

ORIGINAL RESEARCH

Clinician Experiences with Screening for Social Needs in Primary Care

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Background: Despite clear evidence demonstrating the influence of social determinants on health, whether and how clinicians should address these determinants remain unclear. We aimed to understand primary care clinicians' experiences of administering a social needs screening instrument.

Methods: Using a prospective, observational design, we identified patients living in communities with lower education and income seen by 17 clinicians from 12 practices in northern Virginia. Before office visits, patients completed social needs surveys, which probed about their quality of life, education, housing, finances, substance use, transportation, social connections, physical activity, and food access. Clinicians then reviewed the completed surveys with patients. Concurrently, clinicians participated in a series of learning collaboratives to consider how to address social needs as part of care and completed diary entries about how knowing the patient's social needs influenced care after seeing each patient.

Results: Out of a total of 123 patients, 106 (86%) reported a social need. Excluding physical activity, 71% reported a social need, although only 3% wanted help. Clinicians reported that knowing the patient had a social need changed care delivery in 23% of patients and helped improve interactions with and knowledge of the patient in 53%. Clinicians reported that assessing social needs is difficult and resource intensive and that there were insufficient resources to help patients with identified needs.

Conclusions: Clinicians reported that knowing patients' social needs changed what they did and improved communication for many patients. However, more evidence is needed regarding the benefit of social needs screening in primary care before widespread implementation. (J Am Board Fam Med 2018; 31:351–363.)

Keywords: Needs Assessment, Primary Health Care, Prospective Studies, Quality of Life, Surveys and Questionnaires, Virginia

Social determinants of health (SDH) have a demonstrable influence on health outcomes.^{1–6} Defined as the nonclinical factors that affect health, SDH includes personal resources, such as education and income, and social environments in which

people grow up, live, and work.⁷ Growing research is showing that SDH plays a far greater role on health outcomes than medical care.^{8–13} However, the majority of resources in the United States is disproportionately spent on direct medical care instead of public health and social determinants.¹⁴

The National Academy of Medicine (NAM), the Centers for Medicare and Medicaid Services, and the World Health Organization have called for the integration of primary care and public health to address SDH.^{15–18} Aiming to provide comprehensive care for individuals, families and communities¹⁹, primary care clinicians could potentially play a large role in shaping how SDH are screened for and addressed within health care settings.^{20–22} The concept of integrating primary care and public health is not new. In the 1940s, community-ori-

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ented primary care concepts were developed with this goal of integrating public health with primary care.^{23–25} However, successful implementation of this integration has not been achieved at scale. To bolster the most recent momentum to address SDH in primary care, NAM released a consensus statement recommending that 12 SDH domains be routinely collected and made available in electronic health records.^{26,27} The domains include ethnicity/race, tobacco use, alcohol use, residential address, educational attainment, financial resources, stress, depression, physical activity, social isolation, intimate partner violence, and neighborhood median household income.

Several pilot studies have been published to assess how primary care clinicians might collect SDH information. These studies have demonstrated that it is feasible for primary care clinicians to screen for SDH in a variety of primary care settings by using a variety of mechanisms.^{28–31} However, it is unclear whether knowing the social needs of patients could help clinicians address gaps in care, adapt care for patients, and improve morbidity and mortality. Furthermore, adding more required data collection for primary care clinicians could be burdensome without any benefit^{32–34} if clinicians are not able to address social needs.^{35,36} Fundamentally, whether addressing SDH should be within the domain of the health care delivery system remains an unanswered question.^{21,36}

To date, most studies examining SDH screening have taken place in underserved settings.^{28–30} Although NAM has called for the routine collection of SDH information in clinical practice, concerns have been raised over the burden required, as well as the absence of feasibility assessments or evidence of benefit in more affluent neighborhoods. In a recent editorial, Westfall³⁷ argued that practices in all communities should focus resources on what he calls “cold spots,” or neighborhoods with fewer opportunities. This approach could particularly be useful in more affluent communities. In a parallel study, we demonstrate several means of calculating cold spots within a community³⁸ and then used these definitions to select patients for our intervention in an affluent community.

In our study, we sought to address how primary care clinicians might screen for and consider the impact of SDH by piloting a social needs screening instrument in primary care for patients who might be at greater risk based on geospatial factors. Our

objective was to understand primary care clinicians’ experiences with and perspectives on administering the social needs screening instrument, as well as how they might use the information in routine practice.

Methods

Between April 2016 and December 2016, we used a mixed methods design to prospectively evaluate clinicians’ experiences of administering a social needs screening instrument in primary care practices. Clinicians participated in a series of learning collaboratives, while a small subset of their patients completed a social needs survey. The study was approved by the Virginia Commonwealth University Institutional Review Board.

Setting and Participants

Seventeen primary care clinicians from 12 practices in Northern Virginia within one health system participated. The practices function independently for staffing, clinical, and business activities, but they do share an electronic health record and collaborate for population management activities, including work through an accountable care organization and a centralized care management team that clinicians can refer patients to for additional help. Located within a 45-mile radius, the practices mainly care for patients in Fairfax, Loudoun, Prince William, Fauquier, and Arlington counties. These counties collectively have among the highest average income within the United States.³⁹ The practices jointly serve a patient population that is predominantly commercially insured (96.0%), generally more affluent, and speak English as their preferred language (84.9%). To recruit clinicians, we emailed all primary care clinicians from the 12 practices.

