%            | 1.8%             | 1.6%             | 1.8%             | 2.0%             | 2.1%             | 2.3%             | 2.4%             |
| Severe Nephropathy     | 1.0%            | 5.4%             | 5.3%             | 5.9%             | 6.7%             | 7.3%             | 8.0%             | 8.9%             |
| Neuropathy             | 5.7%            | 14.4%            | 12.7%            | 13.3%            | 14.1%            | 14.8%            | 16.0%            | 17.2%            |
| Mild Cerebrovascular   | 0.8%            | 1.1%             | 0.9%             | 0.8%             | 0.9%             | 0.9%             | 0.9%             | 0.9%             |
| Severe Cerebrovascular | 3.0%            | 5.4%             | 4.5%             | 4.5%             | 4.6%             | 4.8%             | 4.9%             | 5.1%             |
| Mild Cardiovascular    | 14.7%           | 25.6%            | 21.4%            | 21.1%            | 21.2%            | 21.2%            | 21.0%            | 21.3%            |
| Severe Cardiovascular  | 7.6%            | 13.2%            | 11.0%            | 11.3%            | 11.7%            | 12.0%            | 12.3%            | 12.9%            |
| Mild Peripheral Vascular Disease | 2.9% | 5.7% | 4.6% | 4.6% | 4.7% | 4.9% | 4.9% | 5.2% |
| Severe Peripheral      | 0.8%            | 1.7%             | 1.3%             | 1.4%             | 1.4%             | 1.6%             | 1.7%             | 2.0%             |
| Group of Complications | Index (n=94359) | Year 1 (n=94359) | Year 2 (n=92012) | Year 3 (n=89743) | Year 4 (n=87551) | Year 5 (n=85368) | Year 6 (n=83124) | Year 7 (n=80845) |
|-------------------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Vascular Disease        |                |                 |                 |                 |                 |                 |                 |                 |
| Metabolic Complications | 0.0%           | 0.4%            | 0.2%            | 0.2%            | 0.2%            | 0.2%            | 0.2%            | 0.2%            |
| No Mental Health or Substance Use Disorder |                |                 |                 |                 |                 |                 |                 |                 |
| Mild Retinopathy        | 0.7%           | 9.7%            | 7.3%            | 7.5%            | 7.5%            | 7.6%            | 7.9%            | 7.9%            |
| Severe Retinopathy      | 1.5%           | 3.7%            | 2.9%            | 3.1%            | 3.2%            | 3.5%            | 3.5%            | 3.5%            |
| Mild Nephropathy        | 0.1%           | 2.1%            | 1.8%            | 2.0%            | 2.2%            | 2.3%            | 2.5%            | 2.7%            |
| Severe Nephropathy      | 0.8%           | 6.0%            | 5.8%            | 6.4%            | 7.3%            | 7.9%            | 8.6%            | 9.5%            |
| Neuropathy              | 3.6%           | 14.0%           | 12.0%           | 12.8%           | 13.5%           | 14.3%           | 15.3%           | 16.5%           |
| Mild Cerebrovascular    | 0.6%           | 1.1%            | 0.8%            | 0.8%            | 0.9%            | 0.8%            | 0.8%            | 0.9%            |
| Severe Cerebrovascular  | 2.3%           | 5.4%            | 4.4%            | 4.3%            | 4.5%            | 4.7%            | 4.8%            | 5.0%            |
| Mild Cardiovascular     | 12.6%          | 26.7%           | 21.7%           | 21.4%           | 21.4%           | 21.3%           | 21.5%           |                 |
| Severe Cardiovascular   | 6.5%           | 13.7%           | 11.0%           | 11.4%           | 11.8%           | 12.1%           | 12.4%           | 13.0%           |
| Mild Peripheral Vascular Disease | 2.3% | 5.8% | 4.6% | 4.7% | 4.7% | 4.9% | 5.0% | 5.3% |
| Severe Peripheral Vascular Disease | 0.5% | 1.7% | 1.4% | 1.5% | 1.5% | 1.6% | 1.8% | 2.0% |
| Metabolic Complications | 0.0%           | 0.4%            | 0.2%            | 0.1%            | 0.1%            | 0.2%            | 0.2%            | 0.2%            |
| Mental Health Disorder Only |                |                 |                 |                 |                 |                 |                 |                 |
| Mild Retinopathy        | 1.5%           | 5.2%            | 3.7%            | 4.0%            | 4.0%            | 4.0%            | 4.3%            | 4.5%            |
| Group of Complications | Index (n=2800) | Year 1 (n=2800) | Year 2 (n=2719) | Year 3 (n=2640) | Year 4 (n=2544) | Year 5 (n=2447) | Year 6 (n=2367) | Year 7 (n=2294) |
|------------------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Severe Retinopathy     | 3.1%          | 3.1%           | 2.6%           | 2.9%           | 2.7%           | 3.0%           | 3.2%           | 3.2%           |
| Mild Nephropathy       | 0.1%          | 1.0%           | 1.0%           | 1.1%           | 1.3%           | 1.4%           | 1.4%           | 1.7%           |
| Severe Nephropathy     | 1.4%          | 3.5%           | 3.8%           | 4.6%           | 5.3%           | 5.7%           | 6.2%           | 7.1%           |
| Neuropathy             | 12.9%         | 16.1%          | 14.9%          | 15.4%          | 16.2%          | 17.0%          | 18.5%          | 19.9%          |
| Mild Cerebrovascular   | 1.7%          | 1.3%           | 1.2%           | 1.1%           | 1.3%           | 1.3%           | 1.2%           | 1.1%           |
| Severe Cerebrovascular | 5.5%          | 5.4%           | 5.0%           | 5.1%           | 5.2%           | 5.3%           | 5.4%           | 5.3%           |
| Mild Cardiovascular    | 23.9%         | 24.3%          | 22.4%          | 21.9%          | 22.3%          | 22.1%          | 21.6%          | 22.1%          |
| Severe Cardiovascular  | 11.7%         | 12.0%          | 11.2%          | 11.5%          | 11.6%          | 12.0%          | 12.1%          | 12.8%          |
| Mild Peripheral Vascular Disease | 4.5% | 5.0% | 4.1% | 4.0% | 4.0% | 4.3% | 4.3% | 4.5% |
| Severe Peripheral Vascular Disease | 1.3% | 1.4% | 1.1% | 1.1% | 1.1% | 1.2% | 1.3% | 1.5% |
| Metabolic Complications | 0.0%          | 0.5%           | 0.1%           | 0.1%           | 0.1%           | 0.1%           | 0.1%           | 0.2%           |

