Health related social needs and whole person health: Relationship between unmet social needs, health outcomes, and healthcare spending among commercially insured adults

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ABSTRACT

Commercially-insured adults comprise a majority of health plan members but are least likely to be surveyed about their social needs. Little is known, consequently, about health-related social needs (HRSNs) in this population. The primary aim of this study was to assess the prevalence of HRSNs and health among commercially-insured adults and estimate their relationship with health outcomes and spending.

This cross-sectional study used survey data from a representative sample of Elevance Health commercially insured members residing in Georgia and Indiana (U.S.) Adult members reported on HSRNs across nine different domains. Survey data were linked to medical claims data, and regression models were used to estimate the relationship between HRSNs and self-reported health, emergency department visits, three major health outcomes, and healthcare spending (medical and pharmaceutical).

Of 1,160 commercially insured adults, 76 % indicated ≥ 1 HRSN, and 29 % reported > 3 HRSNs, (i.e., "high" HRSN). Each HRSN was associated with 2.2 (95 % CI, 1.84–2.55) additional unhealthy days per month, 3.0 percent (95 % CI 1.36 – 4.57) higher prevalence of anxiety/depression, 2.2 percent (95 % CI 0.88 – 3.50) higher prevalence of hypertension, 3.9 more ED visits per 1,000 member-months (95 % CI, 0.29–7.42), and $1,418 higher total healthcare spending (95 % CI, $614.67-$2,220.39) over a 12-month period.

The widespread prevalence of HRSNs among commercially insured adults demonstrates the importance of screening all health plan members for HRSNs—not just Medicare and Medicaid members. Commercially insured members who experience high HRSN are at significantly higher risk for worse health, even after controlling for income and demographic characteristics.

1. Introduction

A recent focus on "whole person health" has spurred the healthcare sector to identify factors outside clinical settings influencing health. Health systems are increasingly devoting efforts to address health-related social needs (HRSNs) to improve health outcomes (Lewis et al., 2022). HRSNs, such as lacking access to healthy food, quality housing, or reliable transportation, are associated with worse health outcomes (Berkowitz and Basu, 2021; Canterberry et al., 2022; Thompson et al., 2019), but health systems' limited information on individuals' HRSNs hinders a whole health approach. Claims-based methods for documenting social needs using Z codes, for example, tend to suffer from bias due to inconsistent collection and reporting (Liss et al., 2022).

Collection of HRSN data has occurred piecemeal, and evidence linking social needs and health exists primarily for subgroups with perceived higher needs (e.g., Medicaid or Medicare beneficiaries, children). (Canterberry et al., 2022; Kreuter et al., 2021; McCarthy et al., 2022; Sherman and Stiehl, 2018; Accountable Health Communities Model Evaluation, 2020.) Meanwhile, HRSN data from commercially-insured populations who comprise approximately two-thirds of the U. S. adult population, are typically inferred from area-level data that reflects neighborhood-level need but does not provide the precision necessary to assess individuals' health and wellbeing. One previously published study integrated results from survey questions with area-level data to show that HRSNs are "prevalent" among commercially insured populations. Individual-level HRSN data, however, pertained only to the areas of financial wellbeing and healthcare access (Pera et al., 2021). Other studies examining the relationship between HRSNs and health among the privately insured have relied upon diagnosis codes, but these studies identify fewer than 2 % of adults with HRSNs (Liss et al., 2022; Bensken et al., 2021).

Elevance Health (formerly Anthem, Inc) developed a pilot survey to assess the social needs of its affiliated health plan members in two states. Elevance Health is the largest commercial health insurer in the U.S., serving approximately 20 million commercially insured members nationally. The survey assessed prevalence of HRSNs among its membership and then linked with claims data to evaluate how such needs relate to health, utilization, and spending. This analysis reports only on findings pertaining to members with commercial health insurance.

2. Methods

2.1. Data

In this cross-sectional study, we utilized survey data from commercially-insured members residing in Georgia and Indiana. These two states were selected to provide geographic and demographic diversity. Inclusion criteria were the following: currently active, commercially insured, adult (age 18 years or older) Elevance Health member; residence in Georgia or Indiana; and complete information on physical address, age, and gender. Members were excluded from the survey if they had been contacted by Elevance Health in the preceding six months regarding another program offering. The survey was fielded between December 2021 and March 2022, and respondents completed the survey via the internet or over the telephone with an interviewer. Respondent survey data were subsequently linked to Elevance Health medical and pharmacy claims data.