Intervention

Using Esri ArcMap 10.3.1, we geocoded all patients seen in the participating practices in the past year to their census tract of residence based on their reported residential address. We then identified all regional census tracts in the lowest quartile of life expectancy, poverty, education, and a validated social deprivation index (SDI), which we defined as “cold spots.” Life expectancy data were extracted from the Virginia Department of Health, Division of Vital Records⁴⁰, whereas poverty, education, and SDI were measured using the 2010 American Community

Survey data.⁴¹ We assessed poverty by calculating the percentage of the population earning less than 200% of the federal poverty level and assessed low educational attainment by the percentage who have not received a high school diploma or passed the General Education Development test. Our selected SDI, which is scored from 0 to 100 with higher numbers indicating higher deprivation, is a composite measure of social and material deprivation, which includes education, crowding, transportation, employment, poverty, housing, and family structure.⁴² This methodology and its limitations are further described in an article by Liaw et al.³⁸

If a patient living in a cold spot had an appointment with 1 of the 17 participating clinicians, we administered a social needs survey to the patient during his or her scheduled visit before seeing the clinician. We continued to identify patients for clinicians until 10 patients were reached or the end of our study period. We excluded patients who were under the age of 18 years and who were unable to read English. Adapted from NAM's social needs measures²⁷ and supplemented with additional questions from the Hennepin County Lifestyle survey⁴³, the patient survey included questions on transportation, food access, physical activity, dental health, safety, education, housing, mental health, social connections, substance use, finances, employment, and overall quality of life (see Appendix A). In addition to answering questions to assess whether patients had a social need in each specific domain, patients were also asked whether or not they wanted help with each domain. The completed survey was then reviewed with the clinician during their visit.

Clinicians then completed a structured diary entry for each patient who completed the social needs survey. Collected on-line within a week after the clinical encounter with each patient to limit recall bias, the diary entry included both closed-ended and open-ended prompts that queried about changes in care and knowledge of the patient as a result of the social needs survey and experiences of collecting the survey and addressing needs from the survey (see Appendix B for survey).

The clinicians also participated concurrently in a series of 4 learning collaboratives in which participants not only provided feedback about their experiences and perspectives but also learned about social needs screening from the facilitator and from

other learning collaborative members.^{44–46} In addition to the 17 clinicians, 3 patient representatives from the practices' existing patient advisory council, 3 selected patients living in cold spots, 3 practice administrators, and 6 population health managers were divided into 3 groups based on geographic location of the practice to participate in these learning collaboratives. During these collaboratives, we shared health outcomes data from cold spots to elicit reactions and obtained feedback on ways to collect the social needs surveys. The first 2 collaboratives occurred before fielding the social needs survey so that clinicians shared their beliefs about the value of collecting SDH and provided suggestions to each other on ways to collect and address SDH as part of their care. In the last 2 collaboratives, which occurred after fielding the survey, clinicians shared experiences of collecting the survey and addressing identified needs from the survey. They also provided suggestions on how SDH might be integrated into primary care in the future.

We did not offer any financial incentives to study practices, participating clinicians, or patients completing surveys.

Data Collection

We used 3 sources for outcomes: learning collaborative transcripts, clinician diary entries, and patient social needs surveys. Learning collaboratives were recorded, transcribed, and coded. Clinician diary entries were reviewed and coded. The social needs surveys that were completed by the patients were also collected.

Statistical Analysis

We used descriptive statistics to calculate percentages and counts from closed-ended questions from the clinician diary entries. We also calculated percentages and counts of domains in which patients identified social needs and for which patients asked for assistance. The software Stata 14.2 was used for all analyses.

Qualitative Analysis

Three reviewers (ST, WL, and AK) used a template approach, which involves the directed coding of collected qualitative material based on a code manual⁴⁷, to capture facilitators, barriers, and suggestions to improve collection of social needs and address identified social needs. The 2 learning col-

laboratives that occurred before the survey administration and the 2 that occurred after the survey administration were included in the analysis; this allowed for comparison of pre-survey and post-survey administration views from clinicians. Two reviewers coded each transcript independently.

Merged data were reviewed for discrepancies in coding and discussed by all 3 reviewers until reaching a consensus. Themes were then identified, with each theme's strength demonstrated by consistency of expression, frequency of associated coding instances, and participant agreement.

