Pandemic Food Response in Primary Care to Minimize Exposure for Elderly Food Insecure Population

Kristina M. Bridges, Ph.D., Jennifer Woodward, M.D., MPH, Megan Murray, MHSA, Emma Mumm, LCSW, K. Allen Greiner, M.D., MPH
University of Kansas Medical Center, Kansas City, KS
Department of Family Medicine and Community Health

ABSTRACT

Introduction. Stay-at-home orders during the first wave of the COVID-19 pandemic encouraged individuals, especially the elderly, to stock up on food and supplies and remain home to limit exposure to the SARS-CoV-2 virus. However, individuals with food insecurity may be able only to afford a few days of food at a time, causing frequent outings to obtain food. An emergency food delivery system decreases the need for frequent outings. This study investigated: (1) whether elderly family medicine patients with previously reported food insecurity were making frequent trips to obtain food during the lockdown, and (2) if social determinants of health screening data could be used successfully to identify patients in need of emergency food delivery during the pandemic.

Methods. Primary care patients 65 years and older with previously reported food insecurity were screened for referral to a community food delivery program. A cross-sectional secondary analysis of screening and referral data were conducted.

Results. Clinic staff called 52 patients and completed screening of 30. For 23/30 respondents (76.7%), reported monthly outings to obtain food exceeded the recommended stay-at-home guidelines. In our sample, 22/30 (73.3%) reported current food need, 14/30 (46.7%) reported two or fewer days of food, 28/30 (93.3%) reported receiving home food delivery would keep them from going out, 24/30 (80.0%) agreed to food delivery, and 17 patients received a food delivery.

Conclusions. Targeted screening and referral for food delivery may reduce the need for patients experiencing food insecurity to leave home during a pandemic or other disaster, potentially decreasing community exposure for a high-risk population. Primary care practices can utilize previously collected food insecurity and other social determinants of health data to identify and assist high-risk patients in a pandemic.
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INTRODUCTION

Food insecurity, the inability to afford sufficient food, is known to be linked to some of the same chronic conditions (e.g., diabetes, hypertension, coronary heart disease) listed by the U.S. Centers for Disease Control and Prevention (CDC) as risk factors for severe COVID-19 outcomes.[1,2] Recent reports described the impact of COVID-19 on food access and rates of food insecurity,[3-5] however, little has been written about the additional risk food insecurity poses on individuals who are already at risk for poor outcomes. Individuals with food insecurity often are able only to afford or store a few days' worth of food at a time.[6-8] This forces them into the community every few days for additional food. Therefore, a compounding risk may exist for these individuals who likely bear a high burden of chronic disease and increased community exposure to the virus.

A family medicine clinic participated in an emergency food response effort targeting individuals with a history of self-reported food insecurity who were at high risk of poor outcomes related to COVID-19 due to age (65 and older).[2] Clinic staff was concerned that this population would be unable to follow public health recommendations to stock up on one to two weeks of food and remain home, therefore experiencing elevated food access-related community exposure to the virus. Our research team conducted a secondary analysis of this emergency outreach to determine: (1) if previously collected social determinants of health screening data (i.e., food insecurity status) could be used to predict patients in need of emergency food delivery during the pandemic, and (2) whether elderly family medicine patients with previously reported food insecurity were making frequent trips out to obtain food during the lockdown.

The use of previously collected social determinants of health (SDOH) data to conduct targeted screening and referral for emergency food assistance to reduce community exposure during a pandemic are reported. Primary care clinics that regularly collect SDOH data may be in a good position to risk-stratify patients and support individuals at high risk of COVID-19 with food insecurity.

METHODS

Study Population. This project was completed in the family medicine department of an academic medical center in the Kansas City metropolitan area. Institutional Review Board approval was obtained to conduct cross-sectional secondary analysis of screening and referral data. Inclusion criteria consisted of patients that were at least 65 years old and who previously answered "yes" to the food insecurity question ("In the last 12 months, did you ever eat less than you should because there wasn't enough money for food?") on a social determinants of health (SDOH) screener during a patient care visit. All primary care patients are screened annually for a variety of SDOH needs using a modified version of the Health Leads screening tool[9] (see Appendix I). Patients were excluded if the last known address was outside the delivery zone (the Kansas City Metro area).

