

Social Determinants of Health, From Assessment to Action:

A Review of 3 Studies from the Value Institute at ChristianaCare

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Abstract

Introduction: The COVID-19 crisis highlights the importance of screening for and managing adverse social determinants of health (SDoH). Many of the same SDoH items that put individuals at increased risk of COVID-19 infection have increased dramatically due to the economic repercussions of slowing the viral spread. **Methods:** This is a review of 3 studies conducted by the Health Services Research Core in the Value Institute at ChristianaCare. The studies had 3 overarching goals: 1) to conduct a survey of primary care providers in Delaware to determine their current methods for collection of social determinants data, 2) to validate a 2-item screening tool for food insecurity, and 3) to assess the geographic distribution of patients with food insecurity. **Results:** Our studies have demonstrated the importance of screening for SDoH by highlighting the inconsistent data collection of SDoH items, examining the prevalence of food insecurity and validating a standardized instrument for rapid data collection, as well as displaying geospatial differences in food insecurity prevalence across New Castle County, DE. **Public Health Implications:** The COVID-19 pandemic has increased the prevalence of these social determinants in our communities. Therefore, it is imperative to employ screening and geospatial strategies to address the SDoH implications of the novel coronavirus.

Introduction

Social determinants of health (SDoH), defined as the socioeconomic, environmental, and health care conditions which impact health, have been associated with adverse health outcomes for many chronic and acute health conditions.¹ Increasingly, health systems have sought to identify and address SDoH with the goal of improving health outcomes of communities and larger populations. The novel Coronavirus 19 (COVID-19) pandemic has provided a critical demonstration of the importance of screening for and managing adverse SDOH. In the state of Delaware and nationally, those with low income and/or minority race and ethnicity have demonstrated higher rates of COVID-19 infection and mortality.^{2,3} Though the reasons for this are multifactorial, these populations may disproportionately experience higher burdens of chronic disease, housing insecurity, crowded living arrangements, and employment in service occupations that impede their ability to adhere to social distancing recommendations.^{4,5} In addition, the financial implications of the COVID-19 pandemic, including loss of employment and employer sponsored health insurance has exacerbated adverse SDoH for many. Data have demonstrated a dramatic increase in food insecurity and housing insecurity since the beginning of the pandemic.⁶

Researchers in the Value Institute at ChristianaCare have recognized the importance of social determinants of health on outcomes in Delaware and have laid a foundation for assessing SDoH among patients to best support their needs. This paper will summarize three studies focused on assessment and management of SDoH. These studies were conducted prior to the pandemic but

relate to the present situation. All studies were conducted by principal investigators from the Value Institute and all received approval from the ChristianaCare Institutional Review Board.

The studies had three overarching goals: 1) to determine the current methods for collection of social determinants data in primary care clinics in Delaware, 2) to validate a 2-item screening tool for food insecurity among general medicine patients, and 3) to assess the geographic distribution of patients with food insecurity in Delaware. Combined, these studies have generated data that will help to assess, support, and predict the social needs of our neighbors and community partners in Delaware.

Description of Three Projects

“Assessment of Social determinants of Health (SDoH) Among Medical Practices in Delaware”

Team members: Jennifer N. Goldstein, MD, MSc; Alexandra Mapp, MPH; Robie Zent, RN; Ginger Huros, MA; Deborah Moore, RN; Zugui Zhang, PhD

Methods

The goal of this study was to assess how medical practices in Delaware collect and use SDoH data. To collect this information, a survey instrument was developed and distributed by email to a sample of primary care practices (Internal Medicine, Family Medicine) including private, multispecialty, and hospital-affiliated practices, as well as a Federally Qualified Health Center. The survey defined “Social Determinants of Health” based on the five categories put forth by HealthyPeople2020, which include economic stability, education, social and community context, health and health care, and neighborhood and built environment.¹ The survey included closed-ended questions that assessed whether practices collected data on specific SDoH, how the SDoH were assessed, and whether practices addressed the social needs of patients. The survey questions were assessed for readability and clarity by three internists prior to the distribution of the survey. The surveys were intended to be completed by medical directors or practice managers who were instructed to obtain all necessary information by consulting with other members of the practice (administrative staff, medical assistants, nurses, physicians) as needed. Survey respondents were compensated with a gift card.

