



Protocol for Responding to and Assessing
Patients' Assets, Risks, and Experiences

Measuring Patient Social Risk to Drive Care Transformation:

The PRAPARE Experience

Introduction

The health care sector has continued to recognize the need to confront the social determinants of health (SDOH) that overwhelmingly affect health outcomes and health care costsⁱ. Data on patients' social needsⁱⁱ help providers and care team members to take action on patients' needs, which is increasingly imperative as the health care sector transitions to value-based models of care. Social risk data should be standardized across providers, clinical settings, electronic health record systems, and communities in order to facilitate data aggregation and analysis. Together, it can inform population health planning and management, community resource investments, and policy and payment models that incentivize and sustain upstream work.ⁱⁱⁱ Social risk data should also be stored and accessible within Electronic Health Records (EHRs) in order to promote the clinical utility of data that can be applied for systems-level change.^{iv} Standardized patient social risk data maintained by health information systems is particularly important for Federally Qualified Health Centers (FQHCs). During a 2011 convening of health center and SDOH experts, it was recommended to create and promote a standardized SDOH risk and asset assessment for each patient, to be used as a routine part of patient assessment and care through clinical data systems^v.

FQHCs make up the nation's largest network of primary and preventive care, with more than 10,000 sites serving more than 28 million patients with disproportionately high levels of socioeconomic and health care needs.^{vi} FQHCs have long embedded social services into their care models and recognized the need to document data to drive socioeconomic and environmental conditions "upstream" to ultimately influence characteristics that manifest further "downstream," such as health behaviors, health conditions, and health outcomes^{4,5}.

FQHCs lacked a standardized approach to document and store patients' socioeconomic needs, as well as tools that accelerate implementation and data use for action. In 2013, the National Association of Community Health Centers, the Association of Asian Pacific Community Health Centers, the Oregon Primary Care Association, and the Institute for Alternative Futures (the National PRAPARE project team) partnered together to develop, test, and spread a national, standardized, patient-centered social determinant of health assessment tool known as the Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences (PRAPARE).

This paper will present findings from a national feasibility study for implementing PRAPARE in seven health centers across four states using four different EHR systems and clinical workflows. It will describe the evidence-based and stakeholder-driven development process, how it balanced both validation and vetting, and how it ensured that standardized SDOH data collection at the patient-level in clinic workflow was both feasible and impactful.

Methods

PRAPARE was developed through five phases over three years.

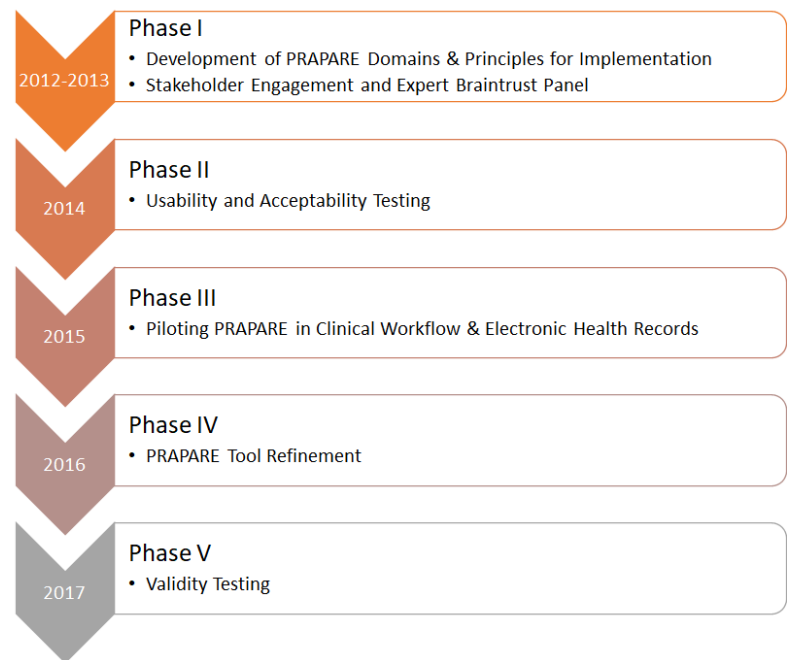
Phase I. Development of PRAPARE Domains and Principles for Implementation

To reach consensus on the tool's social risk domains (not specific questions or measures), the National PRAPARE project team began the process with a literature review to identify social factors closely associated with high cost and poor health outcomes. In addition to the literature review, national initiatives related to SDOH were monitored to ensure that PRAPARE included priority domains that were applicable to a majority of healthcare organizations and stakeholders.¹ As a result of the literature review and alignment with national initiatives, 17 social determinants of health domains were identified to include in the patient risk assessment tool.

