Equity Measure Domain: Clinical Outcomes

30-day Readmissions for Patients with Diabetes

Description:

Patients with diabetes are at increased risk of being readmitted to the hospital within 30 days of care. Their risk is further increased if they are of non-white race.[1]

Measure: Percent of patients with diabetes (defined in appendix below) who are readmitted to an NC hospital within 30 days of discharge, stratified by race and ethnicity.

> Numerator: Number of patients with a primary diagnosis of diabetes who are readmitted within 30 days of hospitalization.

> Denominator: Number of patients with a primary diagnosis of diabetes who have been hospitalized.

Source: NCHA Patient Data System (PDS) - All hospitals and Ambulatory Surgical Centers in North Carolina submit pre-adjudicated claims data to the Patient Data System on a quarterly basis in accordance with the NC Medical Care Act. Through its partnership with providers, NC DHHS and the State Certified Data Processor, the Hospital Industry Data Institute (HIDI), NCHA may use the compiled database to provide aggregate analyses of health system utilization.

Rationale for measure selection:

Diabetes is a complex group of diseases marked by high blood glucose (blood sugar) due to the body's inability to make or use insulin. Left unmanaged, diabetes can lead to serious complications, including heart disease, stroke, hypertension, blindness, kidney disease, diseases of the nervous system, amputations, and premature death. Proper diabetes management is essential to control blood glucose, reduce risks for complications and prolong life.[2]

37.1 million adults aged 18 years or older—or 14.7% of all US adults—had diabetes [in 2019].[3]

Differences in utilization and in health outcomes by race in North Carolina are notable. By tracking performance by race and ethnicity, trends related to these differences will be highlighted. Health systems can structure their quality improvement efforts to identify and address the underlying causes of disparities.

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1 Rodriguez-Gutierrez R, et al, Accessed at: Diabetes and Endocrinology. https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2752820

2 National Committee for Quality Assurance (NCQA), Accessed at: https://www.ncqa.org/hedis/measures/comprehensive-diabetes-care/

3 Centers for Disease Control and Prevention, Accessed at: https://www.cdc.gov/diabetes/data/statistics-report/diagnosed-undiagnosed-diabetes.html

