

COVID-19 and Changes in Reported Social Risk Factors at a Primary Care Practice in the South Bronx

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Abstract

Introduction: Historically, Black and Hispanic patient populations in the Bronx Borough of New York City have experienced the highest rates of social risk factors, and associated poor health outcomes, in New York State. During the pandemic, Bronx communities disproportionately experienced high rates of COVID-19 illness and death. To date, little is known regarding the COVID-19 pandemic's impact on social risk factors in urban, at-risk communities. This study aimed to determine how social risk factors changed during the pandemic in a Bronx-based patient population. **Methods:** Study participants were adult patients seen at a Federally Qualified Health Center in the South Bronx. Using a paired longitudinal study design, 300 participants were randomly selected for telephonic outreach during the pandemic from a sample of 865 participants who had been offered a social risk factor screener in the year prior to the pandemic. The outreach survey used included the social risk factor screener and questions regarding COVID-19 illness burden and prior engagement in social services. The McNemar test was used to analyze trends in reported social risks. **Results:** Housing quality needs, food insecurity, and legal care needs significantly increased during the pandemic. Participants who reported COVID-19 illness burden were 1.47 times more likely to report a social risk factor ($P = .02$). No significant relationship was found between prior enrollment in clinic-based social services and degree of reported social risk ($P = .06$). **Conclusion:** Housing quality needs, food insecurity, and legal care needs increased during the COVID-19 pandemic in a predominantly Black and Hispanic identifying urban patient population. Urgently addressing this increase is imperative to achieving health equity in ongoing COVID-19 mitigation efforts.

Keywords

social determinants of health, social risk factors, COVID-19, health equity, social needs

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Introduction

Social Determinants of Health (SDOH), such as access to stable housing, healthy food, home utilities, employment, personal safety and mental health, are recognized as important drivers of population health and disease.¹⁻³ Individual SDOH that are linked to specific poor health outcomes are often referred to as social risks, or, when placed in the context of a person's subjective values and priorities, as social needs. Distinguishing between social risk and need is useful in developing patient centered interventions to address social drivers that influence health outcomes.⁴ Healthcare systems across the United States have developed various screening and intervention-based methods to identify unmet social risks in order to provide targeted care within a given patient population.⁵⁻⁷

During the COVID-19 pandemic, pre-existing social risk factors, such as housing instability and food insecurity, have been associated with individual and population-level risk of COVID-19 morbidity and mortality. Moreover, pandemic-related economic hardship has disproportionately impacted populations experiencing higher levels of social risk factors.⁸ Therefore, it is concerning that the COVID-19 pandemic, and its socioeconomic ramifications, may further

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exacerbate existing social risk factors and linked poor health outcomes in vulnerable populations.

In March 2020, the prevalence of COVID-19 rapidly escalated in New York City, leading to a city-wide shutdown and quarantine. As numerous waves of COVID-19 variants have since impacted New York City, communities in the Bronx have consistently experienced one of the highest local infection and death rates.⁹ To date, knowledge of how patient reported social risk factors changed during the COVID-19 pandemic in New York City is limited. The primary objective of this study was to determine whether reported social risk factors quantitatively changed during the COVID-19 pandemic in a predominantly Black and Hispanic identifying, New York City-based patient population. This study further aimed to explore how patients' COVID-19 illness burden and prior engagement in social services may have influenced the degree of reported social risk factors in this community during the pandemic.

Methods

Setting

The Bronx, home to nearly 1.4 million New York City residents, is known to have the highest unemployment rate as well as the worst health outcomes of all 62 counties in New York State.^{10,11} In 2018, the Montefiore Medical Group (MMG), one of the largest ambulatory health networks in the Bronx, implemented a standardized, 10-item social risk factor screener and resource referral pathway to identify and address patients' unmet social needs during clinical visits.

Social Risk Factor Screening

One primary care practice, a Federally Qualified Healthcare Center (FQHC) in the South Bronx, was selected as the study site. At this clinic, pediatric and adult patients were historically offered a social risk factor screener, adapted from the Health Leads Toolkit, in-person, during encounters with a new physician.⁷ Prior to the COVID-19 pandemic, adult patients initially completed the screener by self-report on-site. Screener responses were verified and logged into patients' electronic medical records by ancillary clinic staff. Those who reported at least one social risk factor were then offered referral to either a community health worker or behavioral health social worker to address their needs.

