American Hospital Association™

Advancing Health in America

Part 3 – Assess: Building a Data Process for Reporting, Research and More

November 16, 2022

Organized by:

ACHI

AHA Community Health Improvement

Sponsored by:

Metro Health

Welcome & Housekeeping

1. Attendees have been **muted**. Please make comments or ask questions in the Chat.

2. Send a chat message **AHA Host** with any technical issues.

3. If desired, you can **indicate your organization or city, state** by hovering your pointer over your video & clicking on the … and selecting “Rename”.

American Hospital Association™

Advancing Health in America

MetroHealth

ACHI
AHA Community Health Improvement

Building a Comprehensive SDOH Screening and Response Model Within a Health System

Part 3 – Assess: Building a Data Process for Reporting, Research and More

Mark Kalina Jr., Senior Analyst

Kevin Chagin, Manager, Advanced Analytics & Data Operations

Ashwini Sehgal, Physician, Director of Research and Evaluation

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MetroHealth

Devoted to Hope, Health, and Humanity

- Serving Greater Cleveland since 1837
- The essential safety-net health system for the most at-risk members of our community
- Open and accessible to all (95% of Cuyahoga County residents live within 10 minutes of MetroHealth care)
- The region's essential public-health leader during times of crisis
- 300,000+ patients making 1.5 million visits annually
- Provide care at four hospitals, four emergency departments, more than 20 health centers and 40 additional sites in Northeast Ohio
- Operate Ohio's top rehabilitation center, the region's most experienced Level I Trauma Center, and Ohio's only adult and pediatric trauma and burn center
- Total Community Benefit: $238.6 million

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Identifying and acting on the social drivers of health as an integral component of care, through programs and partnerships for:

- Fresh, healthy food
- Stable, safe housing
- Legal assistance
- Education
- Job training
- Transportation
- Language and literacy
- Digital connectivity
- Connection with others
- Safer neighborhoods
- … And much more

Health, Opportunity, Partnership, Empowerment

Redesigning how healthcare and community organizations work together to help communities thrive

Screen for SDOH

- Self > MyChart
- Provider > care setting
- CHW > community
- Team > COVID vaccination clinics

CONNECT

Connect to Meet Needs

- Electronic > Unite Ohio platform
- Curate relationships for people needing more assistance
- Design interventions based on identified community needs

RESPOND

Close the Loop in Real Time

- Inform clinical team & CBOs
- Verify patient needs met
- Reduce duplication
- Identify strength & gaps within social service delivery system

EVALUATE

Evaluate Impact

- Track outcomes at individual & community level
- Prove impact, outcomes, & cost-effectiveness
- Supply data & narratives to drive policy change

IMPROVE

Utilize process and outcome data to drive program evaluation, research and continuous program improvement

Learning Objectives

- Helpful hints on collecting SDOH and social need referral data in a healthcare system
- Identify practices in applying data analytics for internal and external reporting
- Leverage SDOH and social needs data to evaluate impact on program effectiveness, healthcare utilization and cost
- Use SDOH data in effective research and evaluation
- Lessons Learned

Collecting SDOH and Social Need Referral Data

Mark Kalina Jr., Senior Analyst

Collecting SDOH Screen Data

The data from the SDOH screenings are stored in EHR flowsheets and tables. We extract that data using a SQL pull from Clarity. The screen data includes:

- The Date the Screen was Completed
- SDOH Screen Answers
- Patient Encounter CSN which allows us to link:
  - Encounter type
  - Provider ID, Department, Location, Specialty
  - Entry User information
  - Appointment status (scheduled, cancelled, completed)
- Method by which the SDOH survey was Administered

Linking SDOH Data to Demographic Data

Using the patient's MRN and geolocation, we can link the SDOH screen data to demographic and census tract related data:

- Demographics
  - Name
  - Age
  - Race and Ethnicity
  - Address
- Data related to the patient's census tract
  - Median Income
  - Median Percent Poverty
  - Neighborhood Name
  - Voting Ward

Linking SDOH Data to Hospital Data

- Comorbidities
  - Diabetes
  - Depression
  - Drug Abuse
  - Renal Disease
  - And more…

- Labs/Vitals
  - Blood Pressure
  - Cholesterol
  - A1c
  - And more…

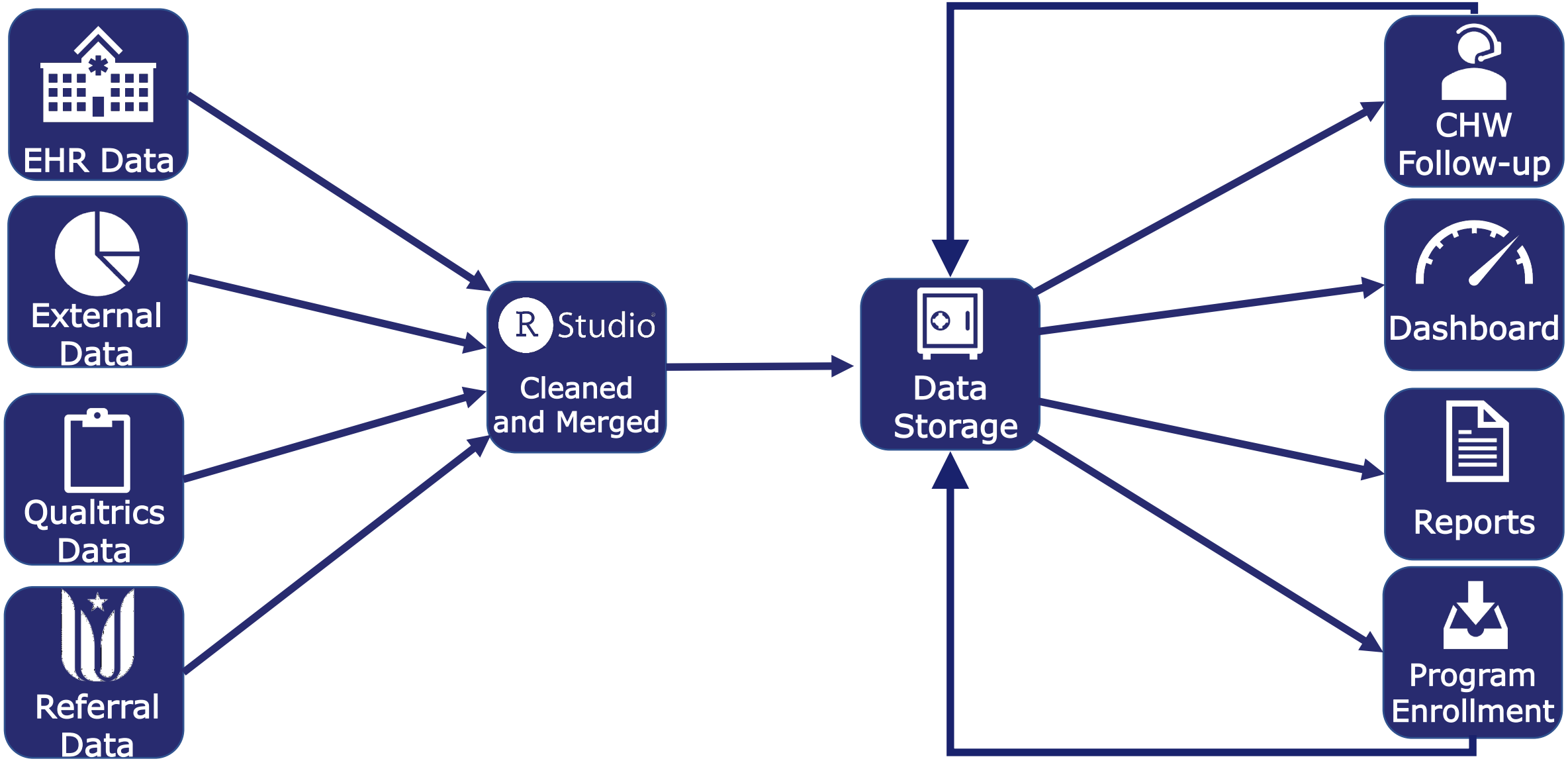
- Hospital Utilization
  - Number of Inpatient Stays
  - Emergency Department visits
  - Elective Admissions
  - Length of stay
  - Cost
  - And more…

Linking SDOH Data to Referral Data

We partnered with an online referral platform. When a referral is made using this platform the data is saved in their system. We can extract that data and match it to our patients by fuzzy matching on a few variables. The information we gather from the referral platform is:

- Referral Sender
- Referral Receiver
- The Service Type of the Referral
- Referral Status (open, accepted, closed)
- Detailed Outcome Notes

The Structure of the Data



Using Data and Analytics for Reporting and Showing the Impact of SDOH

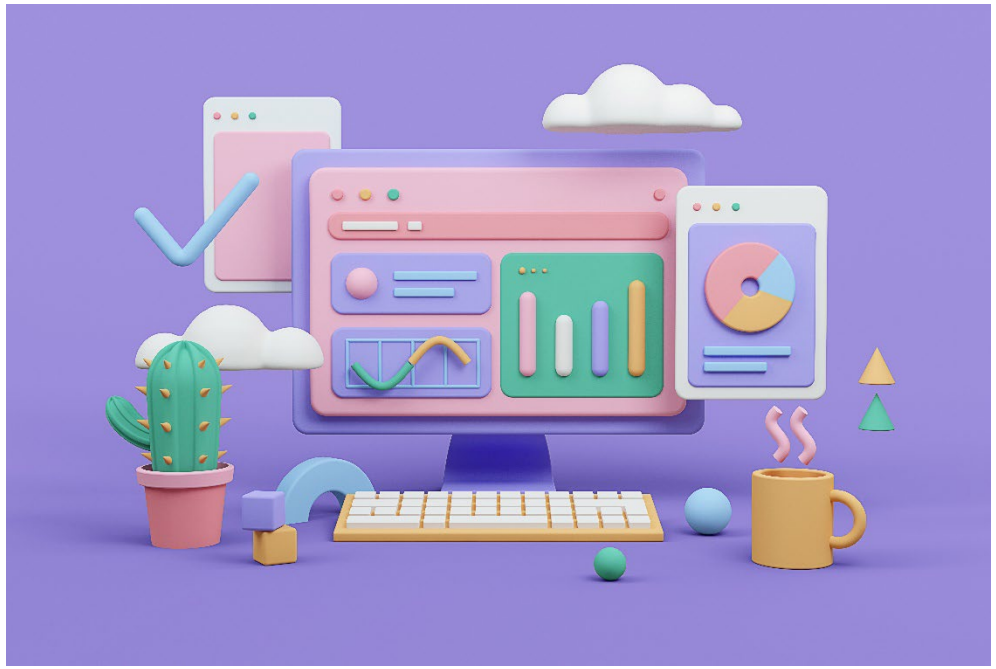
Kevin Chagin, Manager, Advanced Analytics & Data Operations

Reporting and Telling the Story

Know your audience.

What is your end goal?

- Reporting predetermined metrics
- Analyze one aspect of the screening or the process
- Data exploration



We decided to perform a large data exploration

The problem(s):

1. How do you take complex data and present it in a way that shows the whole picture without losing its complexity?

2. How do you put it into a platform that can be viewed by non-technical staff?

Constructing a Story

Raw Data

Visualize the Data in One-Off Plots

Conduct Individual Analysis on Specific Areas of the Data

Construct the Story of How SDOH Impacts Your Community

Constructing a Story

Start with the Raw Data and build out a dataset that contains the desired information

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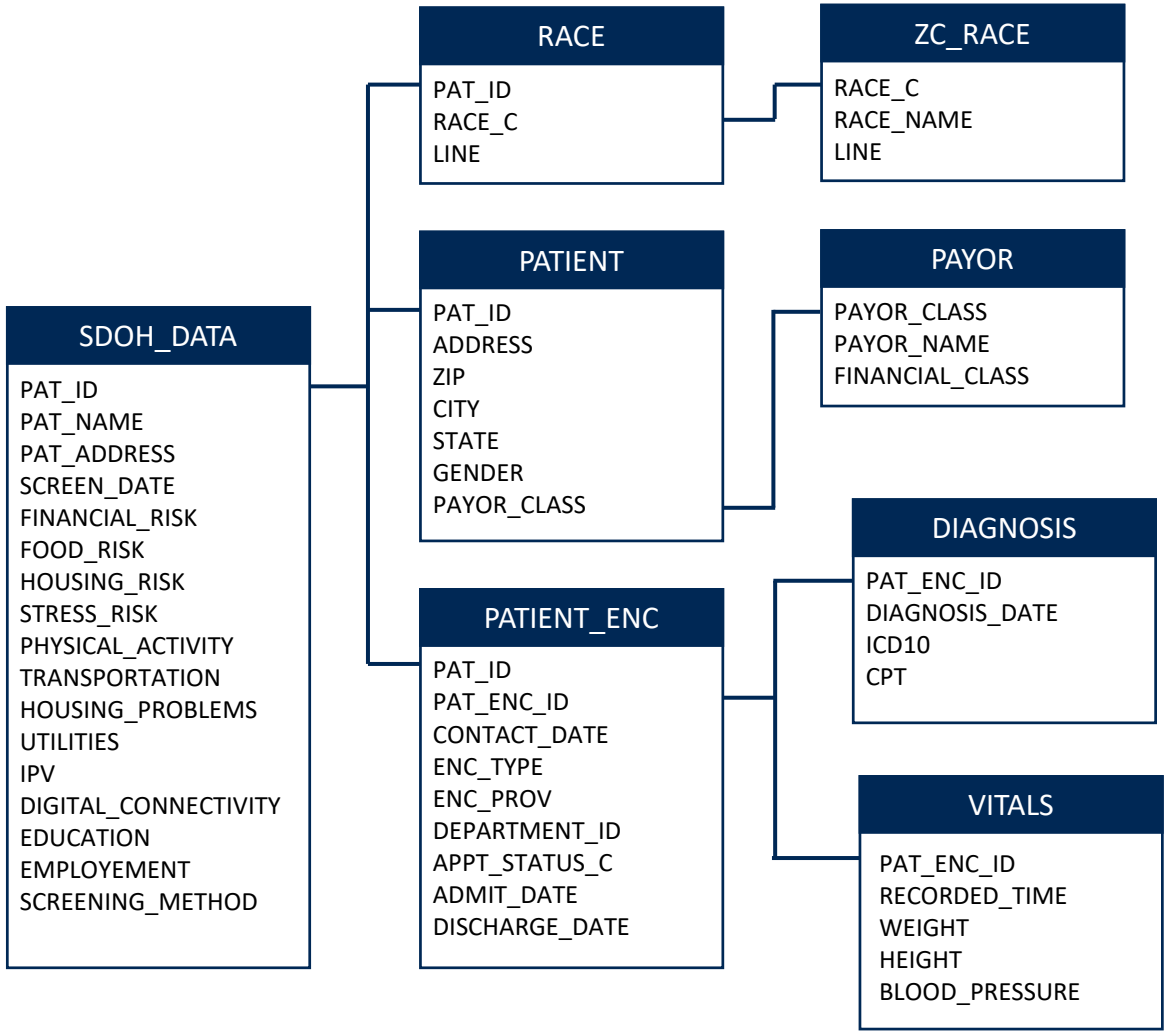
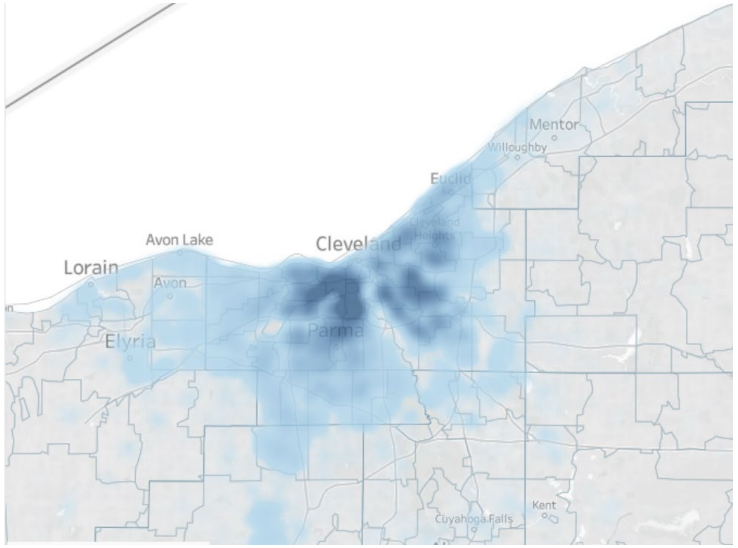