As part of Phase I, a weighted scoring system was developed to determine which social domains should be included in the screening tool. The weighted scoring criteria included:

1. Alignment with national initiatives
2. Evidence of correlation with higher healthcare outcomes and costs resignation as relevant and a priority to health center staff and patients
3. Burden of data collection
4. Actionability
5. Sensitivity²

PRAPARE partners examined how best to design PRAPARE while simultaneously determining its content. An environmental scan of existing SDOH and patient risk assessment tools was conducted to learn more about best practices in measuring socioeconomic risks, engaging patients, and capturing and storing data. Over 52 tools were identified and analyzed from this environmental scan. Interviews were conducted with 28 of the tools' developers and users to learn more about their development process and how they were used.



¹ Monitored national initiatives include [Healthy People 2020](#), [ICD-10's list of Z-Codes](#) for socioeconomic measures, [the National Institute of Health and Society of Behavioral Medicine's research on psychosocial factors](#), [the National Academy of Medicine's guidance on the capture of socioeconomic data for meaningful use](#), and the [National Quality Forum's recommendations as to which sociodemographic factors should be included for risk adjustment](#).

² i.e., is the social determinant domain sensitive such that patients and staff would feel comfortable disclosing and discussing needs.

The environmental scan revealed the following:

1. No national standardized patient-level social determinant of health assessment tool existed at the time in 2014
2. Most social determinant assessment tools were “home-grown” in that they were developed and used only by that organization based on their own priorities and perceived community needs
3. Only a few tools had been formally validated for feasibility and outcomes
4. Most social determinant assessment tools solely existed on paper—they were not built into Electronic Health Records (EHRs) or technological platforms to facilitate better data collection and analysis.

Phase I. Stakeholder Engagement and Expert Braintrust Panel

Throughout the development process, a diverse group of stakeholders were engaged to inform the design of PRAPARE, the development process, and to review and refine the tool. In the early stages of tool development, a group of 20 individuals representing a wide range of stakeholder perspectives participated in the “PRAPARE Braintrust” to help prioritize measures and domains and to guide the PRAPARE development and testing process. The PRAPARE Braintrust included FQHC clinicians, community health workers, patients, researchers, payers, experts in social determinants of health, public health, informatics, payment, and policy, as well as representatives from federal agencies such as the Centers for Medicare and Medicaid Services (CMS) and the Health Resources and Services Administration (HRSA).



FQHC clinicians, leaders, and patient board members were also engaged throughout this process to ensure that PRAPARE focused on social needs that were important to health centers and their populations while also balancing the burden of collecting additional data. A survey was administered to health center clinicians and leaders to provide insight into which SDOH needs were considered most important, which of them were potentially sensitive for patients, and which of them were most actionable (N=84). Towards the end of 2014, members of the Braintrust and other stakeholders were brought together for an in-person meeting to review and refine the PRAPARE domains, questions, protocol, and to strategize ways to implement PRAPARE in different clinic workflows.

Phase II. Usability and Acceptability Testing

Before piloting, PRAPARE was reviewed and revised by a health literacy expert to reach a 4.5 readability level or a 4th – 5th grade reading level, thereby ensuring individual questions could be understood by most health center patients when self-reporting. This revised version of PRAPARE was used to perform cognitive testing with small groups of 10 patients and staff at seven health centers to ensure both staff and patients understood the questions and felt comfortable discussing the questions. Results from cognitive testing

demonstrated that PRAPARE was understandable and sensitive enough for patients to answer comfortably.

Phase III. Piloting PRAPARE in Clinical Workflow and Electronic Health Records (EHR)

Once the paper version of PRAPARE was developed, the national PRAPARE project team led a year-long implementation pilot as part of a national PRAPARE Learning Collaborative. The four participating teams were selected based on a competitive application process and included seven health centers across four states (Hawaii, Iowa, New York, and Oregon), three health center networks, a state primary care association, and a managed care plan. Teams brought design expertise in four different EHR systems commonly used by health centers, including eClinicalWorks, Epic, GE Centricity, and NextGen. The consensus-driven process of refining PRAPARE and developing EHR templates followed best practice guidelines for developing technological tools.^{vii} Participating health centers represented both urban and rural locations (four urban and three rural) and different patient population sizes, ranging from 10,000 to over 150,000 patients, with an average size totaling around 45,000 patients (median of 26,000).