This study, conducted under the Research Exception provisions of Privacy Rule 45 CFR 164.514(e), was exempt from Institutional Board review (IRB) because researchers accessed a limited dataset for analysis that was devoid of individual patient identifiers and complied with all relevant provisions of the Health Insurance Portability and Accountability Act. IRB exemption was unnecessary because the study was an analysis of the managed care organization's membership data for the purposes of health plan treatment, planning, and operations. Survey respondents were fully informed, however, about the nature and objectives of the study and provided electronic or verbal informed consent before completing the survey. The study was conducted in compliance with the principles of the Declaration of Helsinki. The Consensus-Based Checklist for Reporting of Survey Studies (CROSS) reporting guidelines was followed (Sharma et al., 2021).

2.2. Sampling frame

A stratified quota probability sampling strategy was implemented for each state to ensure survey respondents were representative of commercial health plan membership by gender, age, social vulnerability index (SVI) ranking, and urbanicity of residence. SVI, which incorporates the relative social vulnerability of counties based on factors including socioeconomic status, housing composition and disability, minority status and language, and housing and transportation, was categorized into quartiles. Urbanicity was assigned using the 2013 NCHS Urban-Rural classification scheme, where "urban" was classified as large metro areas of 1 million population or more, "suburban" was classified as medium metro or small metro areas of 250,000–999,999 or less than 250,000 population, and "rural" was classified as non-metropolitan areas with populations of 10,000–49,999 or considered "noncore.".

This stratification was important so that we could identify unmet HRSNs in demographic subgroups and generalize our findings to the commercially-insured membership in these states. The total targeted number of completed surveys across all lines of business (i.e., Commercial, Medicare Advantage, Medicaid) was 1,500 for each state (3,000 total). The total number of surveys for commercial membership only was 1,163 (793 in Georgia; 370 in Indiana), which was divided across 144 quota cells (2 states (GA, IN) x 2 genders (female, male) x 3 age group (18–44 years, 45–64 years, 65 years and older) x 4 SVI quartiles x 3

urbanicity terciles (urban, suburban, rural)) in proportion to the membership size in these groups. We multiplied the proportion of members represented in each of the 144 strata by the full sample to determine the quota of respondents in each stratum. The targeted sample size of 1,163 was in proportion to the percentage of commercially-insured health plan members summed from each state (i.e., approximately 53 % of the adult health plan membership in Georgia is comprised of commercially-insured adults, while approximately 25 % of adult health plan membership in Indiana is comprised by commercially-insured adults). Next, we calculated a starting sample, which was a smaller subset of the total membership in the two states. The starting sample was estimated based on the assumption that 50 member names would be needed to obtain one completed survey (1,163 * 50 = 58,150 starting sample list). The survey was closed once the targeted number of completed surveys had been obtained for all sample quota cells.

2.3. Survey content

The survey was based on extant health and social need screening tools and questions, including the PRAPARE screening tool, (PRAPARE, 2022) PROMIS Global-10 short form, (Hays et al., 2009) CDC Healthy Days Measure, (Measuring Healthy Days, 2000) UCLA Loneliness Scale, (Hughes et al., 2004) questions from the Accountable Health Communities HRSN Screening Tool, (Billioux et al., 2017) and the Computer and Internet Access questions from the American Community Survey (America Community Survey. United States Census Bureau, 2021). Each of these survey instruments has been validated and has demonstrated reliability in their respective outcomes. The survey included 68 questions divided into eight sections that touched upon HRSNs, self-reported health, and clinical and demographic characteristics.

2.4. Variables

HRSNs were identified from responses to 32 survey questions that were grouped into nine categories: healthcare access (e.g., usual source of care, access to care), financial wellbeing, internet access, housing quality, healthy food access, interpersonal safety, housing stability, reliable transportation, and social support (supplemental Table 1). Respondents were considered to have a specific HRSN if they indicated need through their response to at least one of the relevant survey questions.

Survey data also were used to assess self-reported health, via the CDC Healthy Days measure, in which respondents reported the number of physically and mentally unhealthy days during the 30 days prior to the survey. The total number of unhealthy days was calculated from the sum of physically and mentally unhealthy days.