Procedures. In the Kansas City region, stay at home orders began at the end of March 2020. Project calls were made from April 1, 2020 through April 8, 2020. Clinical operations staff developed and reviewed a series of questions to assess current food insecurity, patient health, and knowledge of the pandemic and stay-at-home order. Staff called all eligible patients and asked the series of scripted questions (see Appendix II). If a patient could not be reached initially, a second attempt was made. Calls utilized the Doximity© dialer (Doximity, Inc.; San Francisco, CA.) and showed the department's clinic number. All data were recorded securely in the Research Electronic Data Capture software platform (REDCap®). The final question obtained verbal permission from the patient to pass their contact information to the community organization for a community health worker (CHW) to organize non-perishable food delivery, including the option for recurring deliveries.

CHWs recorded patient contact and food delivery data in a shared referral database. The survey was designed as an operational screening tool; therefore, response bias mitigation was not addressed.

Statistical Analysis. Descriptive calculations of patient survey responses were completed using Microsoft® Excel 2016. Statistical tests were completed comparing demographics between patients who met inclusion criteria but were unreachable or declined to participate (n = 22) and those who completed the survey (n = 30). Mean age was compared by Independent Samples t-test, and sex and race were compared by Pearson Chi-Square using IBS SPSS 27. Race was collapsed into dichotomous variables of Black/African American vs. not Black/African American. Partially completed surveys were included in the analysis and missing data were omitted from analysis of each variable. Estimated number of food outings in a 30-day period was calculated based on current self-reported food stores. When patients gave a range of days of food available, the lower limit of the range provided was used for calculations.

RESULTS

Fifty-two patients met the initial inclusion criteria. Forty-eight (92.3%) had a chronic medical condition elevating their risk of poor outcomes due to COVID-19. Characteristics of study participants are listed in Table 1. Fourteen individuals (26.9%) were unable to be reached, 29 individuals (55.7%) were reached with one phone call, and 9 (17.3%) required a second phone call. Three patients (5.8%) were not residing in the food delivery area or declined to participate. Thirty-five patients (67.3%) consented to a phone call, one patient was removed because they reported living in a care facility that provided daily meals, three patients declined to complete the survey, and 30 patients completed the entire screening survey.

Table 1. Patient characteristics.

Characteristic	Met Inclusion Criteria n = 52	Completed Screening n = 30*
Age, mean (range)	70 (65-84)	71 (65-84)
Sex, n (%)		
Male	23 (44.2%)	14 (46.6%)
Female	29 (55.8%)	16 (53.3%)
Race, n (%)		
Black	29 (55.8%)	17 (56.7%)
White	21 (40.4%)	12 (40.0%)
Other	2 (3.8%)	1 (3.3%)
Ethnicity		
Hispanic	3 (5.8%)	1 (3.3%)
Non- Hispanic	49 (94.2%)	29 (96.7%)

* No statistically significant differences were found for mean age (p = 0.199), sex (p = 0.68), and race (p = 0.879) between patients who met inclusion criteria but were unreachable or declined to participate (n = 22) and those who completed the survey (n = 30).

All respondents were aware of the pandemic in the Kansas City area and the stay-at-home orders. Two patients (6%) reported receiving negative test results for COVID-19. Of the contacted patients, 20 (64.7%) reported they needed food and 14 (46.7%) reported they had less than two days of food. The average number of days of food

available for the household was five with the median of three (range 1 - 21). The estimated number of outings in a month to procure additional food ranged from 1 to 30 outings, with 10 as the median (Figure 1). Most patients (25/30; 83.3%) reported "I must go out" or "Different household member can go" to pick up additional food. Of the patients, 29 (96.7%) reported receiving home food delivery would keep them from going out (Table 2).
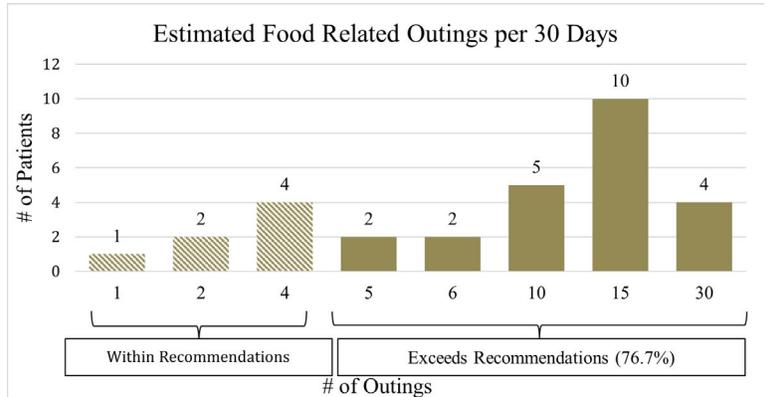