Over the year-long Learning Collaborative in 2015, implementation teams met monthly with national PRAPARE project staff for didactic instruction and shared learning on key focus areas, with monthly homework assignments that centered on the development and testing of key resources necessary for PRAPARE implementation. Monthly reports assessed progress on key milestones, best practices, facilitators for success, challenges and solutions, and remaining needs. Site visits were also conducted to witness PRAPARE data collection workflow, to better understand how PRAPARE data was being incorporated into the care delivery model, to gather feedback from staff and patients, to provide on-site assistance, and to identify strategies and best practices.

The first six months of the Learning Collaborative focused on developing and testing all of the resources necessary for implementation, such as:

1. Change management plans inclusive of the key roles for IT staff, clinical staff, non-clinical staff, and leadership
2. EHR template specifications and functionalities (including user visualization and reporting requirements, data requirements, data collection and decision support triggers, performance requirements, and workflow requirements)
3. Workflows for data collection based on PDSA tests of the paper tool
4. Data dictionary and mapping document that crosswalks data currently being collected with PRAPARE data to avoid data duplication
5. Staff training curriculums and data collection protocol manual to guide staff in patient-centered approaches for PRAPARE social determinant data collection inclusive of workflows, EHR inputs, sensitivity training, and best practices.

Once these resources were developed, teams tested the feasibility and workflows by collecting PRAPARE data on a representative population of at least 400 patients over a period of 3-4 months to enable meaningful pilot analysis. During this time, teams gathered data, validated the data and the data collection process with staff and patients, evaluated workflows, tested interventions to respond to needs identified, and documented implementation best practices and lessons learned.

In the final months, the implementation teams submitted PRAPARE data on 2,982 adult patients collectively using a standardized PRAPARE data reporting template for aggregated data analysis. The reporting template collected raw frequency measures for each social determinant to demonstrate the prevalence of social determinants in the population of focus. In order to tally the number of social risk factors patients faced, population characterization measures were also collected. The average sample size of data submitted for each team was 746 patients, ranging from 438 to 1,152 patients. Pilot teams also completed a 21-question process evaluation survey designed to capture clinic staff process and experience using PRAPARE.

Phase IV. PRAPARE Tool Refinement

At the end of the pilot period, the National PRAPARE project team met in-person with the pilot teams to present and validate data findings of socioeconomic needs in their populations, distill implementation promising practices and lessons learned, discuss revisions to the tool based on findings and feedback from the piloting health centers, and brainstorm necessary resources and infrastructure to ensure the successful spread of PRAPARE. At this meeting, the group decided to revise PRAPARE in the following ways:

1. Make the response choices fewer and more generalized to allow for easier data capture with optional follow-up for more detailed granularity
2. Add clarifying definitions for a few of the PRAPARE measures (e.g., agricultural worker, housing measures on homelessness, etc.)
3. Revise the housing and transportation questions to better capture the various aspects of need

Adding additional questions was discussed, but the concern of additional data burden outweighed the preference for additional questions. This revised version from 2016 became the final PRAPARE tool used today that contained measures on the following core domains: race, ethnicity, agricultural worker status, veteran status, limited English proficiency, housing status, housing stability, neighborhood, education, employment, insurance status, income, material security, transportation, social isolation, and stress. PRAPARE also includes four optional measures on the following domains: incarceration history, refugee status, physical and emotional safety, and domestic violence.^{viii}

Phase V. Validity Testing

In a subsequent analysis, one health center's patient-level data was evaluated for internal consistency reliability, using both Cronbach's alpha and the greatest lower bound (GLB) ^{ix,x}. The Cronbach's alpha was 0.86, and the GLB 0.935, indicating good to excellent internal consistency reliability^{xi}. Through known-groups validity testing with groups of patients with controlled and uncontrolled diabetes and hypertension, our analyses indicated that patients with uncontrolled diabetes were at significantly higher risk compared to patients with controlled diabetes with respect to PRAPARE clusters of Social Background, Social Insecurities and Insurance/Employment. Patients with uncontrolled hypertension were at significantly higher risk compared to patients with controlled hypertension in terms of Social Insecurities^{xii,xiii}.

