ORIGINAL RESEARCH

Colorectal Cancer Screening and Social Needs

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Introduction: **Colorectal cancer (CRC) is the second leading cause of cancer death in the United States. While patient-reported barriers have been previously described, few studies have analyzed how patients' social needs affect screening rates.**

Methods: **This cross-sectional study includes 3,443 Kaiser Permanente (KP) patients ages 50 to 75 years who completed the 2020 KP National Social Needs Survey. Five social needs categories were assessed: "Financial Strain," "Housing Instability," "Transportation Issues," "Social Isolation," and "Food Insecurity." Being up to date on CRC screening was determined from patients' electronic health records, defined as meeting Health care Effectiveness Data and Information (HEDIS) criteria for screening. We used multivariable analyses to explore associations between social needs and completion of colorectal cancer screening in 2020, adjusting for demographic factors.**

Results: **Among the survey respondents, 2,805 (81.5%) were up to date on their colorectal cancer screening. Patients were less likely to be screened if they had severe financial strain (OR 2.1, 95% CI 1.3–3.4), severe social isolation (OR 1.9, 95% CI 1.2 to 3.2), and severe food insecurity (OR 2.5, 95% CI 1.2–5.3). There was a nonsignificant increase in odds of not being up to date with screening for severe transportation issues (OR 3, 95% CI 0.93–10) and severe housing instability (OR 1.7, 95% CI 0.93–3).**

Conclusion: **Even within a fully insured population with high screening rates, respondents with financial strain, social isolation, and food insecurity had lower odds of being up to date with CRC screening. Future efforts should assess how addressing patients' social needs could lead to increased CRC screening rates. (J Am Board Fam Med 2024;37:868–887.)**

Keywords: **Cancer Screening, Colorectal Cancer, Cross-Sectional Studies, Social Determinants of Health, Social Factors**

Introduction

Colorectal Cancer (CRC) is the second leading cause of cancer death for both men and women in the United States, and incidence of cancer in individuals ages 40 to 49 has been increasing.[1] Despite recent COVID-19 related declines in cancer

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Results from this study were previously presented at a poster session at the American Society of Cancer and Oncology conference in June 2023.

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screening, CRC screening rates have been steadily increasing in the United States.[2] In 2020, 70% of adults aged 50 to 75 were reported to be up to date for CRC screening.[3] However, screening rates were noticeably lower among uninsured (37%), low-income (63%), and Hispanic (60%) populations. These rates fall short of targets in the "80% in Every Community" initiative from the National CRC Round Table.[4]

Because of these gaps in screening, numerous studies have been conducted to identify the factors that could be driving low screening rates.[5–7] Systematic reviews of patient-reported barriers to CRC screening cite obstacles to screening such as insurance challenges, concern over the costs of screening, transportation barriers, and lack of social support. Similar social factors have previously been cited as having negative associations with completion of other preventative interventions, such as screening mammography and annual flu immunizations.[8,9] As Social Determinants of Health have emerged as some of the principal driving factors to health outcomes, they have become a target for research because of their modifiable nature.[10,11] The social needs of transportation, social isolation, financial strain, housing instability, and food insecurity have been repeatedly cited as potential barriers. However, their quantitative effect on screening rates has been under studied. Additional research is needed to determine the association between these social needs and CRC screening uptake and disparities.

As gatekeepers to our health care system with strong understandings of their patient's circumstances, Primary Care physicians stand at the intersection of social needs and preventative screening, and thus have the ability to play a large role in promoting increased CRC screening. Understanding which social and demographic factors impact completion of CRC screening is necessary for designing population-level interventions to improve screening rates. This study combines data from a patient-reported survey on social needs with respondent's EHR data. Our aim was to identify the characteristics that most strongly correlate with low screening to inform future efforts within Primary Care to increase CRC screening uptake and decrease screening disparities.

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Materials and Methods

This is a cross-sectional study that merged data from the Kaiser Permanente (KP) 2020 Social Needs Network for Evaluation and Translation (SONNET) National Social Needs Survey with Electronic Health Record (EHR), and administrative CRC claims data (collectively referred to as EHR data).[12] The primary outcome for this analysis was being up to date with CRC screening in 2020; patients' self-reported social needs were combined with their demographic factors and CRC screening status to identify predictors of low screening rates. This study was reviewed and approved by the Kaiser Foundation Research Institute as Not Human Subjects Research.