Healthcare utilization (i.e., emergency department (ED) visits), spending, and health conditions were defined using Elevance Health administrative claims data and were evaluated for the six-month period preceding and six-month period following the survey date (the most recent twelve months of data available). Healthcare spending was defined as the sum of allowed amounts from medical and pharmacy claims (i.e., total contracted reimbursable amount, which is the sum of health plan paid expenditures and out-of-pocket expenditures from the patient). Medical and pharmacy spending was aggregated to provide the most comprehensive perspective on health-related spending in this population. A small set of health conditions also were evaluated to explore the relationship between HRSNs and health among the commercially insured. The following health conditions were assessed: anxiety/depression, hypertension, and type 2 diabetes (ICD 10 codes included in supplemental Table 2). These three conditions were selected based on their widespread prevalence in the U.S. population and their demonstrated associations with HRSNs in other study populations (Heller et al., 2021; Wan et al., 2022).

Covariate data (gender, age, household income, state, and urbanicity of residence) were determined from a combination of self-reported

survey responses and Elevance Health enrollment files. Gender, age, and household income were self-reported; state and urbanicity were derived from the address of the member's residence.

2.5. Statistical analysis

We first calculated the number of HRSNs and the prevalence of each HRSN type by demographic and household characteristics. We also analyzed the number of HRSNs both as a continuous variable ranging from 0 to 9 and as a binary variable (low < 3 vs. high ≥ 3), because plots of HRSN count by various health outcomes indicated a possible threshold effect occurring at 3 HRSNs.

We used multivariable linear regressions to estimate the association between HRSNs and health outcomes (i.e., "unhealthy days", ED visits, health conditions, and healthcare spending). Linear regressions were selected based on scatterplots of HRSNs with the respective health outcomes, which suggested a linear relationship, as well as for its parsimony and ease of interpretability. Although neither the Unhealthy Days nor the distribution of the residuals of the linear model were normally distributed, the distribution of residuals was not improved with alternative Poisson modeling. We also tried log transformations of the outcome variables, but model fit did not change appreciably. All regressions incorporated corrected standard errors using the Huber White sandwich variance estimator.

Regressions were analyzed both as unadjusted models and adjusted for the following covariates: state, urbanicity, income, age, and gender. Given the survey sampling strategy included stratification on these variables, *a priori* reasoning led us to consider that they could affect the prevalence of HRSNs reported and be correlated with health outcomes, utilization, and spending. No covariate information was missing; however, we replaced one outlier value of medical spending with the 99th percentile value to avoid skewing analyses. Additional variables considered for inclusion as covariates were race/ethnicity and household composition. Inclusion of these variables in regression models, however, did not independently change the effect estimates appreciably (i.e., by more than 0.1). Because these variables each had a small amount of missing data associated with them, they were omitted from regressions to help maximize the sample size. Stata version 16.0 SE was used (StataCorp LLC) to perform all data analyses.

3. Results

Overall, 12,924 of 52,203 members responded to the recruitment materials, for a 24.8 % response rate. Of these members, 3,145 provided electronic or verbal consent to participate in the survey, 1,480 members qualified for the survey, and 1,218 completed the survey (58 surveys were considered "overage" because of exceeding sampling plan quotas before the survey closed and were excluded), resulting in a final sample of 1,160 completed surveys) (supplemental Fig. 1). Three surveys were not obtained for three strata in Georgia (one missing per strata). Inability to complete these targets, however, did not affect the target proportions established during the design of the survey sampling strategy. Survey recruitment goals for each state were 100 % met (statistically) for the commercially insured (supplemental Table 3).

Respondent demographic characteristics are summarized in Table 1, showing an equal proportion of male and female respondents and fewer than 1 percent reporting a nonbinary gender. The majority (70 %) of respondents reported they were White, 14 % Black, 5 % Asian, 3 % Hispanic, and 5 % reported other or multiple races. Most respondents (58 %) were married or had a domestic partner, and 25 % had a household income of less than $50,000.