The Importance of Balancing Validation with Vetting

When developing patient risk assessment tools that cover sensitive topics, it is important to balance validation with vetting to ensure that stakeholders are engaged and that measures are tested with

different populations. This is especially true with structurally marginalized populations as previously validated measures are often only validated for research but not validated or acceptable for clinical care^{xiv} or for structurally marginalized populations. Evaluating measures' specificity and sensitivity is an important part of the validation process, but it is also important to consider the vetting of measures, feasibility of implementing measures, and scalability of measures. Validated tools or measures are not necessarily scalable if respondents either do not understand the measures or do not feel comfortable answering the questions.

Results

Quantitative Analysis

Results from the PRAPARE pilot quantitative analysis revealed that most patients tended to face 4 – 9 social determinant risks, with the average number of socioeconomic risks per patient being 6.3. However, the range of risks per patient stretched from 1 to 21 risks, with more complex patients tending to face upwards of 11 social determinant risks. Almost 100% of patients (99.9%) had at least one social risk factor. The most prevalent number of risks per patient was 5 risks, with 23% of the pilot population facing 5 social risks. These results and analyses are discussed further in a manuscript titled “Collecting Social Determinants of Health Data in the Clinical Setting: Findings from National PRAPARE Implementation. *Journal of Health Care for the Poor and Underserved*”.^{xv}

Qualitative Analysis

Results from the pilot process evaluation revealed that PRAPARE was easy to administer and could be implemented using a variety of different workflows and staffing models (Figure 1). The mean administration length as reported by staff in a health center pilot survey was 9 minutes.

Despite the workflow used, organizations found it imperative to provide patient-centered messaging around the purpose of the conversation and screening, how information would be stored and protected, and how information would be used to inform care and services provided. With patient-centered messaging, patients felt comfortable answering the questions and appreciated the opportunity to tell their story so as to not be viewed solely as health conditions, or “non-compliant” patients. These findings align with experiences of other social determinant screening tools.^{xvi} In fact, PRAPARE revealed that screening for social needs in itself is an intervention via conversing about socioeconomic challenges in a patient-centered way shown to be therapeutic for patients. This finding coincides with other research on how patients' outcomes improved simply by discussing them with care team members.^{xvii}

Figure 1: Staffing Models for PRAPARE Implementation

Who	Where	When	How	Rational
Non-clinical staff (Patient Navigator, Community Health Worker)	Waiting Room Staff Office	Before or after the provider visit	Administer PRAPARE with patients who would be waiting 30+minutes for the provider	Provides enough time to discuss SDOH needs. Allows for the same staff to ask the question and address the need. Can administer PRAPARE with other data collection efforts (Patient Activation Measure) to assess patient's ability and motivation to respond to their situation
Nursing Staff MAs	Exam Room	Before the provider enters the exam room	Administer PRAPARE after vitals are taken and reason for visit is noted. (Provider reviews PRAPARE data and refers to case manager)	Allows trained staff to collect sensitive information in a private location.
Care Coordinators	Office of Care Coordinator	During chart review and administering the Health Risk Assessment	Administer PRAPARE in conjunction with Health Risk Assessment	Allows for care coordinators to address similar issues in real time that may arise from PRAPARE and the Health Risk Assessment
Any Staff (Front Desk Staff to Providers)	No wrong door approach	No wrong door approach	No wrong door approach	Allows everyone to be part of the larger process in helping the patient.
Patient Self Assessment	Home Waiting Room	Before visit with the provider	Self-administer using email, tablets, kiosks etc.,	Low burden on staff to collect data. Allows for patient privacy to complete assessment. Utilize waiting time Staff time can be used to discuss and address patients needs.