Table 1. Patient Responses to Social Needs Survey (n = 123)

Domain	Descriptor of Positive Screen	Percentage with Positive Screen	Percentage Asking for Help
Physical activity	Less than 150 minutes of strenuous exercise per week	53.0	1.6
Dental	Last dental appointment ≥ 1 year ago	25.2	1.6
Alcohol use	AUDIT-C* score ≥ 3 in women or ≥ 4 in men	14.6	0.8
Overall health	Self-rated health as "fair" or "poor" [†]	13.0	0.0
Tobacco use	Current use of cigarettes	12.2	0.8
Finances	Lack of medical insurance, concern for losing medical insurance, or problems paying for medications, clinic visits or supplies	11.4	0.0
Work	Currently unemployed, receiving disability, or other government assistance	11.4	0.0
Learning	Problems with understanding, remembering, seeing, hearing, and English literacy	10.6	0.8
Mental health	PHQ-2 [‡] score ≥ 3	10.6	0.8
Food	Insufficient food and lack of money to buy more	7.3	1.6
Drugs	Any use of illicit drugs or prescription drugs for nonmedical purposes	7.3	0.0
Transportation	Problems with access to transportation	4.9	0.8
Housing	Currently homeless or living in shelter; currently at risk of losing housing; or concern that will lose housing in next 6 months	4.1	0.8
Education	Did not complete high school	2.4	1.6
Safety	Feeling unsafe in neighborhood or concern that spouse/partner might hurt them	2.4	2.4
Social connections	Limited interaction with family, friends, and neighbors	1.6	0.8
Overall with at least one domain		86.2	3.3
Overall with at least one domain with physical activity excluded		70.7	3.3

Note: see Appendix A for full social needs survey.

*AUDIT-C is a 3-item validated alcohol screening tool that helps identify persons with hazardous drinking or active alcohol use disorders.

[†]options for health ranking including Excellent, Very Good, Good, Fair and Poor.

[‡]PHQ-2, the Patient Health Questionnaire-2, is a validated depression screening tool, which inquires about frequency of depressed mood and anhedonia over the past 2 weeks.

Results

Seventeen clinicians participated and 100% completed the study. A total of 215 eligible patients in the care of the 17 clinicians were identified. Of these, 123 patients completed the social needs survey and reviewed the results with their clinician. Of the 92 who did not participate, 22 declined, 13 did not show up for their appointment, 23 canceled their appointment, 18 did not participate due to clinic logistics (eg, time constraints, misplaced survey, and neglected to administer), 1 was not able to read in English, and 15 did not participate for other unknown reasons.

Social Needs Survey

The social needs survey is provided in Table 1. We found that 86.2% of patients screened positive in at least 1 of the 16 domains. However, only 3.3% of patients wanted help in any domains. The most common domains for positive screens were physical activity (53.0%), dental (25.2%), and alcohol use (14.6%). When we excluded physical activity, 70.7% of patients screened positive in at least 1 domain and 3.3% wanted help in any domain. The least common domains for positive screens were social connections (1.6%), safety (2.4%), and education (2.4%). There was a significant range in how often patients wanted help when they screened positive with 100% of patients screening positive for safety asking for help but only 3.0% of patients screening positive for physical activity asking for help.

Clinician Experiences

Clinicians reported in their postencounter diary entries that the social needs survey helped change care in 22.5% of encounters (Table 2). Ways that the social needs survey changed care included pro-

viding more exercise and dietary counseling, helping address financial barriers to medications and being mindful of medication costs when prescribing, addressing behavioral health issues, and helping with transportation to access clinical services. Furthermore, clinicians reported that in 52.5% of encounters, the social needs survey helped them know the patient better (Table 2). Specifically, clinicians reported they were able to better understand their patients' finances, relationships with family and friends, beliefs and values, and behavioral health needs.

The themes and findings from our series of 4 learning collaboratives are shown in Table 3. Specifically, although some clinicians expressed skepticism about the value of collecting SDH information before administering the social needs surveys to patients, clinicians identified value in improving interactions with patients and knowledge of their patients after the surveys were administered. For example, one clinician said the following: "It is a reminder that [...] our patients have lives outside of just the medicine that we give them." Others discussed specific examples of how they changed their care and interactions: "I took extra time asking her about barriers" and "I was less inclined to assume she did not care about her health."

However, there remained concern that screening for social needs might not change practice significantly and whether or not the health care system is the right place to address social needs. For example, one clinician stated that "For at least social needs, I would think the doctor is a small little isolated part" and indicated concern that clinicians might be held responsible for one more metric. Clinicians also identified concerns about being overwhelmed with too much information and administrative burden. Furthermore, they were con-

Table 2. Clinician Diary Responses About Using the Social Needs Survey (n = 123)

	Positive Response (%)	Neutral (%)	Negative Response (%)
Information from social needs survey helped during encounter	33.9	64.4	1.7
Knowing patient lives in "cold spot" helped during the encounter	33.3	63.3	3.3
Social needs survey helped change care*	22.5	N/A	77.5
Social needs survey helped me know patient better	52.5	40.8	6.7

Note: see Appendix B for clinician diary response prompts.

*for this question, clinicians were not given a neutral response option.