Figure 1. Estimated number of outings to access food in a 30-day period, based on patient-reported ability to stock food at home. Guideline groupings are based on public health recommendations (at the time of project calls) for at-risk individuals to stock 1-2 weeks' worth of food to limit trips to stores (n = 30 respondents).

Table 2. Screening survey results.

Screening Questions	Yes/Total Responses (%)
Homebound prior to pandemic	3/33 (9%)
Able to stock up on food?	15/33 (45%)
Currently in need of food?	22/33 (67%)
How do you get food?*	
Family or friends will drop off	6/30 (20%)
Different household member can go	11/30 (36.7%)
I must go out	14/30 (46.7%)
Food delivery would keep them home*	29/30 (96.7%)
Would like referral to food delivery*	24/30 (80%)
Received food delivery	17/24 (70.8%)

*Three participants declined to answer these questions.

A total of 24/30 patients (80%) requested a referral to a community-based organization for food delivery. Seven patients were either unable to be contacted or declined services after referral. Seventeen patients received a food delivery, which was 70.8% of those who requested a referral and 32.7% of all patients who met inclusion criteria.

DISCUSSION

Health experts recommend patients at high risk for poor outcomes from COVID-19 limit interactions with other people.[2,10] Public health recommendations during our screening period (April 2020) included stocking up on one to two weeks of food and supplies to limit trips to stores.[11,12] Food insecure patients may be unable to stock up on food due to financial limitations, lack of transportation, or an inability to safely

store food items. Patients then must go to the store to purchase additional food every couple of days, potentially exposing themselves to the virus each time. In our sample, 80.6% of patients had food access-related community exposure either directly or through someone else in the home. For most patients (76.7%), estimated outings per month to procure additional food exceeded the recommended guidelines. Therefore, this population not only has increased risk of poor outcomes (due to age and comorbid conditions)[2], they also may have increased exposure to the virus. This means food insecurity may act as an additional risk factor for this already high-risk population.

The local county health department and other community-based organizations developed an emergency food delivery system during the initial phases of COVID-19. This project leveraged existing partnerships with these organizations to address patient needs rapidly. The primary care clinics regularly collect information on food insecurity in this patient population, allowing quick identification of the target population. Using clinic-to-community linkage to food resources is proving efficient and effective in primary care clinics.[13,14] In addition, food delivery programs may alleviate barriers to transportation which are known to be associated with food insecurity.[15]

This study had several limitations. It had a small sample size and was conducted in a single primary care department at a single academic center. Food insecurity was identified by patient response to a routine SDOH questionnaire collected at primary care appointments (see Appendix). It was possible that a patient may have developed food insecurity since the most recent screening, meaning they would not be identified for the initial cohort. In addition, most of the data was self-reported during the screening process, which may result in response bias. Some patients reported a previous food need had been met since the last appointment and no longer needed assistance. External validity was limited, since the sample size was small and represented patients presenting to one primary care clinic in an urban academic medical center.

Future direction will include a chart review of these at-risk individuals to investigate subsequent COVID-19 positivity rate, hospitalizations, ventilator need, and death compared to a matched population who did not receive food delivery. Evidence is building that racial and ethnic minorities are at higher risk for poor outcomes due to COVID-19.[16] Food insecurity was also higher in these populations than in the white population.[17] In this dataset, the majority of patients (59.4%) were of a racial/ethnic minority. Additional investigations are needed to evaluate the interactions between race/ethnicity, social needs, and COVID-19 clinical outcomes.