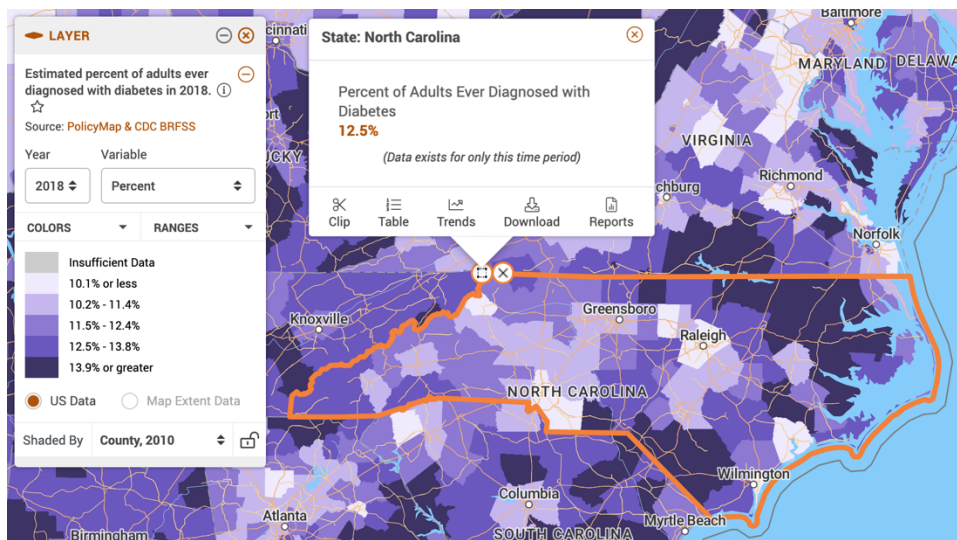Figure 1: Estimated percent of adults ever diagnosed with Diabetes
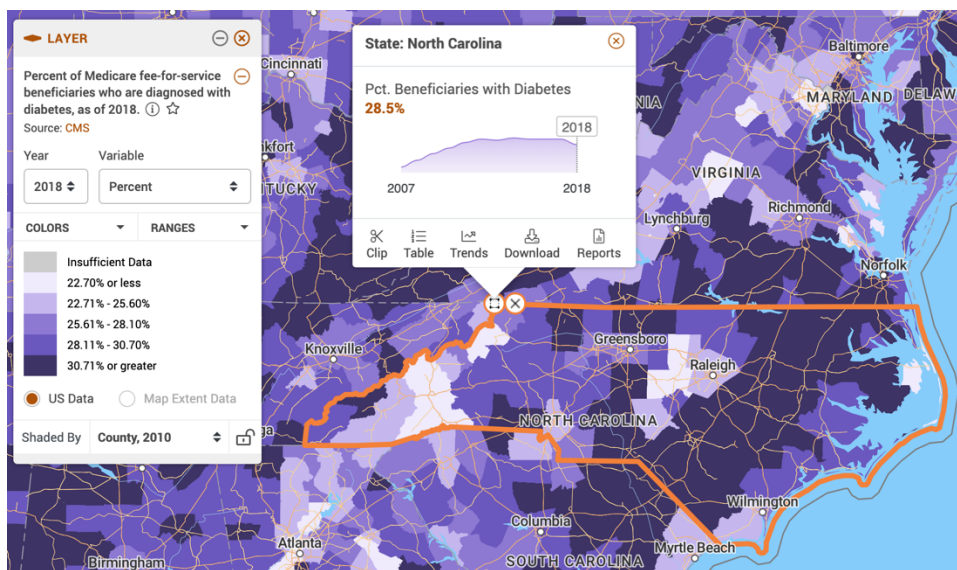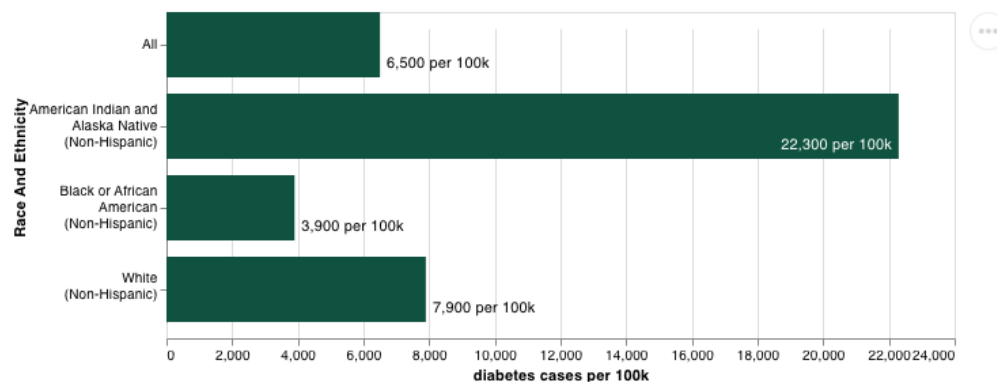

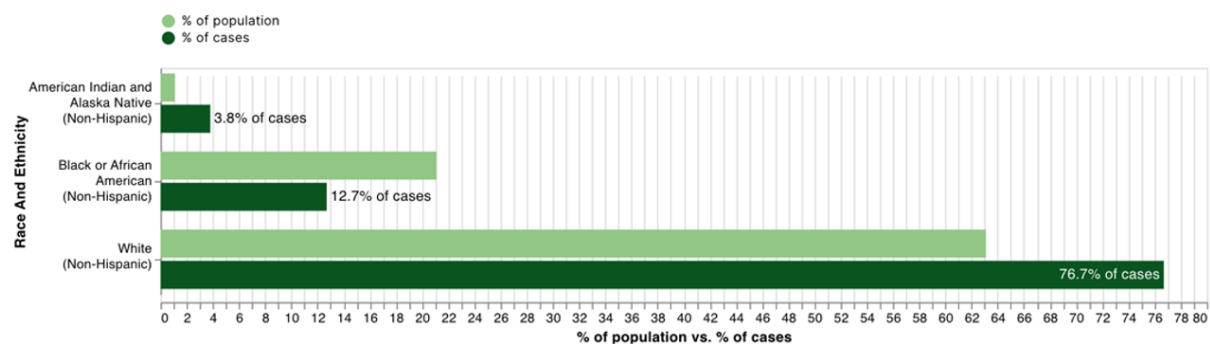Figure 2: Medicare beneficiaries diagnosed with Diabetes