**Substance Use Disorder Only**

| Group of Complications | Index (n=2800) | Year 1 (n=2800) | Year 2 (n=2719) | Year 3 (n=2640) | Year 4 (n=2544) | Year 5 (n=2447) | Year 6 (n=2367) | Year 7 (n=2294) |
|------------------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Mild Retinopathy       | 1.9%          | 7.0%           | 5.3%           | 5.3%           | 5.7%           | 5.8%           | 5.9%           | 6.1%           |
| Severe Retinopathy     | 2.6%          | 3.0%           | 2.5%           | 2.4%           | 2.6%           | 2.8%           | 3.0%           | 3.9%           |
| Mild Nephropathy       | 0.1%          | 0.8%           | 0.8%           | 0.9%           | 1.4%           | 1.2%           | 1.4%           | 1.3%           |
| Severe Nephropathy     | 1.4%          | 3.2%           | 3.4%           | 4.2%           | 4.2%           | 5.3%           | 5.7%           | 6.7%           |
| Neuropathy             | 9.1%          | 13.8%          | 11.5%          | 12.5%          | 14.0%          | 15.0%          | 16.0%          | 17.0%          |
| Mild Cerebrovascular   | 0.9%          | 0.8%           | 0.7%           | 0.6%           | 0.7%           | 0.7%           | 0.7%           | 0.6%           |

