American Journal of Healthcare Strategy

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

Design and Development of a Tablet-Based Social Determinants of Health Screening Tool for Community Settings

Ruhi Saldanha, David Ansell, MD, Omar Lateef, DO, & Oliver Aalami, MD

University of North Carolina Chapel Hill, Rush University, & Stanford University

Abstract

Background: Social determinants of health (SDOH), such as food insecurity, housing instability, transportation barriers, and unemployment, strongly influence health outcomes. While SDOH screening is increasingly common in clinical settings, less is known about digital SDOH screening in community settings.

Objective: This developmental study presents the design and development of a tablet-based SDOH screening and referral tool for non-clinical settings to strengthen identification of unmet social needs among underserved communities in Chicago.

Methods: Rush University Medical Center and Stanford Mussallem Center for Biodesign developed a tablet-based survey app using the Stanford Spezi Framework, integrating SDOH screening among five domains: food, housing, transportation, utilities, and employment. Designed for trained healthcare staff and community workers in non-clinical neighborhood locations, responses are securely sent to a Rush cloud environment, where social needs are routed to referral pathways, including social worker review and community resources. Participants can remain anonymous or provide identifying information for follow-up.

American Journal of Healthcare Strategy

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

Results: The tablet-based application was successfully developed, integrating key SDOH domains into a seven-item screening tool. Backend infrastructure was configured to securely transmit survey responses to Rush's cloud environment, and referral routing directs flagged responses to a social worker dashboard.

Conclusion: This developmental study presents a tablet-based SDOH screening tool designed for community deployment. The tool supports secure data transmission, anonymous participation, and real-time referral routing. Future research should assess usability, screening rates, resource connection, and long-term outcomes among underserved communities in Chicago.

Conflicts of Interest and Source of Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Keywords: Digital tablet app, social determinants of health, health equity, screening, mobile applications, developmental study

Introduction

Consistent with the World Health Organization (WHO), the social determinants of health (SDOH) are defined as "...the conditions in which people are born, grow, work, live, and age… unfair and avoidable differences in health status…"[1]SDOH have been found to be directly tied to individual health outcomes, especially those experienced by vulnerable populations.[2] A 2022 report from the United States Department of Health and Human Services (HHS) found that an estimated 20% of nationwide health outcome variation is from clinical care, while 50% of that variation is due to differences in SDOH. Socioeconomic indicators like poverty, employment, and education were found to have the largest impacts on an individual's health outcomes.[3]

Several organizations and studies have recognized the importance of SDOH screening, especially for contextualizing health outcomes.[4] The integration of SDOH screening into Electronic Health Records (EHRs) has increasingly been adopted and studied.[5] There has also

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

been a greater focus on integrating both patient and community-level SDOH data and screening into the clinical setting.[6,7]

Despite growing national attention to SDOH screening, most existing evidence comes from clinical environments, including primary care practices, emergency departments, hospitals, and community health centers.[8,9] There is a limited body of evidence assessing implementation outside clinical settings.[10,11] This gap is especially important for underserved communities, where non-clinical screening may reach individuals who face barriers to accessing routine health care.

Tablet-based applications have been developed for a variety of health screening purposes, particularly to identify unmet needs.[12–14] A 2021 study found that using a tablet-based system to screen patients for unmet social needs, such as transportation, food insecurity, and housing, in a primary care setting was feasible.[15] A 2024 study in three pediatric primary care practices found increased disclosure rates and referrals when transitioning from paper screening to a tablet-based survey, including increased referrals to social workers and medical-legal partnerships.[12] The surrounding literature suggests digital tools may improve identification of unmet social needs and referral rates.[12,15,16]

This developmental study presents the design and development of a tablet-based SDOH screening application, its technical architecture, and framework for future deployment.

