**Online Supplement**

**Data Sources:**

**Diabetes Analytic Files:**

The diabetes analytic files were developed by CMS to identify and aggregate Medicare fee-for-service (FFS) beneficiaries likely to have diabetes, for the purposes of allowing analyses related to diabetes care and outcomes. The analytic files use information from Medicare Part A claims, Medicare Part B claims, and the enrollment database (EDB), and are updated quarterly on a rolling annual basis. These files identify Medicare beneficiaries with diabetes based on the definition described below.

The files contain last name, first name, age, race, gender, social security number (SSN), Medicare health insurance claim (HIC) number, and three indicator variables for performance of eye exams, lipid, and HbA1C tests during the time period specified for each of the files.

**Medicare Part A file (abase):**

Medicare Part A files contain hospitalization claim information for FFS beneficiaries. The dataset includes the HIC number, date of hospitalization, type of hospital claim (e.g. inpatient hospitalization vs. outpatient service) discharge date, and ICD-9 diagnoses codes.

**Claim Line Level File (arvc):**

This file has revenue center codes for line items within a claim from Medicare Part A.

**Medicare Cross Reference File:**

The Medicare cross reference file, which is supplied by CMS, allowed for the merging of prior HIC numbers with current HIC numbers, enabling merging of data from different time periods and different data abstractions.

**West Virginia (WV) Diabetes self-management education (DSME) course completion list:**

The WV QIO provided the information for beneficiaries who completed DSME in the 10th SOW. There were 965 beneficiaries who completed DSME, along with demographic information.

**Dataset for analysis**

A Medicare beneficiary with diabetes who completed DSME classes (exposure) in WV between February 2013 and June 2014 was called a, “DSME completer”. The method we used for matching the WV file of DSME completers to the diabetes analytic files (DAF) was either to use the Medicare ID which the WV team collected for 17% of the DSME or we constructed a unique ID (last name and last four digits of SSN) in the DAFs that corresponded to what was available for the rest of the WV DSME completers. We used this unique ID to merge the WV file of 965 DSME completers with the diabetes analytic files to identify the study population. In the case where there was more than one beneficiary with the same unique ID, we tried to determine the correct beneficiary by examining age and county. When there were no matches for a unique ID, we examined the beneficiary’s name, along with county and age, to try to determine if there was a typographical error in the last four digits of the SSN. There were other incidences of surnames including Jr. or Sr., in one file and not in the other. This caused other types of mismatches that we corrected, in order for the files to merge correctly.

For each DSME completer, we frequency matched four beneficiaries with diabetes from the diabetes analytic files, based on four variables: county, gender, age group, and time period. The age group variable was a categorical variable broken down as follows: age <65, 65-70, 71-75, 76-80, >80. The time period was defined as the quarter in which the DSME class was completed. For each group of DSME completers with the same county, gender, and age group, a file of potential matches was developed from the diabetes analytic file, covering the same time period and including all beneficiaries who had the same county, gender, and age group as the study population). We used Proc SurveySelect to randomly select the number of beneficiaries with diabetes needed for each combination of county, gender, age group, and time period.

We next merged the Medicare Part A claims with the claim line level file, in order to calculate hospitalization, emergency room and observation stays. For the last step, we merged the cross reference file with the Medicare Part A/claim line level file and the diabetes analytic file/DSME completer/non-DSME completer diabetes file, to link DSME participants to hospitalizations. Hospitalizations directly attributable to diabetes were identified by the following diagnosis codes:

DX 249.00, 249.01, 249.10, 249.11, 249.20, 249.21, 249.30, 249.31, 249.40, 249.41, 249.50,

249.51, 249.60, 249.61, 249.70, 249.71, 249.80, 249.81, 249.90, 249.91, 250.00, 250.01, 250.02,

250.03, 250.10, 250.11, 250.12, 250.13, 250.20, 250.21, 250.22, 250.23, 250.30, 250.31, 250.32,

250.33, 250.40, 250.41, 250.42, 250.43, 250.50, 250.51, 250.52, 250.53, 250.60, 250.61, 250.62,

250.63, 250.70, 250.71, 250.72, 250.73, 250.80, 250.81, 250.82, 250.83, 250.90, 250.91, 250.92,

250.93, 357.2, 362.01, 362.02, 362.03, 362.04, 362.05, 362.06, 366.41 (any DX on the claim).