Participants

Between February 2019 and December 2019, the primary care practice offered 865 adult patients, aged 18 years or

older, the social risk factor screener. During this time, the screener was offered to any adult patient seeking care with a new physician at the clinic study site. The screener was adapted from the Health Leads Toolkit and assessed for social risk in environmental, economic, and social categories.¹² The 10 social risk domains assessed were housing insecurity, housing quality needs, home utility needs, food insecurity, healthcare transportation access needs, healthcare affordability needs, child or dependent adult care needs, legal representation needs, general relationship safety concerns, and intimate partner violence.

Data Collection

Using a random number generator, 300 of the 865 participants who were offered the social risk factor screener in 2019 were selected for telephonic survey outreach during the study period. The outreach team included the study authors and 9 senior medical students rotating on their ambulatory internal medicine rotation at the clinic study site. Rotating medical students received a 1-h introduction and training on survey administration prior to participation. This team performed telephonic outreach between September 2020 and March 2021. The survey, approximately 10 min in length, consisted of a verbal consent request, the 10-item social risk factor screener, and additional questions regarding personal and household COVID-19 illness burden and previous utilization of clinic-based social services. The outreach team followed an embedded survey script to further ensure standardization of survey administration. Upon completion of the survey, participants who reported social risks were offered referrals to behavioral health, community health, and primary care providers. Non-English-speaking patients were called using a telephonic language interpreter service. Patients who did not answer on initial call were contacted 3 additional times on 2 separate days, in accordance with an existing patient outreach protocol at the clinic study site. For the primary analysis, participants were included if they had completed the 10-item screener in the year before and during the pandemic. All included participants responded to all 10 screener questions except for 3 participants with 1 or 2 missing 2019 screener domain responses. For secondary analyses, participants were included if they completed the comprehensive study survey during the pandemic outreach period.

Data Analysis

Participant demographic information was obtained from patient electronic medical records and included participant age, sex, race/ethnicity, and preferred spoken language. Pre-pandemic social risk factor screener data was obtained from an existing REDCap data set. The primary