Table 3. Themes from Clinician Perspectives Identified in Learning Collaboratives and Clinician Diaries

Themes	Findings	Example Quotations
The act of assessing social needs is difficult and resource intensive	Screening is less beneficial for patients that you know well	"Some of the folks I have known for 20 plus years, so there wasn't a lot that could surprise me."
	Patients may be hesitant to share needs	"The patient was very reluctant to complete the survey. He did not report any social needs for any topic and did not ask for help with any topics. However, I actually suspect that the patient has a number of social needs. Talking about the responses made me think he had a number of needs but was embarrassed to mention them."
	Patients who need help do not come in for visits	"I think there's a lot of pride too. Like I had one patient that looked at the survey and he figured out pretty quick what it was and then he just didn't want to do it."
	The information is overwhelming for physicians	"It's important to mention that the people who really need it may not be the ones who are actually coming in." "And I think it does get a bit overwhelming to think about having that burden. I mean as a family practitioner, we already do so much in terms of looking at the whole person, but it just adds another dimension but I don't know how well, right now, we are equipped to deal with." "We're doing too many things. We have too much to do. We have too little time."
Few resources exist to help patients with social needs	Providers want to address social needs but lack agency with respect to addressing social needs	"Our resources as a practice are limited because we can't be paying for rides for patients. We can't be, you know, doing some of these things. So really we have to think about what we really want to accomplish with this."
	Clinicians are not aware of community resources	"One problem is we don't know what resources are even in our community, most of us." "There's so much that's out there that I never stumble upon until like I have one patient who has this one resource that I end up using. It would be helpful just to know what all is there, you know?"
	Practices lack adequate support to address social needs	"It doesn't do you much good in a system to identify issues or problems if the system doesn't have any way to address them."
Screening for social needs did not seem to help with social service delivery, but it did help clinicians to know their patients and seems to change clinician-patient interactions	May change how clinician interacts with patient	"The patient had a new diagnosis of diabetes and told me she did not go to the diabetes education classes because they were \$250 per class. With the survey, my reaction was more understanding and I was less inclined to assume she did not care about her health." "[My patient] had a mammogram ordered from wellness visit last year but never had it done. Knowing she was from a resource poor area, I took extra time asking her about barriers that would prohibit her from getting this done this year."
	May increase clinician awareness	"It's a reminder that our patients, in filling out these surveys and learning more about them, that our patients have lives outside of just the medicine that we give them."
	May not change practice	"I don't think that other than maybe a little bit of insight making me think about those community factors more than I would if I hadn't had the survey to look at [. . .] I haven't changed anything."
	Screening for social needs can cause harms	"Does it make a difference that I'm actually surveying these people? Am I doing this for naught? And I guess that would be another...what's the outcome going to do? Because I always want to do good. I took an oath to do no harm."

Continued

Table 3. Continued

Themes	Findings	Example Quotations
More evidence is needed about how to collect social needs, how to help address social needs, and the impact on health	Some clinicians questioned if health care system is the right place to address social needs	<p>“For at least social needs, I would think the doctor is a small little isolated part that could be addressed by a bigger system [. . .] it seems like there’s probably a better structure to gather the data to identify what the needs are and to actually address the needs that is probably not the doctor’s office.”</p> <p>“We’re not asking the right questions. It makes me think well, gosh, what would be the right questions to ask to identify things that the doctor might be able to help with.”</p>
	More evidence is needed about whether addressing social needs improves health outcomes	<p>“I think the bottom line is: Does it improve social or health outcome? I mean that’s what we want to know the answer to. Is investing your time and doing these things, does it pay off? Does it actually help the patient? It would be nice to see data that shows that it does.”</p>
	Clinicians have ideas about how to address social needs better	<p>“Maybe a print-out of the basic resources in there that we could just easily pick up.”</p> <p>“What about group sessions that we would hold here for people with similar county, in the same county, and similar issues and we could talk to them all at one time? I mean some people may be embarrassed by this but then also they could support each other.”</p>

cerned about the lack of resources to address any identified needs.

When completing the learning collaborative series, clinicians indicated interest in further exploring how social needs screening might be more broadly applied. They indicated interest in finding out whether or not addressing social needs might improve health outcomes and spent significant amounts of the time during the learning collaborative brainstorming ways to better address identified social needs.

Discussion

Although prior studies have examined the feasibility of screening for social needs in primary care practices, our study adds to the literature by examining primary care clinicians’ experiences of collecting SDH information. Through diary entries and learning collaboratives, clinicians reported that knowing patients’ social needs changed what they did and improved communication for a substantial number of patients. Because primary care values patient relationships and continuity of care, screening for social needs may play a role not only in helping address the social needs of patients but also in building the patient-clinician relationship. Improvement in both of these areas may in turn be able to reduce the disparities that are found in

patients who come from these cold spot neighborhoods.³⁷ Furthermore, whereas other studies have focused on social needs screening in underserved communities, our study was able to demonstrate substantial social needs in a subset of a population in an affluent community. This may make the case for screening a subset of patients for social needs in affluent communities.

However, significant work needs to be done before the dissemination and implementation of social needs screening. Clinicians in our study spoke about the need for more meaningful resources to address social needs, more education on how to best address social needs, and the need for collaborations with community partners to adequately address social needs. Creating these resources and community-clinical partnerships will take substantial work and time; clinicians will need to be supported in these activities if they are to be expected to screen for and address social needs within their practices.