Descriptive statistics were calculated to determine the proportion of practices that collected data on SDoH, the most common SDoH assessed, mode of collection (administrative form vs. Electronic Health Record (EHR) form vs. EHR free text) and referral patterns for SDoH (in-house social worker or community-based organization). Chi-square tests were used to compare frequencies of SDoH collected between practices.

Results

To date, there have been 57 respondents with 39 (68.4%) total completed surveys. Practice types were categorized as Internal Medicine (n=14), Family Medicine (n=18), and Other (n=7) (multispecialty/geriatrics/hospice/medicine-pediatrics). Of those that completed surveys, all reported that they collected data on at least one SDoH item and 38/39 (97%) of respondents reported that they collect data on more than one SDoH item. Internal Medicine practices recorded data for a median of five SDoH items, compared to a median of eight items asked by Family Medicine and Other practices. Across all practice types insurance status and employment

status were collected at the highest frequency. There was variability regarding the collection of other SDoH by practice. Overall, Family Medicine practices and practices classified as “Other” collected SDoH data more frequently than Internal Medicine practices. However, there were no significant differences in the frequency of collection of SDoH data between practices (see Figure 1). The method by which different SDoH were collected varied according to the category of SDoH. However, EHR forms and free text were the most commonly used methods compared to paper versions of administrative forms (see Figure 2).

Figure 1. Individual SDoH Items Collected by Practice Type (Total N=39)

