Title: Telehealth Utilization for Diabetes Care Among Individuals with Medicare and Medicaid Coverage

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Research Objectives: This project examined the differences between native and non-native coding by comparing results of a study on diabetes using Medicaid and Medicare claims in native (ICD-10-CM) and the newly transformed (SNOMED-CT) format. Telehealth utilization among identified diabetes cases served as the use case and survival was included as an outcome.

Study Design and Methods:

First, we conducted a cross-sectional analysis using 2018-2020 sample of encounters from Medicare and Transformed Medicaid Statistical Information System (T-MSIS) claims data. We used 753 ICD-9-CM and ICD-10-CM diagnostic codes to identify individuals with diabetes. Second, we transformed diabetic cohort into the new SNOMED vocabulary by using the Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM). The OMOP Athena tool was used for mapping to SNOMED-CT.

'Survival' status was defined based on date of death. Cases who had at least one telehealth visit were assigned "telehealth-ever user" while those without any telehealth visits were considered "telehealth-never user".

We used descriptive statistics including stratification and significance tests to compare the findings from using the data in different formats.

Population Studied

Using 562,735,758 diabetes-qualifying diagnostic events in Medicare and Medicaid claims, we identified 24,693,384 diabetes cases across 172 million individuals from 01/2018 through 12/2020. Of 24 million diabetes cases, 961,882 had a telehealth claim at least once and 2,906,053 deaths were observed.

Principal Findings

SNOMED-CT mapping within table aggregation returned 142 distinct diagnostic codes, while ICD10-CM offered 259 diabetes codes. SNOMED-CT produced 503,048 aggregate patient volume records while ICD10-CM produced 627,219 records. We assessed 13,094 diagnostic aggregates and found telehealth ever and deceased cases had smaller diagnostic breadths than their corollaries.

Of the total cases, 14.6% were diabetic and 3.8% used telehealth. We detected an exponential increase in telehealth utilization within diabetes claims over the study period with monthly distinct case telehealth utilization ranging from 2,109 to 261,627. Patients using some telehealth were less likely to die in 2020 (4.6% vs. 5.7%).

Conclusions

We successfully identified a patient cohort with diabetes and assessed telehealth utilization using the transformed Medicare and T-MSIS to OMOP CDM which can enable more rapid analysis of telehealth utilization. The study found increasing telehealth utilization among individuals with diabetes and differences in survival and breadth of illness between telehealth-ever users vs. telehealth-never users.

SNOMED-CT mapping reduces the diagnostic diversity of case observation while maintaining detection of key study features including survival and service disambiguation. SNOMED-CT mapping of claims is a step towards interoperability between EHRs and claims and their use for data linkages, longitudinal studies and comparative effectiveness research on health care services utilization and outcomes.

Implications for Policy or Practice

Mapping claims data to new vocabularies (I.e., SNOMED-CT) will facilitate interoperability and data aggregation through linkages with electronic health records (EHRs) thereof. This kind of linked data affords complex longitudinal studies on chronic conditions like diabetes and studying the impact of telehealth that better inform policy making about health care services that different populations with health conditions can benefit from receiving.

Figure 1. Diagnostic breadth (distinct codes) by vocabulary (Y axis) by birth year for Diabetic cases who ever used Telehealth disaggregated by survival status.