Study Sample

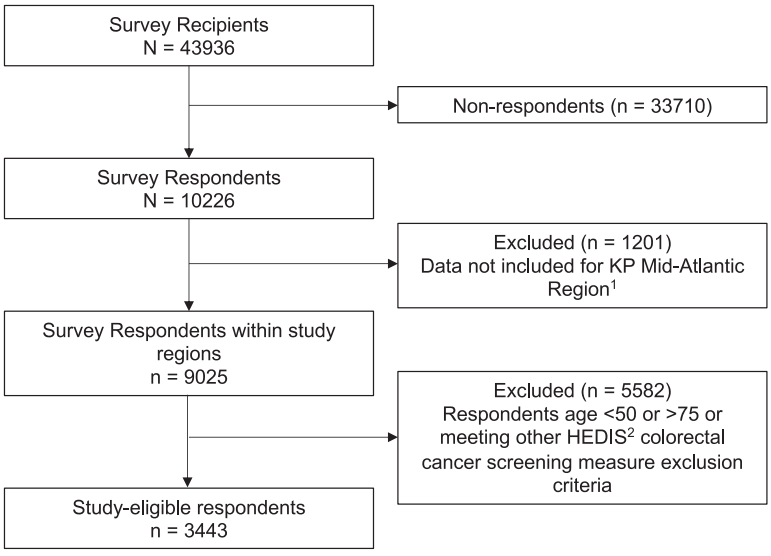
The SONNET Survey was sent out to 43,936 KP members across all 8 KP regions (Colorado, Georgia, Hawaii, Mid-Atlantic, Northern California, Southern California, Northwest, and Washington state). Data were collected between January 2020 and September 2020 with 10,226 members responding (23% response rate). Survey sampling has been described in a previously published study.[13]

This study used data from 7 of the 8 KP Regions. The Mid-Atlantic region elected to not release their data. Of the 10,226 respondents to the survey, 9,025 were from these regions. The study cohort included survey respondents eligible for CRC screening, ages 50 to 75 years, who met the HEDIS inclusion criteria for continuous enrollment and excluding patients with frailty or advanced illness, resulting in a sample size of 3443 (Figure 1).[2] Frailty and advanced illness were defined by ICD-10 and CPT codes, as outlined by the National Committee for Quality Assurance (NCQA).[14] Of note, the United States Preventive Services Task Force (USPSTF) had not yet lowered the screening age range from 50 to 45 at the time this survey was conducted. Participants' characteristics are described in Tables 1 and 2. Thirty-two respondents were excluded from the multivariable model because of missing data.

Main Measures

The primary outcome was being up to date with CRC screening in 2020. Screening requirements could be filled via any HEDIS-approved screening mechanism, including colonoscopy within the past

Figure 1. Study sample.



[1]Mid-Atlantic selected to not release their regional data
[2]Healthcare Effectiveness Data and Information Set

10 years, fecal occult blood test within the past year, flexible sigmoidoscopy in the past 5 years, CT colonography in the past 5 years, or stool DNA in the past 3 years.

Self-reported social needs of Food Insecurity, Social Isolation, Transportation, Housing Instability, and Financial Strain were examined using the SONNET Social Needs Survey (Appendix A). The survey was available in both English and Spanish and conducted either online, via telephone, or on article. Respondents answered each of the 31 questions with either "yes" or "no," or on a Likert scale of 1 to 5 or 1 to 3, depending on the question. Responses to each question were then categorized as "No Need," "Severe Need," or "Any Need" (Appendix B).

In addition, demographic information was analyzed in comparison to screening completion, including age, sex, race/ethnicity, insurance type, language, neighborhood deprivation index (NDI), and Diagnostic Cost Group (DxCG) risk score. Age was analyzed in groups above and below 65 years. Primary language was dichotomized as English versus Non-English as patient-reported primary language. DxCG scores were used as a proxy for disease burden. DxCG scores were stratified into very low (<0.25), low (0.25–0.7), moderate (0.7–1.3), high (1.3–3.0), and very high (>3) subgroups. NDI is reported in the EHR on a scale of 1 to 5, with 1 being the least deprived. The insurance plans within the KP system vary based on means through which that insurance was obtained and include Commercial (obtained through a patient or their domestic partner's employment), Individual (bought through the health care exchange), Medicare, and Medicaid/Dual. Being employed is highly correlated with having commercial insurance within KP, and thus employment status was omitted from our models due to redundancy.