Fig. 1 displays the HRSNs reported by most respondents: out of nine possible HRSNs, 76 % of respondents reported at least one HRSN, and more than one in four reported at least three HRSNs (i.e., "high" HRSN). The most frequently reported HRSNs were healthcare access (53 %), social support (38 %), and financial wellbeing (31 %). The highest
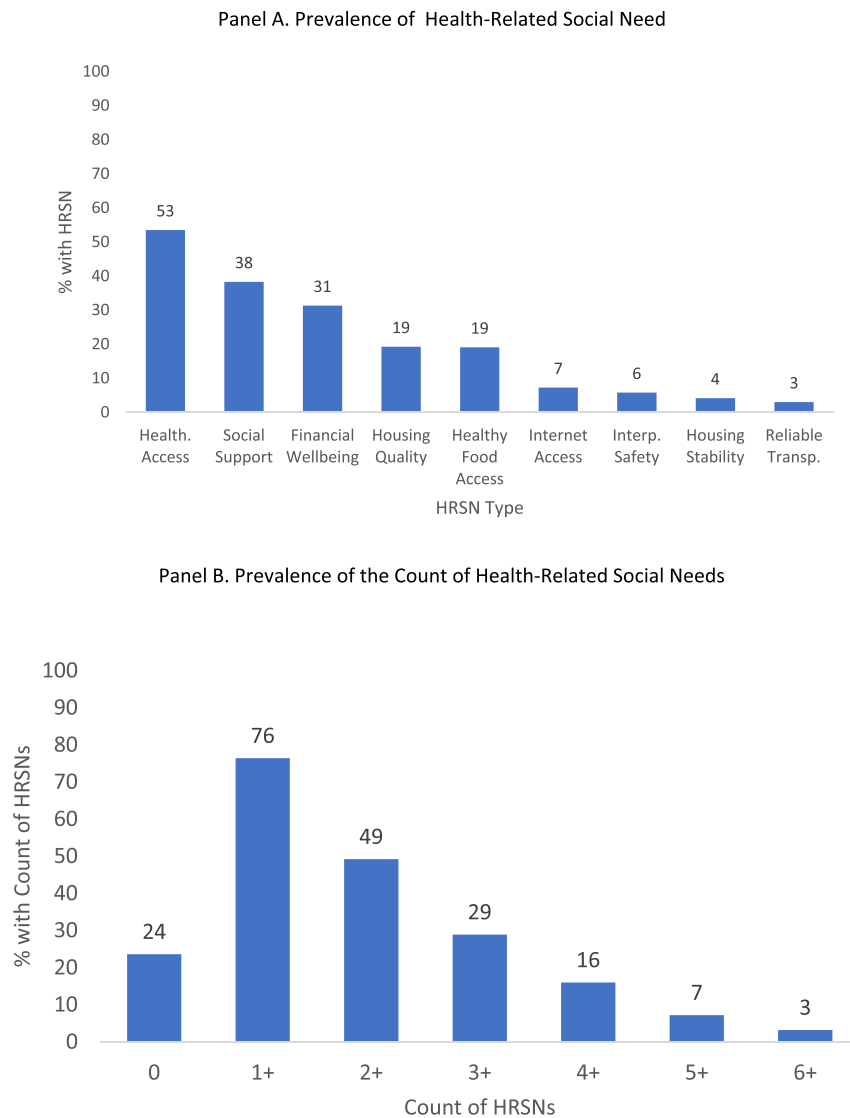
Table 1

Respondent Demographic Characteristics of a Sample of Commercially-Insured Adults (≥18 years) from Georgia and Indiana, Dec 2021-Mar 2022.

	N	%
Gender		
Male	577	49.7
Female	577	49.7
Non-binary	6	0.5
Age group		
18–34	318	27.4
35–54	474	40.9
55+	368	31.7
Race/Ethnicity		
White	811	69.9
Black	164	14.1
Asian	59	5.1
Hispanic	36	3.1
Other/Multiple	59	5.1
Missing	31	2.7
Household Composition		
Single without children	320	27.6
Single with children	101	8.7
Partnered without children	377	32.5
Partnered with children	296	25.5
Missing	66	5.7
Income Category		
Less than $25 K	119	10.3
$25 K-$50 K	168	14.5
$50 K-$75 K	205	17.7
$75 K-$100 K	138	11.9
$100 K or more	339	29.2
Missing	191	16.5
Area-level SES Quartile		
Quartile 1 (highest SES)	326	28.1
Quartile 2	297	25.6
Quartile 3	273	23.5
Quartile 4 (lowest SES)	264	22.8
Urbanicity		
Urban	160	13.8
Suburban	559	48.2
Rural	441	38.0
State		
Indiana	370	31.9
Georgia	790	68.1
Total	1,160	100.0

prevalence and number of HRSNs occurred among those reporting household incomes below $50,000 (2.7 HRSNs on average, 48 % with high HRSN), single individuals with children (2.5 HRSNs, 41 % with high HRSN), and those identifying as Black (2.4, 46 % with high HRSN) (supplemental Table 3).