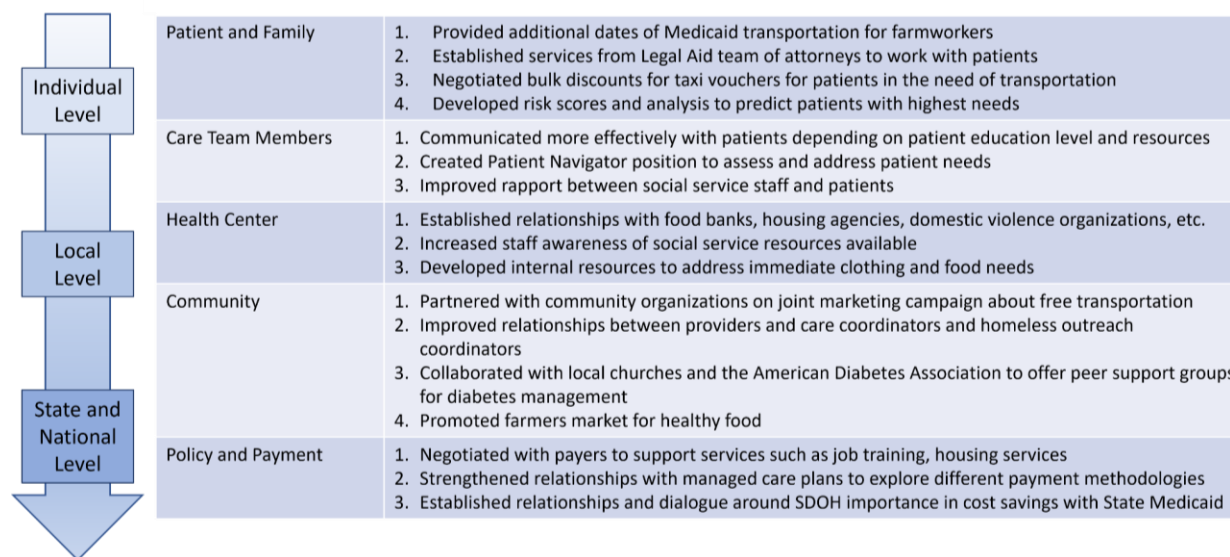
For staff, PRAPARE created awareness of patients' socioeconomic circumstances and how that may affect their health behaviors and outcomes. Having patient-centered conversations and developing a more comprehensive understanding of patients' life circumstances aided in building relationships between patients and staff as well as between healthcare organizations and community social service providers. As a result of their involvement in PRAPARE, many different types of staff became motivated to address SDOH to provide patients with the services that they needed. In many cases, PRAPARE improved both patient satisfaction as well as staff satisfaction because patients were able to receive needed services, staff had a greater role in impacting the lives of their patients by addressing their socioeconomic needs, and providers appreciated being able to focus on clinical treatment plans that were not impeded by social risk factors. At an organizational level, PRAPARE demonstrated patient complexity, often shedding light on new needs the organization was not aware existed in their patient population, which is consistent with other research findings.^{xviii}

Impact by Level of Change

PRAPARE has shown a significant impact with early implementers and led to immediate action at the patient, health center, and community-levels (Figure 2). Some organizations have used PRAPARE data to update their community resource lists and to build services in-house to address identified needs, ranging from clothing closets, food banks, hygiene kits, mobile shower units,^{xix,xx} exercise classes, and farmers markets.^{xxi} These findings build on previous research that highlight the extent of resources and services that can be provided to address social risks on-site in the clinical setting by organizations who wish to do so.^{xxii} Many organizations incorporated PRAPARE data into their care team meetings to inform patients'

treatment plans. Other organizations have used PRAPARE data to establish or strengthen partnerships with community-based organizations and social service organizations to provide needed services, such as housing, food, transportation, and more. Several organizations have used PRAPARE data in regional or state coalitions to advocate for more community investment or more services for upstream change. Increasingly, health centers, health systems, health plans, and states are using PRAPARE data to stratify their populations according to their clinical and non-clinical risks to inform population health management and best practices for caring for complex patients. PRAPARE social risk data is increasingly being used to drive delivery system transformation and payment models that incentivize upstream interventions and cross-sector collaborations to address socioeconomic needs.

Figure 2: PRAPARE’s Impact by Level of Change



Health centers encountered some challenges in collecting patient-level data on social needs in the care setting. It required staff time and capacity—often on activities that are not currently reimbursable—and could lengthen visit time depending on the workflow chosen and the extent of a patient’s needs. Staff turnover is an evergreen issue, so health centers quickly learned to involve a team of staff in PRAPARE data collection and action efforts to ensure sustainability despite turnover. There was also a concern about the ethics of screening for patient social needs when the organization has no means of addressing needs identified—a concern documented in other research.^{xxiii} However, health centers discovered that patient-centered messaging around using this data to inform care and services that can be provided now or in the future helped to quell those concerns for both staff and patients. Relatedly, staff can experience an emotional burden by engaging in sensitive conversations on difficult life experiences, so it is important to have support systems in place for staff, such as self-care promotion with passes for therapy, gym, and/or yoga sessions, private rooms to decompress or meditate, or group discussion opportunities to reduce feelings of isolation.

Challenges can exist within individual EHR templates depending on the development and deployment processes.^{xxiv} An increasingly common challenge is the burden of collecting similar data for various state, federal, and project initiatives that could lead to duplication of data and of staff’s time. Health centers were taught by the national PRAPARE project team to map these data requirements to see when, where,

how, and by whom each data element was collected. Mapping these data collection elements would allow users to see if any overlap could be aligned, especially since many initiatives' data reporting requirements were on paper only. Alignment of data elements with PRAPARE and the PRAPARE EHR template helped to facilitate the data capture and storage of these data elements and added value to these other initiatives by making the data more actionable and useful for the organization rather than simply collecting data for reporting purposes.