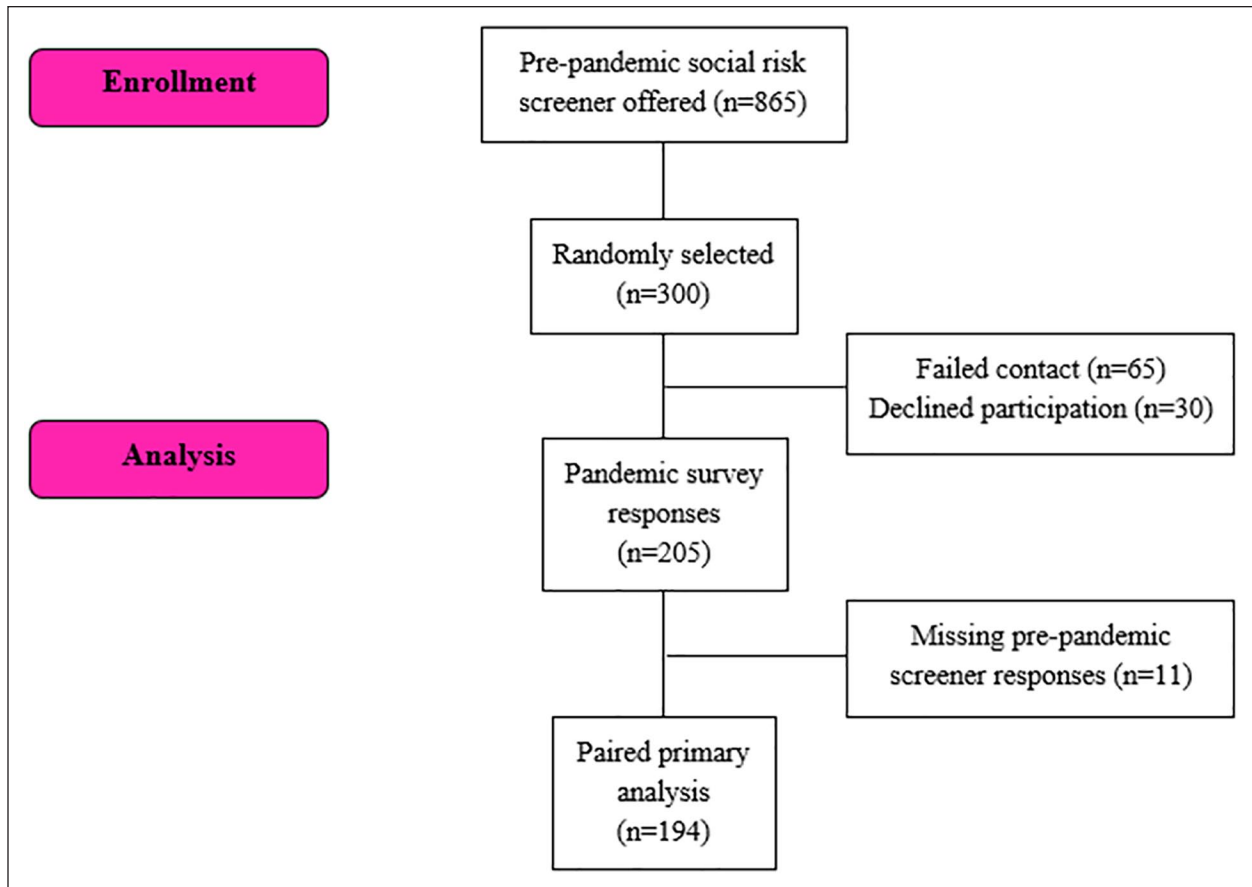


Figure 1. Consort diagram of study enrollment and primary paired analysis.

analysis utilized a longitudinal, paired design where participant 10-item screener responses were analyzed with each participant serving as their own control. The McNemar test was used to analyze paired social risk factor screener responses and a generalized estimating equation model with log link was used to analyze non-paired response trends to account for the 3 included participants with 1 or 2 missing 2019 screener domain responses. The secondary analysis cross-sectionally analyzed survey responses regarding COVID-19-related illness burden and prior engagement in social services. Log linked binomial models were used to analyze the association between these variables and reported social risks during the pandemic. A one-way chi-square goodness of fit test was used to compare participant reports of the pandemic as the direct cause of their experienced social risks to that expected by chance alone. Four surveys had missing social service enrollment data and one survey had incomplete COVID-19 illness burden data. These participants were excluded from the respective cross-sectional analyses. The study was approved by the Albert Einstein College of Medicine Institutional Review Board (#2020-11920).

Results

Of the 300 participants randomly selected, 68% (205) verbally consented to study participation and completion of the comprehensive study survey during the pandemic. Of these participants, 191 completed the 10-item screener pre-pandemic and during the study period. In addition, 3 participants completed the screener during the pandemic outreach period and had missing pre-pandemic screener responses in 1 (2 participants) or 2 (1 participant) domains (Figure 1). The average age of paired study participants was 47.9 years, 68% identified as cis-gendered female, 48% Hispanic, 37% non-Hispanic Black, and 73% identified English as their preferred language (Table 1). There were no meaningful demographic differences between the original, randomly selected, paired, and cross-sectional study cohorts.

Social Risk Factor Screener Results

Pre-pandemic, 29% (57) of participants reported at least one social risk factor compared to 44% (85) of participants during the pandemic ($P=.001$). The direction and significance

Table 1. Demographics of Longitudinal Study Cohort.