Statistical Analysis

Distribution of CRC screening completion was compared across measures of social needs and demographic characteristics via Chi-square and Kruskal-Wallis tests, for categorical and continuous variables respectively. Weighted logistic models were computed using the survey package in R for screening rate, 1 corresponding to severe social need in each of the 5 domains, adjusting for age, sex, race/ethnicity, DxCG, and insurance type. *P*-values from the Wald test are presented along with odds ratios—and their 5% confidence intervals—comparing the risk of screening for each covariate relative to its reference. The survey weights were chosen to make the sample representative of the national KP population. All survey results presented have been statistically weighted to account for oversampling and nonresponse bias. Weights were winsorized to the 99th

Table 1. Patient Demographics by Cancer Screening

Characteristics n (%)	Not Screened (n = 638)	Screened (n = 2,805)	Overall (n = 3,443)	*P*-value[a]
Age				
50 to 64	474 (74.3)	1,624 (57.9)	2,098 (60.9)	**<0.001**
65 to 74	164 (25.7)	1,181 (42.1)	1,345 (39.1)	
Gender				
Woman	370 (58.0)	1,603 (57.1)	1,973 (57.3)	0.927
Man	268 (42.0)	1,202 (42.9)	1,470 (42.7)	
Insurance type				
Commercial[b]	395 (61.9)	1,478 (52.7)	1,873 (54.4)	**<0.001**
Individual	80 (12.5)	2,16 (7.7)	296 (8.6)	
Medicare	139 (21.8)	1,030 (36.7)	1,169 (34.0)	
Medicaid/Dual	24 (3.8)	81 (2.9)	105 (3.0)	
Primary spoken language				
English	489 (76.6)	2,365 (84.3)	2,854 (82.9)	**<0.001**
Non-English	30 (4.7)	142 (5.1)	172 (5.0)	
Missing/Unknown	119 (18.7)	298 (10.6)	417 (12.1)	
Race				
White	424 (66.5)	1,738 (62)	2,162 (62.8)	0.366
Other[b]	28 (4.4)	91 (3.2)	119 (3.5)	
African American	65 (10.2)	332 (11.8)	397 (11.5)	
Asian	59 (9.2)	326 (11.6)	385 (11.2)	
Hispanic	62 (9.7)	318 (11.3)	380 (11.0)	
Neighborhood deprivation index				
1 (Least Deprivation)	85 (13.3)	418 (14.9)	503 (14.6)	0.853
2	126 (19.7)	612 (21.8)	738 (21.5)	
3	164 (25.7)	647 (23.1)	811 (23.6)	
4	152 (23.8)	679 (24.2)	831 (24.2)	
5 (Most Deprivation)	110 (17.2)	447 (15.9)	557 (16.2)	
Diagnostic cost group[c]				
Very Low <0.25	109 (17.1)	173 (6.2)	282 (8.2)	**<0.001**
Low 0.25-0.7	136 (21.3)	434 (15.5)	570 (16.6)	
Moderate 0.7-0.1.3	131 (20.5)	616 (22)	747 (21.7)	
High 1.3-3	120 (18.8)	816 (29.1)	936 (27.2)	
Very High >3	142 (22.3)	766 (27.3)	908 (26.4)	

Missing: Insurance type n = 62 (1.8%), Primary spoken language n = 417 (12%), Race n = 8 (0.2%), Neighborhood deprivation index n = 3 (0.09%).
[a]Boldface indicates statistical significance ($P < .05$) [χ^2 test comparing screened to not screened].
[b]Insurance Type Commercial and Race Other categories include missing values.
[c]Diagnostic Cost Group is a measure of how much a patient is expected to cost a healthcare system; it is used as a proxy for disease burden, with lower levels indicating healthier individuals.

percentile to limit extreme values, and prevalence rates account for stratification variables (ie, region, gender, age, risk).[15]

Results

Among the 3,443 survey respondents, 2,098 (60.9%) were below age 65 and 1,973 (57.3%) were female. Most were English-speaking (2,854, 82.9%) and White (2,162, 62.8%). All participants were enrolled in the KP Foundation Health Plan; (1,873 (54.4%) commercial, 296 (8.6%) individual [purchased via the exchange], 1,169 (34.0%) Medicare, and 105 (3.0%) Medicaid or Medicare/Medicaid combined (Table 1).