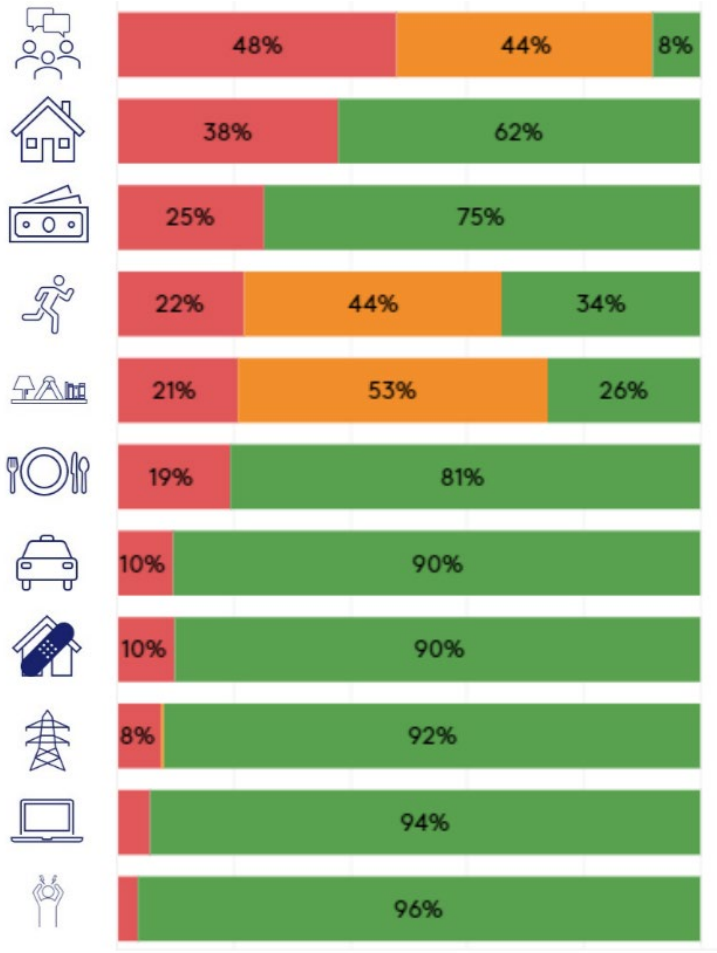
Constructing a Story

Visualize the Data with one-off plots that can show trend or convey a point about a particular metric

Density Plot of Screened Patients



SDOH Risk by Domain



Constructing a Story

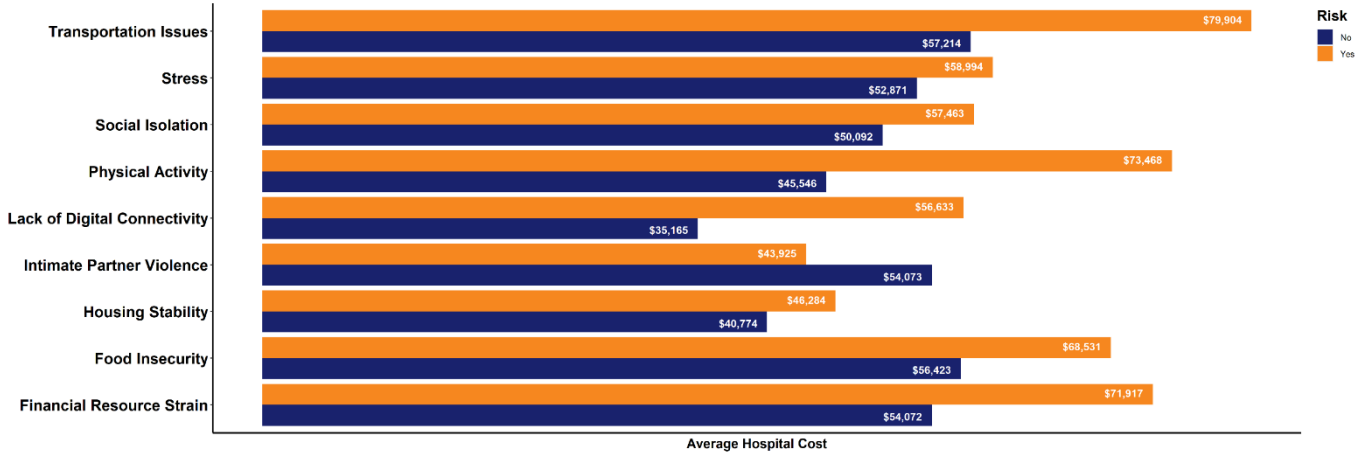
Conduct Individual Analysis on specific areas of the data to provide insight

Likelihood of Being at Risk for Other SDOH Domains: for Those who are at risk for Food Insecurity

11.7x More Likely	Financial Resource Strain
3.4x More Likely	Transportation
3.0x More Likely	Housing Stability
1.9x More Likely	Intimate Partner Violence

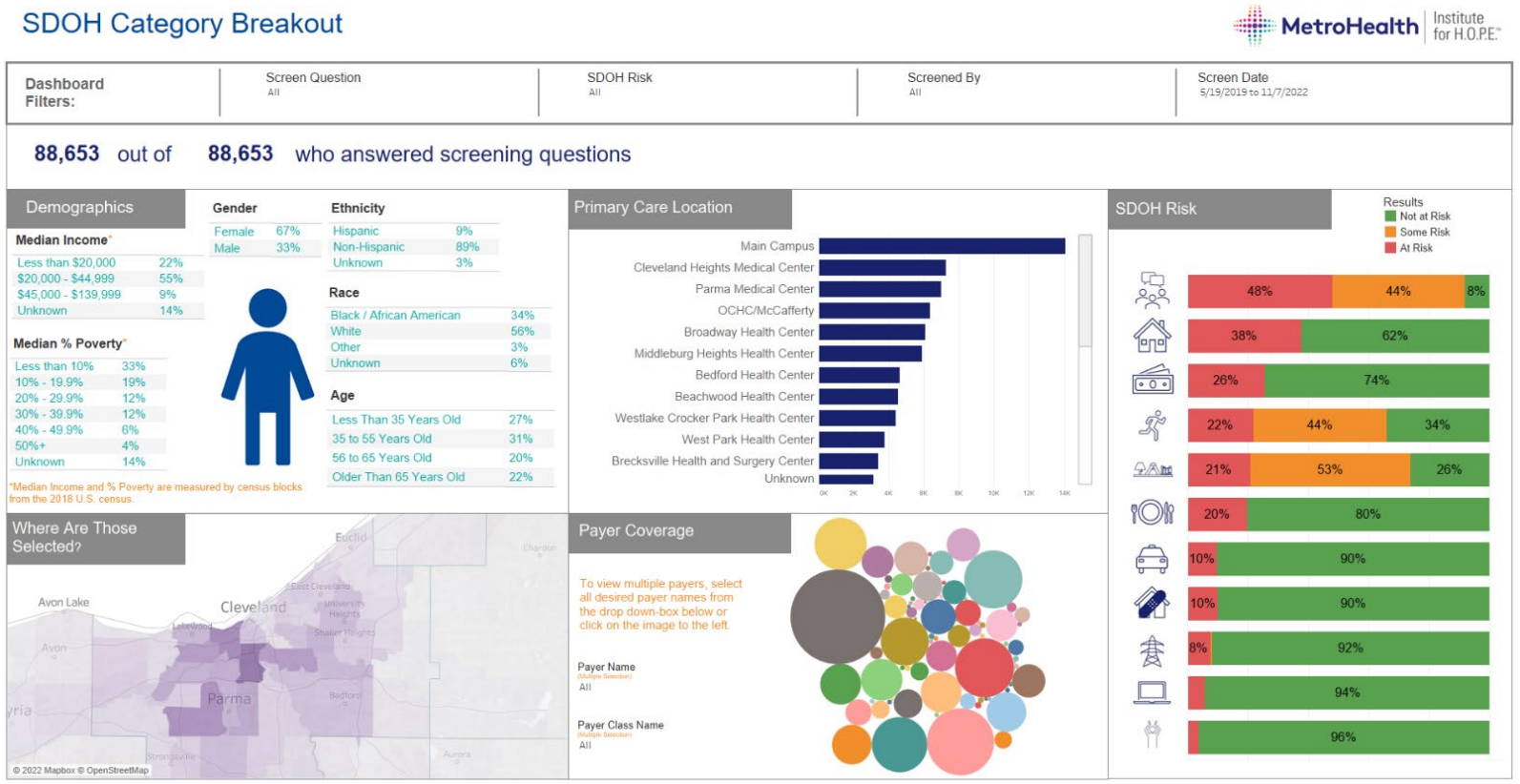
*p-value < 0.01

Average Hospital Cost Between Those 'At Risk' and 'Not at Risk' within +/- One Year of SDOH Screen



Constructing a Story

Combined all Visualizations and Analysis into a Comprehensive View or Dashboard that shows how SDOH impacts your population.



SDOH Category Breakout

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Dashboard Filters:	Screen Question	SDOH Risk	Screened By	Screen Date
	All	All	All	5/19/2019 to 11/7/2022

88,653 out of **88,653** who answered screening questions

Demographics

Median Income*

Less than $20,000	22%
$20,000 - $44,999	55%
$45,000 - $139,999	9%
Unknown	14%

Median % Poverty*

Less than 10%	33%
10% - 19.9%	19%
20% - 29.9%	12%
30% - 39.9%	12%
40% - 49.9%	6%
50%+	4%
Unknown	14%

*Median Income and % Poverty are measured by census blocks from the 2018 U.S. census.

Gender

Female	67%
Male	33%

Ethnicity

Hispanic	9%
Non-Hispanic	89%
Unknown	3%

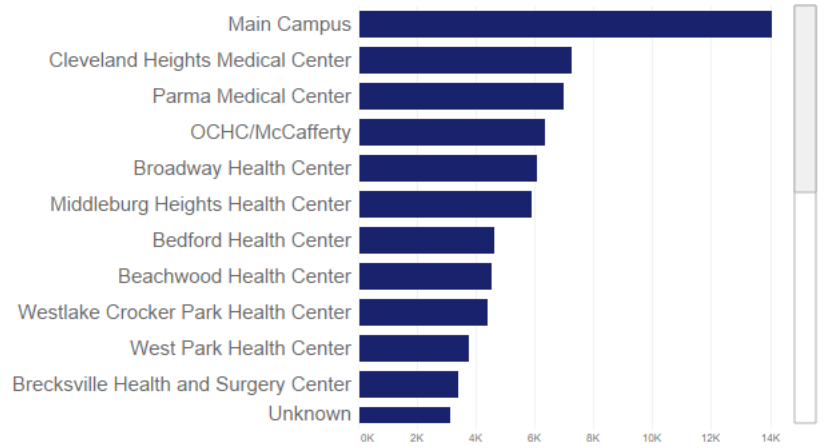
Race

Black / African American	34%
White	56%
Other	3%
Unknown	6%

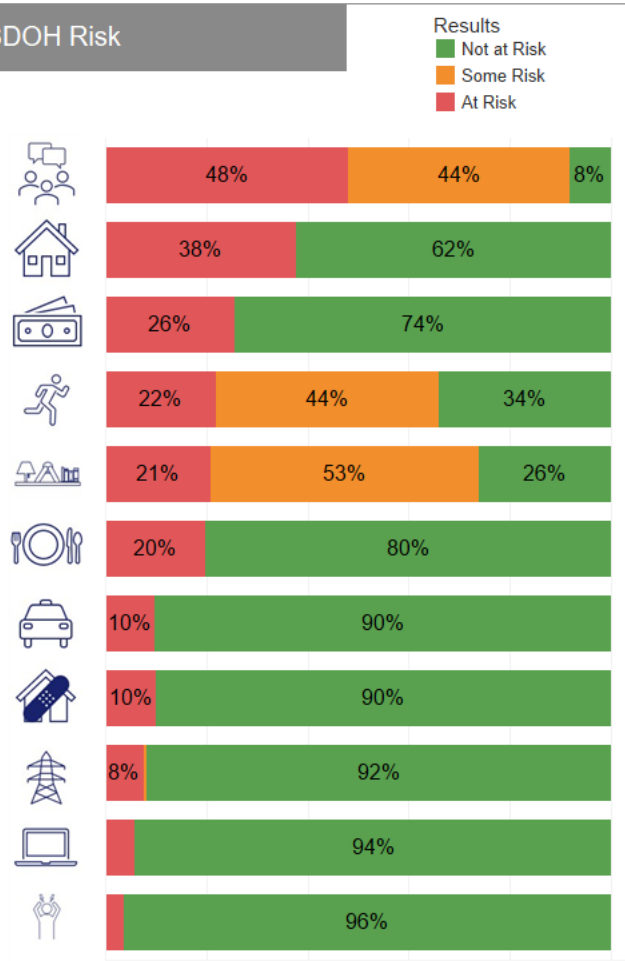
Age

Less Than 35 Years Old	27%
35 to 55 Years Old	31%
56 to 65 Years Old	20%
Older Than 65 Years Old	22%