The main goal of this emergency referral response was to keep patients safe by reducing the need for community exposure for a high risk-population during a pandemic. Additionally, the ability to reduce exposure and potentially prevent complications in a high-risk population may assist with conserving resources, such as personal protective equipment, patient beds, and ventilators. Primary care practices can utilize previously collected SDOH data to identify and assist high-risk patients. The continued development of community relationships is integral to the ability of a health care organization to provide emergency services rapidly. The authors recommended the following priority areas for primary care practices to be prepared to engage in rapid response to social needs in an emergency: collect SDOH screening results for all patients, invest in relationships with community organizations able to respond to social needs, and assign staff (CHWs, social workers, trainees) to reach out to and triage high-need patients during emergencies. Understanding the effect food delivery has on reducing community exposure for individuals who are at risk of poor COVID-19 outcomes can help guide future pandemic and disaster planning.

REFERENCES
[1] Jih J, Stijacic-Cenzer I, Seligman HK, Boscardin WJ, Nguyen TT, Ritchie CS. Chronic disease burden predicts food insecurity among older adults. Public Health Nutr 2018; 21(9):1737-1742. PMID: 29388533.
[2] U.S. Centers for Disease Control and Prevention. People with Certain Medical Conditions. 2020. https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html. Accessed October 19, 2020.
[3] Kulish N. Never seen anything like it: Cars line up for miles at food banks. New York Times. April 8, 2020; 1.
[4] The Lancet Global Health. Food insecurity will be the sting in the tail of COVID-19. Lancet Glob Health 2020; 8(6):e737. PMID: 32446335.
[5] Niles MT, Bertmann F, Belarmino EH, Wentworth T, Biehl E, Neff R. The early food insecurity impacts of COVID-19. Nutrients 2020; 12(7):2069. PMID: 32679788.
[6] Goger A. For Millions of low-income seniors, coronavirus is a food-security issue. March 16, 2020. https://www.brookings.edu/blog/the-avenue/2020/03/16/for-millions-of-low-income-seniors-coronavirus-is-a-food-security-issue/#:~:text=Measures%20such%20as%20social%20distancing,and%20other%20adverse%20health%20events. Accessed April 19, 2022.
[7] Food Research and Action Center. Helping Older Adults Struggling Against Hunger Access Food in the Age of COVID-19. May 2020. https://frac.org/wp-content/uploads/FRAC-Brief-Helping-Older-Adults-Struggling-Against-Hunger-Access-Food-in-the-Age-of-COVID-19.pdf. Accessed October 19, 2021.
[8] Wolfson JA, Leung CW. Food insecurity and COVID-19: Disparities in early effects for US adults. Nutrients 2020; 12(6):1648. PMID: 32498323.
[9] Health Leads. Social Needs Screening Toolkit. 2018. https://healthleadsusa.org/wp-content/uploads/2018/10/Health-Leads-Social-Needs-Screening-Toolkit-1.pdf. Accessed October 19, 2021.
[10] Honein MA, Christie A, Rose DA, et al. Summary of guidance for public health strategies to address high levels of community transmission of SARS-CoV-2 and related deaths. MMWR Morb Mortal Wkly Rep 2020; 69(49):1860-1867. PMID: 33301434.
[11] Healthline. Stocking Up for COVID-19: What Do You Actually Need? March 23, 2020. https://www.healthline.com/health/stocking-up-for-covid-19. Accessed December, 2021.

[12]   Moreland A, Herlihy C, Tynan MA, et al. Timing of state and territorial COVID-19 stay-at-home orders and changes in population movement - United States, March 1-May 31, 2020. MMWR Morb Mortal Wkly Rep 2020; 69(35):1198-1203. PMID: 32881851.

[13]   Hager K, De Kesel Lofthus A, Balan B, Cutts D. Electronic medical record-based referrals to community nutritional assistance for food-insecure patients. Ann Fam Med 2020; 18(3):278. PMID: 32393567.

[14]   Smith S, Malinak D, Chang J, et al. Implementation of a food insecurity screening and referral program in student-run free clinics in San Diego, California. Prev Med Rep 2016; 5:134-139. PMID: 27990340.

[15]   Martinez JC, Clark JM, Gudzune KA. Association of personal vehicle access with lifestyle habits and food insecurity among public housing residents. Prev Med Rep 2019; 13:341-345. PMID: 30792950.