Among these 3,443 individuals, 2,805 (81.5%) were up to date on their CRC screening. Demographic factors that were significantly correlated with CRC screening included age, DxCG, and insurance status. Individuals were less likely to be screened if they were younger than 65 years compared with those who were older, and those with lower disease burden (DxCG)

Table 2. Association Between Social Needs and Colorectal Cancer Screening

Social Need (%)	Not Screened (n = 638)	Screened (n = 2,805)	Overall (n = 3,443)	*P*-value[a]
Any need	400 (62.7)	1,489 (53.1)	1,889 (54.9)	<0.001
Any severe need	219 (34.3)	668 (23.8)	887 (25.8)	<0.001
Any financial strain	285 (45.1)	967 (34.7)	1,252 (36.7)	<0.001
Severe financial strain	114 (18.1)	325 (11.7)	439 (12.9)	<0.001
Any social isolation	229 (36.1)	843 (30.1)	1,072 (31.2)	0.013
Severe social isolation	91 (14.4)	286 (10.2)	377 (11)	0.011
Any transportation issues	40 (6.3)	96 (3.4)	136 (4)	0.004
Severe transportation issues	611 (96.5)	2,747 (98.5)	3,358 (98.2)	0.003
Any food insecurity	180 (28.4)	578 (20.7)	758 (22.1)	0.001
Severe food insecurity	43 (6.8)	107 (3.8)	150 (4.4)	0.005
Any housing instability	98 (15.5)	294 (10.6)	392 (11.5)	0.002
Severe housing instability	79 (12.5)	233 (8.4)	312 (9.1)	0.005

Missing: Any financial strain n = 27 (0.8%), Severe financial strain n = 30 (0.9%), Any social isolation n = 9 (0.3%), Severe social isolation strain n = 9 (0.3%), Any transportation issues n = 20 (0.6%), Severe transportation issues n = 22 (0.6%), Any food insecurity n = 19 (0.6%), Severe food insecurity n = 24 (0.7%), Any housing instability n = 30 (0.9%), Severe housing instability n = 31 (0.9%).

[a]Chi-squared test comparing screened to not screened.

compared with those with higher DxCG. Rates also differed by insurance type, ranging from a low of 73% (216/296) completion for those with private insurance to a high of 88% (1,030/1,169) with Medicare. There were no significant differences in screening rates by sex, race/ethnicity, primary language, or NDI.

The prevalence of social needs within the study sample is presented in Table 2. Within this group, 55% (1,889/3,443) of respondents indicated some level of need, and 26% (8,87/3,443) reported a severe need. The need that was most reported was financial strain (37% [1,252/3,416] of respondents reporting any need, 13% [439/3,413] reporting severe need). Transportation issues were the lowest reported (4% [136/3,423] with any need, 2% [63/3,421] with severe need).

Not being up to date on CRC screening was significantly associated with having severe need in 3 of the 5 social need domains when adjusted for sociodemographic and health status factors (Figure 1, Table 3); severe financial strain (OR 2.1, 95% CI 1.3–3.4), severe social isolation (OR 1.9, 95% CI 1.2–3.2), and severe food insecurity (OR 2.5, 95% CI 1.2–5.3). There was a nonsignificant increase in odds for severe transportation issues (OR 3, 95% CI 0.93–10) and severe housing instability (OR 1.7, 95% CI 0.93–3).

Discussion

In this population there was significant association between CRC screening rates with 3 of 5 social need domains: Financial Strain, Food Insecurity, and Social Isolation, after adjustment for demographic, health status, and neighborhood-level factors. There were nonsignificant but similar trends for Transportation Needs and Housing Instability.

Our study is the first we know of linking EHR CRC screening data to a variety of patient self-reported social needs. A recent study that explored the relationship between self-reported social determinants and CRC screening used only claims data

Table 3. Multivariable Analysis of the Association Between Social Needs and Uptake of Colorectal Cancer Screening

	Adjusted Odds Ratio[a]	95% CI	
Severe financial strain	2.1	3.4	1.3
Severe social isolation	1.9	3.2	1.2
Severe food insecurity	2.5	5.3	1.2
Severe housing instability	1.7	3.0	0.9
Severe transportation issues	3.0	10.0	0.9
Any severe need	2.3	3.3	1.5

[a]Colon Cancer Screening (No) odds ratios were adjusted for Age, Neighborhood Deprivation Index, Gender, Diagnostic Cost Group (DxCG) Risk Score, Race/Ethnicity, Spoken Language and Insurance Type in the multivariable analysis. Each social need had its own model which included all demographic variables. Sampling weights were also included to correct for non-response and oversampling by design and to make the survey sample representative of national Kaiser Permanente membership.