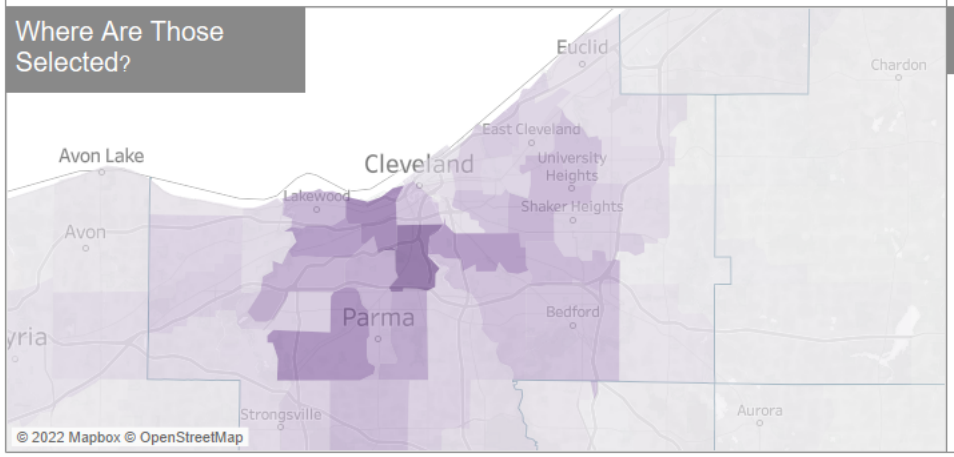
Primary Care Location



SDOH Risk



Where Are Those Selected?

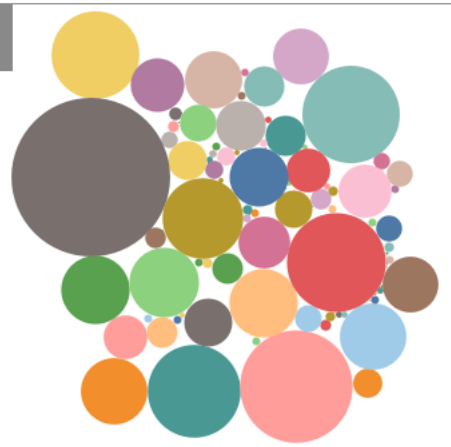


Payer Coverage

To view multiple payers, select all desired payer names from the drop down-box below or click on the image to the left.

Payer Name
(Multiple Selection)
All

Payer Class Name
(Multiple Selection)
All



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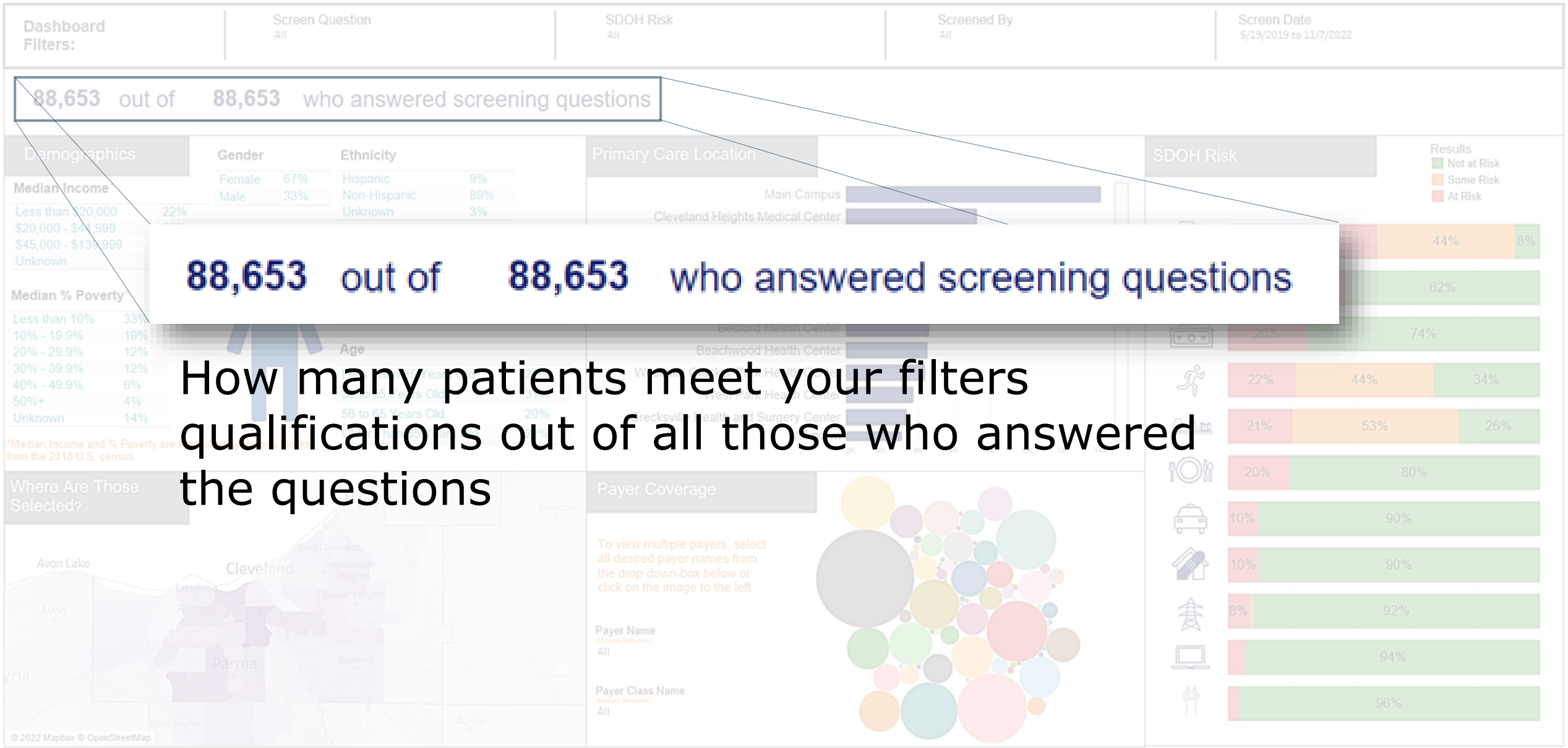
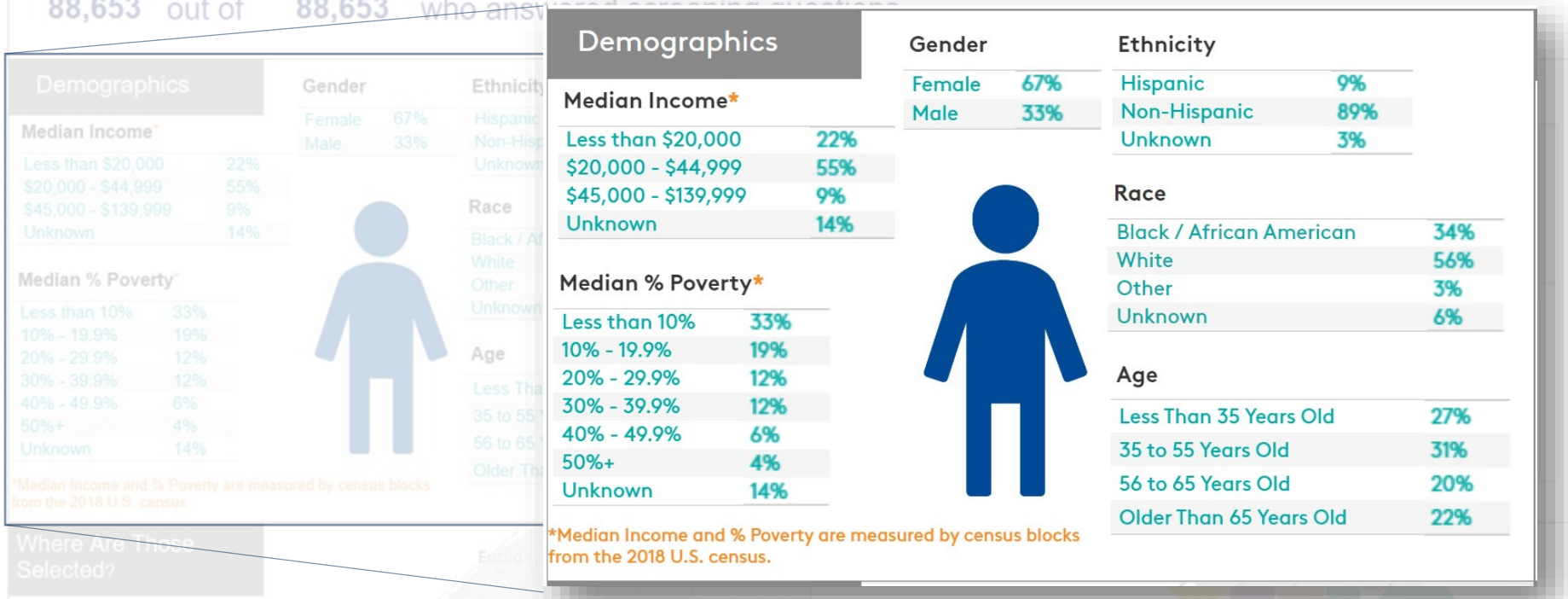


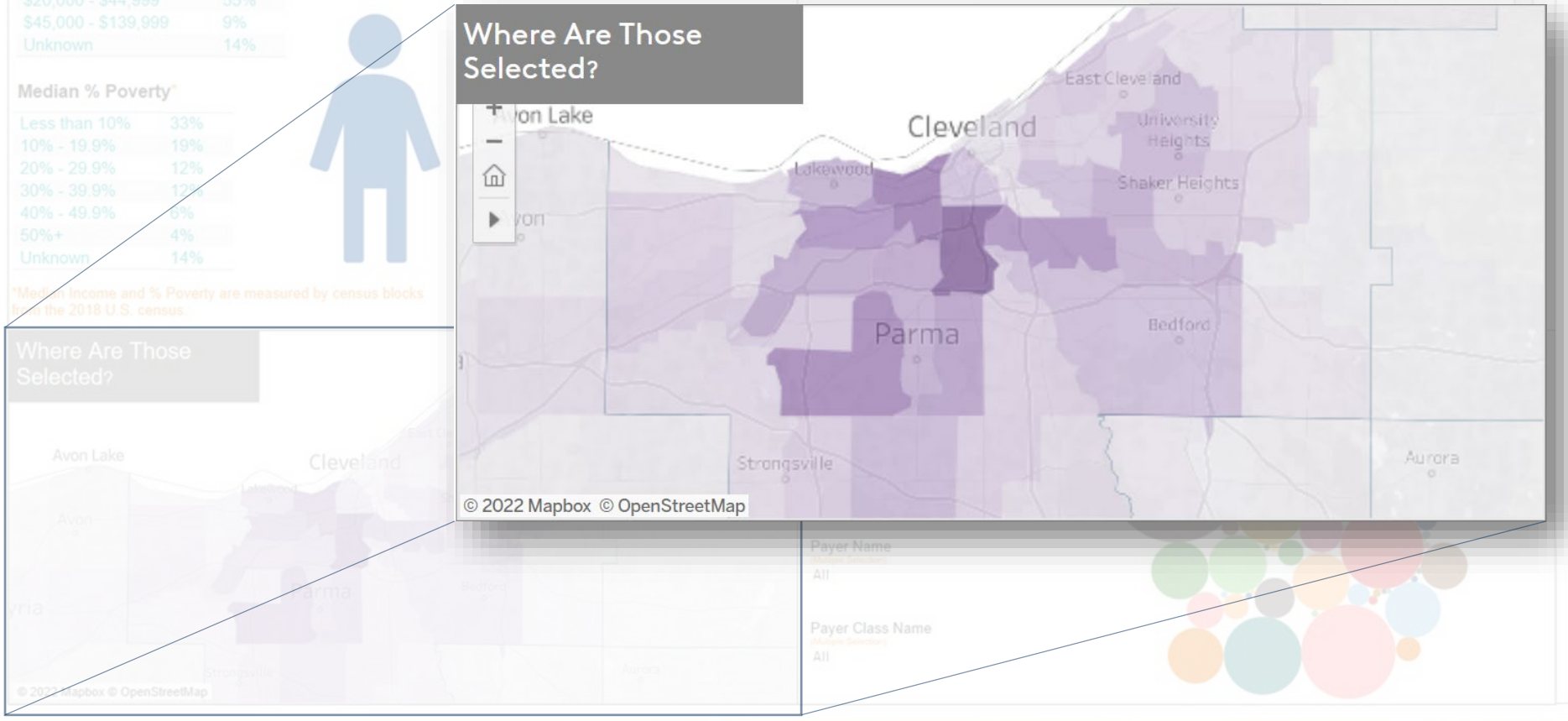
88,653 out of 88,653 who answered screening questions