Methods

Rush University Medical Center and the Stanford Mussallem Center for Biodesign collaborated to develop a tablet-based survey application assessing SDOH among underserved communities on the West Side of Chicago. The tool was designed for administration by trained healthcare staff and community workers in settings like community centers and other neighborhood locations outside of hospitals or medical clinics, aimed to enhance comfort and accessibility when participants disclose sensitive information regarding social and economic difficulties.[17,18]

American Journal of Healthcare Strategy

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

Stanford Spezi Framework

This survey tool was built using the Stanford Spezi Framework, which is an adaptable platform for building digital applications.[19] The open-source framework provides the infrastructure to customize the SDOH tool for meeting diverse participant needs (Figure 1).[19] The design allowed developers to seamlessly connect modular survey structure and EHR systems.[19]

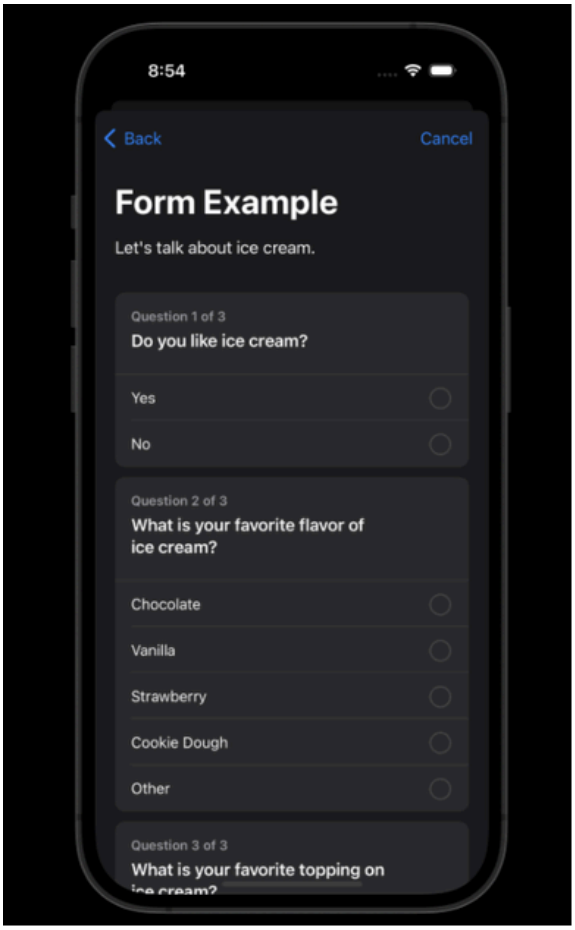

Figure 1: Stanford Spezi Framework with Sample Survey.

This open-source framework was used in collaboration with Rush to develop the digital SDOH screening tool in this study.

American Journal of Healthcare Strategy

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

Rush's SDOH survey

The survey integrates key SDOH domains into seven questions outlined below (Table 1). These questions were selected based on alignment with critical SDOH domains and other established national screening tools.[9]

Table 1. Survey Questions

1.	Currently or within the past 3 months, have you worried your food would run out before you had money to buy more?
2.	Within the past 12 months, have you run out of food or been unable to get more?
3.	Are you currently without housing?
4.	Are you currently worried about losing your housing?
5.	Currently or within the past 3 months, has a lack of transportation kept you from medical appointments, getting food or medicine, or providing care to a family member?

American Journal of Healthcare Strategy

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

6.	Currently or within the past 12 months, have you or household members gone without utilities (heat, water, electricity)?
7.	Are you currently unemployed?

Table 1: SDOH screening survey questions administered to participants.

Upon completion, participants may provide identifying information to receive resource referrals or remain fully anonymous to support population-level data collection.

Backend Architecture

The survey responses are securely pushed from the tablet to a backend API hosted in a Rush cloud environment. In the Rush cloud environment, survey responses are processed to identify social needs. Based on specific criteria, individuals with particular social needs are referred to a social worker, who may choose the appropriate intervention relevant to the needs the participant may have. Examples of interventions include the Rush VeggieRx Food Pantries for food insecurity and the Community and Economic Development Association of Cook County (CEDA) for utility assistance.