Abbreviation: CI, confidence interval.

and included only individuals from a single region, Washington, D.C. Our study draws on both EHR and claims data and encompasses a more geographically diverse population, with individuals from 7 different regions of the United States.[16] Two other similar studies evaluated area-level deprivation with CRC screening, rather than individual-level, self-reported social needs data such as in our study.[17,18]

Prior studies have described barriers to completion of specific types of CRC tests, such as transportation difficulties and lack of social support as reasons for not completing a follow-up colonoscopy, because the procedure requires anesthesia and thus necessitates the patient have someone to drive them home.[19] Another study noted how the hidden costs of screening are often cited by patients as a major consideration when deciding to screen, indicating the potential impact of financial strain.[20]

An ecological study addressing neighborhood social disadvantage found that census data for housing disadvantage (eg, multifamily residence and address changes) were significantly associated with decreased odds of completing CRC screening.[21] Another study addressing predictors of CRC screening in California found an 89% increased odds of being up to date for CRC screening among individuals who were food secure, with lack of health insurance associated with 81% decreased odds of screening, but did not include other social needs. This study relied on self-reported screening data rather than medical records.[22] Our study is unique in describing the impact of social needs in an insured population using patients' EHR data and self-reported social needs.

There is a large body of research focused on interventions to increase adherence to CRC screening.[11,23,24,25] A 2018 systematic review of various interventions found that among 73 randomized clinical trials, interventions that were associated with increased CRC screening rates included patient education, outreach, navigation, and patient and clinician reminders.[22] The most effective strategies were direct mailing of fecal tests and patient navigation. The authors described navigation as a barrier-focused intervention, addressing logistic barriers, sociocultural education, and minimizing loss to follow-up. Individuals with social needs might be more likely to need navigation to complete CRC screening. However, it is unknown whether programs that address social needs in general (eg, food banks, ride shares) without specifically targeting CRC would result in increased CRC screening.

Our study has limitations. Data obtained within the KP population may not be generalizable to patients outside of this health care system. Furthermore, there was possible survey response bias, with respondents possibly being more literate and engaged in their health care. There was also no data collected on various individual-level factors such as health beliefs, education level, lack of trust, and patient embarrassment, all which may have acted as confounders.[6,10] In addition, CRC screening rates were high, 81.5% (2,805/3,443) compared with 70% nationally in 2020.[3] This high screening rate is likely in-part driven by characteristics of the KP system, in which patients all had some level of health insurance with no out-of-pocket costs for screening. It is notable that we found these results within a population in which there were no differences in screening among its subpopulations (ie, sex, race/ethnicity, or primary-language). It is also important to note that this study was completed in the year 2020, during the start of the COVID-19 pandemic. Most KP regions mailed fecal immunochemical test kits directly to patients due for screening during this time, and, in contrast to national decreases in breast and cervical cancer screening, research has shown that CRC screening rates did not decline during the pandemic thanks to increases in at-home stool testing.[26] Lastly, we were unable to distinguish between a screening test versus a clinically indicated test (eg, anemia workup), nor were we able to distinguish between average risk versus increased risk patients. Test modality was also not analyzed, and social needs might impact the 2 most common tests, FIT and colonoscopy, differently. Despite these limitations, our study has several important strengths. Research has shown that KP membership is representative of the socioeconomic diversity of the national population, suggesting our results may provide valid applicability to settings outside of the KP system.[27] Our sample represents a geographically diverse population nationally, and detailed, patient-reported social needs were found to be associated with CRC screening rates even among a fully insured population. These significant results show that social needs put pressure on health care outcomes despite insurance status, and therefore even primary care physicians with fully insured patient panels

must take social needs into consideration when caring for their patients.

Primary Care physicians are well positioned to help assess and address these needs. Research has shown that EHR-based screening and referral systems within Primary Care can be successful in identifying and providing resources to patients with social needs.[28,29] Kaiser Permanente's Community Support Hub, a free online directory that can be filtered by area code and social need, is an example of one way health care systems can begin responding to the housing, food, and other daily needs of their patients.[30] Furthermore, patient navigators who help with filling out forms, calling community partners, and other navigation services have been demonstrated to help patients access the resources to which they were referred.[31]

Conclusions

While there are many societal and health care reasons that social needs should be addressed, further research is needed to determine whether assessing and addressing these needs lead to increases in CRC screening uptake. Possible future directions to address social needs include developing systems through which clinicians can easily connect patients to community resources, and investing in health care navigators who can help ensure that those connections come to fruition. Quality improvement efforts to increase CRC screening should consider such interventions and evaluate their potential impact on screening uptake and other important health and wellness outcomes.

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To see this article online, please go to: http://jabfm.org/content/37/5/868.full.

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Appendix A

KP National Social Needs Survey

Thank you for helping Kaiser Permanente understand more about the needs of its members!