Interestingly, whereas 70.7% of patients screened positive for at least one social need (excluding physical activity), only 3.3% asked for help for a social need. It would likely be overwhelming for primary care clinicians to address social needs in more than half of their patients; however, clinicians could potentially focus on the smaller proportion of patients who sought help

with their social needs within the subset of patients identified as living in a cold spot. This approach might make addressing social needs more manageable for primary care clinicians and likely more successful if resources were targeted toward patients who sought help from their clinicians and lived within cold spot communities. Clinicians could then focus on developing resources and community-clinical partnerships in domains where their patients are more likely to seek help.

Limitations

There are several limitations to our study. First, our clinician sample may not be representative of all primary care clinicians, but rather biased by self-selection to participate among clinicians more interested in addressing SDH. Second, selection bias may exist from our patient sample for 3 reasons: (1) the cold-spotting methodology used may have excluded patients who did not live in a cold spot who have social needs, (2) patients who could not read English were excluded, and (3) patients who did not show up for their visit were excluded. However, it may be the case that in most primary care practices, it would not be practical to initially target interventions to address social needs in patients who do not come for appointments. Third, we had a limited sample size from clinics within one health system. Although our study demonstrated that there is value in screening for social needs even in an affluent population, it may not be representative of clinician experiences in other settings and may not represent the proportion of patients with social needs in other settings. Furthermore, different health care settings may have different resource availability. Fourth, although our social needs survey (Appendix A) is derived from NAM's social needs measures and the Hennepin County Lifestyle Survey, it is not a validated instrument. Fifth, because this study focused on the experiences of clinicians screening for social needs, our sample of patients is small and may limit findings from the patient responses on the social needs survey.

Conclusions

Our study suggests that clinicians may find value in screening for and addressing social determinants of health in their practice. Finding out about patients' social needs may not only change care but also may

help improve the patient-clinician relationship. However, before social needs screening is widely implemented, more work is needed to develop resources for primary care clinicians to address identified social needs, particularly those with which patients ask for help. Future studies are also needed to assess the health benefits of social needs screening in primary care before widespread implementation. If these associations are found, there are potentially significant implications on how primary care clinicians could address SDH in their practices.

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To see this article online, please go to: <http://jabfm.org/content/31/3/351.full>.

References

1. Galea S, Vlahov D. Social determinants and the health of drug users: Socioeconomic status, homelessness, and incarceration. *Public Health Rep* 2002; 117:S135–S145.
2. Galobardes B, Smith GD, Jeffreys M, McCarron P. Childhood socioeconomic circumstances predict specific causes of death in adulthood: The Glasgow student cohort study. *J Epidemiol Community Health* 2006;60:527–9.
3. Danaei G, Ding EL, Mozaffarian D, et al. The preventable causes of death in the United States: Comparative risk assessment of dietary, lifestyle, and metabolic risk factors. *PLoS Med* 2009;6: e1000058.
4. Hammig O, Bauer GF. The social gradient in work and health: A cross-sectional study exploring the relationship between working conditions and health inequalities. *BMC Public Health* 2013;13:1170.
5. Krieger N, Kosheleva A, Waterman PD, Chen JT, Beckfield J, Kiang MV. 50-year trends in US socioeconomic inequalities in health: US-born black and white Americans, 1959–2008. *Int J Epidemiol* 2014; 43:1294–313.
6. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the United States, 2000. *JAMA* 2004;291:1238–45.
7. World Health Organization. What are social determinants of health? 2012. Available from: http://www.who.int/social_determinants/sdh_definition/en/. Accessed June 20, 2017.
8. Woolf SH, Johnson RE, Phillips RL, Jr., Philipsen M. Giving everyone the health of the educated: an examination of whether social change would save more lives than medical advances. *Am J Public Health* 2007;97:679–83.