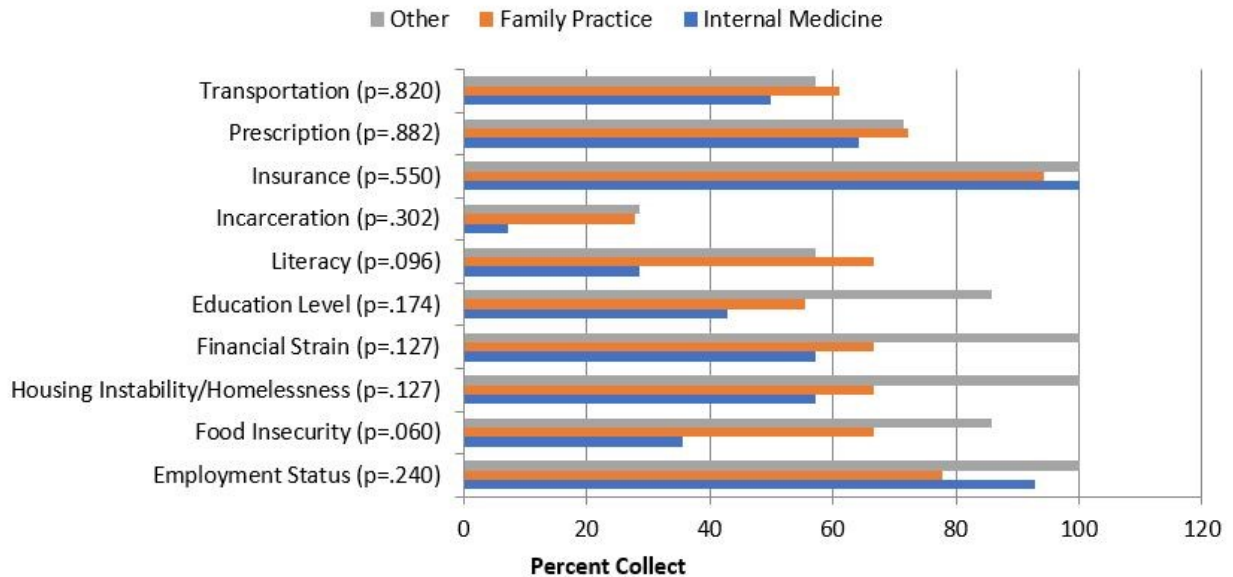
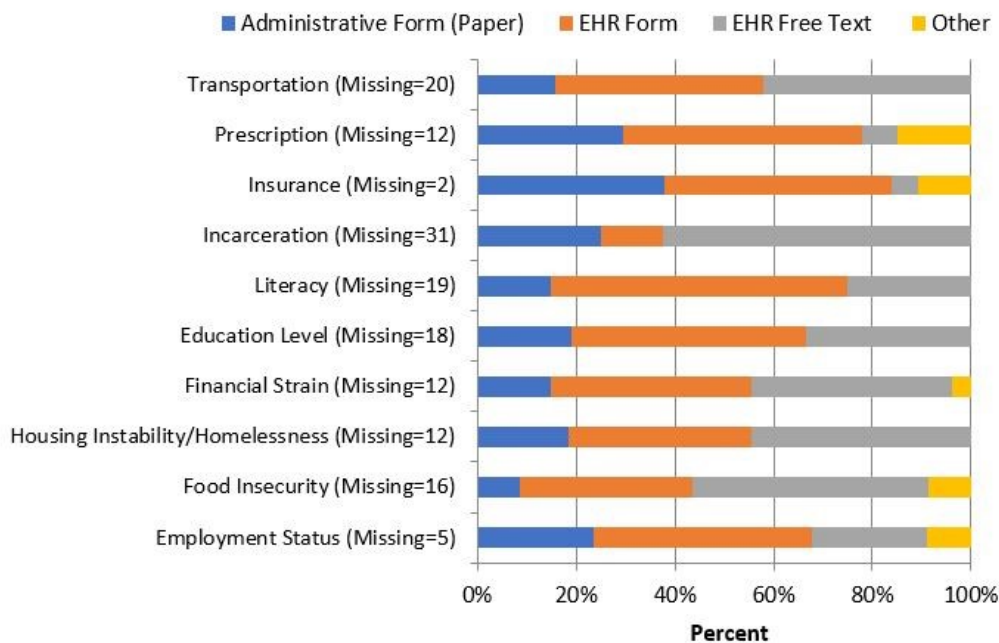


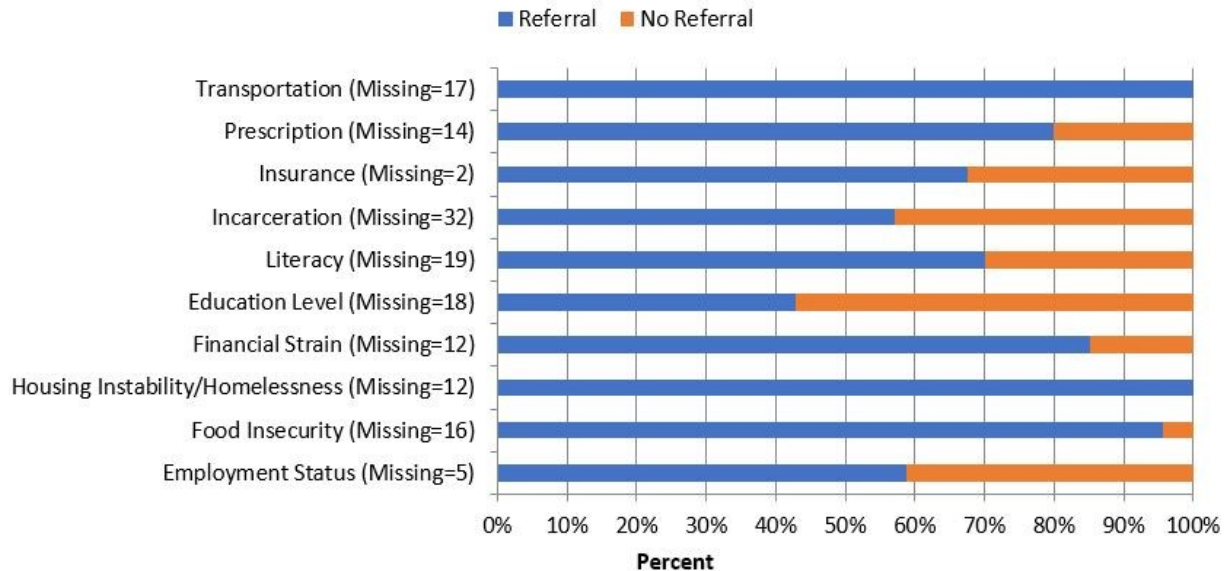
Figure 2. Individual SDoH Items by Collection Method (Total N=39)