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Severe Cerebrovascular: 5.6%  5.7%  5.1%  4.8%  4.8%  5.1%  5.5%  5.9%
Mild Cardiovascular: 15.6%  17.2%  15.7%  15.9%  15.6%  16.3%  17.0%  17.3%
Severe Cardiovascular: 10.7%  12.4%  11.1%  11.1%  12.0%  12.2%  12.6%  12.7%
Mild Peripheral Vascular Disease: 5.8%  7.1%  6.6%  5.8%  6.5%  7.0%  6.1%  6.9%
Severe Peripheral Vascular Disease: 2.6%  3.1%  1.8%  2.2%  2.2%  2.5%  2.2%  2.9%
Metabolic Complications: 0.0%  1.5%  0.4%  0.4%  0.4%  0.3%  0.4%  0.5%

| Both Mental Health and Substance Use Disorder | Index (n=5801) | Year 1 (n=5801) | Year 2 (n=5660) | Year 3 (n=5503) | Year 4 (n=5378) | Year 5 (n=5235) | Year 6 (n=5085) | Year 7 (n=4939) |
|-----------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Mild Retinopathy                              | 1.9%           | 5.9%           | 4.2%           | 4.0%           | 3.9%           | 3.8%           | 4.2%           | 4.1%           |
| Severe Retinopathy                            | 3.8%           | 3.3%           | 2.7%           | 2.6%           | 2.5%           | 2.8%           | 2.8%           | 2.8%           |
| Mild Nephropathy                              | 0.2%           | 0.9%           | 0.9%           | 1.0%           | 1.2%           | 1.4%           | 1.7%           | 1.5%           |
| Severe Nephropathy                            | 1.4%           | 3.0%           | 3.4%           | 3.5%           | 4.3%           | 4.7%           | 5.5%           | 6.5%           |
| Neuropathy                                    | 13.5%          | 16.2%          | 15.4%          | 15.1%          | 15.6%          | 16.4%          | 17.5%          | 19.0%          |
| Mild Cerebrovascular                          | 1.4%           | 1.1%           | 0.9%           | 0.8%           | 0.7%           | 0.9%           | 0.9%           | 0.7%           |
| Severe Cerebrovascular                        | 4.8%           | 4.6%           | 4.3%           | 4.2%           | 4.3%           | 4.9%           | 5.0%           | 5.1%           |
| Mild Cardiovascular                           | 17.6%          | 17.7%          | 16.6%          | 16.4%          | 16.6%          | 16.7%          | 16.4%          | 17.3%          |
| Severe Cardiovascular                         | 10.0%          | 10.3%          | 9.7%           | 10.0%          | 10.4%          | 10.2%          | 11.1%          | 11.9%          |
| Mild Peripheral Vascular Disease              | 5.2%           | 5.7%           | 5.1%           | 5.3%           | 5.1%           | 5.4%           | 5.1%           | 5.3%           |

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|                              | 1.9% | 2.1% | 1.4% | 2.1% | 1.3% | 1.5% | 1.8% | 1.9% |
|------------------------------|------|------|------|------|------|------|------|------|
| Severe Peripheral Vascular  |      |      |      |      |      |      |      |      |
| Disease                     |      |      |      |      |      |      |      |      |
| Metabolic Complications     | 0.0% | 1.0% | 0.2% | 0.4% | 0.4% | 0.4% | 0.3% | 0.4% |
Complete Mixed-Effects Regression Analysis Results

This section of the Supplement provides complete mixed-effects regression results for the main analysis and for both sensitivity analyses.

eTable 5. Complete Mixed Effects Regression Model Results With All Covariates (See also Table 3 in Manuscript)