9. Galea S, Tracy M, Hoggatt KJ, Dimaggio C, Karpati A. Estimated deaths attributable to social factors in the United States. *Am J Public Health* 2011;101:1456–65.
10. Schoeni RF, Dow WH, Miller WD, Pamuk ER. The economic value of improving the health of disadvantaged Americans. *Am J of Prev Med* 2018;40:S67–S72.
11. Barnard LS, Wexler DJ, DeWalt D, Berkowitz SA. Material need support interventions for diabetes prevention and control: a systematic review. *Curr Diab Rep* 2015;15:2.
12. Berkowitz SA, Seligman HK, Choudhry NK. Treat or eat: Food insecurity, cost-related medication underuse, and unmet needs. *Am J Med* 2014;127:303–10.
13. Patel MR, Piette JD, Resnicow K, Kowalski-Dobson T, Heisler M. Social determinants of health, cost-related nonadherence, and cost-reducing behaviors among adults with diabetes: Findings from the National Health Interview Survey. *Med Care* 2016;54:796–803.
14. Dieleman JL, Baral R, Birger M, et al. US spending on personal health care and public health, 1996–2013. *JAMA* 2016;316:2627–46.
15. Committee on Integrating Primary Care and Public Health. Primary care and public health: Exploring integration to improve population health. Washington, DC: National Academies Press; 2012.
16. Commission on Social Determinants of Health. Closing the gap in a generation. Geneva: World Health Organization; 2008.
17. Alley DE, Asomugha CN, Conway PH, Sanghavi DM. Accountable health communities—addressing social needs through Medicare and Medicaid. *N Engl J Med* 2016;374:8–11.
18. Adler N, Cutler D, Fielding J, et al. Addressing social determinants of health and health disparities: A vital direction for health and health care. Washington, DC: National Academy of Medicine; 2016.
19. World Health Organization. Declaration of Alma-Ata. Paper presented at: International Conference on Primary Health Care 1978; Alma-Ata, USSR.
20. Braveman P, Gottlieb L. The social determinants of health: It's time to consider the causes of the causes. *Public Health Rep* 2014;129:19–31.
21. Kaufman A. Theory vs practice: Should primary care practice take on social determinants of health now? Yes. *Ann Fam Med* 2016;14:100–1.
22. 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;14:104–8.
23. Liaw W, Rankin J, Bazemore AW. Community oriented primary care curriculum. 2016. Available from: <http://www.graham-center.org/rgc/maps-data-tools/tools/copc.html>. Accessed February 27, 2016.
24. Mullan F, Epstein L. Community-oriented primary care: New relevance in a changing world. *Am J Public Health* 2002;92:1748–55.
25. Institute of Medicine Division of Health Care Services. Community-oriented primary care: A practical assessment. Washington, DC: National Academies Press; 1984.
26. Billioux A, Verlander K, Anthony S, Alley D. Standardized screening for health-related social needs in clinical settings: The accountable health communities screening tool. Washington, DC; 2017.
27. Institute of Medicine. Capturing social and behavioral domains and measures in electronic health records: Phase 2. Washington, DC: The National Academies Press; 2014.
28. Garg A, Toy S, Tripodis Y, Silverstein M, Freeman E. Addressing social determinants of health at well child care visits: a cluster RCT. *Pediatrics* 2015;135:e296–e304.
29. Byhoff E, Cohen AJ, Hamati MC, Tatko J, Davis MM, Tipirneni R. Screening for social determinants of health in Michigan health centers. *J Am Board Fam Med* 2017;30:418–27.
30. Page-Reeves J, Kaufman W, Bleecker M, et al. Addressing social determinants of health in a clinic setting: The WellRx pilot in Albuquerque, New Mexico. *J Am Board Fam Med* 2016;29:414–8.
31. Klein MD, Kahn RS, Baker RC, Fink EE, Parrish DS, White DC. Training in social determinants of health in primary care: Does it change resident behavior? *Acad Pediatr* 2011;11:387–93.
32. Erickson SM, Rockwern B, Koltov M, McLean RM. Putting patients first by reducing administrative tasks in health care: A position paper of the American College of Physicians. *Ann Intern Med* 2017;166:659–61.
33. Christino MA, Matson AP, Fischer SA, Reinert SE, DiGiovanni CW, Fadale PD. Paperwork versus patient care: a nationwide survey of residents' perceptions of clinical documentation requirements and patient care. *J Grad Med Educ* 2013;5:600–4.
34. Siegler JE, Patel NN, Dine CJ. Prioritizing paperwork over patient care: Why Can't we do both? *J Grad Med Educ* 2015;7:16–8.
35. Baum FE, Legge DG, Freeman T, Lawless A, Labonté R, Jolley GM. The potential for multi-disciplinary primary health care services to take action on the social determinants of health: actions and constraints. *BMC Public Health* 2013;13:460.
36. Solberg LI. Theory vs practice: Should primary care practice take on social determinants of health bow? No. *Ann Fam Med* 2016;14:102–3.
37. Westfall JM. Cold-Spotting: Linking primary care and public health to create communities of solution. *J Am Board Fam Med* 2013;26:239–40.
38. Liaw W, Krist A, Tong S, et al. Are cold spots associated with worse clinical outcomes? *J Am Board Fam Med*. In press.

39. United States Census Bureau. Northern Virginia dominates list of highest-income counties, Census Bureau Reports. 2013. Available from: <https://www.census.gov/newsroom/press-releases/2013/cb13-214.html>. Accessed Aug 1, 2017.
40. Virginia Department of Health. Division of Vital Records. 2017. Available from: <http://www.vdh.virginia.gov/vital-records/>. Accessed Jul 31, 2017.
41. United States Census Bureau. American Community Survey. 2016. Available from: <https://www.census.gov/programs-surveys/acs/>. Accessed Jul 31, 2017.
42. Butler DC, Petterson S, Phillips RL, Bazemore AW. Measures of social deprivation that predict health care access and need within a rational area of primary care service delivery. *Health Serv Res* 2013;48:539–559.
43. Sandberg SF, Erikson C, Owen R, et al. Hennepin Health: A safety-net accountable care organization for the expanded Medicaid population. *Health Aff (Millwood)* 2014;33:1975–84.
44. Contandriopoulos D, Lemire M, Denis JL, Tremblay E. Knowledge exchange processes in organizations and policy arenas: A narrative systematic review of the literature. *Milbank Q* 2010;88:444–83.
45. Agency for Healthcare Research and Quality. Establishing an AHRQ learning collaborative, a white paper. 2014. Available from: <http://www.ahrq.gov/research/findings/final-reports/learningcollab/index.html>.
46. Institute for Healthcare Improvement. The breakthrough series: IHI's collaborative model for achieving breakthrough improvement. Boston: Institute for Healthcare Improvement; 2003.
47. Crabtree B, Miller W. Using codes and code manuals: A template organizing style of interpretation. In: Crabtree B, Miller W, editors. *Doing qualitative research*. 2nd ed. Thousand Oaks, CA: Sage Publications, Inc.; 1999.