Among respondents that provided referrals to social work or community-based organizations for

SDoH needs, between 90-100% reported that they referred for housing insecurity, transportation needs, and food insecurity. Greater than 80% provided referrals for patients who reported financial strain and those with inadequate prescription drug coverage. Average referral rates were lower for the remainder of SDoH categories (see Figure 3).

Figure 3. Individual SDoH Items by Referral or No Referral (Total N=39)



Public Health Implications

Our study demonstrated that among a sample of primary care and mixed primary care / specialty practices in Delaware, all collected data on at least one SDoH, and the vast majority collected data on more than one SDoH. Overall, we found that practices that identified as Internal Medicine had lower rates of SDoH collection than other practices. The reason for this is not clear. These practices may perceive that they serve patients who generally do not have or may not present obviously with SDoH needs. Alternatively, the practices may lack resources to evaluate and reliably refer patients based on their social needs. Our survey demonstrated that while some practices use electronic forms to capture SDoH, many also rely on capturing SDoH data through the medical history as free text in the EHR. Prior work has demonstrated that systematic screening approaches capture SDoH more predictably and reliably than free text formats.^{7,8} Therefore, this finding presents an opportunity to develop and incorporate systematic tools for SDoH screening in primary care practices in Delaware. Lastly, the findings demonstrate that there was discontinuity between patterns of SDoH collection versus SDoH referral. For example, although assessment of transportation needs, food insecurity, and housing insecurity was not performed consistently across practices, these three social risk factors received almost universal referrals to social work and community-based organizations. This demonstrates that when specific social risk factors are presented in the health care setting, there is considerable response from health care providers. Opportunities to increase and improve SDoH screening practices across Delaware could therefore, potentially improve referrals for social support and downstream health outcomes.

“Validation of a 2-item Food Insecurity Screen among Adult General Medicine Outpatients”

Team members: Cecelia Harrison, MPH; Jennifer N. Goldstein, MD Msc; Adebayo Gbadebo, MBA; Mia Papas, PhD MS

The first study demonstrated that when specific SDoH such as food insecurity are identified in health care settings, providers often deliver actionable support by referring patients to social workers, community health workers, and community-based organizations. This demonstrates that increased identification of specific SDoH such as food insecurity could lead to improved support via referral to resources. The following study focuses specifically on rapid identification of patients with food insecurity at the point of care.

Methods

The goal of this study was to validate a 2-item screening tool for food insecurity in a sample of adults in the primary care setting. The gold standard instrument to assess food insecurity is the 18-item USDA Household Food Security Scale.⁹ Although reliable, this instrument is lengthy and may not be suitable for all environments such as outpatient visits where time with providers may be limited. There have been several studies which have examined the validity of the 2-item version of the USDA Household Food Security Scale in a variety of populations but not among adult general medicine outpatients.¹⁰⁻¹² It is reasonable to hypothesize that the prevalence of food insecurity would be greater among general medicine patients compared to the general population due to older age and more comorbidities, factors which have both been associated with food insecurity.^{13,14} Therefore, we examined the validity of the 2-item screening instrument in adult general medicine outpatients in four primary care practices in New Castle County, Delaware.