3.1. HRSNs and self-reported health

Fig. 2 shows that respondents with high HRSN reported more unhealthy days. Individuals with high HRSN had twice as many physically and mentally unhealthy days, relative to those who reported "low" (≤2) HRSN (11.5 vs. 5.1 unhealthy days). Table 2, Panel A similarly shows that each additional HRSN was associated with 2.2 more total unhealthy days (95 % CI, 1.84–2.55), 1.2 more physically unhealthy days (95 % CI, 0.88–1.50), and 1.6 more mentally unhealthy days (95 % CI, 1.30–1.91). The adjusted average difference in unhealthy days among those with high HRSN relative to those with low HRSN was 6.0 total unhealthy days (95 % CI, 4.72–7.31), 3.0 physically unhealthy days (95 % CI, 1.96 – 3.99), and 4.5 mentally unhealthy days (95 % CI, 3.45–5.50). All HRSNs were individually associated with more unhealthy days (p < 0.05), except for inadequate internet (Table 2, Panel B). (Full reporting of estimates for covariates in adjusted models is included in supplemental Table 4).

Panel A. Prevalence of Health-Related Social Need

Panel B. Prevalence of the Count of Health-Related Social Needs

Source: Authors' calculations from Elevance Health's Social Risk Survey.

Fig. 1. Prevalence and Number of Health-Related Social Needs among a Sample of Commercially-Insured Adults (≥18 years) from Georgia and Indiana, Dec 2021-Mar 2022 Survey (n = 1,160) Source: Authors' calculations from Elevance Health's Social Risk Survey.

3.2. HRSNs and ED visits

Most respondents (93 %) had no ED visit during the study period. Still, the prevalence of ED visits among those with high HRSN was significantly higher than those with low HRSN (22.4 vs. 10.6 ED visits per 1,000 member months; see Fig. 2). Analyses adjusting for socio-demographic characteristics similarly reflect a positive correlation of higher numbers of HRSNs associated with higher numbers of ED visits (Table 3, Panel A)). Each additional HRSN was associated with an adjusted average of 3.9 more ED visits (95 % CI, 0.29–7.42), although we note caution with the interpretation of the effect size, given the wide confidence intervals (arising from the reduced sample who had an ED visit). (Full reporting of estimates for covariates in adjusted models is included in supplemental Table 5).

3.3. HRSNs and healthcare spending

Average total per member healthcare spending during the study period was more than twice as high among those with high versus low HRSN ($6,656 vs. $3,000). Table 3, Panel A shows that each additional HRSN was associated with an average of $1,418 (95 % CI, $614.67-$2,220.39) in additional healthcare spending, adjusting for socio-demographic characteristics. Healthcare spending disaggregated into its component parts (medical + pharmaceutical spending) showed significant association between high HRSN and medical spending only. Each additional HRSN was associated with an adjusted average of $1173.08 (95 % CI, $514.89 - $1831.27) in additional medical spending. The lack of a significant correlation for pharmacy spending (each HRSN was associated with an adjusted average of $244.45 (95 % CI, -$98.91 - $587.81) may be due to the relatively smaller amount of spending on pharmacy.