Variable	Paired cohort (n = 194)
Age-years mean (SD)	47.9 (17.4)
Sex n (%)	
Female	131 (68%)
Male	63 (32%)
Race/Ethnicity n (%)	
Hispanic	93 (48%)
Non-Hispanic Black	72 (37%)
Other	17 (9%)
Unavailable	12 (6%)
Preferred language n (%)	
English	142 (73%)
Non-English	50 (26%)
Unavailable	2 (1%)

of this association remained unchanged after adjustment for participant demographics (Table 2). A median of 2 social risk factors per participant were reported in both screening periods. Regarding each of the 10 social risk factor domains screened for, there was a significant increase in reported housing quality needs ($P = .002$), food insecurity ($P = .0004$), and legal care needs ($P = .03$) during the pandemic. There was no significant decrease in reported social risk factors appreciated (Figure 2).

COVID-19 Illness Burden and Social Service Engagement

Of the 205 participants who completed the study survey during the pandemic, 15% (30) reported a personal and/or household member COVID-19 diagnosis. These participants were 1.47 times more likely to report a social risk factor during the pandemic (95% CI: (1.06-2.04), $P = .02$). Independent of reported COVID-19 illness burden, 76% of participants identified the pandemic as the direct cause of their experienced social risk ($P < .0001$). Additionally, 23% (46) of participants reported previous enrollment in clinic-based social services. Of these participants, 54% (25) reported at least one social risk factor during the pandemic, compared to 42% (65) of those who reported no prior enrollment in social services (95% CI: (0.98-1.93), $P = .06$). The direction and significance of association in these secondary analyses remained unchanged after adjustment for participant demographics (Table 3). Of the participants who reported social risk factors, 48% (41) accepted referral to social services during the pandemic.

Discussion

This longitudinal study assessed how reported social risk factors changed in a paired, clinic-based cohort before and during the COVID-19 pandemic. In this New York

City-based, predominantly Black- and Hispanic-identifying patient population, we found that reported housing quality needs, food insecurity, and legal care needs significantly increased during the pandemic. Fifteen percent of participants reported COVID-19 illness burden, which was associated with a 1.47 times increased prevalence of self-reported social risk. No significant relationship was found between prior enrollment in clinic-based social services and degree of reported social risk. Interestingly, less than half of participants who reported social risks during the pandemic accepted a referral to social services.

Our study has notable findings that contribute to the current literature on the pandemic's impact on social risks in marginalized patient communities. Prior studies that have assessed patient social risk factors during the pandemic are often cross-sectional and focus on one social risk, such as housing instability. This longitudinal study provides a comprehensive analysis of the pandemic's impact on 10 reported social risk factor domains in a paired, urban patient population. This is important given that social risks are dynamic, interrelated, and often informed by personal and local circumstance. Communities in the Bronx have experienced disproportionate rates of COVID-19—related illness and death. In our study, COVID-19 illness burden appeared to be associated with reported social risk. However, most participants, including but not limited to those with COVID-19 illness burden, identified the pandemic as the direct cause of their social risk. This suggests that non-illness pandemic-related stressors are also driving the observed increase in reported social risks. Given that Bronx communities, represented in our study population, predominantly identify as Black and/or Hispanic, the pandemic's economic and infrastructural impacts are likely exacerbating pre-existing racial disparities in social risks that stem from systemic racism.^{13,14} Therefore, as municipalities continue to invest in COVID-19 mitigation efforts, our study highlights the equally important need to address the worsening of social risks in minority communities in order to prevent related racial health disparities.^{15,16}

Our study findings are supported by city and state level data. Higher rates of reported food insecurity paralleled similar trends city-wide, with the number of reported food insecure persons in New York City increasing 25% during the first year of the pandemic compared to the year prior.¹⁷ The significant burden of food insecurity in racial minority communities during the pandemic was also demonstrated in a survey from the City University of New York (CUNY) School of Public Health. Between April and November 2020, New York City residents of color were 1.8 times more likely to report running out of money for food compared to their white counterparts.^{18,19} Regarding changes in housing quality during the pandemic, a report from the New York City Independent Budget Office demonstrated how lower annual resident incomes led to significant

