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### Partnered rapid research with K-12 school districts during the COVID-19 pandemic

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**OBJECTIVES/GOALS:** During the COVID-19 pandemic, translational scientists sought to provide scientific and data expertise to school districts serving diverse and disadvantaged students to enable equitable access to in-person learning. **METHODS/STUDY POPULATION:** We showcase two CTSA examples. One is a partnership with the second largest U.S. school district; the second is a national network of scientists and urban and rural school districts. In each example, CTSA assembled expert science teams to support data-driven decision-making. The teams provided honest brokering of COVID-19 science, scientific interpretation that is sensitive to local context, and responses to community-driven questions. The teams collaborated with school district partners to design actionable data displays on key metrics including primary COVID-19 cases, school-acquired cases, quarantines, and missed school. The national ABC Science Collaborative) provided a platform for shared learning and reproducibility and credibility of science using district data. **RESULTS/ANTICIPATED RESULTS:** The CTSA developed easily interpretable and actionable data displays. Partnered school districts observed data in real time to identify signals of change. Districts in the national network were able to learn in real time from variation across districts based on policies and procedures that they adopted, such as quarantine, masking, and physical distancing. **DISCUSSION/SIGNIFICANCE:** This scientific collaboration is a model of rapid CTSA response, informing science and real-time action. The data displays enable school districts to explain decisions regarding student and staff health and safety. These partnerships and data designs are infrastructure that can be quickly mobilized for emergent and for ongoing information needs.

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### Patient Engagement in Diabetes Care: Missed Appointments Among Adults Living with Type 2 Diabetes\*

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**OBJECTIVES/GOALS:** Missed appointments (MAs) negatively impact the health outcomes of adults living with type 2 diabetes mellitus (T2DM), causing disruptions in clinic operation and added financial cost to healthcare providers and systems. This study aimed to identify risk factors for MAs in both in-person and telehealth settings among adults living with T2DM. **METHODS/STUDY POPULATION:** Using a sequential multi-method design guided by the modified Quality-Caring Model, the quantitative phase of this study used electronic health records (EHR) data in Calendar Years 2019 and 2020 with 7,276 encounters made by 2,235 patients with T2DM from four diabetes clinics within a tertiary academic medical

center in Baltimore, MD. Multivariable random effect logistic regression were used to examine the association between MAs and included predictors (i.e., patient characteristics [e.g., age, race, health status], health provider factors [e.g., types of provider], and health system factors [e.g., scheduling lag]). Based on the results of the quantitative phase, a purposive sample of 23 adults with T2DM and 10 providers were then interviewed individually via phone or zoom. **RESULTS/ANTICIPATED RESULTS:** The EHR data found that the following variables decreased the odds of MAs: having an activated patient portal account, patients with age over 46 or with white race. Telehealth was associated with 50% decreased odds of MAs during COVID (after 3/23/2020). On the other hand, longer scheduling lag increased the odds of MAs. Qualitative interviews revealed that MAs were often related to social needs, such as lack of/limited health-related transportation and its associated financial burden. Telehealth helped break these barriers for some adults with T2DM, but technical challenges in telehealth persisted for those with low digital health literacy and people who did not have a digital device and/or with unstable internet connection. Providers worried that these challenges might undermine the quality of diabetes care. **DISCUSSION/SIGNIFICANCE:** Disparities in MAs by age and race were noted, which might reflect the impact of unmeasured social needs in EHR. Perceived convenient telehealth may reduce MAs in T2DM care. However, the persistent technical challenges of telehealth should be addressed to optimize the quality of diabetes care and to promote care continuity for underserved populations.

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### Patients without health insurance and experiencing food insecurity are more likely to suffer from anxiety and depression—a cross-sectional study at a Milwaukee student-run free clinic

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**OBJECTIVES/GOALS:** At the Saturday Clinic for the Uninsured (SCU), a Milwaukee student-run free clinic affiliated with the Medical College of Wisconsin, we screened patients for food insecurity and evaluated associations of food security status with nine separate social determinants of health (SDOH) needs and eight chronic medical conditions influenced by diet. **METHODS/STUDY POPULATION:** This cross-sectional study took place from October 2021-April 2022 at SCU, which only sees uninsured patients. We added the USDA six-item food insecurity form to the clinic's larger SDOH survey, which screens for medication financing, housing stability, energy assistance, legal issues, educational/work opportunities, substance use, mental health, health insurance options, and dental care needs. We then completed chart review for demographic, diagnostic, lab, and medication information pertaining to obesity, hypertension, diabetes, dyslipidemia, chronic kidney disease (CKD), gastroesophageal reflux disease (GERD), anxiety, and depression. We conducted descriptive statistics on demographics and measured associations using both Kendall's tau correlation and odds ratios from binomial regression. **RESULTS/ANTICIPATED RESULTS:** Of the 157 patients seen during this time, most were middle-aged (mean age = 49.4 years ± 14.5 years), female (n = 98, 62.4%), Black or African American (n = 66, 42%) and resided in Milwaukee County (n = 144, 92.9%). 22 (16%) screened as