The survey covers a variety of topics including general questions about your health and wellbeing, your personal connections with family and friends, as well as housing, food, and financial challenges you may or may not face. By taking this survey, you can help with Kaiser Permanente efforts to offer programs to assist patients with life stressors that can impact total health, including basic needs and mental health.

The survey will take about 10 – 15 minutes to complete. When you've completed it, we will send you a $15 Target gift card.

Your answers will remain confidential. You are free to skip any question you prefer not to answer. Your health care and insurance benefits will not be affected by whether or not you complete the survey.

First, please imagine a ladder with steps numbered from zero at the bottom to 10 at the top. Suppose we say that the top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you.

1. On which step of the ladder would you say you personally feel you stand at this time.

(Worst Possible) 0 1 2 3 4 5 6 7 8 9 10 (Best Possible)

2. On which step do you think you will stand about five years from now?

(Worst Possible) 0 1 2 3 4 5 6 7 8 9 10 (Best Possible)

SOCIAL CONNECTION

3. In a typical week, how many times do you talk on the telephone or video chat like Facetime with family, friends, or neighbors?

1. Less than 1 time per week
2. 1 time per week
3. 2 times per week
4. 3 times per week
5. More than 3 times per week

4. How often do you text, email, or send messages using social media like Facebook with family, friends, or neighbors?

1. Several times a day
2. Once a day
3. A few times a week
4. Once a week
5. Less than weekly

5. How often do you get together with friends or relatives?

1. Less than 1 time per week
2. 1 time per week
3. 2 times per week
4. 3 times per week
5. More than 3 times per week

6. How often do you attend church or religious services?

1. Rarely/Never
2. 1 to 4 times per year
3. More than 4 times per year

7. How often do you attend meetings for the clubs or organizations you belong to?

1. Rarely/Never
2. 1 to 4 times per year
3. More than 4 times per year

8. How often do you get the social and emotional support you need?

1. Always
2. Usually
3. Sometimes
4. Rarely
5. Never

SELF REPORTED HEALTH/MENTAL HEALTH STATUS

9. Would you say that, in general, your health is:

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

10. In general, how would you rate your overall mental or emotional health?

1. Excellent
2. Very good
3. Good
4. Fair
5. Poor

STRESS

11. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

1. Never
2. Almost never
3. Sometimes
4. Fairly often
5. Very often

MENTAL HEALTH

12. During the **past 4 weeks**, have you accomplished less than you would like with your work or other regular daily activities **as a result of any emotional problems?**

1. Yes
2. No

13. During the **past 4 weeks**, have you not done work or other activities as carefully as usual **as a result of any emotional problems** (such as feeling depressed or anxious)?

1. Yes
2. No

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

14. How much of the time during the **past 4 weeks** have you felt calm and peaceful?

1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. None of the time

15. How much of the time during the **past 4 weeks** did you have a lot of energy?

1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. None of the time

16. How much of the time during the **past 4 weeks** have you felt downhearted and blue?

1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. None of the time

FINANCIAL RESOURCE STRAIN

17. How hard is it for you to pay for the very basics like food, housing, medical care, and heating?

1. Very hard
2. Hard
3. Somewhat hard
4. Not very hard
5. Not hard at all

18. Thinking about the past 12 months, would you say that at the end of each month you generally ended up with:

1. More than enough money left over
2. Some money left over
3. Just enough to make ends meet
4. Almost enough to make ends meet
5. Not enough to make ends meet

FOOD INSECURITY

Please answer whether the next 3 statements were NEVER, SOMETIMES, or OFTEN true for you and your household in the last 12 months.

19. Within the past 12 months, you worried whether your food would run out before you got money to buy more.

1. Never true
2. Sometimes true
3. Often true

20. Within the past 12 months, the food you bought just didn't last and you didn't have money to get more.

1. Never true
2. Sometimes true
3. Often true

21. Within the past 12 months, it was hard for you to get enough healthy food?

1. Never true
2. Sometimes true
3. Often true

TRANSPORTATION NEEDS

22. In the past 12 months, has a lack of transportation kept you from medical appointments or from getting medications?

1. Yes
2. No

23. In the past 12 months, has a lack of transportation kept you from meetings, work, or from getting things needed for daily living?

1. Yes
2. No

HOUSING INSTABILITY (available in Epic SDOH module in Nov 2019)

24. In the past 12 months, was there a time when you were not able to pay the mortgage or rent on time?

1. Yes
2. No

25. In the past 12 months, how many places have you lived?

1. One
2. Two
3. Three or more

26. In the past 12 months, was there a time when you did not have a steady place to sleep or slept in a shelter (including now)?

1. Yes
2. No

Q27. What is your living situation today?