All survey responses, including identifying information about the survey respondents, are stored securely in a Rush secure cloud database in accordance with Rush's information security policies and procedures (Figure 2).

American Journal of Healthcare Strategy

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

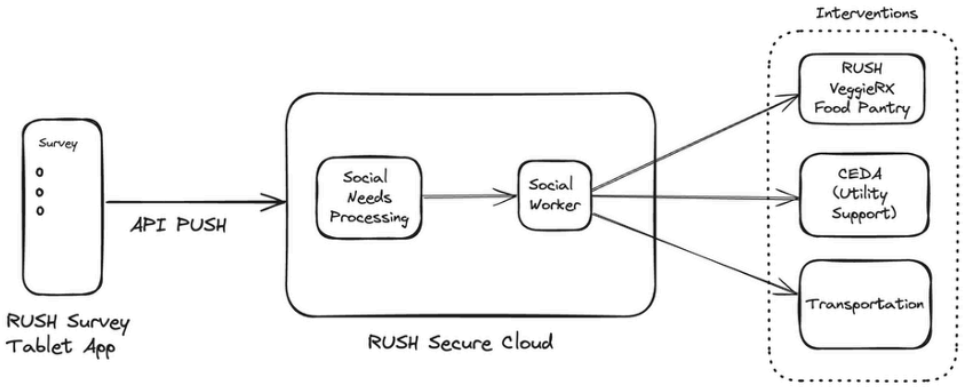

Figure 2: Framework outlining how the electronic SDOH survey data is linked to referrals through an automatic API push that is integrated into a secure Cloud database then linked to various interventions.

The design of the tablet app has taken into consideration the scenario where the tablet may not have network connectivity. The surveys are securely stored on the tablets until a network connection is established. Once the tablet connects, the survey responses are pushed to the Rush cloud database using an automated backend API. The backend cloud system's design incorporates automated referral workflows, eliminating the need for a human-directed or manual intervention.

Planned Pilot and Usability Evaluation

Future deployment is planned at community sites on the West Side of Chicago. Participants will be recruited through walk-in engagement at community center sites, with eligibility open to community members seeking to participate. Target sample size will be determined prior to pilot deployment.

American Journal of Healthcare Strategy

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

The process of administering this survey will involve trained healthcare staff and community workers collecting responses. Rush's interdisciplinary teams will then collaborate to connect consenting participants with appropriate resources and support services, including dietary counseling, transportation assistance, and social work services.

Usability will be evaluated through participant and administrator satisfaction surveys to assess navigation ease, comfort, and overall acceptability. By monitoring pilot metrics like regular feedback loops, participant satisfaction surveys, and other outcome data related to SDOH interventions, we will be able to evaluate the impact of the tool.

Ethical Implications

All participants will provide informed consent before the survey is administered. Data will be anonymized for research purposes unless participants choose to provide identifying information to receive referrals to community services.

IRB Statement

Institutional Review Board (IRB) review was not applicable for this developmental study. Full IRB approval will be obtained prior to participant data collection during pilot deployment.

Development Outcomes

Development of the digital SDOH screening tool successfully produced a tablet-based system that can be deployed in community settings. Using the Stanford Spezi Framework, the application was built to integrate key SDOH domains into a seven-item screening tool.[19]

Backend infrastructure was configured to securely transmit survey responses to Rush's cloud environment, and referral routing logic was implemented to direct flagged responses to be reviewed by a social worker. The architecture supports automated referral workflows and

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

anonymity options, positioning the system for structured deployment in non-clinical community settings on the West Side of Chicago.

Discussion

The development of this tablet-based SDOH screening tool represents a meaningful step toward expanding social needs identification beyond clinical environments. Traditional paper-based screening processes often face inefficiencies, scattered data storage, and irregular follow-up.[9,16] Electronic screening has shown to standardize administration and improve referral rates.[12,15] The referral routing built into this tool's backend enables a more consistent link to resources.