Patients were approached by trained research assistants in the patient rooms of designated primary care offices. Informed consent was obtained and patients were administered a survey that consisted of social and demographic questions, as well as the 18-item USDA Household Food Security Scale. We assessed whether responses to the first two items in the 18-item instrument reliably predicted food insecurity among the respondents by assessing sensitivity, specificity, and convergent validity of the 2-item screen compared to the 18-item gold standard instrument.

The 2-item screen tested in this population was comprised of the first two questions of the 18-item USDA Household Food Security Scale:

- “We worried whether our food would run out before we got money to buy more. Was that often true, sometimes true, or never true for your household in the last 12 months?”
- “The food we bought just didn’t last and we didn’t have money to get more. Was that often true, sometimes true, or never true for your household in the last 12 months?”⁹

Results

We found that 17.6% (52/295) of patients surveyed were food insecure as defined by the 18-item instrument. The proportion of food insecure patients in the general medicine sample was higher

than the state and national averages, 11.9% and 12.3% respectively.^{15,16} Lastly, the 2-item version of the gold standard tool was found to be valid in this sample of the population.

Public Health Implications

Our findings build upon previous studies which have validated this tool in families, children, adolescents, elderly populations, and other high-risk groups; and our findings serve an important role in supporting the use of the 2-item food insecurity screening instrument in the adult general medicine population.^{10,11,17} This work also provides support to alleviate known barriers to screening such as time constraints and burdening the clinical workflow.¹⁸ Thus, a very brief and simple screening for this social need has the potential to impact a variety of comorbidities and provide actionable interventions for food insecurity without impeding workflows.

“Geographic Distribution of Food Insecure Patients at ChristianaCare Primary Care Clinics in Delaware”

Team members: *Cecelia Harrison, MPH; Madeline Brooks, MPH; Jennifer Goldstein, MD Msc; Mia Papas, PhD MS*

As health systems screen patients for social needs, there is value in determining if and where these needs vary geographically so they can identify neighborhood determinants of health amenable to intervention. There are limitations, however, in using patient data from a single health system to infer geographic trends in SDoH. First, patient populations may lack complete screening coverage. Second, patients may not demographically or spatially represent the general population. Finally, providers risk making the reductionist fallacy by equating individual needs to community needs. Health systems can supplement patient screening data with external data sources to more confidently track geographic trends in SDoH. We sought to identify geographic areas in which ChristianaCare primary care patients experience high levels of food insecurity and compare these findings with ChristianaCare’s Community Health Needs Assessment (CHNA) and other area-level data sources related to socioeconomic status.¹⁹