Financial wellbeing and healthy food access were individually associated with healthcare spending (Table 3, Panel B). Financial wellbeing was associated with an adjusted average of $3,323 (95 % CI, $437.95 - $6207.89) in additional healthcare spending, and healthy food access was associated with an adjusted average of $3,950 (95 % CI, $939.83-$6,959.94) in additional healthcare spending. Quality housing also was correlated with higher healthcare spending ($4,008, 95 % CI, $599.26-$7,417.38).
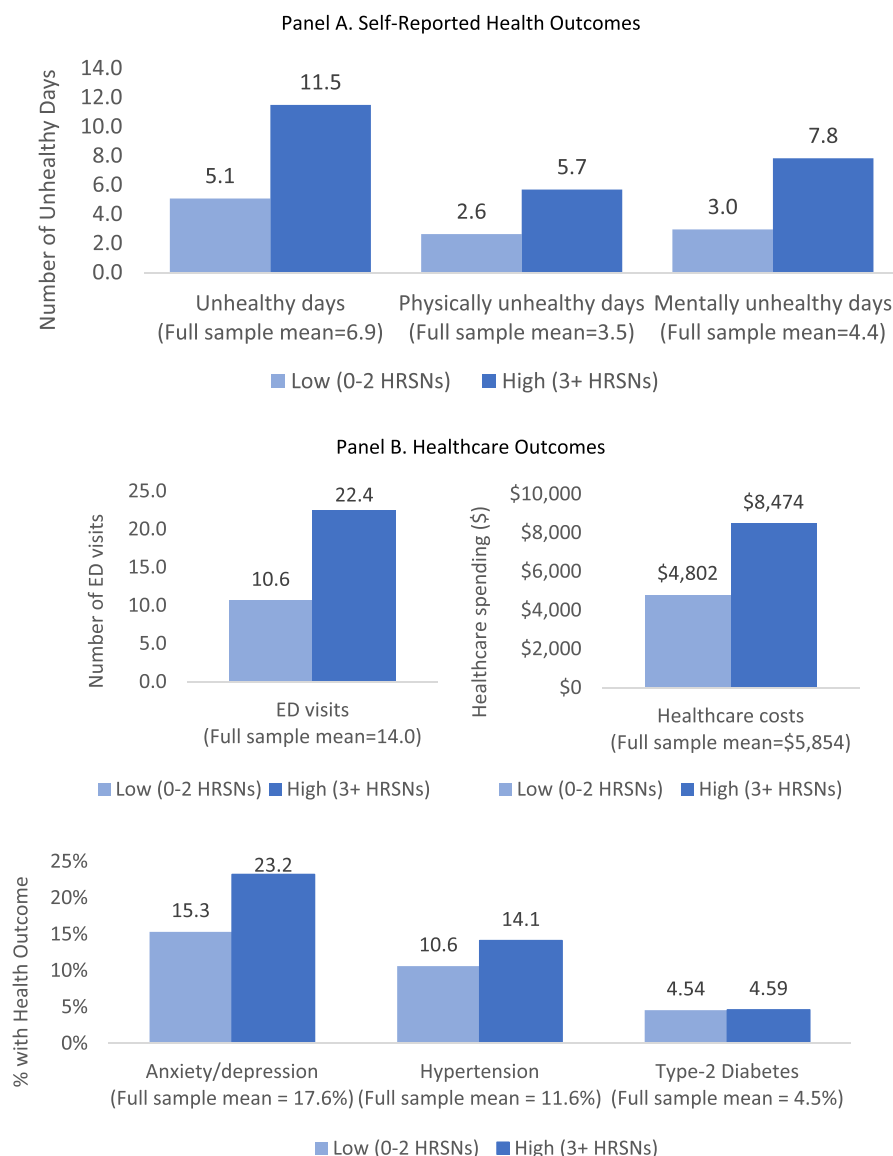
Fig. 2. Self-Reported Health and Healthcare Outcomes by Number of Health-Related Social Needs among a Sample of Commercially-Insured Adults (≥18 years) from Georgia and Indiana, Dec 2021-Mar 2022 (n = 1,160). Source: Authors' calculations from Elevance Health's Social Risk Survey linked with administrative claims data. Note: The figure reports unadjusted average outcomes among those with 0–2 HRSNs (low), those with 3 or more HRSNs (high), and the full sample. ED visits are scaled to per 1,000 member-months.

3.4. HRSNs and health outcomes

Those with high HRSN showed a higher prevalence of the three major health conditions evaluated in this study (anxiety/depression, hypertension, and type 2 diabetes), compared to those with low HRSNs. The difference in prevalence of conditions was especially pronounced for diagnoses of anxiety/depression (30.0 % vs. 18.5 %) (see Fig. 2). Table 3, Panel A shows that each additional HRSN was associated with an adjusted average of 2.96 % higher prevalence of anxiety/depression (95 % CI 1.36 % – 4.57 %) and 2.19 % higher prevalence of hypertension (95 % CI 0.88 % – 3.50 %). Anxiety/depression also was associated with an adjusted average of 8.18 % higher prevalence among those with high HRSN (95 % CI 2.58 % – 13.77 %). Type 2 diabetes was not significantly associated with HRSN count in regression analyses.

To reduce the threat of Type 1 errors that could arise from the multiple tests of association, we assessed the statistical significance of all estimates using a Bonferroni correction. Results were still statistically significant for most of the associations reported, including all self-

reported health outcomes and healthcare spending. Associations that were no longer significant include the correlation between HRSN count and ED visits, HRSN count and hypertension, and high HRSNs and anxiety/depression (Tables 2 and 3).

4. Discussion

Survey results on social needs experienced by a representative sample of commercial health plan members in Georgia and Indiana showed that more than 3 in 4 members expressed at least one HRSN. Linkage of social needs survey data with administrative claims data revealed that these needs were associated with increases in health care spending ($1,418 per member per social need) and decreases in health (including increased emergency department visits, more reported unhealthy days, and a higher prevalence of anxiety/depression and hypertension). These findings are consistent with results from other surveys of social needs among U.S. adults, which report a widespread prevalence of HRSNs (Social Needs in America, 2019; Cole and Nguyen,

Table 2

Regression Estimates of the Difference in Number of Unhealthy Days Associated with Health-Related Social Needs among a Sample of Commercially-Insured Adults (≥18 years) from Georgia and Indiana, Dec 2021-Mar 2022.