Figure 3

Diabetes Cases Per 100k People By Race And Ethnicity In North Carolina

Sources: America's Health Rankings (updated 2021) and American Community Survey 5-year estimates (updated 2019).

Figure 4

Share of Total Diabetes Cases vs. Population By Race And Ethnicity In North Carolina

Sources: America's Health Rankings (updated 2021) and American Community Survey 5-year estimates (updated 2019).

In the North Carolina population, there are more people who have diabetes among white, American Indians and Alaskan Natives race groups. For American Indians, the total share of total diabetes cases is more than double the national rate. For people who are Black in NC, the rate is lower than national, and white slightly higher than the national rate.[4]

However, hospitalization and readmission for diabetes are not equally distributed among the groups with diabetes across the population. This reflects differences in ongoing care for chronic illness in the community and in the hospital setting.

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4 Health Equity Tracker, Satcher Health Leadership Institute. Morehouse School of Medicine. Accessed at: https://healthequitytracker.org.

Figure 5

Share of Total Diabetes Hospital Utilization Vs. Population By Race, NC 2021
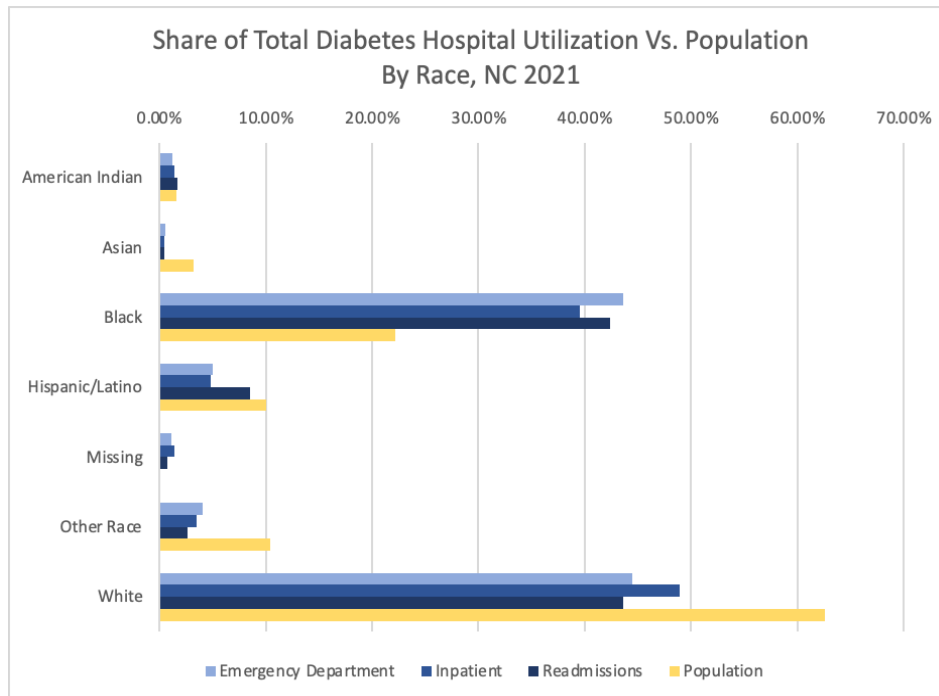
American Indians make up 1.6% of the population, but have 3.8% of diabetes cases, and average 2% of hospital utilization. People of Black race make up 22.2% of the population, have 12.7% of diabetes cases, and average 43% of hospitals utilization. People of white race make up 62.6% of the population, have 76.7% cases, and average 49% of hospital utilization.
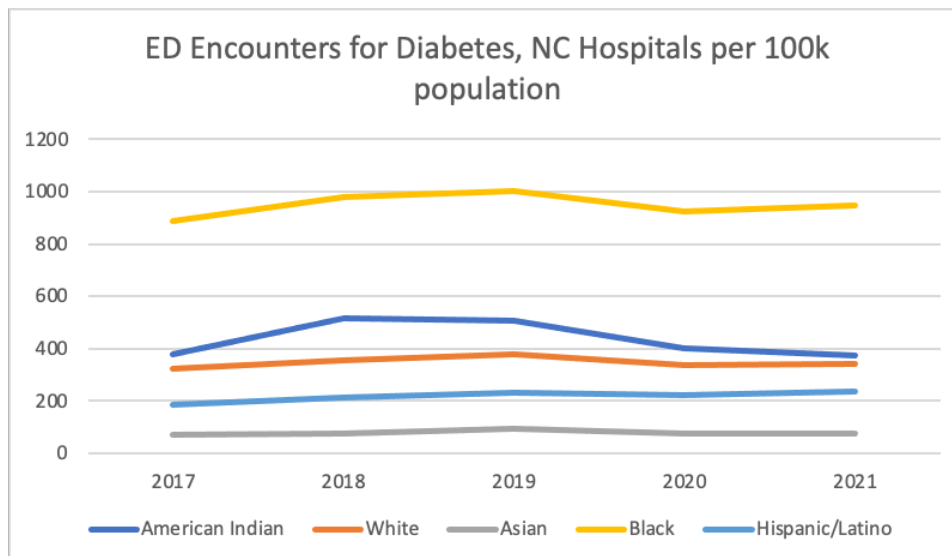
Figure 6