Methods

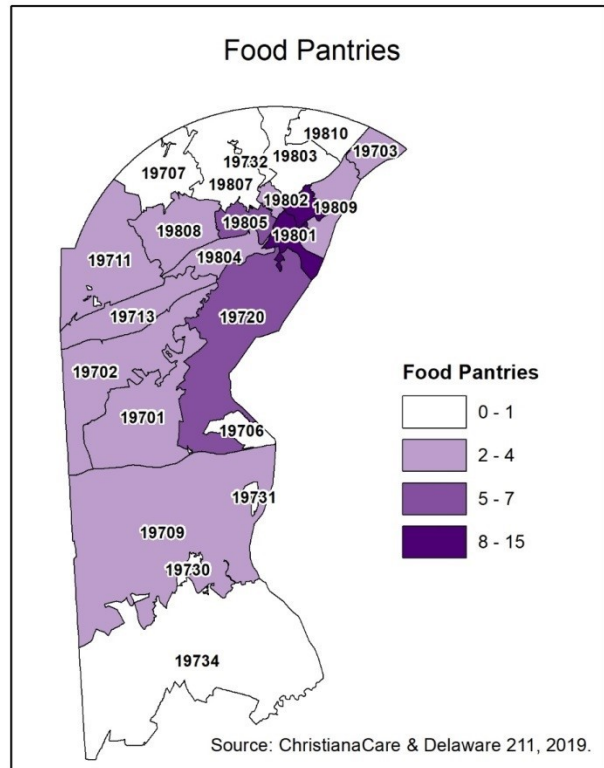
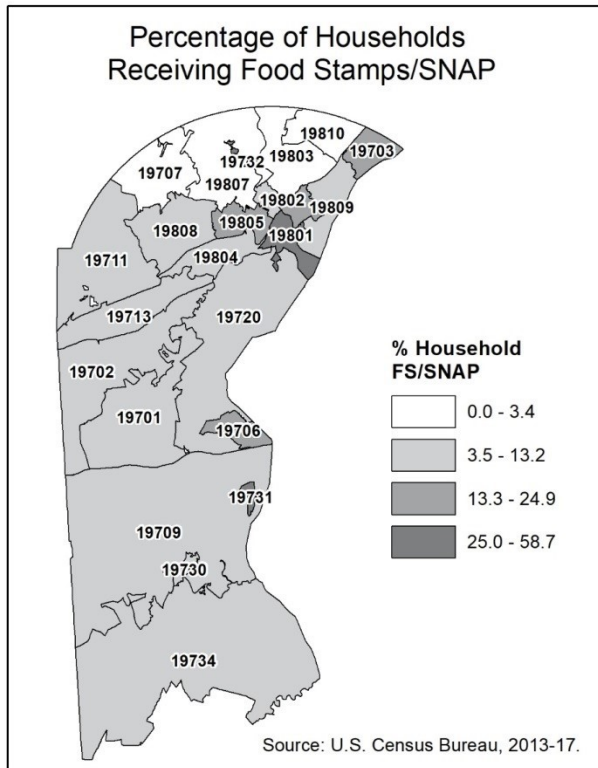
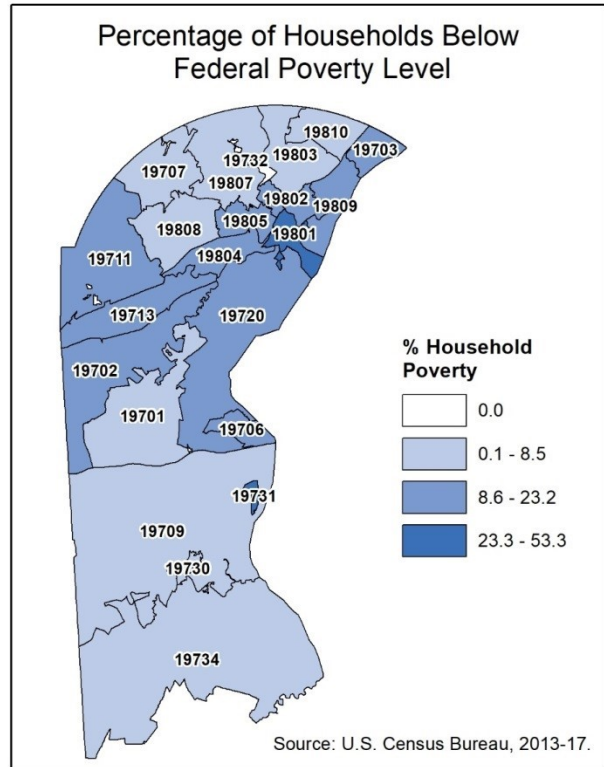
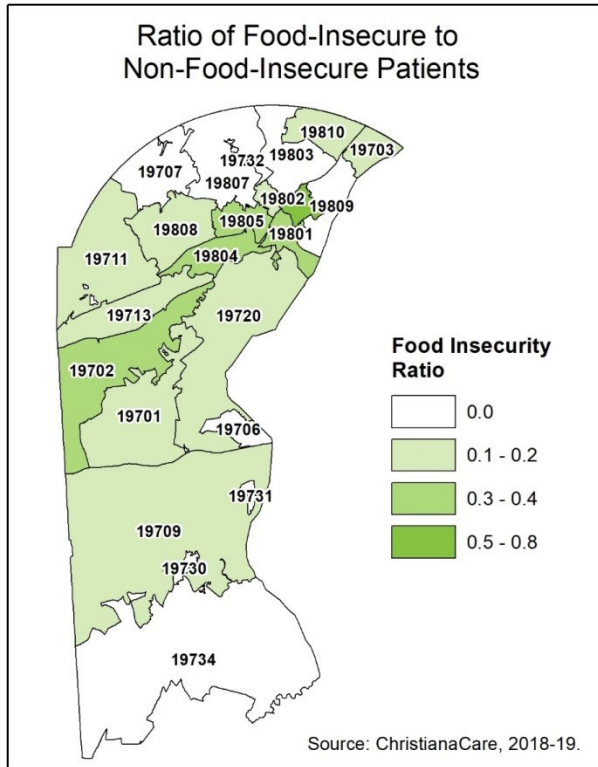
Adult patients from four ChristianaCare primary care clinics were screened for food insecurity and geocoded to their respective New Castle County zip codes. A zip code-level ratio of food-insecure to food-secure patients was created to control for geographic variation in where ChristianaCare patients reside. We obtained zip code-level data from the Census Bureau to assess household poverty and receipt of food stamps/SNAP benefits. A directory of county food pantries was created and mapped to consider the spatial distribution of food resources. These measures were mapped and compared to ChristianaCare’s CHNA to identify zip codes with overlapping social needs.