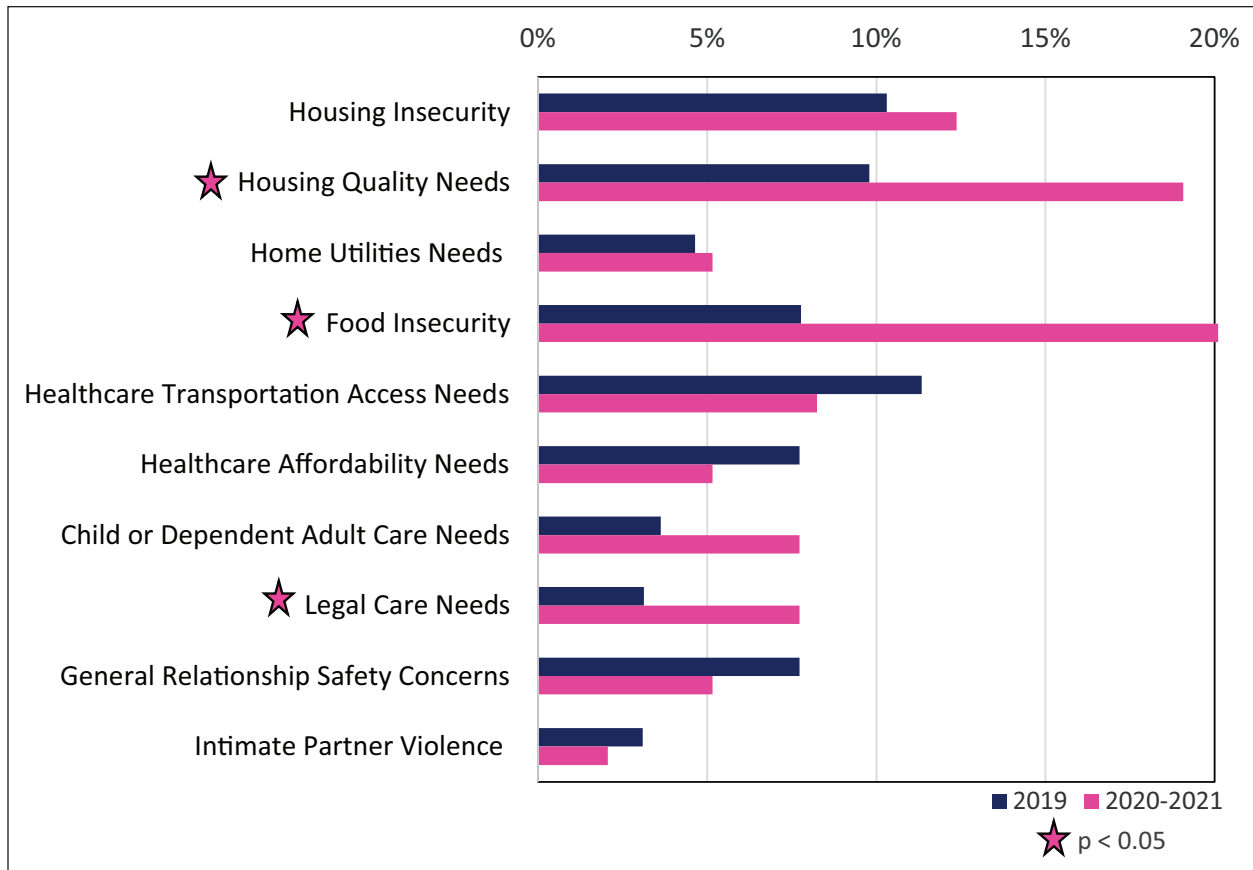


Figure 2. Changes in 10-item social risk factor screener responses between pre-pandemic and pandemic outreach periods.

Table 2. Comparison of Social Risk Factor Screener Positivity Between Pre-Pandemic and Pandemic Outreach Periods Using a Paired (Sample Size (n) = 191) and Unpaired (n = 194) Study Sample, Adjusted for Participant Demographics.

