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## Title

Factors Associated with Accumulating Diabetes Complications in a Medicare Advantage Cohort to Inform a Prediction Tool

# Priority 1 (Research Category)

Diabetes and endocrine disease

#### Presenters

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# Abstract

Context: Complications contribute to significant type 2 diabetes mellitus (T2DM) morbidity. While preventable, many fail to receive timely treatment in primary care, leading the most vulnerable to accumulate complications.

Objective: To identify the factors associated with the accumulation of T2DM complications

Study Design and Analysis: In this cohort study, we assessed the factors associated with the Diabetes Complications Severity Index (DCSI; which captures the number and severity of complications).

Population Studied: Adults aged 65 years and older with T2DM enrolled in a national Medicare Advantage plan

Setting or Dataset: Enrollment and claims data (2016-2020)

Measures: The dependent variable was DCSI. Independent variables included year, demographics (age, sex, race/ethnicity, language, dual eligibility), geography (rural vs. non-rural), comorbidities (Charlson Comorbidity Index (CCI) and Functional Comorbidity Index (FCI)), utilization, and quality measures. We used multilevel mixed effects models with a progressively expanding set of variables, including demographics (model 1), comorbidities (model 2), utilization (model 3), and quality measures (model 4).

Results: We included 49,843 individuals in model 1. All four models showed a consistent relationship between year (incidence rate ratio (IRR)=1.30, p<0.001, 2020 vs. 2016, model 1), sex (IRR=0.85, p<0.001, female vs. male, model 1), race / ethnicity (IRR=1.05, p<0.001, Black vs. white, model 1), dual eligibility (IRR=1.26, p<0.001 yes vs. no), and rurality (IRR=0.90, p<0.001, yes vs. no, model 1). In model 2, CCI (IRR=1.18, p<0.001) and FCI (IRR=1.08, p<0.001) were associated with higher DCSI. In model 3, emergency department visits (IRR=1.002, p=0.01) were associated with higher DCSI while physician visits (IRR=0.998, p<0.001) were associated with lower DCSI. In model 4, not meeting the quality measure for blood pressure (a target blood pressure that is less than 140/90) was associated with higher DCSI (IRR=1.08, p<0.001), while meeting the quality measures for LDL cholesterol and hemoglobin A1c were not associated with DCSI.

Conclusions: Year, male sex, race / ethnicity, non-rural status, comorbidities, emergency department visits, and not meeting the quality measure for blood pressure were associated with higher DCSI. These results will inform a primary care tool that uses artificial intelligence/machine learning to predict those individuals at high risk for diabetes progression.

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