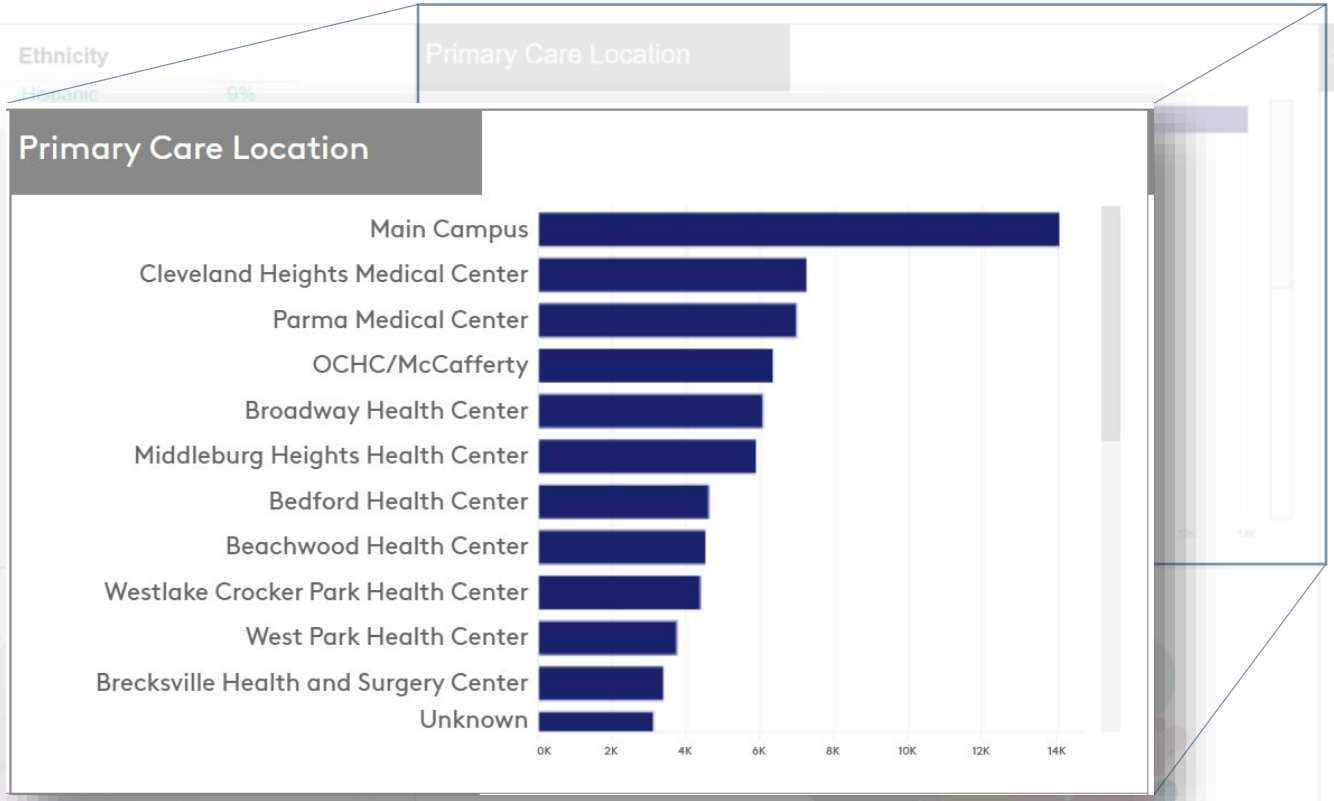
How many patients meet your filters qualifications out of all those who answered the questions



Patient's Demographics

Where Patients Live by Zip Code





Where Patient Receives Primary Care

Patients Primary Payer Coverage

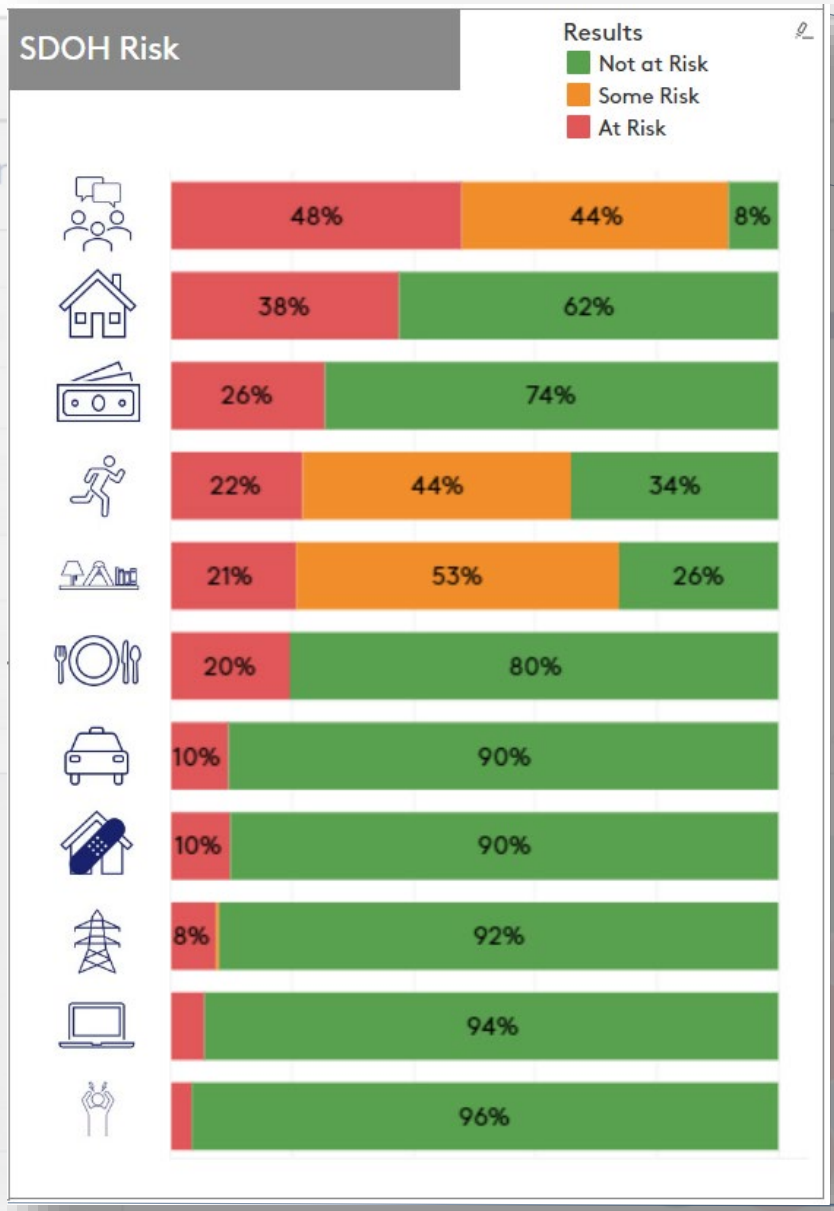
Payer Coverage

To view multiple payers, select all desired payer names from the drop down-box below or click on the image to the left.

Payer Name
(Multiple Selection)
(All)

Payer Class Name
(Multiple Selection)
(All)

Patients SDOH Risk by Domain



SDOH Category Breakout

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Dashboard Filters:	Screen Question	SDOH Risk	Screened By	Screen Date
	Food Insecurity	At Risk	All	5/19/2019 to 11/7/2022

14,720 out of **88,653** who answered screening questions

Demographics

Median Income*

Less than $20,000	34%
$20,000 - $44,999	47%
$45,000 - $139,999	3%
Unknown	15%

Median % Poverty*

Less than 10%	17%
10% - 19.9%	19%
20% - 29.9%	16%
30% - 39.9%	18%
40% - 49.9%	9%
50%+	6%
Unknown	15%

*Median Income and % Poverty are measured by census blocks from the 2018 U.S. census.

Gender

Female	68%
Male	32%

Ethnicity

Hispanic	13%
Non-Hispanic	85%
Unknown	3%

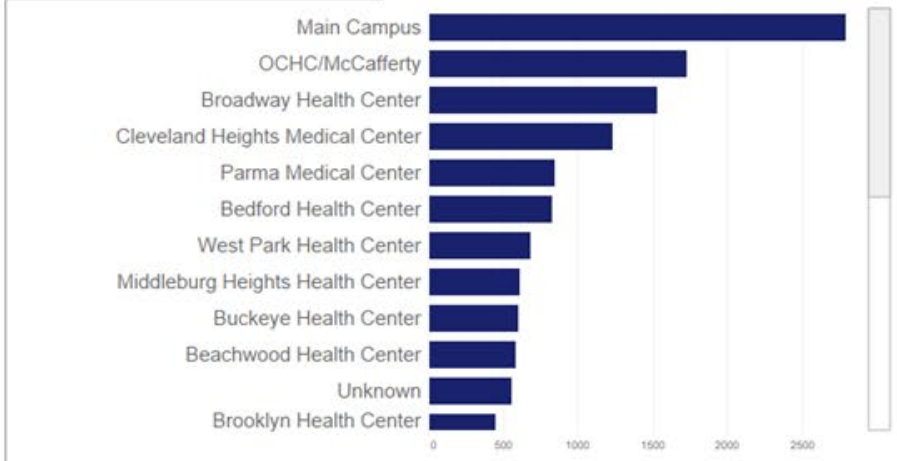
Race

Black / African American	48%
White	41%
Other	2%
Unknown	9%

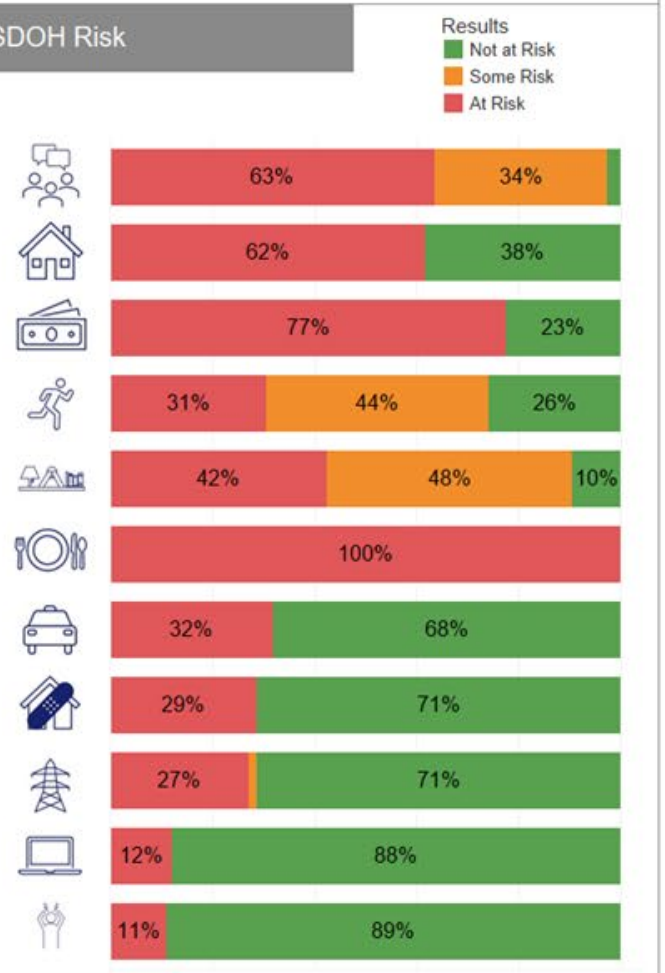
Age

Less Than 35 Years Old	29%
35 to 55 Years Old	37%
56 to 65 Years Old	21%
Older Than 65 Years Old	13%

Primary Care Location



SDOH Risk



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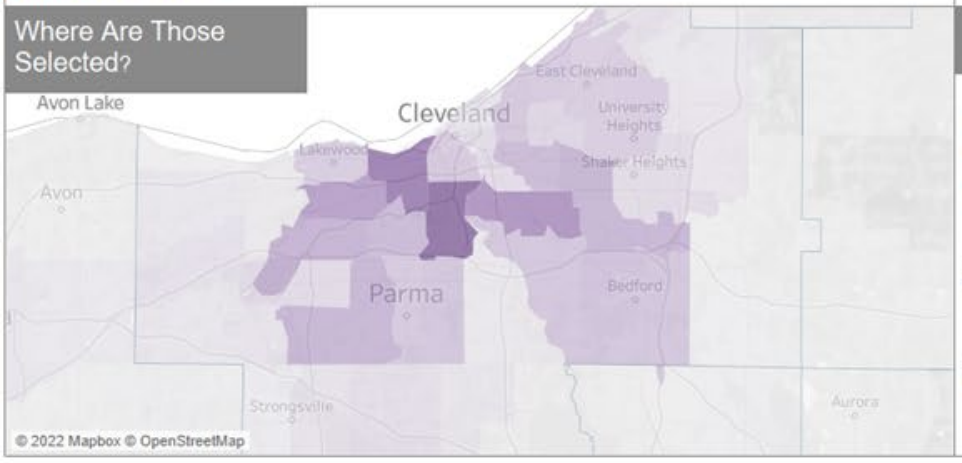

Payer Coverage

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Payer Name
(Multiple Selection)
All

Payer Class Name
(Multiple Selection)
All

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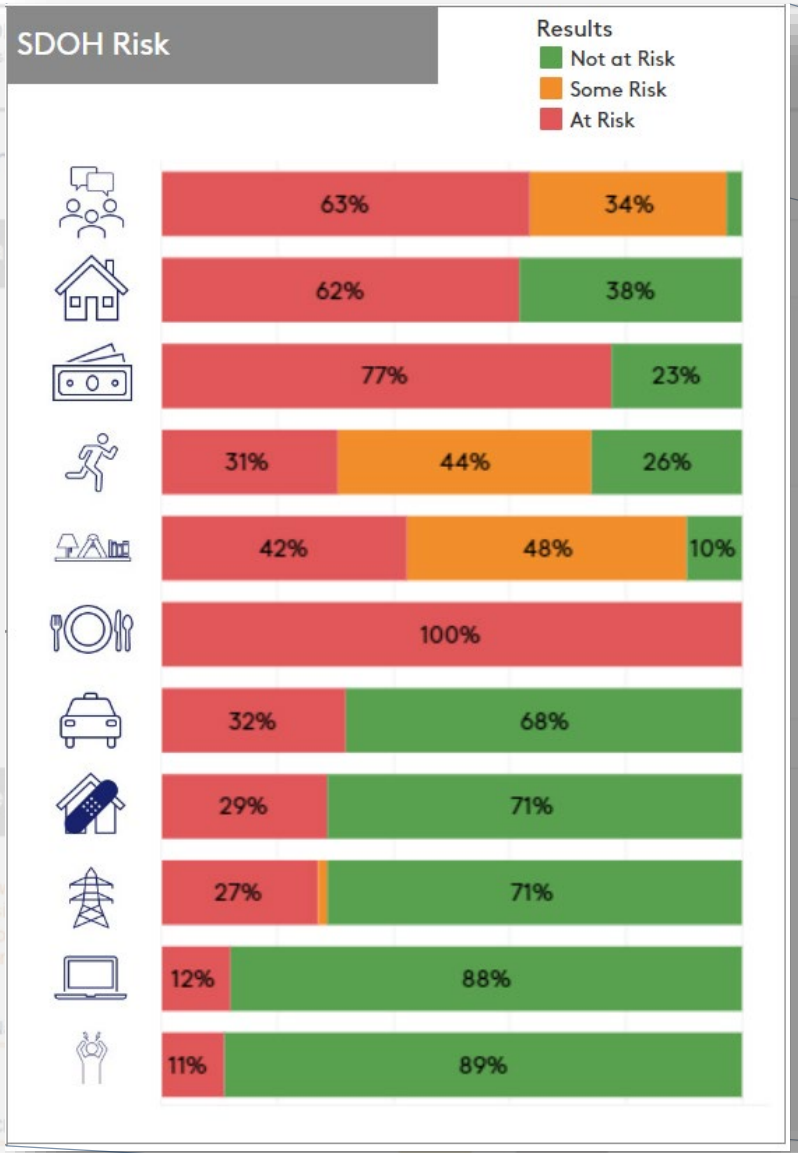
We see an increase across all domains

With the largest increases in
- Financial Resource Strain
- Transportation
- Utilities



SDOH Category Breakout

MetroHealth | Institute for H.O.P.E.