| Variable [Reference Category] | Model A, Unconditional Growth Model | Model B, Conditional, Unadjusted | Model C, Fully Adjusted |
|-------------------------------|-------------------------------------|---------------------------------|-------------------------|
|                               | Est. (SE)   | p       | Est. (SE)   | p       | Est. (SE)   | p       |
| Initial DCSI Score            |            |         |            |         |            |         |
| Intercept                     | .845 (.010) | <.001   | .841 (.011) | <.001   | -.310 (.023) | <.001   |
| Mental or Substance Use Disorder [ref: None] | | | | | |
| MH Only                        |            |         |            |         |            |         |
| SU Only                        |-.081 (.024) | .001    |-.088 (.023) | <.001   |            |         |
| MH and SU                     |-.041 (.017) | .01     |-.126 (.017) | <.001   |            |         |
| Age in years                  |            |         |            |         |            |         |
| Male [ref: Female]            |            |         |            |         |            |         |
| Race/Ethnicity [ref: White, non-Hispanic] | | | | | |
| Black                          |-.052 (.009) | <.001   |            |         |            |         |
| Hispanic                      |-.094 (.014) | <.001   |            |         |            |         |
| Asian/Pacific Islander        |-.126 (.024) | <.001   |            |         |            |         |
| American Indian/Alaska Native |-.049 (.033) | .144    |            |         |            |         |
| Married [ref: Not Married]    |            |         |            |         |            |         |
| Homeless [ref: Not Homeless]  |            |         |            |         |            |         |
| Rurality [ref: Urban]         |            |         |            |         |            |         |
| Rural                         |-.013 (.007) | .07     |            |         |            |         |
| Highly Rural                  |-.070 (.028) | .01     |            |         |            |         |
| Medical Comorbidities         |            |         |            |         |            |         |
| [dummy coded]                 |            |         |            |         |            |         |
| Pulmonary Circulation Disorder| .485 (.050) | <.001   |            |         |            |         |
| Hypertension                  | .102 (.008) | <.001   |            |         |            |         |
| Paralysis                     | .489 (.038) | <.001   |            |         |            |         |
| Other Neurological Disorder   | .174 (.021) | <.001   |            |         |            |         |
| Chronic Obstructive Pulmonary Disease | .141 (.010) | <.001   |            |         |            |         |
| Hypothyroidism                | .024 (.016) | .13     |            |         |            |         |
| Liver Disease                 |-.152 (.021) | <.001   |            |         |            |         |
| Chronic Peptic Ulcer          | .022 (.029) | .45     |            |         |            |         |
| Solid Tumor w/o Metastases    |-.051 (.012) | <.001   |            |         |            |         |
| Rheumatoid Arthritis          | .065 (.027) | .02     |            |         |            |         |
| Variable [Reference Category] | Model A, Unconditional Growth Model | Model B, Conditional, Unadjusted | Model C, Fully Adjusted |
|-------------------------------|-------------------------------------|----------------------------------|------------------------|
|                               | Est. (SE)   | p       | Est. (SE)   | p       | Est. (SE)   | p       |
| Coagulopathy                  | .682 (.027) | <.001  | .622 (.027) | <.001  | .622 (.027) | <.001  |
| Fluid and Electrolyte Disorders | .162 (.021) | <.001  | .162 (.021) | <.001  | .162 (.021) | <.001  |
| Blood Loss Anemia             | .220 (.123) | .07    | .220 (.123) | .07    | .220 (.123) | .07    |
| Deficiency Anemia             | .191 (.191) | <.001  | .191 (.191) | <.001  | .191 (.191) | <.001  |
| Obesity                       | -.043 (.008) | <.001  | -.043 (.008) | <.001  | -.043 (.008) | <.001  |
| Tobacco Use Disorder          | .093 (.010) | <.001  | .093 (.010) | <.001  | .093 (.010) | <.001  |
| Inpatient Index Diagnosis     | .448 (.015) | <.001  | .448 (.015) | <.001  | .448 (.015) | <.001  |
| Diabetes Diagnosis            |                       |                    |                       |                    |                       |                    |
| (ref: Outpatient)             |                       |                    |                       |                    |                       |                    |
| Primary Care Visits           |                       |                    |                       |                    |                       |                    |
| (ref: 0 Visits)               |                       |                    |                       |                    |                       |                    |
| 1-2 visits                    | -.408 (.009) | <.001  | -.408 (.009) | <.001  | -.408 (.009) | <.001  |
| 3-4 visits                    | -.497 (.011) | <.001  | -.497 (.011) | <.001  | -.497 (.011) | <.001  |
| 5-8 visits                    | -.387 (.011) | <.001  | -.387 (.011) | <.001  | -.387 (.011) | <.001  |
| 9+ visits                     | -.149 (.013) | <.001  | -.149 (.013) | <.001  | -.149 (.013) | <.001  |
| Medical Inpatient Stay        |                       |                    |                       |                    |                       |                    |
| (ref: No Stay)                |                       |                    |                       |                    |                       |                    |
| DCSI Progression Over Time    |                       |                    |                       |                    |                       |                    |
| Time in years                 | .083 (.002) | <.001  | .110 (.003) | <.001  | .102 (.003) | <.001  |
| Time$^{2}$ in years           | -.002 (.0003) | <.001 | -.004 (.0003) | <.001 | -.0034 (.0003) | <.001 |
| Interaction: Time X MH or SU Status [ref: no MH or SU] | | | | | |
| MH Only                       | -.076 (.005) | <.001  | -.076 (.005) | <.001  | -.076 (.005) | <.001  |
| SU Only                       | -.048 (.012) | <.001  | -.048 (.012) | <.001  | -.048 (.012) | <.001  |
| MH and SU                     | -.100 (.008) | <.001  | -.100 (.008) | <.001  | -.100 (.008) | <.001  |
| Interaction: Time$^{2}$ X MH or SU Status [ref: no MH or SUD] | | | | | |
| MH Only                       | .007 (.0006) | <.001  | .007 (.0006) | <.001  | .007 (.0006) | <.001  |
| SU Only                       | .005 (.0016) | .001   | .005 (.0016) | .001   | .005 (.0016) | .001   |
| MH and SU                     | .009 (.0011) | <.001  | .009 (.0011) | <.001  | .009 (.0011) | <.001  |