Outcome	Year n (%)		Unpaired analysis		Paired analysis
	2019	2020-2021	RR (95% CI)	P-value	P-value
Positive screen	57 (29%)	85 (44%)	1.51 (1.19-1.93)	.001	.001

The McNemar test and a generalized estimating equation model with log link were used for the paired and unpaired analysis, respectively. Abbreviations: RR, relative risk; CI, confidence interval.

delays in repairs of public housing due to decreased annual revenue used for building maintenance.²⁰ The concerning increase in reported legal care needs is supported by the increase in unmet litigant needs reported by various New York City-based organizations. The New York City Bar released a committee report highlighting the exponential increase in family court litigant needs during the pandemic. This was postulated to be due to the New York City Family Court only hearing essential or emergent cases during the first year of the pandemic.²¹

Prior engagement in clinic-based social services was not associated with reported social risk factors. This may suggest

that prior engagement in social services did not prevent experienced social risks during the pandemic. This is potentially due to the pandemic's unique impact on the volume and severity of social risk factors experienced by the study population. Interestingly, less than half of the participants who reported a social risk accepted a referral to clinic-based, social services. This may, in part, be due to participant enrollment in non-clinic based social services. However, the discrepancy between social risk and social need is a well-documented phenomenon in SDOH literature and is determined by the interest and ability of a person to prioritize seeking care for an experienced hardship. A lack of patient

Table 3. Comparison of COVID-19 Illness Burden (n=204), Prior Engagement in Social Services (n=201), and Social Risk Factor Screener Responses During the Pandemic Outreach Period, Adjusted for Participant Demographics.

Exposures	Positive screen n (%)	RR (95% CI)	P-value
COVID-19 infection			
No (n=174)	72 (41%)	1.47 (1.06-2.04)	.02
Yes (n=30)	18 (60%)		
Social service engagement			
No (n=155)	65 (42%)	1.37 (0.98-1.93)	.06
Yes (n=46)	25 (54%)		

Log linked binomial models were used to analyze the association between these variables and social risk factor screener responses during the pandemic.

Abbreviations: RR, relative risk; CI, confidence interval.

interest or ability to engage in social needs-targeted resources is thought to be due to a range of factors, such as mistrust, discrimination, stigma, previous trauma, and time constraints.^{4,22,23} This finding suggests the persistence of this phenomenon in the context of heightened social risk during the COVID-19 pandemic, and the urgent need to address it.

There were several limitations to this study. First, the urban, single site setting of the study limits the generalizability of our findings. The small sample size may have limited the power of the study to detect additional significant trends in individual social risk domains and general associations with prior participant engagement in social services. Additionally, it is unknown how reported social risks trended annually at the clinic study site prior to 2019, limiting the ability to assess how study findings compare to a baseline of reported social risks prior to 2019. Before the pandemic, social risk factor screeners were initially completed by patient self-report, however, the study survey was administered telephonically by a member of the study team. This discrepancy in screening methods introduces the risk for response bias in patient screener results obtained during this study. Given that prior enrollment in social services did not significantly prevent or lower reported social risks, it remains unknown if referral to these same services will be successful in addressing current and preventing future social risks during the pandemic.

In summary, housing quality needs, food insecurity, and legal care needs increased in a Bronx-based, adult patient population during the ongoing COVID-19 pandemic. There is an urgent need to further understand and address the pandemic's reciprocal and compounding impact on social risks, and related health outcomes, experienced by patients in the Bronx and similar patient communities. In addition, this study highlights the need to center health equity in policy development that aims to prevent social risk exacerbations in future global health emergencies. Many patients experiencing social risks may not seek healthcare-based

assistance. Further research is needed to better understand existing barriers to patient interest and ability to engage in health system-based social services, especially during the pandemic.

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Declaration of Conflicting Interests