Dashboard Filters:

14,720 out of 88,653 who answered screening questions

Demographics

Median Income*	
Less than $20,000	34%
$20,000 - $44,999	47%
$45,000 - $139,999	3%
Unknown	15%

Median % Poverty*	
Less than 10%	17%
10% - 19.9%	19%
20% - 29.9%	16%
30% - 39.9%	18%
40% - 49.9%	9%
50%+	6%
Unknown	15%

*Median Income and % Poverty are measured by census blocks from the 2018 U.S. census.

Gender	
Female	68%
Male	32%

Ethnicity	
Hispanic	13%
Non-Hispanic	85%
Unknown	3%

Race	
Black / African American	48%
White	41%
Other	2%
Unknown	9%

Age	
Less Than 35 Years Old	29%
35 to 55 Years Old	37%
56 to 65 Years Old	21%
Older Than 65 Years Old	13%

We see in increase in:

- Black/African American
- Hispanic

SDOH Category Breakout

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Dashboard Filters:	Screen Question	SDOH Risk	Screened By	Screen Date
	All	All	All	5/19/2019 to 11/7/2022

30,446 out of **30,446** who answered screening questions

Demographics

Median Income*

Less than $20,000	39%
$20,000 - $44,999	42%
$45,000 - $139,999	3%
Unknown	16%

Median % Poverty*

Less than 10%	12%
10% - 19.9%	19%
20% - 29.9%	17%
30% - 39.9%	20%
40% - 49.9%	10%
50%+	7%
Unknown	16%

*Median Income and % Poverty are measured by census blocks from the 2018 U.S. census.

Gender

Female	71%
Male	29%

Ethnicity

Hispanic	2%
Non-Hispanic	96%
Unknown	2%

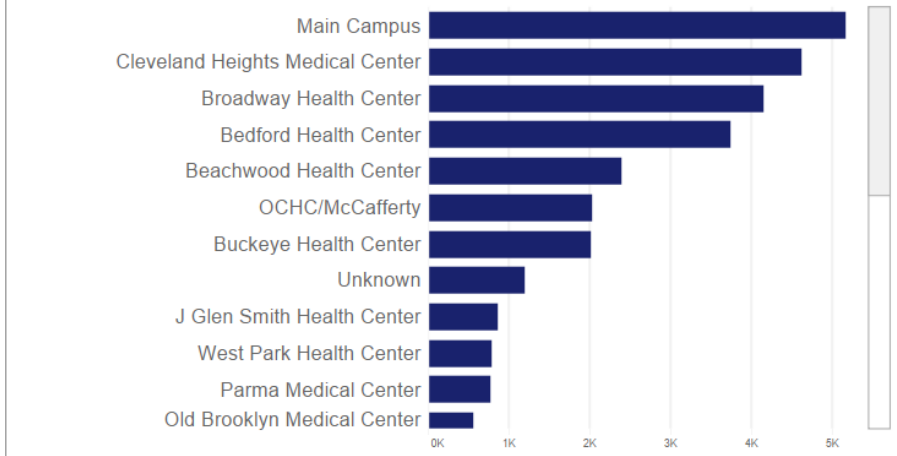
Race

Black / African American	34%
White	56%
Other	3%
Unknown	6%

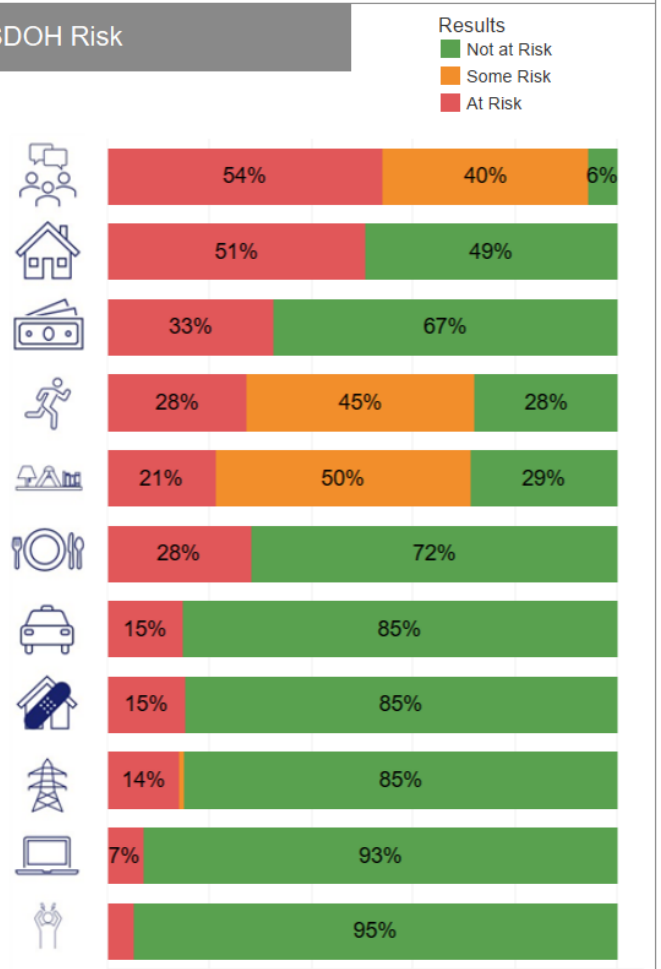
Age

Less Than 35 Years Old	30%
35 to 55 Years Old	32%
56 to 65 Years Old	20%
Older Than 65 Years Old	18%

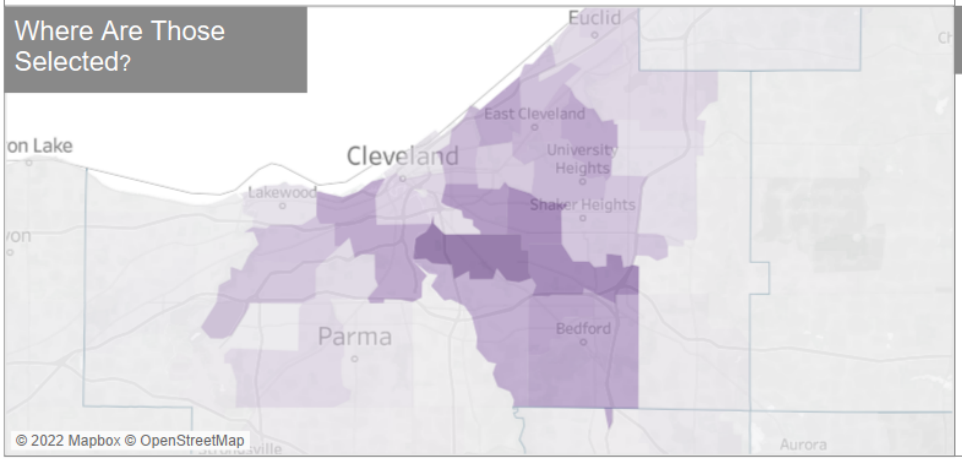
Primary Care Location



SDOH Risk



Where Are Those Selected?



Payer Coverage

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Payer Name
(Multiple Selection)
All

Payer Class Name
(Multiple Selection)
All

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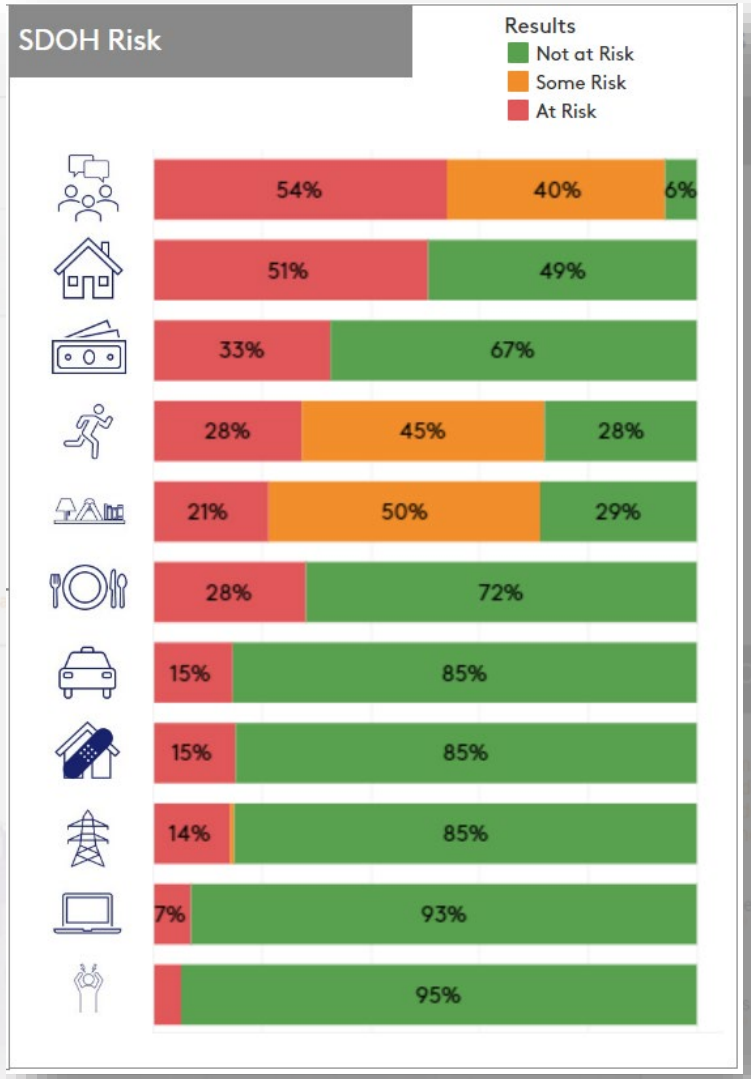
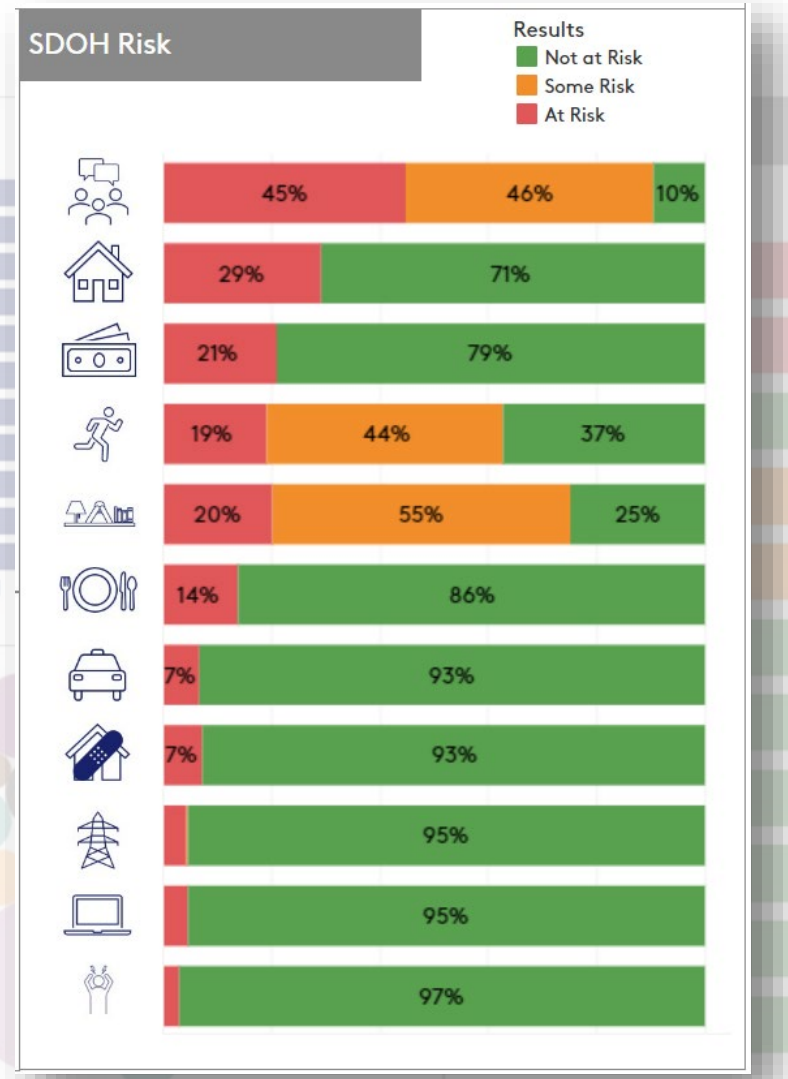
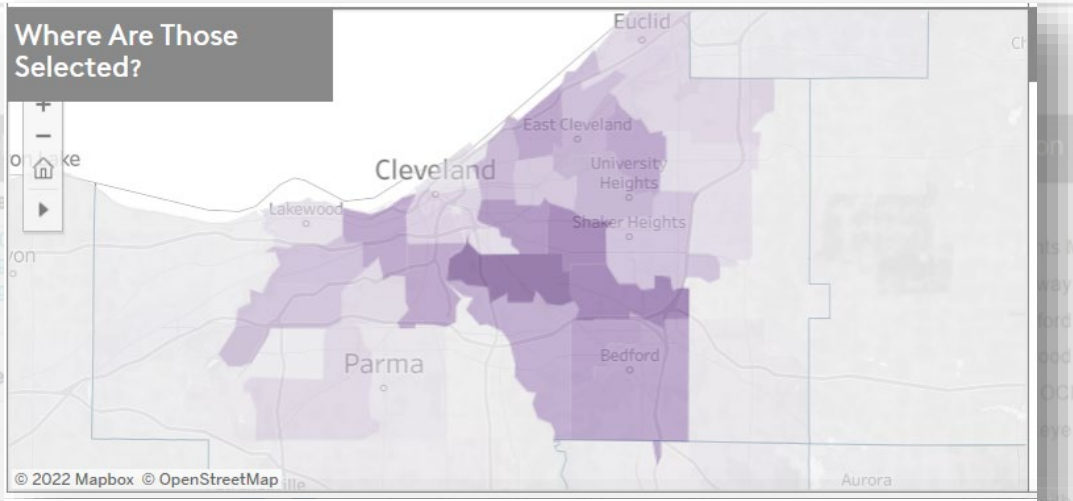
Race: Black / African American