Variance Components

Level 1 Residual | .924 | .925 | .931
Level 2
Intercept      | .897 | .897 | .774
Time            | .125 | .124 | .120
Correlation     | .172 | .171 | .307
Level 3
Intercept      | .105 | .105 | .083
Time            | .014 | .014 | .014
Correlation     | .072 | .079 | .064

Fit Statistics
Deviance        | -1179763 | -1179492 | -1170937
AIC             | 2359548  | 2359018  | 2341979
BIC             | 2359676  | 2359215  | 2342581
### eTable 6. Complete Mixed Effects Regression Model Results From Sensitivity Analyses

| Variable [Reference Category] | Sensitivity Analysis: Exclude Ps without Primary Care Use (N = 102,489) | Sensitivity Analysis: Exclude Ps who Died during Observation Period (N = 66,834) |
|-------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------|
|                               | Estimate (SE) | p      | Estimate (SE) | p      |
| Intercept                     | -0.223 (.022) | <.001  | -0.810 (.026) | <.001  |
| Mental or Substance Use Disorder [ref: None] |                       |                       |                       |
| MH Only                       | 0.017 (.010)  | 0.09   | 0.053 (.010)  | <.001  |
| SU Only                       | -0.063 (.024) | 0.009  | 0.007 (.025)  | 0.76   |
| MH and SU                     | -0.097 (.018) | <.001  | -0.085 (.017) | <.001  |
| Age in years                  | 0.020 (.0003) | <.001  | 0.026 (.0004) | <.001  |
| Male [ref: Female]            | 0.218 (.016) | <.001  | 0.216 (.019)  | <.001  |
| Race/Ethnicity [ref: White, non-Hispanic] |                       |                       |                       |
| Black                         | -0.053 (.009) | <.001  | -0.054 (.010) | <.001  |
| Hispanic                      | -0.079 (.014) | <.001  | -0.163 (.017) | <.001  |
| Asian/Pacific Islander        | -0.120 (.024) | <.001  | -0.130 (.030) | <.001  |
| American Indian/Alaska Native | -0.054 (.034) | 0.11   | -0.073 (.045) | 0.11   |
| Married [ref: Not Married]    | 0.041 (.006)  | <.001  | 0.010 (.008)  | 0.19   |
| Homeless [ref: Not Homeless]  | -0.010 (.018) | 0.56   | 0.063 (.018)  | 0.001  |
| Rurality [ref: Urban]         |                       |                       |                       |
| Rural                         | -0.007 (.007) | 0.31   | -0.001 (.008) | 0.88   |
| Highly Rural                  | -0.024 (.028) | 0.40   | -0.048 (.031) | 0.12   |
| Medical Comorbidities [dummy coded] |                       |                       |                       |
| Pulmonary Circulation Disorder| 0.418 (.060)  | <.001  | 0.488 (.048)  | <.001  |
| Hypertension                  | 0.100 (.008)  | <.001  | 0.135 (.008)  | <.001  |
| Paralysis                     | 0.534 (.041)  | <.001  | 0.528 (.038)  | <.001  |
| Other Neurological Disorder   | 0.160 (.023)  | <.001  | 0.185 (.020)  | <.001  |
| Chronic Obstructive Pulmonary Disease | 0.122 (.010) | <.001  | 0.147 (.009)  | <.001  |
| Hypothyroidism                | 0.031 (.016)  | 0.05   | 0.019 (.015)  | 0.20   |
| Liver Disease                 | -0.121 (.022) | <.001  | -0.138 (.021) | <.001  |
| Chronic Peptic Ulcer          | 0.066 (.030)  | 0.03   | 0.024 (.027)  | 0.38   |
| Solid Tumor w/o Metastases    | -0.044 (.013) | 0.01   | -0.049 (.012) | <.001  |