ED Encounters for Diabetes, NC Hospitals per 100k population

Figure 7: Inpatient hospitalizations per 100,000 population

IP Discharges for Diabetes, NC Hospitals per 100k population

Legend: American Indian, White, Asian, Black, Hispanic/Latino
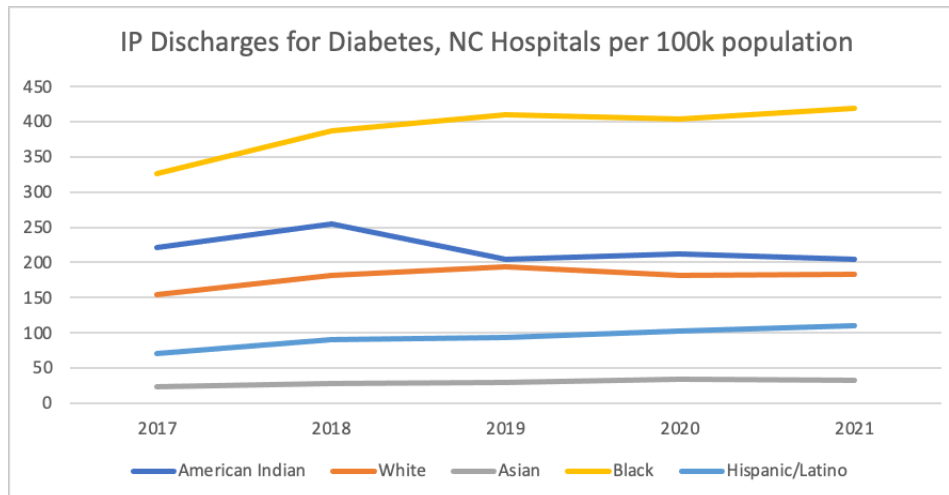
Figure 8: Readmissions per 100,000 population