Resources to Support Implementation

Throughout the pilot, the PRAPARE project team harvested best practices, lessons learned, and resources that were packaged into the PRAPARE Implementation and Action Toolkit. The Toolkit, released in 2016, was the first of its kind to provide guidance on how to best collect and act on standardized SDOH data. Today, the PRAPARE Implementation and Action Toolkit (available for free at www.prapare.org) contains ten chapters that walk through SDOH data collection strategies, how to engage stakeholders, develop workflow models, use the PRAPARE EHR templates, map social risks to standardized data codes, evaluate and analyze data, build capacity to respond to identified needs, and track non-clinical services and referrals. Since 2016, the National PRAPARE project team has updated and expanded the toolkit and translated the PRAPARE paper tool into twenty-six (26) languages. More resources for implementation can be found on the PRAPARE website (www.prapare.org).

Discussion

PRAPARE's extensive development, testing, and vetting process led to its unique features. For example, PRAPARE is standardized and coded to align with ICD-10 and LOINC codes, thereby better enabling data aggregation across settings. It is also flexible and designed to fit in a variety of workflows. PRAPARE is evidence-based and stakeholder-driven given it was informed by research yet designed and tested by health center users. It is standardized but flexible, allowing for a conversational approach to discovering patient needs, rather than rigorous research.

Today, PRAPARE is used by thousands of organizations in every U.S. state and even across the globe. It is the dominant standardized social risk screening tool used by FQHCs^{xxv} and is rapidly growing in use among hospitals, health systems, health plans, Medicaid agencies, social service organizations, and more. It is also informing and supporting national efforts such as the CMS Accountable Health Communities, Office of Minority Health, and American Academy of Family Physicians. With this spread, organizations now have data on millions of patients regarding their socioeconomic needs and circumstances that can be harnessed to provide more appropriate care and to inform upstream transformation.

The Importance of Balancing Standardization and Flexibility

Another major finding is the need to balance standardization with flexibility in implementation. Findings from the national PRAPARE pilot demonstrate that standardization of the risk is more practical than standardization of the question. This allows for standardized data aggregation and analysis while at the same time allowing care team members to engage patients using empathic inquiry, and motivational interviewing approaches rather than a standard and static question and answer approach, which is less likely to build the patient-provider relationship^{xxvi}.

Standardization can be further advanced by using the standardized codification systems (e.g., ICD-10, LOINC, SNOMED) that are mapped to PRAPARE while still allowing care team members to utilize a patient-

centered approach. Similarly, it is important to have a national standardized tool to collect comprehensive data on social needs but allow options for granularity depending on community needs and resources. To meet this need, PRAPARE was purposefully designed to be more general and high-level as a “conversation starter” while allowing for granularity into specific needs or risks to best target care and interventions as needed.

The Importance of Using Patient-Centered Approaches When Discussing Socioeconomic Circumstances

PRAPARE’s success also points to the significance of collecting social risk data in the care setting in a patient-centered way, particularly as a method to build trusting relationships, engage patients in an action plan to access available community resources, and add value to the patient’s care plan. When collecting sensitive information in the care setting that open people up to vulnerability, it is important to have patient-centered approaches that emphasize sensitivity, compassion, respect, and patient empowerment (such as empathic inquiry or motivational interviewing). It is also important to use patient-centered messaging that explains the purpose of the data collection, how information will be protected, and how information shared will be used to inform care and services. This messaging will help to build trusting relationships between patients and care teams.

Conclusion

PRAPARE’s use for meaningful action demonstrates that screening tools that identify and document patient needs in a patient-centered way can be effective and useful^{xxvii} for individual patient care, population health management, and upstream change. PRAPARE’s use proves that data are foundational to advance change at multiple levels, including the individual level, the organizational/population level, the community level, and the larger system-level. Documenting the non-clinical complexity of patients can inform risk adjustment methodologies while documenting the effectiveness of non-clinical interventions can inform alternative payment methodologies for delivery system transformation.

The PRAPARE experience also builds the evidence base on how to successfully screen for and act on patient SDOH needs. Providers seek SDOH screening tools that allow for flexibility in implementation, support them in successfully engaging patients on sensitive issues in patient-centered ways, are not burdensome, and can be aggregated across patients and settings to inform population health as well as delivery system redesign and payment models.