| Rheumatoid Arthritis          | 0.041 (.028)  | 0.15   | 0.065 (.026)  | 0.01   |
| Coagulopathy                  | 0.684 (.030)  | <.001  | 0.683 (.026)  | <.001  |
| Fluid and Electrolyte Disorders | 0.139 (.022) | <.001  | 0.157 (.020)  | <.001  |
| Blood Loss Anemia             | 0.137 (.133)  | 0.30   | 0.264 (.115)  | 0.02   |
| Variable [Reference Category] | Sensitivity Analysis: Exclude Ps without Primary Care Use (N = 102,489) | Sensitivity Analysis: Exclude Ps who Died during Observation Period (N = 66,834) |
|-------------------------------|-------------------------------------------------|-------------------------------------------------|
|                               | Estimate (SE) | p       | Estimate (SE) | p       |
| Deficiency Anemia             | .148 (.017) | <.001   | .182 (.015) | <.001   |
| Obesity                       | -.041 (.008) | <.001   | -.022 (.008) | .007    |
| Tobacco Use Disorder          | .084 (.010) | <.001   | .117 (.009) | <.001   |
| Inpatient Index Diabetes Diagnosis [ref: Outpatient] | .437 (.016) | <.001   | .327 (.018) | <.001   |
| Primary Care Visits [ref: 0 Visits] | Excluded | | |
| 1-2 visits                    | -.347 (.009) | <.001   | Reference Category | |
| 3-4 visits                    | -.425 (.011) | <.001   | -.078 (.012) | <.001   |
| 5-8 visits                    | -.324 (.011) | <.001   | .020 (.012) | .09     |
| 9+ visits                     | -.109 (.013) | <.001   | .238 (.013) | <.001   |
| Medical Inpatient Stay [ref: No Stay] | .355 (.013) | <.001   | .420 (.012) | <.001   |
| Time in years                 | .090 (.003) | <.001   | .062 (.003) | <.001   |
| Time^2 in years               | -.0016 (.0003) | <.001 | .005 (0.0004) | .23     |
| Interaction: Time X MH or SU Status [ref: no MH or SU] | | | |
| MH Only                       | -.058 (.005) | <.001   | -.053 (.005) | <.001   |
| SU Only                       | -.039 (.012) | .001    | -.047 (.012) | <.001   |
| MH and SU                     | -.087 (.008) | <.001   | -.067 (.008) | <.001   |
| Interaction: Time^2 X MH or SUH Status [ref: no MH or SUD] | | | |
| MH Only                       | .0049 (.0006) | <.001   | .0053 (.0007) | <.001   |
| SU Only                       | .0045 (.0016) | .006    | .0058 (.0017) | .001    |
| MH and SU                     | .0075 (.0011) | <.001   | .0060 (.0011) | <.001   |
| Variance Components           | | | |
| Level 1 Residual              | .882     | | .871     |
| Level 2                        | | | |
| Intercept                     | .707     | | .751     |
| Time                          | .123     | | .116     |
| Correlation                   | .259     | | .118     |
| Level 3                        | | | |
| Intercept                     | .079     | | .003     |
| Time                          | .014     | | .001     |
| Correlation                   | -.036    | | .012     |
| Fit Statistics                | | | |
| Deviance                      | -1004397 | | -666419  |
| AIC                           | 2008897  | | 1332939  |
| BIC                           | 2009493  | | 1333504  |

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eReference

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