	Unhealthy days	Physically unhealthy days	Mentally unhealthy days
Panel A. Number of HRSNs			
Number of HRSNs (0–9, continuous)	2.19***†	1.19***†	1.60***†
	[1.84; 2.55]	[0.88; 1.50]	[1.30; 1.91]
High (3 + HRSNs, binary)	6.02***†	2.98***†	4.47***†
	[4.72; 7.31]	[1.96; 3.99]	[3.45; 5.50]
Panel B. Individual HRSNs			
Healthcare access	2.97***†	2.11***†	1.60***†
	[1.90; 4.03]	[1.29; 2.92]	[0.78; 2.42]
Social support	4.87***†	2.04***†	3.99***†
	[3.75; 5.99]	[1.17; 2.90]	[3.12; 4.86]
Financial wellbeing	5.45***†	2.94***†	3.88***†
	[4.18; 6.72]	[1.96; 3.92]	[2.86; 4.90]
Housing quality	3.89***†	1.97***	3.07***†
	[2.43; 5.36]	[0.82; 3.12]	[1.84; 4.30]
Healthy food access	5.21***†	2.90***†	3.90***†
	[3.57; 6.84]	[1.62; 4.18]	[2.54; 5.25]
Internet access	−0.18	0.50	−0.97
	[−2.19; 1.83]	[−1.17; 2.16]	[−2.28; 0.34]
Interpersonal safety	4.70***†	3.48**	4.02***
	[2.13; 7.27]	[1.11; 5.84]	[1.74; 6.31]
Housing stability	8.26***†	4.08**	6.43***†
	[4.99; 11.53]	[1.16; 6.99]	[3.42; 9.43]
Reliable transportation	4.61*	2.92	3.12*
	[0.91; 8.31]	[−0.30; 6.14]	[0.13; 6.11]

Notes: Quantities presented represent the adjusted mean difference in unhealthy days associated with the presence of HRSNs. All regressions control for state, urbanicity, gender, age category, and income category. Ninety-five percent confidence intervals are shown in brackets below each estimate. Individual HRSN estimates come from separate regressions (not controlling for other HRSNs). *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. †Significant after Bonferroni adjustment at $p < 0.001$.

2020).

The sizable proportion (29 %) of members who indicated experiencing a high level of HRSNs (>3) demonstrate the importance of assessing HRSNs in commercially-insured populations. Members with HRSNs had significantly worse health, in terms of self-reported health and healthcare spending. Members with a high level of need experienced more than six additional "unhealthy days" and more than $4,500 in additional healthcare spending (over a 12-month period), compared to those with a low level of need.

Although this pilot survey demonstrated the importance of identifying social needs to health care payors, we also note the importance of implementation of effective solutions for those who express social needs. The dynamic nature of HRSNs, in particular, reveals the importance for payors and providers to adopt or adhere to standardized screening, definitions, and categorization for social needs. A common set of standards and definitions of HRSNs, such as those being established by the Gravity Project, allows data collected at different patient interaction points to be shared and integrated into the delivery of health care. Rather than developing and fielding an annual survey, for example, HRSN data could be collected and shared when members are screened at outpatient visits, visit the ED, at the time of health plan enrollment/re-enrollment, or in other interfaces with health plans (e.g., patient portals and case management programs). As of 2023, the Centers for Medicare and Medicaid Services requires hospitals to collect HRSN data; collection of HRSN data theoretically could be expanded to include all patients. Collaboration between providers and health plans to collect HRSN data would increase the frequency and likelihood of members

being assessed to coordinate an appropriate care plan.

5. Limitations

With no standard way to identify HRSNs, we used questions from multiple, commonly used survey screening tools to assess social needs, resulting in varying numbers of questions per HRSN. Certain HRSNs, such as reliable transportation (one question), may be under-identified compared to other HSRNs, such as housing quality (seven questions). On the other hand, some social needs may require a larger number of different questions to adequately identify them within a population. More broadly, lack of standard definitions for HRSNs and a standard screening tool to measure HRSNs mean results from different studies cannot necessarily be compared, because different HRSN constructs may be measured depending on the HRSN definition and screening tool used.