food insecure and had greater odds and positively correlated with needing resources for medication financing (OR = 7.28,  $I^2 = 0.33$ ), housing (OR = 129.99,  $I^2 = 0.28$ ), energy assistance (OR = 3.94,  $I^2 = 0.2$ ), mental health (OR = 4.54,  $I^2 = 0.28$ ), insurance (OR = 2.86,  $I^2 = 0.18$ ), and dental care (OR = 3.65,  $I^2 = 0.28$ ), but not legal concerns, education/work opportunities, or substance use. Food insecure patients had higher odds and positively correlated with having anxiety (OR = 3.26,  $I^2 = 0.23$ ) or depression (OR = 2.88,  $I^2 = 0.19$ ), but not obesity, hypertension, diabetes, dyslipidemia, CKD, or GERD. DISCUSSION/SIGNIFICANCE: Patients without health insurance and experiencing food insecurity were more likely to have multiple SDOH needs and mental health diagnoses. Risk factors separate from food security status may explain associations with other chronic medical conditions, including uninsured status, socioeconomic status, eating behaviors, or food accessibility.

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### Perceived Needs and Access to Community-based Dementia Resources in the Rural Deep South

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OBJECTIVES/GOALS: The goal of this project is to investigate dementia caregivers' needs, barriers to access, and current utilization of community-based dementia-care services in Alabama, and how these vary across rural/urban settings and racial groups. METHODS/STUDY POPULATION: We partnered with Marketry Inc. to recruit and conduct interviews among three groups: dementia caregivers, healthcare providers, and aging services representatives. We recruited caregivers from dementia support groups and aging services in 2 rural and 2 urban Alabama counties. Purposive and snowball sampling was used to recruit healthcare providers and aging services representatives. Interviews were conducted by trained Marketry staff, recorded, and transcribed verbatim. Rapid content analysis was conducted by three investigators using the Social Determinants of Health as a coding framework to assess patterns in barriers and facilitators to utilizing community-based dementia resources. RESULTS/ANTICIPATED RESULTS: We interviewed 5 healthcare providers, 32 caregivers, and 15 aging services representatives. Providers thought that the process of memory loss care is not streamlined and they lack key information necessary to fulfill their role. Caregivers expressed a need for more dementia education, social connection, and access to financial resources. Aging services agencies need more funding and volunteers to sustain community-based dementia services. Dementia resources, like memory clinics, were more available in urban than in rural counties. African-American caregivers mentioned a reluctance to accept outside help for taking care of their loved ones with dementia, potentially due to distrust. DISCUSSION/SIGNIFICANCE: There is a need for more accessible dementia services in rural AL and a need to build service trust and familiarity, especially among African-American caregivers. Future research should develop tools for providers and caregivers to start conversations and increase awareness of service availability.

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### Perceptions of the COVID-19 Pandemic on Social, Mental, and Physical Health of Native American and Latino Communities

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OBJECTIVES/GOALS: The COVID-19 pandemic impacted health systems and exposed disparities in access to health care among underserved populations. We examined how the pandemic shaped social, mental, and physical health among Native American and Latino communities in rural and underserved areas. METHODS/STUDY POPULATION: Using Theory of Planned Behavior, Social Cognitive Theory, and Social Contextual Factor frameworks, we developed interview guides to examine perceptions of the COVID-19 pandemic on social, mental, and physical health among community members. Stakeholders of the Confederated Salish and Kootenai Tribes of the Flathead Reservation in Montana and the Hispanic/Latinx population in Yakima Valley in Washington were selected through purposeful community-engagement. A total of six focus group discussions and 30 key informant interviews were administered in both communities. A codebook was developed and deductive coding was applied to informant responses, followed by an inductive, constant comparison approach. The codebook was further refined and inter-rater agreement was completed by three analysts. RESULTS/ANTICIPATED RESULTS: Four themes were highlighted as areas impacted by the COVID-19 pandemic (mental and physical health, family dynamics, and social disruptions) with few differences among geographic areas or between focus group (n=39) and key informant (n=28) participants. Perceived impacts on mental health included increased stress, anxiety, and depression, while pandemic-related lifestyle or family changes impacted physical health. Participants reported changes to family routines and dynamics due to staying home, social distancing, and more frequent interactions inside or limited interactions outside the household respectively. Social disruptions reported included impacts on finances, employment, and household staples, though participants highlighted how many community members stepped up to help those in need. DISCUSSION/SIGNIFICANCE: The COVID-19 pandemic had similar impacts on two geographically distinct underserved communities in Montana and Washington. Understanding the community's experience with the COVID-19 pandemic is critical to identify strategies to support families, community needs, and mental and physical health in underserved communities.