1. You have a steady place to live
2. You have a place to live today, but you are worried about losing it in the future
3. You do not have a steady place to live (You are temporarily staying with others, in a hotel, in a shelter, living outside on the street, on a beach, in a car, abandoned building, bus or train station, or in a park)

28. The next questions are about the types of help you may want to receive if it were available to you. Your answers will help Kaiser Permanente learn what types of help our members are most likely to request. If you currently need help with any of these things, we would suggest that you contact Member Services to see if they can assist you.

Which of the following would you want to receive help with at this time if help were available? *(Select ALL that apply) (*

a. Food
b. Housing
c. Transportation
d. Utilities *(heat, electricity, water, phone, internet, etc.)*
e. Medical care, medicine, medical supplies
f. Dental services
g. Vision services
h. Applying for public benefits *(WIC, SSI, SNAP, etc.)*
i. More help with activities of daily living
j. Childcare/other child-related issues
k. Caregiver/adult-care-related assistance
l. Debt, loan, or credit card repayment
m. Legal issues
n. Employment
o. Physical
p. Behavioral
q. Education
r. Weight
s. Finance=Utilities, Public benefits, debt & employment
t. Finance, Food, Housing & Transportation
u. Other, please specify: _____
v. You wouldn't want help with any of these

If yes to any in Q28:
29. What kind of assistance are you **most** interested in?

1. Written information on the types of help available in your community
2. Someone to talk to that can give you information on the types of help available in your community
3. Someone that can help you enroll and complete paperwork
4. Someone that can help you advocate for what you feel you need
5. Access
6. Help accessing resources
7. Financial
8. Reduced costs
9. Mental health
10. In home services
11. Something else
12. None
13. Something else (SPECIFY)

If yes to Q28-E, wants help with "Medical care, medicine, medical supplies"):
Q30. Which of the following would you want help with related to medical care, medicine or medical supplies?

1. Paying the monthly cost of health insurance
2. Paying for medical care
3. Paying for medical supplies
4. Paying for medications
5. Understanding your options for medications
6. Understanding what's covered by your health plan
7. Getting an appointment with a doctor or other health care provider
8. Coordinating care across multiple doctors or health care providers
9. Someone to advocate for me
10. Something else (Please specify)
11. Not applicable

31. Are you currently getting assistance with any social or living conditions? For example, help with housing, food, transportation, utilities, or safety issues. Please do not include any help you're receiving from family or friends.

1. Yes
2. No

(COVID QUESTIONS ADDED 3/18/2020)

NEED-SPECIFIC IMPACT: Which of the following, if any, do you feel the coronavirus has negatively affected for you personally? (check all that apply)

1. Your emotional and mental health
2. Your ability to pay your rent or mortgage
3. Your ability to maintain your job
4. Your ability to access healthy food
5. Your ability to pay for medical care, including prescriptions
6. Your transportation needs
7. Your child or elder care coverage
8. Your ability to pay bills
9. Your ability to exercise
10. Your ability to be social/travel
11. Your ability to meet education needs
12. Something else
13. Not negatively affected by the coronavirus

MENTAL HEALTH-Social isolation: How much, if at all, has physically distancing yourself from others due to the coronavirus negatively affected your emotional or mental health?

1. A lot
2. Some
3. Just a little
4. Not at all
5. Have not been physically distancing myself from others

HEALTH IMPACT: Do you personally know anyone who has become sick from the coronavirus? If yes, Is that…. ? (select all that apply)

1 Me personally

2 A family member

3 A close friend

4 An acquaintance or coworker

5 Someone else

6 No, do not personally know anyone who has become sick

DEMOGRAPHICS

Next are a few questions that will be used to describe the people who took part in this survey...

What is your age?

____ years **[RECORD EXACT AGE]**

Are you male or female?

1 Male
2 Female
3 Other

What is your current work status? (*Mark all that apply.)*

1. Full-time employed
2. Part-time employed
3. Employed
4. Retired
5. Unable to work due to health/disability
6. Full-time student
7. Part-time student
8. Student
9. Full time homemaker or unpaid caregiver
10. Volunteer
11. Unemployed
12. Other (specify):_____

Are you now married, living with a partner, widowed, divorced, separated, or never married?

1. Married
2. Living with a partner
3. Widowed
4. Divorced
5. Separated
6. Never married

What is your zip code?

_____

How many adults, age 18 and over, currently live in your household INCLUDING YOURSELF?

_____ [Record exact number 1-5]

6 6 or greater

How many children under the age of 18 are living in your household?