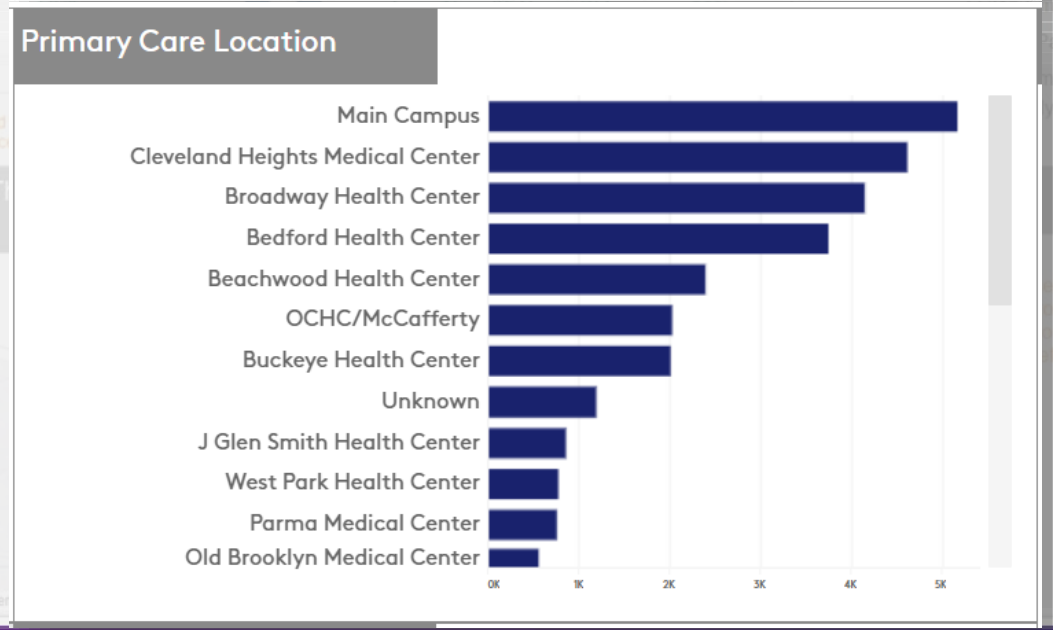


Race: White

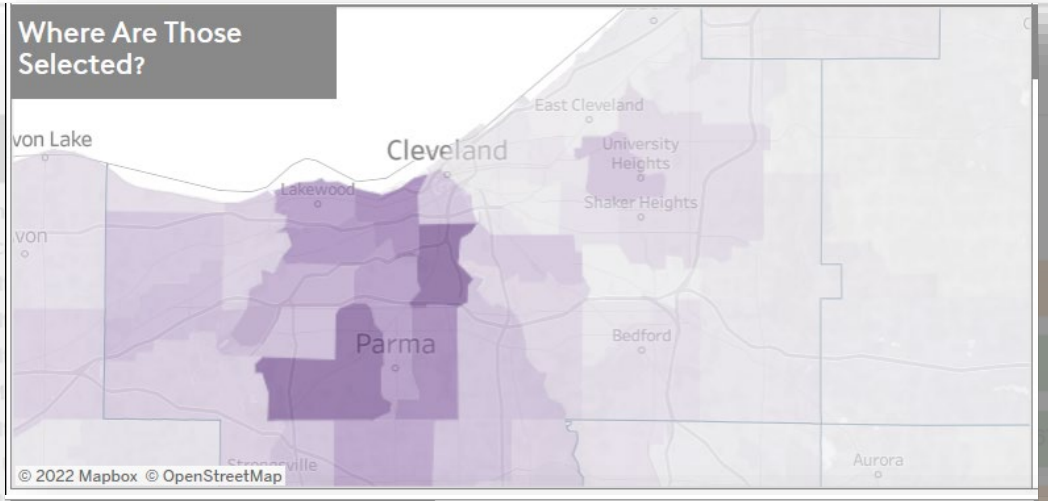


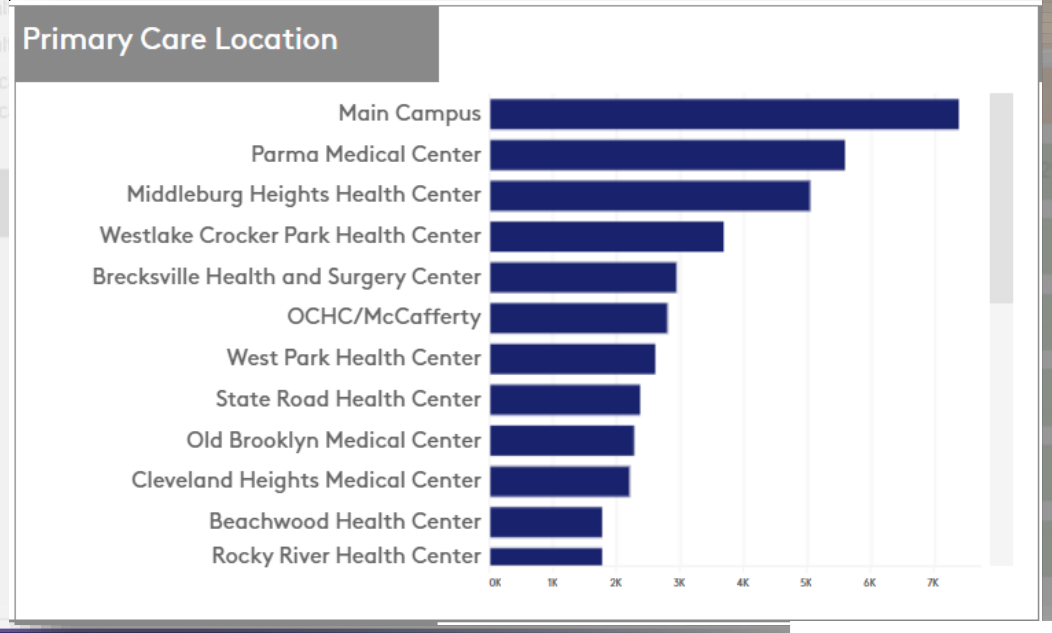
Race: Black / African American





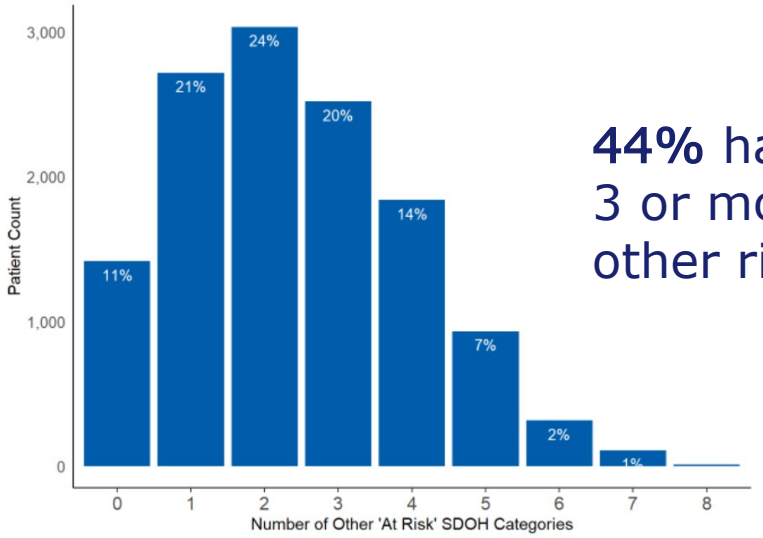
Race: White





Deep Dive: Food Insecurity

SDOH Co-Occurring Risk



44% have 3 or more other risks

11.7x More Likely | Financial Resource Strain

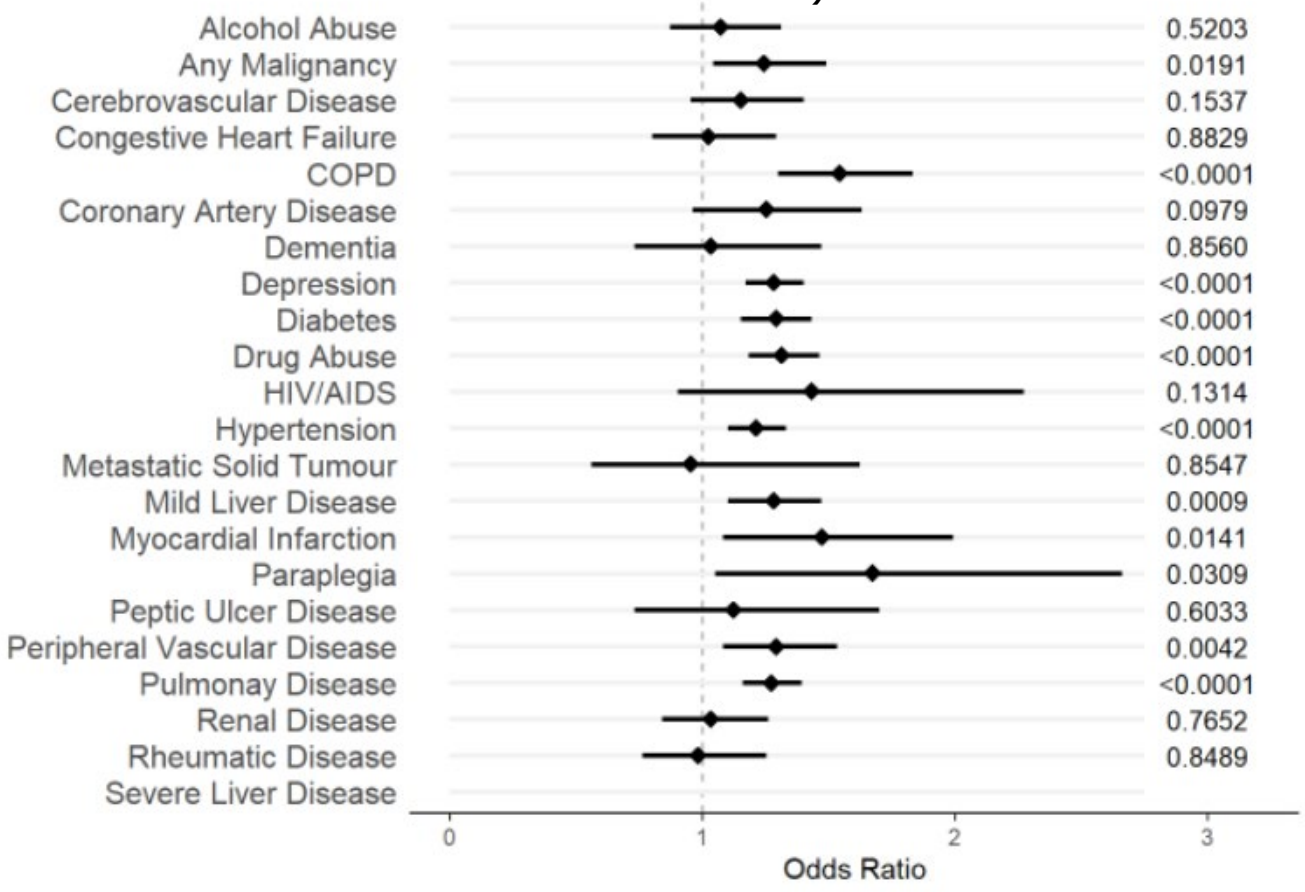
3.4x More Likely | Transportation

3.0x More Likely | Housing Stability

1.9x More Likely | Intimate Partner Violence

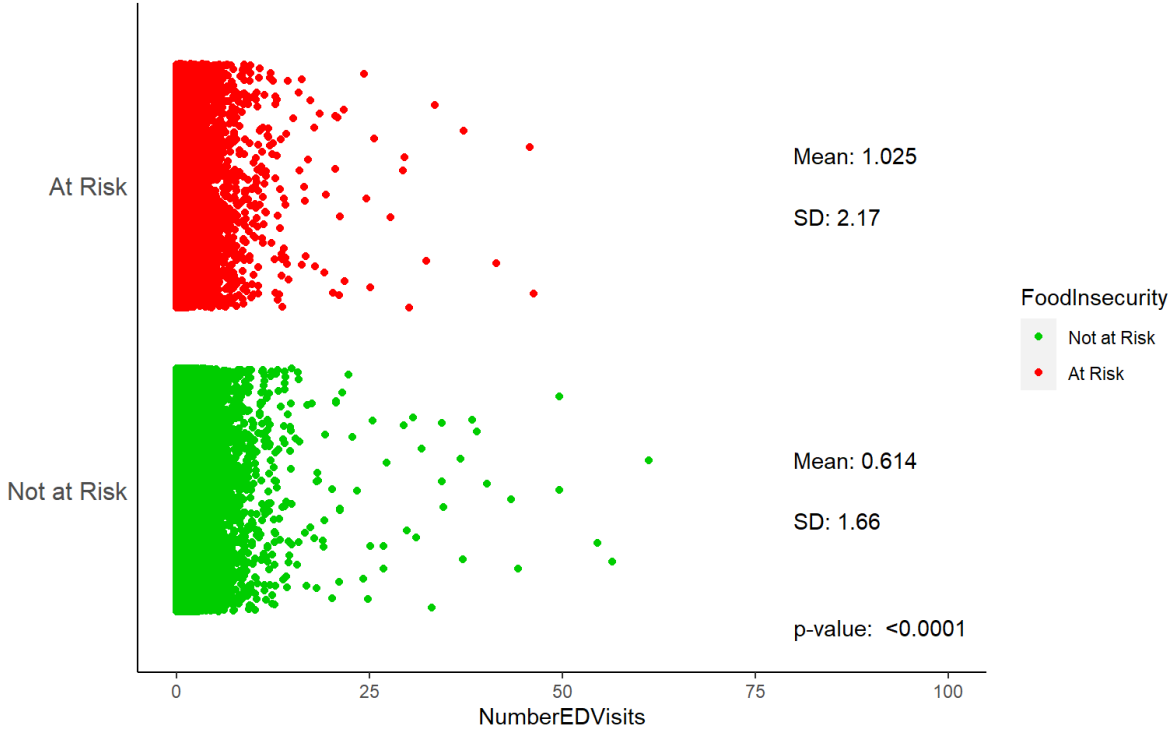
*p-value < 0.01

Likeliness of Comorbidities (Odds Ratio)