Appendix A: Social Needs Survey

TRANSPORTATION					o I want help with this	
1) How often do you have access to transportation?						
<input type="checkbox"/> All the time	<input type="checkbox"/> Some of the time	<input type="checkbox"/> Rarely	<input type="checkbox"/> Never	<input type="checkbox"/> I choose not to answer this question		
FOOD					o I want help with this	
2) In the past 6 months, how often did the food you bought not last, and you didn't have money to buy more?						
<input type="checkbox"/> Often	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Never	<input type="checkbox"/> I choose not to answer this question			
PHYSICAL ACTIVITY					o I want help with this	
3) On average, how many days per week do you engage in moderate to strenuous exercise (like walking fast, running, jogging, dancing, swimming, biking, or other activities that cause a light or heavy sweat)?						
Number of days per week (from 0 to 7)			<input type="checkbox"/> I choose not to answer this question			
4) On average, how many minutes do you engage in exercise at this level?						
Number of minutes _____			<input type="checkbox"/> I choose not to answer this question			
DENTAL					o I want help with this	
5) When was your last dental appointment?						
<input type="checkbox"/> Less than a year ago	<input type="checkbox"/> 1 to 2 years ago	<input type="checkbox"/> Greater than 2 years ago	<input type="checkbox"/> I choose not to answer this question			
SAFETY					o I want help with this	
6) Do you feel safe in your neighborhood?						
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> I choose not to answer this question				
7) Are you ever afraid that your spouse / partner or another person you live with might hurt you?						
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> I choose not to answer this question				
LEARNING					o I want help with this	
8) Do any of these things make it hard for you to take good care of your health (choose all that apply)?						
<input type="checkbox"/> Understanding what your provider tells you			<input type="checkbox"/> Reading English			
<input type="checkbox"/> Remembering what your provider tells you			<input type="checkbox"/> Speaking English			
<input type="checkbox"/> Asking questions when you don't understand			<input type="checkbox"/> Writing English			
<input type="checkbox"/> Seeing			<input type="checkbox"/> None of the these			
<input type="checkbox"/> Hearing			<input type="checkbox"/> Other			
<input type="checkbox"/> Getting in and out of the car			<input type="checkbox"/> I choose not to answer this question			
HOUSING					o I want help with this	
9) Where are you living today?						
<input type="checkbox"/> Homeless	<input type="checkbox"/> Shelter	<input type="checkbox"/> With a friend or family member				
<input type="checkbox"/> Home / apartment	<input type="checkbox"/> Other	<input type="checkbox"/> I choose not to answer this question				
10) Are you at risk to lose your housing?						
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> I choose not to answer this question				
11) How concerned are you that you will not have a place to live sometime in the next 6 months?						
<input type="checkbox"/> Very	<input type="checkbox"/> Somewhat	<input type="checkbox"/> Not concerned	<input type="checkbox"/> I choose not to answer this question			
MENTAL HEALTH					o I want help with this	
12) Over the past 2 weeks, how often have you been bothered by little interest or pleasure in doing things?						
<input type="checkbox"/> Not at all	<input type="checkbox"/> Several days	<input type="checkbox"/> More than half the days				
<input type="checkbox"/> Every day	<input type="checkbox"/> I choose not to answer this question					
13) Over the past 30 days, how many times have you been bothered by feeling down, depressed, or hopeless?						
<input type="checkbox"/> Not at all	<input type="checkbox"/> Several days	<input type="checkbox"/> More than half the days				
<input type="checkbox"/> Every day	<input type="checkbox"/> I choose not to answer this question					
SOCIAL CONNECTIONS					o I want help with this	
14) Are you now married, widowed, divorced, separated, never married, or living with a partner?						
<input type="checkbox"/> Married			<input type="checkbox"/> Separated			
<input type="checkbox"/> Widowed			<input type="checkbox"/> Never married			
<input type="checkbox"/> Divorced			<input type="checkbox"/> Living with a partner			
<input type="checkbox"/> I choose not to answer this question						
15) In a typical week, how many times do you talk on the telephone with family, friends, or neighbors?						
Number of times _____			<input type="checkbox"/> I choose not to answer this question			
16) In a typical week, how often do you get together with friends or relatives?						
Number of times _____			<input type="checkbox"/> I choose not to answer this question			
17) How often do you attend church or religious services?						