Community-based deployment addresses a structural gap in current screening efforts. Food insecurity affects an estimated 21.3% of Chicago-area residents, with a higher proportion on the West and South sides of the city.[20] A nonclinical screening approach may reach individuals who would otherwise go unidentified.[21]

This model also offers strategic implications for healthcare organizations and community partnerships. Health systems seeking to advance health equity can leverage community-based digital screening as a scalable method for identifying social needs upstream of clinical care.[22] By deploying screening into non-clinical spaces, health systems can strengthen community partnerships to improve resource allocation and build more responsive care systems.[23] This approach aligns with the national prioritization of community-clinical linkages to reduce health disparities.[22,24]

Several limitations must be acknowledged. The tool has not yet been deployed with participants, and therefore its usability, acceptability, and real-world effectiveness remain to be evaluated. The findings are not yet generalizable until pilot testing is completed. Future research should examine user experiences across diverse populations, including those with limited digital

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

literacy or language barriers, and assess long-term sustainability in resource-limited community settings. This system should also be compared with existing screening methods to assess relative accuracy and efficiency.

Conclusion

This developmental study presents a tablet-based SDOH screening tool designed for non-clinical deployment. By integrating community outreach with secure, interoperable digital infrastructure, the collaborative effort between Rush and Stanford offers a model for how health systems can advance equitable access to social care and improve health equity.[22,24] Wider deployment and long-term assessment will be essential to assess real-world effectiveness, reduce disparities, and support sustainable care.

American Journal of Healthcare Strategy

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

References

1. Social determinants of health. World Health Organization. Accessed May 12, 2026. https://www.who.int/health-topics/social-determinants-of-health

2. Morelli V. Social Determinants of Health: An Overview for the Primary Care Provider. Prim Care. 2023;50(4):507-525. doi:10.1016/j.pop.2023.04.004

3. Whitman A, De Lew N, Chappel A, Aysola V, Zuckerman R, Sommers BD. Addressing Social Determinants of Health: Examples of Successful Evidence-Based Strategies and Current Federal Efforts. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services; April 2022. Accessed May 20, 2026. https://aspe.hhs.gov/sites/default/files/documents/e2b650cd64cf84aae8ff0fae7474af82/SDOH-Evidence-Review.pdf

4. Perrin EC. Ethical Questions About Screening. J Dev Behav Pediatr. 1998;19(5):350.

5. Chishtie JA, Tea J, Ester M, et al. Integration of Screening and Referral Tools for Social Determinants of Health and Modifiable Lifestyle Factors in the Epic Electronic Health Record System: Scoping Review. J Med Internet Res. 2025;27:e73615. doi:10.2196/73615

6. DeVoe JE, Bazemore AW, Cottrell EK, et al. Perspectives in Primary Care: A Conceptual Framework and Path for Integrating Social Determinants of Health Into Primary Care Practice. Ann Fam Med. 2016;14(2):104-108. doi:10.1370/afm.1903

7. Gold R, Kaufmann J, Cottrell EK, et al. Implementation Support for a Social Risk Screening and Referral Process in Community Health Centers. NEJM Catal Innov Care Deliv. 2023;4(4). doi:10.1056/CAT.23.0034

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

8. Vilendrer S, Thomas SC, Belnap T, et al. Screening for Social Determinants of Health During Primary Care and Emergency Department Encounters. JAMA Netw Open. 2023;6(12):e2348646. doi:10.1001/jamanetworkopen.2023.48646

9. Neshan M, Padmanaban V, Tsilimigras DI, Obeng-Gyasi S, Fareed N, Pawlik TM. Screening tools to address social determinants of health in the United States: A systematic review. J Clin Transl Sci. 2024;8(1):e60. doi:10.1017/cts.2024.506