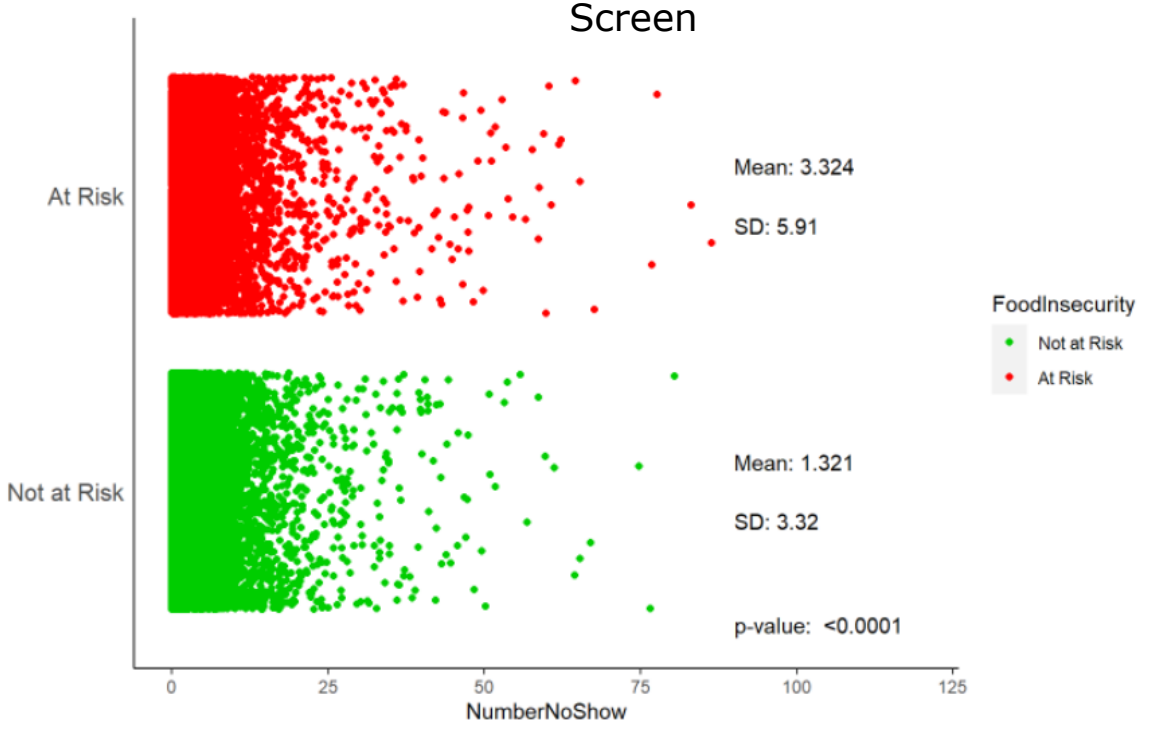


Deep Dive: Food Insecurity

Number of ED Visits Within the Year Prior to SODH Screen



Number of PCP No Shows Within the Year Prior to SODH Screen



25% More Likely | 3 or more ED visits

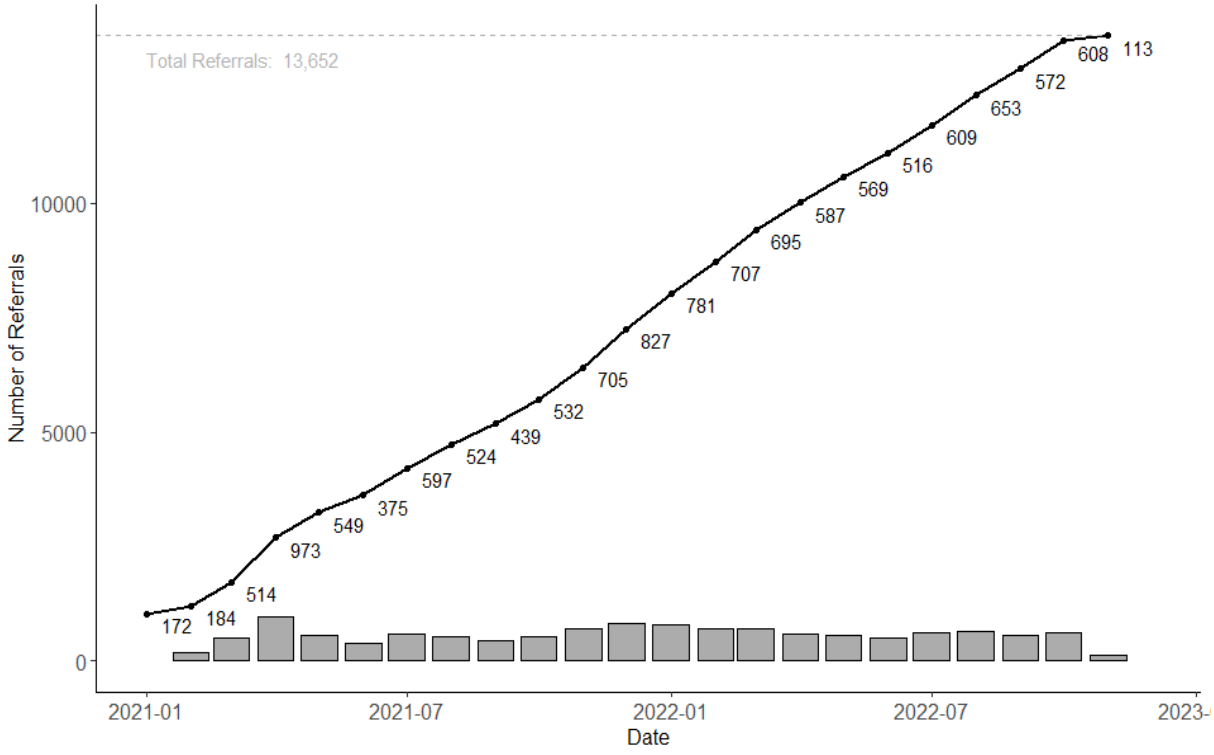
62% More Likely | 10 or more ED visits

*p-value < 0.01

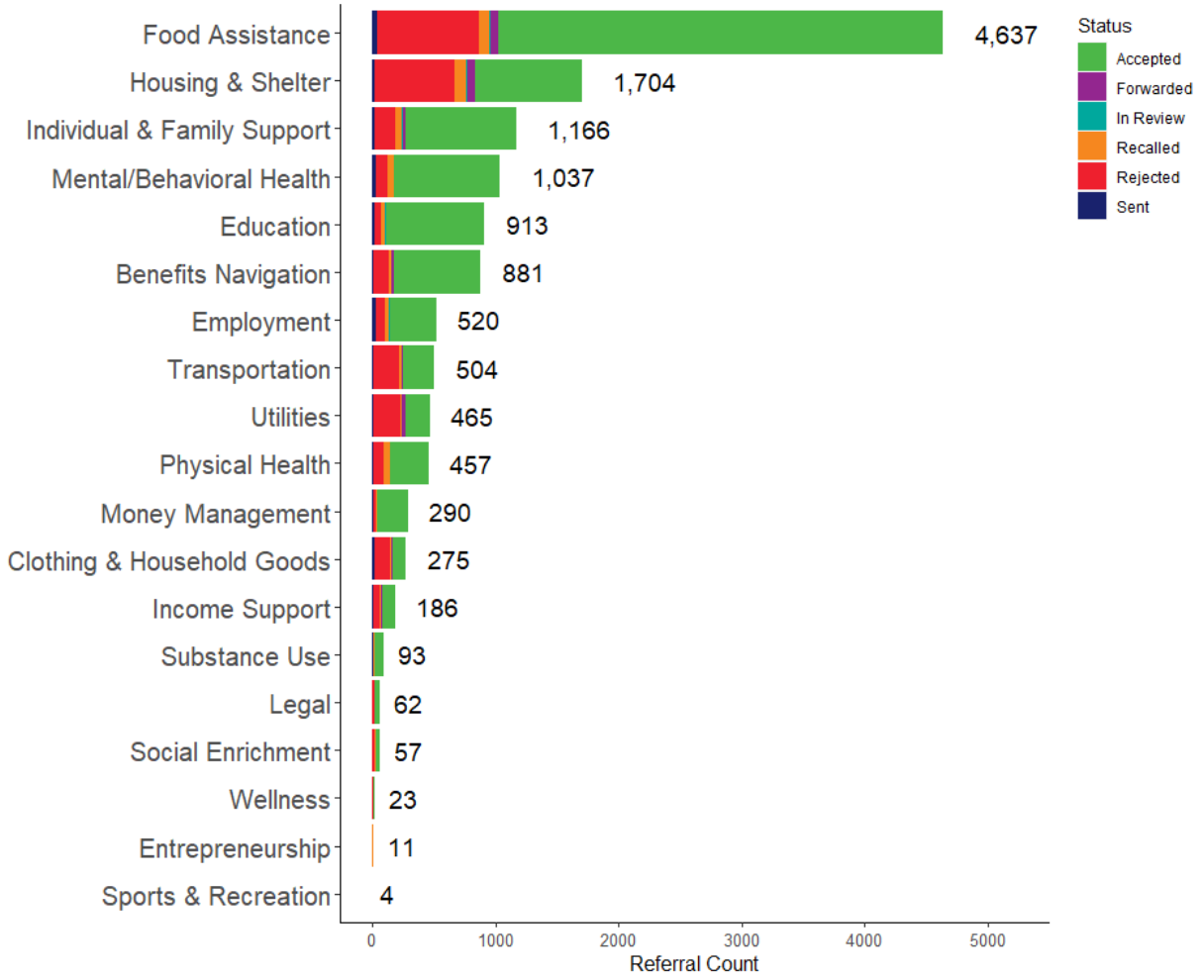
35

Linking to Referrals

Total Number of Social Needs Referrals Made by Month



Social Needs Referrals by Referral Type and By the Referral Status



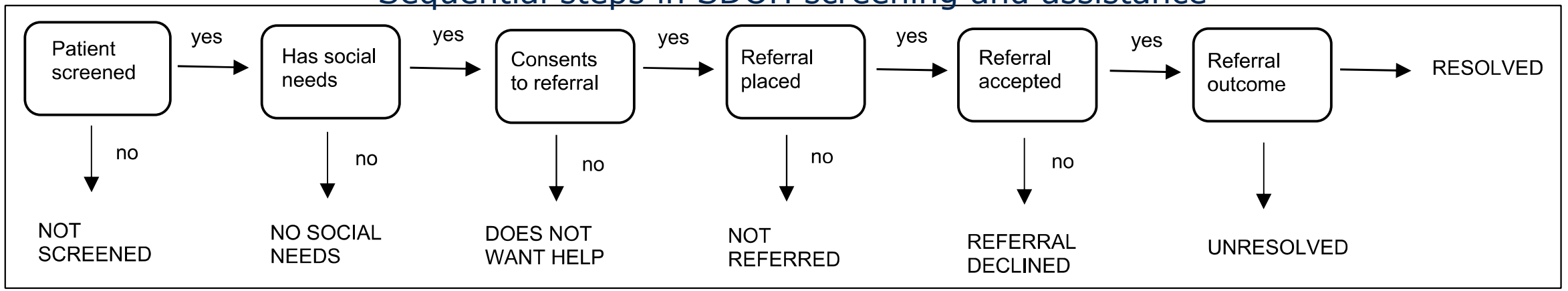
Using SDOH and Social Needs Data for Effective Evaluations

Ashwini Sehgal, Physician, Director of Research and Evaluation

Using SDOH and Social Needs Data for Effective Evaluations

A Framework for Evaluating Social Determinants of Health Screening and Referrals for Assistance

Sequential steps in SDOH screening and assistance



Citation: Chagin KM, Choate F, Cook K, Fuehrer SM, Misak JE, Sehgal AR. A Framework for Evaluating Social Determinants of Health Screening and Referrals for Assistance. *J Prim Care Community Health*. 2021 Jan-Dec;12:21501327211052204.