We also note that the survey questions referred to varying time intervals (despite having been validated), which limits our capacity to establish temporality. Some questions, for example, ask about a HSRN experienced "today" or "currently" while other questions ask about HRSNs experienced "within the past 12 months". The varying references to time impede the ability to ascertain causality. This challenge is further complicated by the bidirectional nature of the relationship between HRSNs and health. HRSNs can lead to worse health and higher acute care utilization and spending, but worse health also is associated with higher HRSNs. These limitations are not unique to this study; repeating this survey at more regular intervals may allow us to arrive at a clearer understanding of the causal relationship. Regardless of the causal explanation underlying the association between HRSNs and health, medical care and social care are typically provided independently from each other. Integration of social care with medical care may enable identifying protective factors and addressing risk factors to health to make meaningful change in health outcomes. Knowledge of social risks also can enable providers to modify the clinical care they provide to accommodate social needs and provide better quality care.

6. Takeaways

As payors embrace the whole health concept and include the social drivers of health within the scope of health, efficient and routine methods for assessing members' social needs will be needed. Elevance Health's social needs survey and linkage to claims data showed that not only are HRSNs prevalent among commercially insured adult members, but also that a high number of HRSNs is associated with worse health and higher healthcare utilization and spending. Although no single solution may solve an issue as widespread as HRSNs, identification of HRSNs through frequent checkpoints and implementation of a combination of efforts that connect members to supports addressing their social needs may lead to meaningful improvements in health for commercially insured adults.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

Table 3

Regression Estimates of the Difference in Healthcare Outcomes Associated with Health-Related Social Needs among a Sample of Commercially-Insured Adults (≥18 years) from Georgia and Indiana, Dec 2021-Mar 2022.

	ED visits	Healthcare spending	Anxiety/Depression	Hypertension	Type 2 Diabetes
	(# of visits)	(U.S. dollars)	(% prevalence)	(% prevalence)	(% prevalence)
Panel A. Number of HRSNs					
Number of HRSNs (0–9, continuous)	3.86*	1417.53***†	2.96***†	2.19***	0.40
	[0.29; 7.42]	[614.67; 2220.39]	[1.36; 4.57]	[0.88; 3.50]	[−0.58; 1.37]
High (3 + HRSNs, binary)	7.26	4548.73**	8.18**	4.30	0.26
	[−1.97; 16.50]	[1695.22; 7402.23]	[2.58; 13.77]	[−0.07; 8.67]	[−2.68; 3.19]
Panel B. Individual HRSNs					
Healthcare access	1.46	1839.74	−0.58	3.87*	−0.38
	[−5.76; 8.68]	[−396.89; 4076.37]	[−5.19; 4.04]	[0.11; 7.63]	[−2.87; 2.10]
Social support	5.80	2095.11	8.48***†	3.15	−0.57
	[−2.69; 14.28]	[−137.76; 4327.98]	[3.68; 13.29]	[−0.61; 6.92]	[−2.96; 1.82]
Financial wellbeing	11.30*	3322.92*	8.78**	5.14*	0.81
	[2.40; 20.19]	[437.95; 6207.89]	[3.45; 14.10]	[0.82; 9.45]	[−2.03; 3.64]
Housing quality	4.03	4008.32*	3.12	3.73	1.88
	[−7.58; 15.91]	[599.26; 7417.38.65]	[−2.77; 9.01]	[−1.30; 8.75]	[−1.61; 5.36]
Healthy food access	10.88	3949.88*	7.39*	2.67	2.72
	[0.13; 17.51]	[939.83; 6959.94]	[0.71; 14.07]	[−2.35; 7.68]	[−1.02; 6.46]
Internet access	5.20	1601.70	5.68	8.81	3.83
	[−10.57; 20.97]	[−1680.11; 4883.51]	[−3.55; 0.14.91]	[−0.11; 17.73]	[−2.28; 9.95]
Interpersonal safety	7.96	1133.63	13.98*	1.92	1.99
	[−12.66; 28.57]	[−3244.46; 5511.71]	[2.73; 25.23]	[−6.15; 9.98]	[−4.08; 8.06]
Housing stability	23.51	2927.10	6.0.17	10.00	−1.00
	[−16.97; 63.99]	[−3200.15; 9054.34]	[−6.88; 19.22]	[−1.62; 21.61]	[−7.02; 5.02]
Reliable transportation	31.40	5645.80	5.91	7.64	−1.37
	[−7.85; 70.65]	[−2510.74; 13802.33]	[−9.38; 21.20]	[−4.57; 19.85]	[−7.56; 4.83]

Notes: ED visits are scaled to 1,000 member-months. Individual HRSN estimates come from separate regressions (not controlling for other HRSNs). All regressions control for state, urbanicity, gender, age category, and income category. Ninety-five percent confidence intervals are shown in brackets below each estimate. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. †Significant after Bonferroni adjustment at $p < 0.001$.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pmedr.2023.102491.

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