Health centers’ comprehensive model of care and community partnerships, common mission to improve population health, and diverse health information systems make them ideal testing grounds for strategies to document, store, aggregate, analyze, and apply standardized patient-level data on health-related social risks. Lessons learned within health center settings could inform other systems of care working towards whole person models of care.

The PRAPARE experience demonstrates the feasibility of standardized SDOH data collection in multiple clinical workflows and the actionability of SDOH data to accelerate change for impact and population health management. The success of PRAPARE in terms of its wide dissemination and use proves that validation alone is not enough when developing standardized patient-level SDOH assessment tools. Rather, it is equally important to engage the community of stakeholders and end-users to inform, vet, and test tools and resources to ensure that they are patient-centered, feasible, and actionable. PRAPARE and its supporting resources can serve as a patient-centered model for other providers and practices

interested in collecting and applying standardized data on the SDOH to inform care and community transformation.

Acknowledgement: Thank you to the following individuals who contributed to the primary PRAPARE Process Experience Document: Michelle Jester, Michelle Proser, Vivian Li, and Carly Hood-Ronick

PRAPARE Team Contributors: Rosy Chang Weir, Nalani Tarrant, Sarah Halpin, Yuriko de la Cruz, Albert Ayson Jr., Julia Liu, Joe Lee

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References

- ⁱ Magnan S. Social Determinants of Health 101 for health care: Five plus five. *NAM Perspectives*. 2017;7(10).
- ⁱⁱ Joynt KE, De Lew N, Sheingold SH, Conway PH, Goodrich K, Epstein AM. Should Medicare value-based purchasing take social risk into account? *NEJM*. 2017; 376: 510 – 513.
- ⁱⁱⁱ Byhoff E, Cohen AJ, Hamati MC, Tatko J, Davis MM, Tipirneni R. Screening for social determinants of health in Michigan health centers. *JABFM*. 2017; 30(4): 418 – 427.
- ^{iv} Institute of Medicine. 2014. *Capturing Social and Behavioral Domains and Measures in Electronic Health Records: Phase 2*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/18951>.
- ^v Institute for Alternative Futures. Community Health Centers Leveraging the Social Determinants of Health. Alexandria, VA. March 2012. Available from <http://www.altfutures.org/pubs/leveragingSDH/IAF-CHCsLeveragingSDH.pdf>
- ^{vi} 2017 Uniform Data System, Bureau of Primary Health Care, HRSA, DHHS.
- ^{vii} Karsh BT. Beyond usability: designing effective technology implementation systems to promote patient safety. *Qual Saf Health Care*. 2004; 13:388 – 394.
- ^{viii} Paper Version of PRAPARE for Implementation as of September 2, 2016 [Internet]. PRAPARE: Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences. National Association of Community Health Centers, Inc., Association of Asian Pacific Community Health Organizations, Oregon Primary Care Association; 2016 [cited 2021]. Available from: <https://prapare.org/the-prapare-screening-tool/>
- ^{ix} Sijtsma K. On the Use, the Misuse, and the Very Limited Usefulness of Cronbach's Alpha. *Psychometrika*. 2009 Mar;74(1):107-120. doi: 10.1007/s11336-008-9101-0. Epub 2008 Dec 11. PMID: 20037639; PMCID: PMC2792363.
- ^x Trizano-Hermosilla I, Alvarado JM. Best alternatives to Cronbach's alpha reliability in realistic conditions: Congeneric and asymmetrical measurements. *Frontiers in Psychology*. 2016;7.
- ^{xi} PRAPARE Validation Using 8 "Gold Standard" Stages of Measure Development [Internet]. PRAPARE. National Association of Community Health Centers, Inc., Association of Asian Pacific Community Health Organizations, Oregon Primary Care Association; 2019 [cited 2021]. Available from: <https://prapare.org/knowledge-center/prapare-infographic-factsheets/prapare-validation-fact-sheet/>
- ^{xii} Li, V, Wan, W, Chin M & Chang Weir, R. Development of PRAPARE Social Determinants of Health Clusters and Correlation with Diabetes and Hypertension Outcomes. *Journal of American Board and Family Medicine*. Manuscript accepted and in revision, 2021.
- ^{xiii} Identifying Clusters of PRAPARE Social Determinants of Health Risk Factors Using Factor Analysis [Internet]. Association of Asian Pacific Community Health Organizations, University of Chicago, Siouxland Community Health Center, National Association of Community Health Centers, Inc.; 2021 [cited 2021]. Available from: <https://prapare.org/knowledge-center/prapare-infographic-factsheets/identify-clusters-of-prapare-sdoh-risk-factors-using-factor-analysis/>
- ^{xiv} Garg A, Boynton-Jarrett R, Dworkin PH. Avoiding the Unintended Consequences of Screening for Social Determinants of Health. *JAMA*. 2016;316(8):813–814. doi:10.1001/jama.2016.9282
- ^{xv} Chang Weir, R., Proser, M., Jester, M., Li, V., Hood-Ronick, C.M., & Gurewich, D. (2020). Collecting Social Determinants of Health Data in the Clinical Setting: Findings from National PRAPARE Implementation. *Journal of Health Care for the Poor and Underserved* 31(2), 1018-1035. doi:10.1353/hpu.2020.0075
- ^{xvi} LaForge K, Gold R, Cottrell E, Bunce AE, Proser M, Hollombe C, Dambrun K, Cohen DJ, Clark KD. How 6 organizations developed tools and processes for social determinants of health screening in primary care: an overview. *J Ambul Care Manage*. 2018; 41(1): 2 - 14.
- ^{xvii} Cleeland CS, Wang XS, Shi Q, et al. Automated symptom alerts reduce postoperative symptom severity after cancer surgery: a randomized controlled clinical trial. *J Clin Oncol*. 2011; 29: 994 – 1000.
- ^{xviii} Chang Weir, R, and Ly, M. PRAPARE Impact Stories: Uncovering Multiple Levels of Impact of PRAPARE Implementation. Manuscript in progress.
- ^{xix} Butz D. Health Center Debuts Mobile Shower Unit for Homeless and Underserved [Internet]. *Sioux City Journal*. 2018 [cited 2021Dec8]. Available from: https://siouxcityjournal.com/lifestyles/local/health-center-debuts-mobile-shower-unit-for-homeless-and-underserved/article_080f74a0-c791-5555-8047-0fb3ad2379f8.html
- ^{xx} Butz D. Health Center Helps Siouxlanders Meet Basic Needs to Improve Medical Outcomes [Internet]. *Sioux City Journal*. 2017 [cited 2021Dec8]. Available from: <https://siouxcityjournal.com/lifestyles/local/health-center-helps->