Results

Nearly 300 (N=291) adult primary care patients were screened for food insecurity at the time of this analysis. Of these, 52 (17.8%) were identified as food insecure. The zip codes 19802, 19805, 19702, 19801, and 19804, which represent the City of Wilmington and southern Newark, had some of the highest ratios of food-insecure to non-food-insecure patients across the county. These zip codes included more than half of all county food pantries (57%, 39/69) and were identified as having higher levels of household poverty and food stamp/SNAP participation

according to Census Bureau data (see Figure 4). ChristianaCare’s CHNA previously identified a “community 1” area consisting of five lower-income zip codes which accounted for 27% of discharges in 2018.¹⁹ This area includes zip codes 19801, 19802, 19804, 19805, and 19720, which cover the City of Wilmington and New Castle. The CHNA also identified 19801 and 19802 as “high-need” zip codes based on measures of socioeconomic status.¹⁹

Figure 4: Food Insecurity, Socioeconomic Status, and Food Pantries by New Castle County, DE Zip Codes



All maps created using natural breaks classification.

Public Health Implications

In comparing these findings, the CHNA identified a broad segment of northeastern New Castle County that appears to have greater social needs confirmed by the screening and Census Bureau data. Reliance on the CHNA findings, however, may not direct attention to zip codes in southern Newark such as 19702 that have relatively high burdens of food insecurity and poverty. Furthermore, county food pantries were concentrated in Wilmington and New Castle. It remains unknown whether and how often ChristianaCare patients with food insecurity can access these food pantries, and whether such resources are sufficient to meet heightened need during the COVID-19 pandemic. The mapping of social needs data can be used to cross-reference their spatial trends while examining the locations of resources to meet those needs. This study demonstrates the value in using multiple data sources to confidently triangulate areas that warrant intervention for SDoH.

Conclusion

The social determinants of health have shown to be powerful influencers of health outcomes. Through this research, we have shown how inconsistent data collection of SDoH items across different clinic settings suggests a need for standardized survey instruments. The first study suggested that food insecurity is under-screened yet actionable for resource referrals, making it an ideal case study for SDoH efforts. We continued this work by examining the prevalence of food insecurity and validating a standardized instrument for routine and rapid data collection in clinical settings. Lastly, we examined food insecurity prevalence geospatially in our community while highlighting methodology with potential for broad application to a variety of health and social needs. The COVID-19 crisis has increased the prevalence of these social determinants in our communities. Therefore, it is imperative to employ screening, geospatial techniques, and triangulation of data to address the SDoH implications of the novel coronavirus.

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