[16]   Coughlin SS, Moore JX, George V, Johnson JA, Hobbs J. COVID-19 among African Americans: From preliminary epidemiological surveillance data to public health action. Am J Public Health 2020; 110(8):1157-1159. PMID: 32639918.

[17]   Coleman-Jensen A, Rabbitt MP, Gregory CA, Singh A. Household food security in the United States in 2015. ERR-215, US Department of Agriculture, Economic Research Service 2016, 1-32.

APPENDIX I

SDOH Screening Questions

🍎	In the last 12 months, did you ever eat less than you should because there wasn't enough money for food?	YES	NO
💡	In the last 12 months, has your utility company shut off your service for not paying your bills?	YES	NO
🏠	Are you worried that in the next 2 months you may not have stable housing?	YES	NO
🏠	Are you afraid you might be hurt in your home by someone you know?	YES	NO
	Are you afraid you might be hurt in your apartment building or neighborhood?	YES	NO
🛒	Do problems getting child care make it difficult for you to work or study?	YES	NO
$	In the last 12 months, have you needed to see a doctor, but could not because of cost?	YES	NO
💊	In the last 12 months, did you skip medications to save money?	YES	NO
🚗	In the last 12 months, have you ever gone without health care because you didn't have a way to get there?	YES	NO
🩺	Do you have problems understanding what is told to you about your medical conditions?	YES	NO
👥	Do you often feel that you lack companionship?	YES	NO

COVID Emergency Food Response Screening Questions

Are you aware of the COVID-19 disease in Kansas City?	yesno
	1 Yes 0 No

Special population	checkbox
	1 Healthcare worker 2 KUMC faculty, staff, student 3 Public safety occupation (EMS, police, fire) 4 Involved in illness cluster from faculty or institution (healthcare, school, corrections, homeless/shelters) 5 Severe lower respiratory illness 6 Lives in group setting 7 Homeless/shelter 8 Other

Specify other population	text

Have you been tested for COVID-19?	radio
	0 No 1 Yes at KU Med 2 Yes somewhere else

Specify where pt got tested	text

Date of testing	text (date_mdy)

Was COVID-19 test positive?	yesno
	1 Yes 0 No

Have you been advised that your symptoms might be consistent with COVID and asked you to stay home?	yesno
	1 Yes 0 No

If provider feels that patient meets testing criteria, refer patient to RN coordinator.	dropdown
	0 Patient referred 1 Patient not referred

Are you aware of the stay-at-home order?	yesno
	1 Yes 0 No

Are you staying home?	checkbox
	0 Yes, I was home bound prior to the pandemic 1 Yes, I am quarantined due to either having symptoms or possible exposure 2 Yes, I am following the self-isolation recommendations 3 No, I am going to the groce 4 No, I am visiting family or friends 5 No, I still have to work 6 No, I don't want to stay home and am not worried

Who is patient isolating with?	checkbox | 0	Significant other
1	Children
2	Parents
3	Other family
4	Friends
5	No one	
Section header: Food Questions Did you stock up on food due to COVID-19?	yesno | 1	Yes
0	No	
Comments for stock-up	notes
How many days' worth of food do you think you currently have?	text
How many people are in the home?	text
If you get low on food, is someone in the home able to go get more, would family or friends drop off food, or would you have to go get more?	radio | 1	Someone in the home able to go get more
2	Family or friends drop off food
3	You have to go get more	
Would receiving food keep you from going out in the community or minimizing your exposure to others?	yesno | 1	Yes
0	No	
Are you currently in need of food?	yesno | 1	Yes
0	No	
Great, we hope you stay healthy. Please reach out if anything changes. (Hang up)	descriptive
Would patient be interested in someone bringing them food?	yesno | 1	Yes
0	No	
We are partnering with the Community Health Council of Wyandotte County and Cross-Lines Community Outreach. They are setting up deliveries of food to patient's front doors. Boxes may consist of shelf stable items like oats, beans, pasta, and/or canned vegetables. Would you like us to pass along your name, phone number for them to connect with you?	yesno | 1	Yes
0	No	
Okay, call your primary care office if anything changes. (Hang up)	descriptive
Wonderful, someone will be in contact with you soon.	descriptive