0. None
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6 or more

What was the highest grade or level of school that you have completed?

1. 8th grade or less
2. Some high school, but did not graduate
3. High school graduate or GED
4. Some college or 2-year degree
5. 4-year college graduate (B.A., B.S., etc.)
6. More than a 4-year college degree

Are you of Hispanic, Latino/a or Spanish origin, such as Mexican, Puerto Rican, Cuban, or some other Spanish background?

1 Yes
2 No

Which one or more of the following best describes your race? **PLEASE CHECK ALL THAT APPLY**

1. White/Caucasian
2. Black or African-American
3. Asian
4. Pacific Islander
5. American Indian or Alaska Native
6. Other

What best describes your household income in the past year (before taxes)? **If phone**: Just stop me when I get to the right category

1. Less than $10,000
2. $10,000 to less than $15,000
3. $15,000 to less than $25,000
4. $25,000 to less than $35,000
5. $35,000 to less than $50,000
6. $50,000 to less than $75,000

7. $75,000 to less than $100,000
8. $100,000 to less than $150,000
9. $150,000 to less than $200,000
10. $200,000 or more
99. Don't know or decline to state

Thank you for your help!

We will mail your $15 Target gift card within the next few weeks. Where should we send it?

Address [address]
City [city] State [state] Zip [zip]

Address is the same
Update address (will be redirected to PII survey to update)

Thank you again for your help.

Appendix B

KP National Social Needs Survey – Social Need Cutoffs

Financial Strain Cutoffs

FINANCIAL #1: How hard is it for you to pay for the very basics like food, housing, medical care, and heating?

NEED	SEVERE	1. Very hard
		2. Hard
		3. Somewhat hard
NO NEED		4. Not very hard
		5. Not hard at all

OR

FINANCIAL #2: Thinking about the past 12 months, at the end of each month you generally ended up with:

NO NEED		1. More than enough money left
		2. Some money left over
NEED		3. Just enough to make ends meet
	SEVERE	4. Almost enough to make ends meet
		5. Not enough to make ends meet

Social Isolation Cutoffs

SOCIAL #1. How often do you get the social and emotional support you need?

NO NEED		1. Always
		2. Usually
NEED		3. Sometimes
	SEVERE	4. Rarely
		5. Never

Transportation cutoffs

TRANSPORT #1. In the past 12 months, has a lack of transportation kept you from medical appointments or from your medications?

TRANSPORT #2. In the past 12 months, has a lack of transportation kept you from getting things needed for daily living?

SEVERE NEED	"Yes" to both questions
NEED	"Yes" to either question
NO NEED	"No" to both questions

Food Insecurity Cutoffs

FOOD #1: Within the past 12 months, you worried whether your food would run out before you got money to buy more.

NO NEED		1. Never true
NEED		2. Sometimes true
	SEVERE	3. Often true

OR

FOOD #2: Within the past 12 months, the food you bought just didn't last and you didn't have money to get more.

NO NEED		1. Never true
NEED		2. Sometimes true
	SEVERE	3. Often true

OR

FOOD #3: Within the past 12 months, it was hard for you to get enough healthy food.

NO NEED		1. Never true
NEED		2. Sometimes true
	SEVERE	3. Often true

Housing Instability Cutoffs

HOUSING #1. In the past 12 months, was there a time when you were not able to pay the mortgage or rent on time?

NEED	1. Yes
NO NEED	2. No

OR

HOUSING #2. In the past 12 months, how many places have you lived?

NO NEED	1. One
	2. Two
NEED	3. Three or more

OR

HOUSING #3. In the past 12 months, was there a time when you did not have a steady place to sleep or slept in a shelter?

NEED	1. Yes
NO NEED	2. No

OR

HOUSING #4. What is your living situation today?

NO NEED	1. You have a steady place to live
NEED	2. You have a place to live today, but you are worried about losing it in the future
	3. You do not have a steady place to live

HOUSING #2. In the past 12 months, how many places have you lived?

NO NEED	1. One
	2. Two
SEVERE	3. Three or more

OR

HOUSING #3. In the past 12 months, was there a time when you did not have a steady place to sleep or slept in a shelter?

NEED	1. Yes
NO NEED	2. No

AND

HOUSING #4. What is your living situation today?

NO NEED	1. You have a steady place to live
SEVERE	2. You have a place to live today, but you are worried about losing it in the future
	3. You do not have a steady place to live

OR

HOUSING #4. What is your living situation today?

NO NEED	1. You have a steady place to live
	2. You have a place to live today, but you are worried about losing it in the future
SEVERE	3. You do not have a steady place to live