Readmissions Among Patients with Diabetes to NC Hospitals per 100k population

Legend: American Indian, Asian, Black, White, Hispanic/Latino
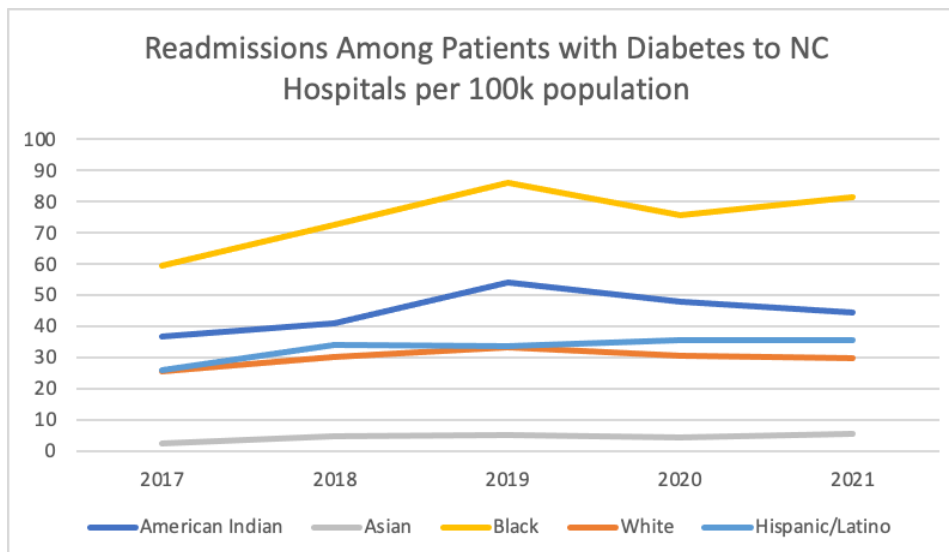
Annotated citations:

Ostling, S., Wyckoff, J., Ciarkowski, S.L. *et al.* The relationship between diabetes mellitus and 30-day readmission rates. *Clin Diabetes Endocrinol* 3, 3 (2017). https://doi.org/10.1186/s40842-016-0040-x

> Patients with both a primary or secondary diagnosis of DM have higher readmission rates. The reasons for readmission vary; patients with a principal diagnosis of DM have more DM related readmissions and those with secondary diagnosis having more infection-related readmissions.

Rodriguez-Gutierrez R, Herrin J, Lipska KJ, Montori VM, Shah ND, McCoy RG. Racial and Ethnic Differences in 30-Day Hospital Readmissions Among US Adults With Diabetes. JAMA Netw Open. 2019 Oct 2;2(10):e1913249. doi: 10.1001/jamanetworkopen.2019.13249. PMID: 31603490; PMCID: PMC6804020.

> A total of 467 324 index hospitalizations among 272 758 adults with diabetes (mean [SD] age, 67.7 [12.7]; 143 498 [52.6%] women) were examined. The rates of 30-day all-cause readmission were 10.2% (33 683 of 329 264) among White individuals, 12.2% (11 014 of 89 989) among Black individuals, 10.9% (4151 of 38 137) among Hispanic individuals, and 9.9% (980 of 9934) among Asian individuals (P < .001).

> Results: In this study, Black patients with diabetes had a significantly higher risk of readmission than members of other racial/ethnic groups. This increased risk was most pronounced among lower-income patients hospitalized in nonprofit, academic, or large hospitals.

Soh, J., Wong, W. P., Mukhopadhyay, A., Quek, S. C., & Tai, B. C. (2020). Predictors of 30-day unplanned hospital readmission among adult patients with diabetes mellitus: a systematic review with meta-analysis. *BMJ open diabetes research & care*, *8*(1), e001227. https://doi.org/10.1136/bmjdrc-2020-001227

> Belonging to the White race had a protective effect on 30- day hospital readmission suggesting health disparities between major and minor (non-White) ethnic groups. Generally, Black and Hispanic patients have been reported to receive less effective health services including diabetes monitoring than White patients.

Schpero WL, Morden NE, Sequist TD, Rosenthal MB, Gottlieb DJ, Colla CH. For Selected Services, Blacks And Hispanics More Likely To Receive Low-Value Care Than Whites. Health Aff (Millwood). 2017 Jun 1;36(6):1065-1069. doi: 10.1377/hlthaff.2016.1416. PMID: 28583965; PMCID: PMC5568010.

> For selected services, Blacks and Hispanics more likely to receive low- value care than Whites.