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References

1. Braveman P, Gottlieb L. The Social Determinants of Health: it's time to consider the causes of the causes. *Public Health Rep.* 2014;129 (Suppl 2):19-31.
2. Chambers EC, McAuliff KE, Heller CG, Fiori K, Hollingsworth N. Toward understanding social needs among primary care patients with uncontrolled diabetes. *J Prim Care Community Health.* Published online January 19, 2021. doi:10.1177/2150132720985044
3. Syed ST, Gerber BS, Sharp LK. Traveling towards disease: transportation barriers to health care access. *J Community Health.* 2013;38:976-993.
4. Alderwick H, Gottlieb LM. Meanings and misunderstandings: a social determinants of health lexicon for health care systems. *Milbank Q.* 2019;97:407-419.
5. Berry C, Paul M, Massar R, Marcello RK, Krauskopf M. Social needs screening and referral program at a large US public hospital system, 2017. *Am J Public Health.* 2020;110: S211-S214.
6. Buitron de la Vega P, Losi S, Sprague Martinez L, et al. Implementing an EHR-based screening and referral system to address social determinants of health in primary care. *Med Care.* 2019;57 (2):S133-S139.
7. Fiori KP, Rehm CD, Sanderson D, et al. Integrating social needs screening and community health workers in primary care: the community linkage to care program. *Clin Pediatr.* 2020;59:547-556.
8. Linton SL, Leifheit KM, McGinty EE, Barry CL, Pollack CE. Association between housing insecurity, psychological distress, and self-rated health among US adults during the COVID-19 pandemic. *JAMA Network Open.* 2021;4: e2127772.

9. NYC Department of Health and Mental Hygiene. COVID-19: data. New York City Department of Health and Mental Hygiene. Accessed July 24, 2021. <https://www1.nyc.gov/site/doh/covid/covid-19-data-totals.page>
10. New York State Labor Department Area Unemployment Rates. Labor force and unemployment data. New York State Labor Department Area Unemployment Rates. Accessed September 28, 2021. <https://dol.ny.gov/local-area-unemployment-statistics>
11. University of Wisconsin Population Health Institute. New York 2021 State level data and ranks. University of Wisconsin Population Health Institute. Accessed September 28, 2021. www.countyhealthrankings.org
12. Heller CG, Parsons AS, Chambers EC, Fiori KP, Rehm CD. Social risks among primary care patients in a large urban health system. *Am J Prev Med.* 2020;58:514-525.
13. Morales DX, Morales SA, Beltran TF. Racial/ethnic disparities in household food insecurity during the COVID-19 pandemic: a nationally representative study. *J Racial Ethn Health Disparities.* 2021;8:1300-1314.
14. Chowkwanyun M, Reed AL Jr. Racial health disparities and covid-19 - caution and context. *N Engl J Med.* 2020;383:201-203.
15. Lett E, Asabor E, Beltrán S, Cannon AM, Arah OA. Conceptualizing, contextualizing, and operationalizing race in Quantitative Health Sciences Research. *Ann Fam Med.* 2022;20:157-163.
16. Dalsania AK, Fastiggi MJ, Kahlam A, et al. The relationship between social determinants of health and racial disparities in COVID-19 mortality. *J Racial Ethn Health Disparities.* 2022;9:288-295.
17. Food Forward NYC. A 10-year food policy plan. *NYC Mayor's Office.* 2021. Accessed September 28, 2021. <https://www1.nyc.gov/assets/foodpolicy/downloads/pdf/Food-Forward-NYC.pdf>
18. Freudenberg N. Food Security in New York City in the Time of COVID-19: Reports from the CUNY SPH COVID-19 Survey. CUNY Urban Food Policy Institute Newsletter; 2020.
19. El-Mohandes A, Ratzan SC, Rauh L, et al. COVID-19: a barometer for social justice in New York City. *Am J Public Health.* 2020;110:1656-1658.
20. Goodwin A. *Mounting Troubles: Coronavirus Burdens the New York City Housing Authority's Already-Strained Finances.* Fiscal Brief New York City Independent Budget Office; 2020:1-3.
21. Council on Children. The Impact of Covid-19 on the New York City Family Court: Recommendations; 2022. Accessed January 20, 2022. https://www.nycbar.org/member-and-career-services/committees/reports-listing/reports/detail/family-court-covid-19-impact#_ftn2
22. Bottino CJ, Rhodes ET, Kreatsoulas C, Cox JE, Fleegler EW. Food insecurity screening in pediatric primary care: can offering referrals help identify families in need? *Acad Pediatr.* 2017;17:497-503.
23. Gold R, Bunce A, Cowburn S, et al. Adoption of social determinants of health EHR tools by Community Health Centers. *Ann Fam Med.* 2018;16:399-407.