10. Social Needs Screening among Non-Federal Acute Care Hospitals, 2022. ONC Health IT Research & Analysis. Accessed May 20, 2026. https://healthit.gov/data/data-briefs/social-needs-screening-among-non-federal-acute-care-hospitals-2022/

11. Rangachari P, Thapa A. Impact of hospital and health system initiatives to address Social Determinants of Health (SDOH) in the United States: a scoping review of the peer-reviewed literature. BMC Health Serv Res. 2025;25(1):342. doi:10.1186/s12913-025-12494-2

12. Gorecki MC, Klein MD, Anyigbo CU, et al. Social Needs Screening Via Electronic Tablet in Pediatric Primary Care. Pediatrics. 2024;154(3):e2024065918. doi:10.1542/peds.2024-065918

13. Miller DP Jr, Weaver KE, Case LD, et al. Usability of a Novel Mobile Health iPad App by Vulnerable Populations. JMIR Mhealth Uhealth. 2017;5(4):e43. Published 2017 Apr 11. doi:10.2196/mhealth.7268

14. Sezgin E, Jackson DI, Boch S, et al. Digital Health Technologies for Screening and Identifying Unmet Social Needs: Scoping Review. J Med Internet Res. 2025;27:e78793. doi:10.2196/78793

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

15. Palakshappa D, Benefield AJ, Furgurson KF, et al. Feasibility of Mobile Technology to Identify and Address Patients' Unmet Social Needs in a Primary Care Clinic. Popul Health Manag. 2021;24(3):385-392. doi:10.1089/pop.2020.0059

16. Meltzer K, Yang M, Rossmann A, Kinsey EW, Cronholm PF, Morgan AU. Patient-Portal Compared with Supplemental In-Office Tablet Screening for Health-Related Social Needs in Primary Care. J Gen Intern Med. 2024;39(13):2425-2431. doi:10.1007/s11606-024-08929-x

17. Johnson D, Saavedra P, Sun E, et al. Community health workers and medicaid managed care in New Mexico. J Community Health. 2012;37(3):563-571. doi:10.1007/s10900-011-9484-1

18. Li C, Mowery DL, Ma X, et al. Realizing the Potential of Social Determinants Data: A Scoping Review of Approaches for Screening, Linkage, Extraction, Analysis and Interventions. medRxiv. Preprint posted online February 5, 2024:2024.02.04.24302242. doi:10.1101/2024.02.04.24302242

19. Schmiedmayer P, Ravi V, Aalami O. The Path to a Modular and Standards-based Digital Health Ecosystem. arXiv. Preprint posted online September 29, 2023:arXiv:2311.03363. doi:10.48550/arXiv.2311.03363

20. Food insecurity. Chicago Health Atlas. Accessed July 7, 2026. https://chicagohealthatlas.org/indicators/FAI

21. Lindenfeld Z, Chen K, Kapur S, Chang JE. Assessing Differences in Social Determinants of Health Screening Rates in a Large, Urban Safety-Net Health System. J Prim Care Community Health. 2023;14:21501319231207713. doi:10.1177/21501319231207713

22. Richardson S, Lawrence K, Schoenthaler AM, Mann D. A framework for digital health equity. Npj Digit Med. 2022;5(1):119. doi:10.1038/s41746-022-00663-0

DOI 10.61449/ajhcs.2026.9 | E-ISSN 2995-6242

Published in Volume 4, Issue 3, on July 23, 2026

23. Ashe JJ, Baker MC, Alvarado CS, Alberti PM. Screening for Health-Related Social Needs and Collaboration With External Partners Among US Hospitals. JAMA Netw Open. 2023;6(8):e2330228. doi:10.1001/jamanetworkopen.2023.30228

24. CMS Framework for Health Equity 2022–2032. Centers for Medicare & Medicaid Services. Accessed July 18, 2026. https://www.cms.gov/files/document/cms-framework-health-equity.pdf