Food insecurity: all patients

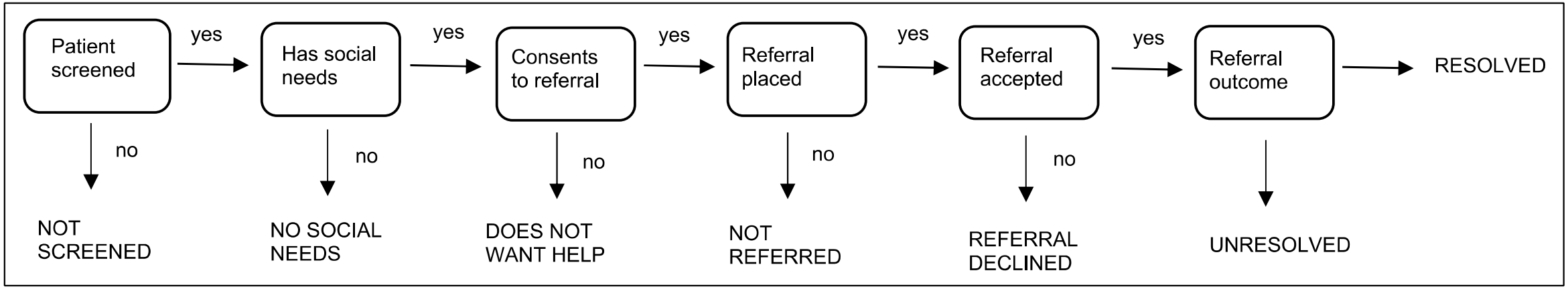


Table 1. Completion of Specific Food Insecurity Screening and Assistance Steps by All Patients

Group	Number of Patients	Patients Screened	Have Food Insecurity	Want Referral	Referrals Placed	Total Referrals	Referrals Accepted	Referrals Resolved
All patients	9537	5741/9537 (60%)	988/5741 (17%)	848/988 (86%)	356/848 (42%)	366	357/366 (98%)	98/357 (27%)

Food insecurity: age subgroups

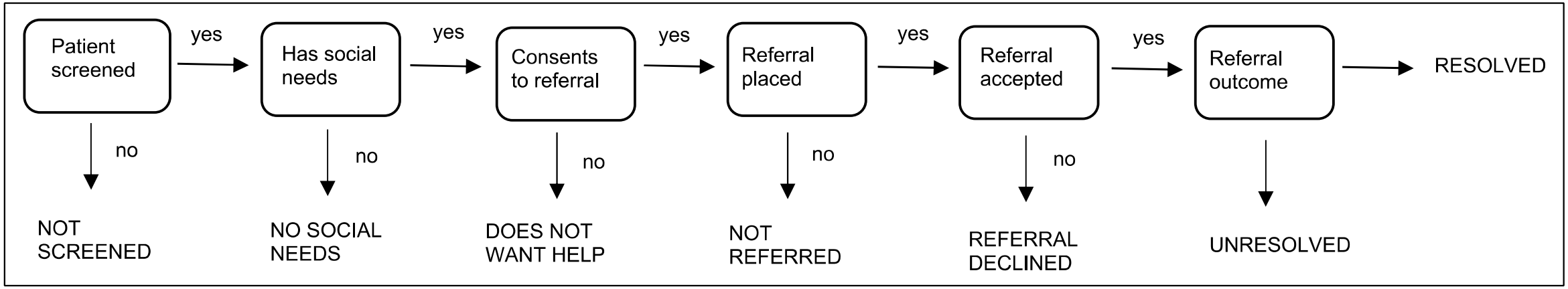


Table 2. Completion of Specific Food Insecurity Screening and Assistance Steps by Age

Group	Number of Patients	Patients Screened	Have Food Insecurity	Want Referral	Referrals Placed	Total Referrals	Referrals Accepted	Referrals Resolved
Age								
< 65 years	4368	2985/4368 (68%)	560/2985 (19%)	497/560 (89%)	152/497 (31%)	154	152/154 (99%)	27/152 (18%)
≥ 65 years	5163	2756/5163 (53%)	428/2756 (16%)	351/428 (82%)	204/351 (58%)	212	205/212 (97%)	71/212 (33%)

Food insecurity: specific community-based organizations

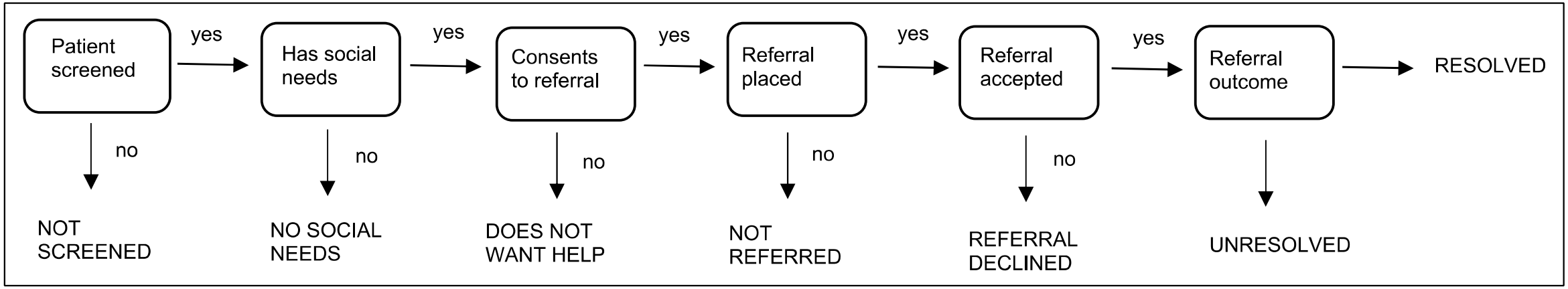


Table 3. Completion of Specific Food Insecurity Screening and Assistance Steps by Referrals to the Food Bank

Group	Number of Patients	Patients Screened	Have Food Insecurity	Want Referral	Referrals Placed	Total Referrals	Referrals Accepted	Referrals Resolved
Referred to Food bank	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	355	354/355 (100%)	96/354 (27%)

Food insecurity: Reasons for Failure to Complete Specific Steps

Step not completed	Reasons for failure to complete (number of patients or referrals)
Patient not screened	Patient not approached for screening (number not recorded) Patient declined screening (number not recorded)
Patient does not have food insecurity	Patient not at risk for food insecurity based on screening questionnaire (4753)
Patient does not want help	Patient did not consent to referral to community service organizations (140)
Patient not referred	Reasons not recorded (492)
Referral declined	Patient ineligible for services (3) Patient declined services (3) Community organization does not provide service requested (2) Missing reason (1)
Referral unresolved	Patient unable to be contacted (151) Patient declined services (27) Patient denied having food insecurity (8) Duplicate referral (2) Missing reason (71)

Effective Research with SDOH Data

Ashwini Sehgal, Physician, Director of Research and Evaluation

Jin Kim-Mozeleski, PhD, Assistant Professor

Effective Research with SDOH Data

Original Research

Clustering of Social Determinants of Health Among Patients

Journal of Primary Care & Community Health
Volume 13: 1–7

DOI: 10.1177/21501319221113543
journals.sagepub.com/home/jpc
SAGE

Nicholas K. Schiltz[1], Kevin Chagin[2], and Ashwini R. Sehgal[2]

- Clustering of SDOH within patients: 19 dyads, 13 triads, 1 tetrad
- Food insecurity, Social isolation, Inability pay housing/utilities: 4.7% observed vs. 1.2% expected

SDOH risk among health system employees

	Food Insecurity	Financial Strain	Inability to Pay for Housing and/or Utilities
Physicians	1%	0%	3%
Nurses	5%	8%	6%
Administrative Support	20%	20%	17%

Citation: Seeholzer EL, Santiago M, Thomas C, DeAngelis M, Scarl F, Webb Anastasia, Woods T, Sehgal AR. Prevalence of Social Determinants of Health Among Health System Employees. *J Prim Care Community Health*. 2022

SCHOOL OF MEDICINE
CASE WESTERN RESERVE UNIVERSITY

Department of Population and Quantitative Health Sciences

Healthy Neighborhoods

Prevention Research Center for Healthy Neighborhoods at Case Western Reserve University

Mission: The PRCHN bridges community partners and university researchers to focus their collective expertise to develop, test, and implement sustainable strategies to improve health in underserved communities.

Five Primary Areas:

- *Tobacco Prevention and Control*
- *Healthy Food Access and Food Security*
- *Cancer & Community – Clinical Linkages*
- *Supportive Environments for Physical Activity*
- *Adolescent Health & Surveillance*

Supported by:

- *Evaluation & Technical Assistance*
- *Place-Based Surveillance*

Effective Research with SDOH Data

Research Interests: SDOH and health behaviors that lead to health disparities – food insecurity and tobacco use

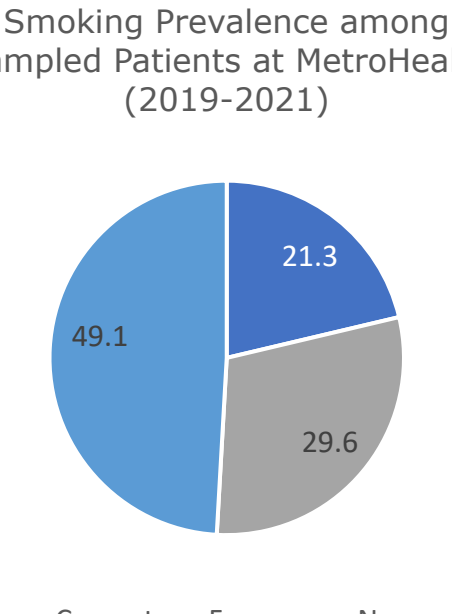
Research Question: How is food insecurity, *as well as* related social needs around financial resources, transportation, and housing, related to smoking status?

Methods: Secondary analysis study with SDOH data and smoking status from the EHR (May 2019 – June 2021)

- Sampling criteria
- SDOH Measures
- Covariates

Analytic Sample and Analysis: *N*=45,141 patients

- Descriptive statistics and logistic regression analyses



Citation: Kim-Mozeleski JE, Chagin KM, Sehgal AR, Misak JE, Fuehrer SM. Food insecurity, social needs, and smoking status among patients in a county hospital system. *Preventive Medicine Reports*. 2022;29:101963.

Prevention Research Center for Healthy Neighborhoods at Case Western Reserve University

Effective Research with SDOH Data

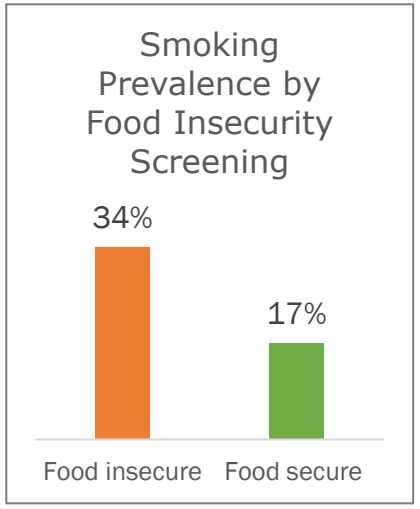
SDOH Screening Rates in Sample:

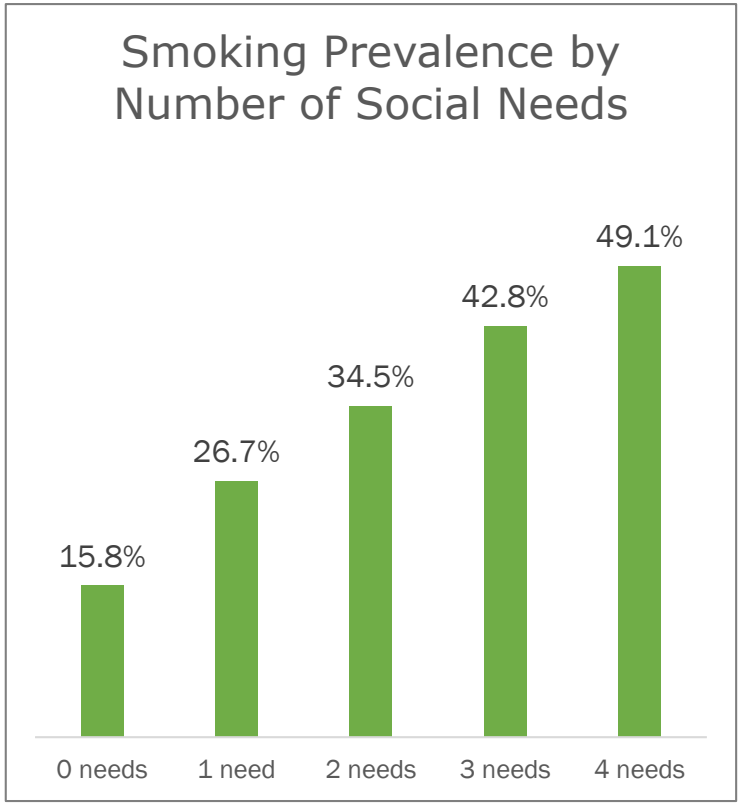
Food insecurity – **24%**

Financial strain – **8%**

Transportation barriers – **10%**

Housing and utility insecurity – **15%**





Adjusted Odds of Current Smoking

SDOH variable	Adjusted Odds Ratio (95% CI)
Food Insecurity	**1.58** (1.44, 1.74)
Financial Strain	**1.16** (1.02, 1.31)
Transportation Barriers	**1.62** (1.43, 1.83)
Housing and Utility Insecurity	**1.25** (1.15, 1.37)

Healthy Neighborhoods
Prevention Research Center for Healthy Neighborhoods at Case Western Reserve University

Citation: Kim-Mozeleski JE, Chagin KM, Sehgal AR, Misak JE, Fuehrer SM. Food insecurity, social needs, and smoking status among patients in a county hospital system. *Preventive Medicine Reports*. 2022;29:101963.

Effective Research with SDOH Data

Pilot Feasibility Study: "Food for SucCess" (Food Security for Successful Smoking Cessation)

Background

- Most people want to quit and try to quit, yet disparities in successfully quitting
- Food insecurity is a barrier to smoking cessation

Research Question

- Does addressing food insecurity during the cessation process improve cessation outcomes?

Design

- 12-week intervention, leveraging CHWs at the Institute for H.O.P.E.™ as navigators linking participants with tobacco cessation resources and food assistance resources in the community
- RCT: Randomized to receive economic support for groceries (flexible)

Resource Area	Key Examples
Tobacco cessation	-Referral to tobacco quitline -Access to group-based counseling/classes -Pharmacotherapy and nicotine replacement through primary care -Self-help materials
Food assistance	-Referral to the food bank, SNAP and Produce Perks -Food as Medicine clinic at MetroHealth -Food pantries in local area

Healthy Neighborhoods
Prevention Research Center for Healthy Neighborhoods at Case Western Reserve University

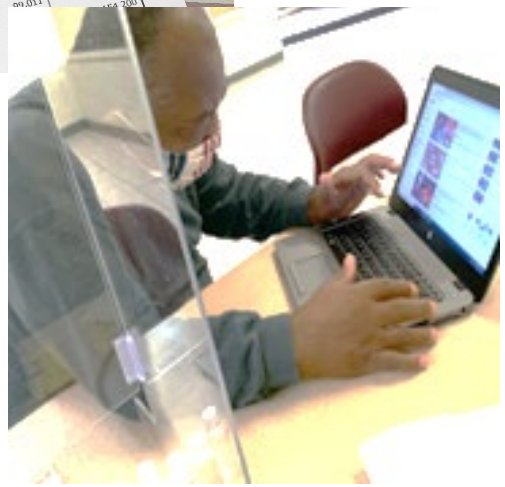
Funding: Cleveland Clinical and Translational Science Collaborative, NIH/NCATS UL1TR002548

Lessons Learned

Kevin Chagin, Manager, Advanced Analytics & Data Operations

Lessons Learned

- Bad data in, Bad data out
- Design a system and process of collecting data
- Understand and identify the goals of your analytics process
- Understand how to conduct research and evaluation of SDOH effect
- Make sure to include everyone within the development of reporting tools, research, and/or program evaluations
- Not Everyone is an analyst/researcher



Thank you!

For more information:
InstituteForHOPE@metrohealth.org

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