**Methods**

*Overview*

x

*Data Sources*

We drew from five data primary sources. First, we use annual reports from the Center of Medicare & Medicaid Services (CMS) to collect state-level enrollment numbers for Medicaid and Medicare from 2004 to 2020. Second, we use the Behavioral Risk Factor Surveillance System (BRFSS) from the Centers for Disease Control and Prevention to estimate the proportion of individuals in each program with type 2 diabetes. Third, we use the National Drug Code Directory (NDCD) from the Food & Drug Administration to flag SGLT-2 and GLP-1 NDC codes. Finally, we use the State Drug Utilization Data (SDUD) and the Medicare Part D Prescribers dataset both made available by CMS, which provided state-by-year drug utilization numbers.

**Variables**

*Number of Enrollees with Type 2 Diabetes*

To estimate the number of enrollees with type 2 diabetes we used the first two primary data sources. First, we used the annual reports which benchmark Medicaid and Medicare enrollment in June for each year at a state-level. Next, we used the BRFSS to calculate the percent of enrollees with type 2 diabetes in each program. Because the BRFSS lacks program indicators, we estimate Medicaid and Medicare eligibility by using household size, income, age, state of residence, along with federal poverty lines and expansion status of the state’s Medicaid program. Respondents were considered to have type 2 diabetes if they were older than 30, not pregnant, and reported to have diabetes.

*GLP-1 and SGLT-2 Utilization*

To calculate GLP-1 and SGLT-2 utilization we used the NDCD, the SDUD, and the Medicare Part D Prescribers dataset. First, we used the pharmaceutical class variable NDCD to select all GLP-1 and SGLT-2 NDCs and proprietary names. Then we used publicly available days supplied counts by NDC to calculate the days supplied by each of the GLP-1s and SGLT-2s. Next, we used the list of NDCs, proprietary names, and days supplied to subset the Medicaid and Medicare utilization data. Because the Medicare Part D Prescribers dataset does not contain NDC codes, we selected relevant observations in both datasets using proprietary names. Medicare Part D Prescribers dataset includes the number of 30-day refills supplied, which we multiplied by 30 to create days supplied. The SDUD is merged to our days supplied crosswalk and filtered to dosages that we consider 30-day refills. An NDC is considered a 30-day refill if the days supplied are a multiple of 30. Lastly, we divide these utilization numbers by the prior type 2 diabetes estimates to create utilization rates.

**Result**

A picture containing toy

Description automatically generated

Chart, line chart

Description automatically generated

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table 1: Program Qualities by Quintile of Rate (2013-2019) | | | | | |
| **Variable** | **Top Quintile** | **Second Quintile** | **Third Quintile** | **Fourth Quintile** | **Bottom Quintile** |
| **Medicaid** |  |  |  |  |  |
| **Rate of Days Supplied per 1000 Enrollees (GLP-1 & SGLT-2)** | 4851.27 (2913.91) | 3015.52 (1879.55) | 2023.61 (1265.03) | 1316.58 (849.72) | 604.84 (523.54) |
| **Population of Program** | 209924.67 (285114.79) | 109967.2 (164785.28) | 137551.05 (141628.2) | 152790.84 (195932.59) | 104515.87 (91039.55) |
| **Percent Diabetic in Program** | 9.92 (2.44) | 10.34 (2.15) | 10.68 (2.27) | 10.59 (2.6) | 11.81 (2.32) |
| **Medicare** |  |  |  |  |  |
| **Rate of Days Supplied per 1000 Enrollees (GLP-1 & SGLT-2)** | 17454.61 (9849.54) | 15000.36 (8666.71) | 13083.49 (7852.09) | 11684.06 (7207.02) | 9559.49 (6140.84) |
| **Population of Program** | 275157.3 (225669.69) | 241176.22 (248919.28) | 303782.49 (341169.92) | 208194.27 (224878.24) | 158641.36 (185623.53) |
| **Percent Diabetic in Program** | 21.26 (2.69) | 22.2 (3.05) | 21.4 (3.04) | 20.58 (2.81) | 20.09 (2.29) |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table 1: Days Supplied Per 1000 Eligible Enrollees (GLP-1 & SGLT-2) | | | | | |
| **Year** | **Top Quintile** | **Second Quintile** | **Third Quintile** | **Fourth Quintile** | **Bottom Quintile** |
| **2013** | 3597.81 (2064.19) | 2753.84 (1889.92) | 2218.54 (1684.32) | 1890.71 (1573.7) | 1406.07 (1326.03) |
| **2014** | 4795.36 (3002.26) | 3737.27 (2783.57) | 3096.22 (2485.01) | 2587.69 (2172.84) | 1875.22 (1833.83) |
| **2015** | 7440.75 (4701.5) | 5819.38 (4187.83) | 4871.97 (3713.86) | 4115.72 (3348.16) | 3009.78 (2853.54) |
| **2016** | 10084.3 (6106.52) | 8008.91 (5569.89) | 6534.64 (4860.48) | 5460.46 (4395.28) | 4221.54 (3853.85) |
| **2017** | 13747.77 (7216.39) | 10870.87 (7149.17) | 8972.25 (6634.71) | 7693.46 (6324.62) | 6278.32 (5755.86) |
| **2018** | 16842.38 (8764.92) | 13529.07 (8902.85) | 11282.9 (8439.22) | 9934.55 (8172.25) | 7877.62 (7178.14) |
| **2019** | 21844.82 (14573.03) | 18336.22 (12689) | 15898.33 (11990.9) | 13819.66 (11350.12) | 10906.62 (9853.33) |