siouxlanders-meet-basic-needs-to-improve-medical-outcomes/article_ffca66ef-52d1-51af-a50e-196a1869c578.html

^{xxi} Chapter 2: Engage Key Stakeholders and Answer Commonly Asked Questions [Internet]. PRAPARE Implementation and Action Toolkit. National Association of Community Health Centers, Inc., Association of Asian Pacific Community Health Organizations, Oregon Primary Care Association; 2019 [cited 2021]. Available from: <https://prapare.org/wp-content/uploads/2021/10/Full-Toolkit.pdf>

^{xxii} Lewis JH, Whelihan K, Navaroo I, Boyle KR. Community health center provider ability to identify, treat, and account for the social determinants of health: a card study. *BMC Family Practice*. 2016; 17(121): 1 – 12.

^{xxiii} Garg A, Boynton-Jarrett R, Dworkin PH. Avoiding the Unintended Consequences of Screening for Social Determinants of Health. *JAMA*. 2016;316(8):813–814. doi:10.1001/jama.2016.9282

^{xxiv} Gold R, Bunce A, Cowburn S, Dambrun K, Dearing M, Middendorf M, Mossman N, Hollombe C, Mahr P, Melgar G, Davis J, Gottlieb L, Cottrell E. Adoption of Social Determinants of Health EHR Tools by Community Health Centers. *Ann Fam Med*. 2018;16(5):399 – 407.

^{xxv} Table EHR: Health Center Health Information Technology (HIT) Capabilities [Internet]. Data.hrsa.gov. 2021 [cited 2021 Dec 7]. Available from: <https://data.hrsa.gov/tools/data-reporting/program-data/national/table?tableName=EHR&year=2020>

^{xxvi} Empathic Inquiry: A Patient-Centered Approach to Social Determinants of Health Interviewing [Internet]. Youtube.com. 2016 [cited 2021 Dec 7]. Available from:

<https://www.youtube.com/watch?v=9rfmfsMMeEU&list=PLvoNbrkrX4YRsfMJz3qJMGrwZGCWPfsqE&index=3>

^{xxvii} Fryback DG, Thornbury JR. The efficacy of diagnostic imaging. *Med Decis Making*. 1991; 11:88 – 94.