<input type="checkbox"/> Never	_____ times per (circle one: day / week / month / year)		<input type="checkbox"/> I choose not to answer this question		
18) Do you belong to any clubs or organizations such as church groups, unions, fraternal or athletic groups, or school groups?					
<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> I choose not to answer this question		
EDUCATION					o I want help with this
19) What is the highest level of school you have completed?					
<input type="checkbox"/> Elementary school	<input type="checkbox"/> High school	<input type="checkbox"/> College	<input type="checkbox"/> Graduate / Professional school	<input type="checkbox"/> I choose not to answer this question	
TOBACCO USE					o I want help with this
20) Do you smoke cigarettes every day, some days, or not at all?					
<input type="checkbox"/> Every day	<input type="checkbox"/> Some days	<input type="checkbox"/> Not at all	<input type="checkbox"/> Do not know	<input type="checkbox"/> I choose not to answer this question	
ALCOHOL USE					o I want help with this
21) How often do you have a drink containing alcohol?					
<input type="checkbox"/> Never (Skip to Question 24)		<input type="checkbox"/> 2 to 3 times a week			
<input type="checkbox"/> Monthly or less		<input type="checkbox"/> 4 or more times a week			
<input type="checkbox"/> 2 to 4 times per month		<input type="checkbox"/> I choose not to answer this question			
22) How many standard drinks (one can of beer, glass of wine, or shot of liquor) containing alcohol do you have on a typical day?					
<input type="checkbox"/> 1 or 2		<input type="checkbox"/> 7 or 9			
<input type="checkbox"/> 3 or 4		<input type="checkbox"/> 10 or more			
<input type="checkbox"/> 5 or 6		<input type="checkbox"/> I choose not to answer this question			
23) How often do you have six or more drinks on one occasion?					
<input type="checkbox"/> Never		<input type="checkbox"/> Weekly			
<input type="checkbox"/> Less than monthly		<input type="checkbox"/> Daily or almost daily			
<input type="checkbox"/> Monthly		<input type="checkbox"/> I choose not to answer this question			
DRUGS					o I want help with this
24) Over the past year, how often have you used prescription drugs for non-medical reasons or in excess of how they were prescribed?					
<input type="checkbox"/> Never		<input type="checkbox"/> Weekly			
<input type="checkbox"/> Less than monthly		<input type="checkbox"/> Daily or almost daily			
<input type="checkbox"/> Monthly		<input type="checkbox"/> I choose not to answer this question			
25) Over the past year, how often have you used illegal drugs?					
<input type="checkbox"/> Never		<input type="checkbox"/> Weekly			
<input type="checkbox"/> Less than monthly		<input type="checkbox"/> Daily or almost daily			
<input type="checkbox"/> Monthly		<input type="checkbox"/> I choose not to answer this question			
FINANCIAL					o I want help with this
26) In the past year, have you been uninsured or concerned about losing your health insurance?					
<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> I choose not to answer this question		
27) During any part of the year, have you had trouble paying for medications, clinic visits, and / or supplies?					o I want help with this
<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> I choose not to answer this question		
WORK					o I want help with this
28) What is your current source of income (choose all that apply)?					
<input type="checkbox"/> Employed, full time		<input type="checkbox"/> Disabled			
<input type="checkbox"/> Employed, part time		<input type="checkbox"/> Social security / government assistance			
<input type="checkbox"/> Homemaker		<input type="checkbox"/> Student			
<input type="checkbox"/> Retired		<input type="checkbox"/> Other _____			
<input type="checkbox"/> Unemployed		<input type="checkbox"/> I choose not to answer this question			
OVERALL HEALTH					o I want help with this
29) In general, would you say that your health is:					
<input type="checkbox"/> Excellent	<input type="checkbox"/> Very good		<input type="checkbox"/> Good		
<input type="checkbox"/> Fair	<input type="checkbox"/> Poor		<input type="checkbox"/> I choose not to answer this question		

Appendix B: Postencounter Clinician Diary Entry Questions

1. Did you review the social needs survey completed by the patient?
o Yes
o No
o Did not receive the social needs survey
2. How much did the information from the social needs survey help or distract you during the encounter?
o Helped a lot
o Helped somewhat
o Neither helped nor distracted
o Distracted somewhat
o Distracted a lot
3. How much did knowing that your patient lives in a resource poor community help or distract you during the encounter?
o Helped a lot
o Helped somewhat
o Neither helped nor distracted
o Distracted somewhat
o Distracted a lot
4. As a result of having this additional information, how much did you change the care you delivered (consider the language used, time spent, follow up planned, tests ordered, medications prescribed, referrals made, etc.)?
o I changed my care a lot
o I changed my care somewhat
o I did not change my care at all
5. How did your care change (consider both positive and negative changes)?
6. What additional community or social information would have helped you?
7. What additional support would help you better address community or social needs?
8. I know my patient better as a result of having this additional information.
o Strongly disagree
o Slightly disagree
o Neutral
o Slightly agree
o Strongly agree
9. What did you learn about your patient that you did not already know?