CSC data:

https://gis.cdc.gov/grasp/diabetes/DiabetesAtlas.html

With social vulnerability index: https://www.atsdr.cdc.gov/placeandhealth/svi/index.html

Appendix, codes:

Diagnosis codes defining patients with diabetes:[ii]

E10.10, E10.11, E10.21, E10.22, E10.29, E10.311, E10.319,

E10.3211, E10.3212, E10.3213, E10.3219, E10.3291, E10.3292, E10.3293, E10.3299, E10.3311,E10.3312, E10.3313, E10.3319, E10.3391, E10.3392, E10.3393, E10.3399, E10.3411, E10.3412,E10.3413, E10.3419, E10.3491, E10.3492, E10.3493, E10.3499, E10.3511, E10.3512, E10.3513,E10.3519, E10.3521, E10.3522, E10.3523, E10.3529, E10.3531, E10.3532, E10.3533, E10.3539, E10.3541, E10.3542, E10.3543, E10.3549, E10.3551, E10.3552, E10.3553, E10.3559, E10.3591, E10.3592, E10.3593, E10.3599, E10.36, E10.37X1, E10.37X2, E10.37X3, E10.37X9, E10.39, E10.40, E10.41, E10.42, E10.43, E10.44, E10.49, E10.51, E10.52, E10.59, E10.610, E10.618, E10.620, E10.621,

E10.622, E10.628, E10.630, E10.638, E10.641, E10.649, E10.65, E10.69, E10.8, E10.9, E11.00, E11.01, E11.21, E11.22, E11.29, E11.311, E11.319, E11.3211, E11.3212, E11.3213, E11.3219, E11.3291, E11.3292, E11.3293, E11.3299, E11.3311, E11.3312, E11.3313, E11.3319, E11.3391, E11.3392, E11.3393, E11.3399, E11.3411, E11.3412, E11.3413, E11.3419, E11.3491, E11.3492, E11.3493, E11.3499, E11.3511, E11.3512, E11.3513, E11.3519, E11.3521, E11.3522, E11.3523, E11.3529, E11.3531, E11.3532, E11.3533, E11.3539, E11.3541, E11.3542, E11.3543, E11.3549, E11.3551, E11.3552, E11.3553, E11.3559, E11.3591, E11.3592, E11.3593, E11.3599, E11.36, E11.37X1, E11.37X2, E11.37X3, E11.37X9, E11.39, E11.40, E11.41, E11.42, E11.43, E11.44, E11.49, E11.51, E11.52, E11.59, E11.610, E11.618, E11.620, E11.621, E11.622, E11.628, E11.630, E11.638, E11.641, E11.649, E11.65, E11.69, E11.8, E11.9, E13.00, E13.01, E13.10, E13.11, E13.21, E13.22, E13.29, E13.311, E13.319, E13.3211, E13.3212, E13.3213, E13.3219, E13.3291, E13.3292, E13.3293, E13.3299, E13.3311, E13.3312, E13.3313, E13.3319, E13.339, E13.3391, E13.3392, E13.3393, E13.3399, E13.3411, E13.3412, E13.3413, E13.3419, E13.3491, E13.3492, E13.3493, E13.3499, E13.3511, E13.3512, E13.3513,

E13.3519, E13.3521, E13.3522, E13.3523, E13.3529, E13.3531, E13.3532, E13.3533, E13.3539, E13.3541, E13.3542, E13.3543, E13.3549, E13.3551, E13.3552, E13.3553, E13.3559, E13.3591, E13.3592, E13.3593, E13.3599, E13.36, E13.37X1, E13.37X2, E13.37X3, E13.37X9, E13.39, E13.40, E13.41, E13.42, E13.43, E13.44, E13.49, E13.51, E13.52, E13.59, E13.610, E13.618, E13.620, E13.621, E13.622, E13.628, E13.630, E13.638, E13.641, E13.649, E13.65, E13.69, E13.8, E13.9, O24.011, O24.012, O24.013, O24.019, O24.02, O24.03, O24.111, O24.112, O24.113, O24.119, O24.12, O24.13,

O24.311, O24.312, O24.313, O24.319, O24.32, O24.33, O24.811, O24.812, O24.813, O24.819, O24.82, O24.83