Social needs and place-based social determinants of health (SDOH) greatly outrank medical care in terms of impact on a person's length and quality of life. Challenges associated with social needs and SDOH disproportionately affect racial and ethnic minority populations, such as Black individuals, and are critical factors in explaining many health-related disparities, ultimately leading to higher mortality rates among racial and ethnic minority populations and those with low income and poor overall population health. Thus, advancing population health goes beyond merely documenting clinical diseases and medical interventions.

Health information technology (HIT) offers considerable opportunities to advance the health system's role in positively affecting the health of high-risk populations and achieving good population health. Although health systems are encouraging the uptake of HIT among their practitioners and patients, to advance population health, the application of HIT solutions needs to include the capture, analysis, and dissemination of information on social needs within electronic health records (EHRs). Moreover, to truly have an impact, assessment of individual social needs is not enough. We must also consider place-based SDOH and characteristics of the environment where patients live and assess how such factors affect one's ability to stay healthy and receive care when needed.

One area in which HIT would provide new opportunities to improve the health of individuals and communities is in the identification and management of type 2 diabetes. Type 2 diabetes is a major cause of morbidity and mortality in the US, especially among at-risk populations. In the US, 26 million people, approximately 8.5% of the population, have type 2 diabetes. Compared with non-Hispanic White adults, type 2 diabetes is more common among Black adults, who are also more likely to experience diabetes-related complications such as end-stage kidney disease and to die from type 2 diabetes. Higher frequencies of type 2 diabetes and its complications have also been associated with lower socioeconomic status.

Among social factors associated with the risk of type 2 diabetes and poor diabetes management, the impact of food insecurity and issues related to physical access to food, in particular, have not been extensively researched. Limited research has found a significant association between food insecurity and hypoglycemic events in patients with diabetes. These findings indicated that in food-insecure households with patients with diabetes, hypoglycemia may occur when meals are skipped or calorie intake is reduced in response to inadequate food supplies. The research so far has been limited to the direct screening of food insecurity among a limited number of patients, with most studies using claims data to identify adverse events. To my knowledge, no study has performed a comprehensive assessment of food insecurity among patients with type 2 diabetes at a health system level and of the occurrence and outcomes of type 2 diabetes complications in association with such social risk factors using HIT solutions.

Moreover, few studies have assessed the association of place-based determinants of health, such as living in a food desert or having access to fast-food establishments, with the risk of type 2 diabetes. Kanchi et al performed a unique study using HIT tools to examine the association between neighborhood food environment and the risk of incident type 2 diabetes across different community types (ie, high-density urban, low-density urban, suburban, and rural) in the US. The authors used the US Veterans Administration (VA) national EHR data for the VA Diabetes Risk cohort, a cohort of veterans without type 2 diabetes constructed by the New York University...
Grossman School of Medicine and George Mason University. They also used the VA EHR data on different priority groups based on the patient’s military service history, disability, income, and eligibility for Medicaid or other VA benefits and created a low-income or disability flag that was used as a proxy for socioeconomic status. The authors then linked the individual-level data and neighborhood-level attributes with the food environment, including the percentage of total food-serving establishments that were fast-food establishments and the proportion of the total retail food outlets that were supermarkets. Other neighborhood-level covariates included neighborhood social and economic environment, created as a community type–stratified $z$ score sum of the US Census–derived measures from the American Community Survey.

The study found that the neighborhood food environment was associated with increased type 2 diabetes risk among US veterans in multiple community types. Moreover, male veterans had a higher incidence of type 2 diabetes compared with female veterans (13.6% vs 8.2%). Non-Hispanic Black adults had the highest incidence (16.9%) compared with other racial and ethnic groups (15.0% for non-Hispanic Native Hawaiian and other Pacific Islander individuals, 14.2% for non-Hispanic American Indian and Alaska Native individuals, 12.9% for non-Hispanic White individuals, and 12.8% each for non-Hispanic Asian and Hispanic individuals). Adults with disabilities and those with low income but no disability had a higher incidence of type 2 diabetes (13.7% and 14.1%, respectively) than those with neither disability nor low income (11.5%).

The study by Kanchi et al is a great example of the capabilities of HIT to provide a comprehensive assessment of a person’s health, which goes beyond just documenting clinical diseases and medical interventions. Other HIT methodological advances, such as those in natural language processing and machine learning, have enabled health systems to use real-world data sources such as EHR's free-text notes for the identification of patients at risk of a disease or those with complications of the clinical condition. The natural language processing and machine learning approaches can help to improve the identification of challenges related to type 2 diabetes management and social needs in EHR data. The integration of these HIT tools in a health system's EHR can help to identify at-risk patients, link their EHR data to publicly available data on place-based SDOH, and evaluate the associations between social needs and place-based SDOH and type 2 diabetes incidence and management.

Such comprehensive assessment of social needs and place-based SDOH of patients with type 2 diabetes would enable the health systems to evaluate the outcomes of underlying factors associated with diabetes-related disparities and to identify the modifiable factors. The use of real-time EHR data on a large population of patients, compared with the use of survey data with limited scope and claims data with the time lag, provides a source of high-volume data, the potential of which has not been fully exercised in health care systems. The advanced HIT tools would enable the health systems to systematically identify social needs and challenges in EHR's structured and unstructured data (free-text notes), which are arguably one of the major sources of data on social risk factors for a large percentage of the US population. The linkage of such data to community-level data would help to comprehensively assess and identify patients likely to experience type 2 diabetes and its complications, as a result of their risk factors or characteristics of the neighborhoods where they reside. This approach could foster collaborations between the health systems and at-risk communities they serve and help to reallocate health system resources to those in most need in the community to reduce the burden of type 2 diabetes and other chronic conditions among racial minority groups and socioeconomically disadvantaged patients and to advance population health.
Corresponding Author: Elham Hatef, MD, MPH, Center for Population Health IT, Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, 624 N Broadway, Rm S02, Baltimore, MD 21205 (ehatef1@jhu.edu).

Author Affiliations: Division of General Internal Medicine, Department of Medicine, Johns Hopkins School of Medicine, Baltimore, Maryland; Center for Population Health Information Technology, Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland.

Conflict of Interest Disclosures: None reported.

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