**Table A.1: Pre- and Post- Counts and Percentages among Outcome Measures**

| **Outcomes** | **DSME Completers (N=422)** | | **Beneficiaries with Diabetes (N=1688)** | |
| --- | --- | --- | --- | --- |
|  | **Pre N (%)** | **Post N (%)** | **Pre N (%)** | **Post N (%)** |
| Admissions Counts |  |  |  |  |
| - - 0 | 342 (81.0%) | 343 (81.3%) | 1287 (76.2%) | 1257 (74.5%) |
| - - 1 | 57 (13.5%) | 55 (13.0%) | 263 (15.6%) | 263 (15.6%) |
| - - 2 | 14 ( 3.3%) | 16 ( 3.8%) | 79 ( 4.7%) | 93 ( 5.5%) |
| - - 3 | 4 ( 0.9%) | 3 ( 0.7%) | 23 ( 1.4%) | 44 ( 2.6%) |
| - - 4 | 3 ( 0.7%) | 4 ( 0.9%) | 17 ( 1.0%) | 12 ( 0.7%) |
| - - 5+ | 2 ( 0.5%) | 1 ( 0.2%) | 19 ( 1.1%) | 19 ( 1.1%) |
| ED Visits |  |  |  |  |
| - - 0 | 310 (73.5%) | 295 (69.9%) | 1164 (69.0%) | 1124 (66.6%) |
| - - 1 | 66 (15.6%) | 74 (17.5%) | 310 (18.4%) | 300 (17.8%) |
| - - 2 | 26 ( 6.2%) | 29 ( 6.9%) | 105 ( 6.2%) | 140 ( 8.3%) |
| - - 3 | 6 ( 1.4%) | 12 ( 2.8%) | 51 ( 3.0%) | 58 ( 3.4%) |
| - - 4 | 7 ( 1.7%) | 7 ( 1.7%) | 20 ( 1.2%) | 27 ( 1.6%) |
| - - 5+ | 7 ( 1.7%) | 5 ( 1.2%) | 38 ( 2.3%) | 39 ( 2.3%) |
| Obs Visits |  |  |  |  |
| - - 0 | 385 (91.2%) | 380 (90.0%) | 1542 (91.4%) | 1480 (87.7%) |
| - - 1 | 30 ( 7.1%) | 38 ( 9.0%) | 129 ( 7.6%) | 174 (10.3%) |
| - - 2 | 5 ( 1.2%) | 3 ( 0.7%) | 10 ( 0.6%) | 29 ( 1.7%) |
| - - 3 | 1 ( 0.2%) | 0 ( 0.0%) | 3 ( 0.2%) | 4 ( 0.2%) |
| - - 4 | 1 ( 0.2%) | 1 ( 0.2%) | 4 ( 0.2%) | 0 ( 0.0%) |
| - - 5+ | 0 ( 0.0%) | 0 ( 0.0%) | 0 ( 0.0%) | 1 ( 0.1%) |
| All Hospital Encounters |  |  |  |  |
| - - 0 | 258 (61.1%) | 244 (57.8%) | 930 (55.1%) | 882 (52.3%) |
| - - 1 | 82 (19.4%) | 85 (20.1%) | 360 (21.3%) | 335 (19.8%) |
| - - 2 | 39 ( 9.2%) | 44 (10.4%) | 171 (10.1%) | 172 (10.2%) |
| - - 3 | 11 ( 2.6%) | 18 ( 4.3%) | 74 ( 4.4%) | 119 ( 7.0%) |
| - - 4 | 12 ( 2.8%) | 15 ( 3.6%) | 59 ( 3.5%) | 67 ( 4.0%) |
| - - 5+ | 20 ( 4.7%) | 16 ( 3.8%) | 94 ( 5.6%) | 113 ( 6.7%) |
| Admissions related to Diabetes |  |  |  |  |
| - - 0 | 418 (99.1%) | 420 (99.5%) | 1668 (98.8%) | 1674 (99.2%) |
| - - 1 | 3 ( 0.7%) | 2 ( 0.5%) | 19 ( 1.1%) | 13 ( 0.8%) |
| - - 2 | 1 ( 0.2%) | 0 ( 0.0%) | 1 ( 0.1%) | 1 ( 0.1%) |
| ED Visits related to Diabetes |  |  |  |  |
| - - 0 | 415 (98.3%) | 416 (98.6%) | 1669 (98.9%) | 1664 (98.6%) |
| - - 1 | 6 ( 1.4%) | 5 ( 1.2%) | 17 ( 1.0%) | 22 ( 1.3%) |
| - - 2 | 1 ( 0.2%) | 1 ( 0.2%) | 0 ( 0.0%) | 1 ( 0.1%) |
| - - 3 | 0 ( 0.0%) | 0 ( 0.0%) | 1 ( 0.1%) | 1 ( 0.1%) |
| - - 6 | 0 ( 0.0%) |  | 1 ( 0.1%) |  |
| Obs Visits related to Diabetes |  |  |  |  |
| - - 0 | 421 (99.8%) | 422 ( 100%) | 1683 (99.7%) | 1677 (99.3%) |
| - - 1 | 1 ( 0.2%) | 0 ( 0.0%) | 5 ( 0.3%) | 11 ( 0.7%) |
| All Hospital Encounters related to Diabetes |  |  |  |  |
| - - 0 | 411 (97.4%) | 414 (98.1%) | 1647 (97.6%) | 1647 (97.6%) |
| - - 1 | 9 ( 2.1%) | 7 ( 1.7%) | 37 ( 2.2%) | 32 ( 1.9%) |
| - - 2 | 1 ( 0.2%) | 1 ( 0.2%) | 2 ( 0.1%) | 7 ( 0.4%) |
| - - 3 | 1 ( 0.2%) | 0 ( 0.0%) | 0 ( 0.0%) | 1 ( 0.1%) |
| - - 4 | 0 ( 0.0%) | 0 ( 0.0%) | 2 ( 0.1%) | 1 ( 0.1%) |

**Table A.2: West Virginia 10th SOW EDC program Cost Saving**

| **Label** | **DSME Completers** | | | **Non-DSME Completers** | | | **Cost Saving** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Pre** | **Post** | **% Change** | **Pre** | **Post** | **% Change** | **Average Cost per stay** | **Reductions** | **Savings** |
| Admissions | 121 | 119 | (1.7%) | 675 | 747 | 10.7% | $10,101 | 15 | $151,515 |