

# Laboratory Testing to Promote Health Equity

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# Disclosures

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- Research support was provided by Roche Diagnostics

# Objectives

- Understand the role of the laboratory in identifying and addressing health disparities
- Determine how the laboratory can expand access to underserved communities using the COVID-19 pandemic as a model
- Recognize that the laboratory is a key partner in health care and elimination of health disparities

# What are Health Disparities

- “Health disparities are preventable differences in the burden of disease, injury, violence, or in opportunities to achieve optimal health experienced by socially disadvantaged racial, ethnic, and other population groups, and communities”



# What Determines Health?

Genetic  
Inheritances

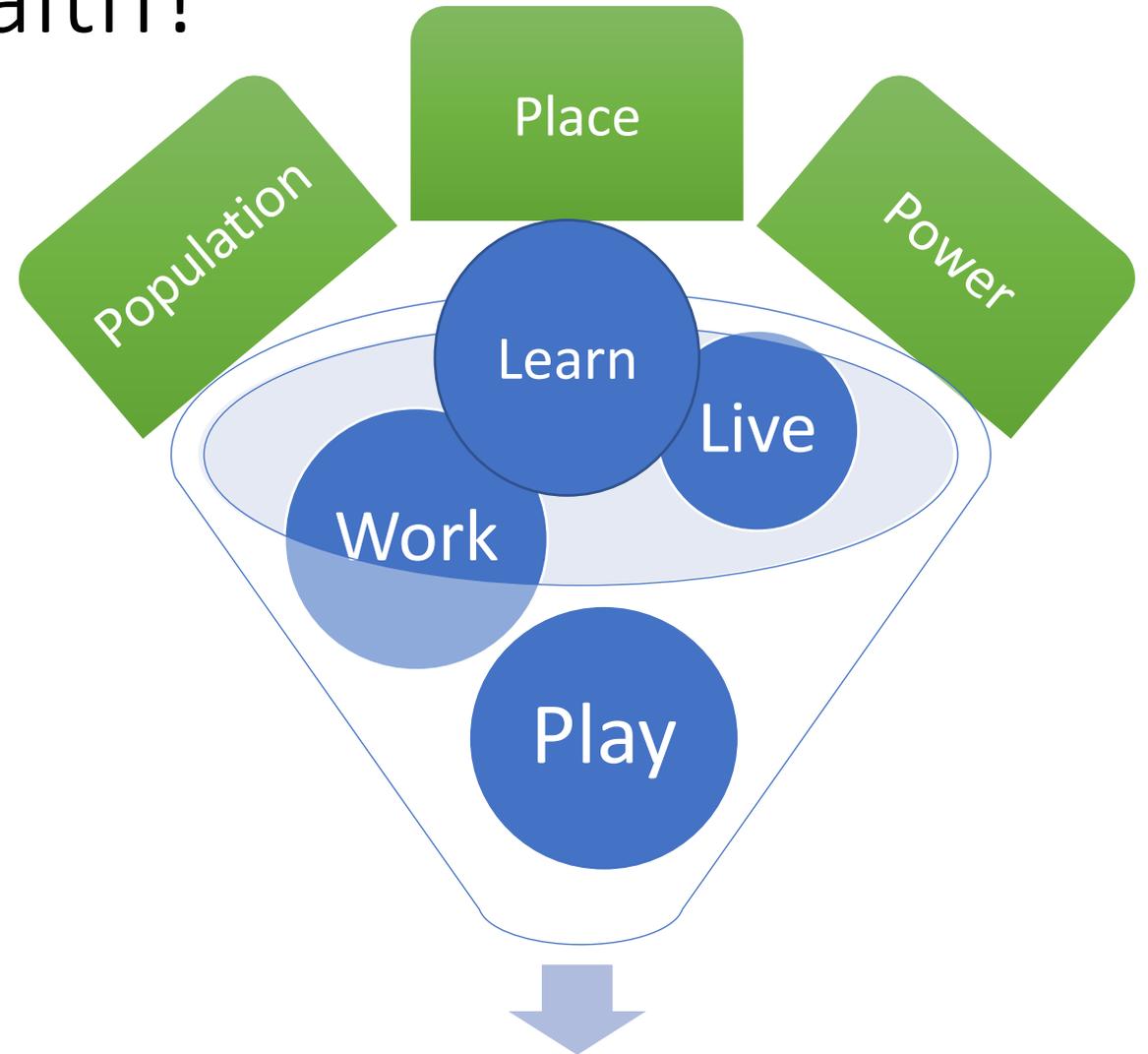
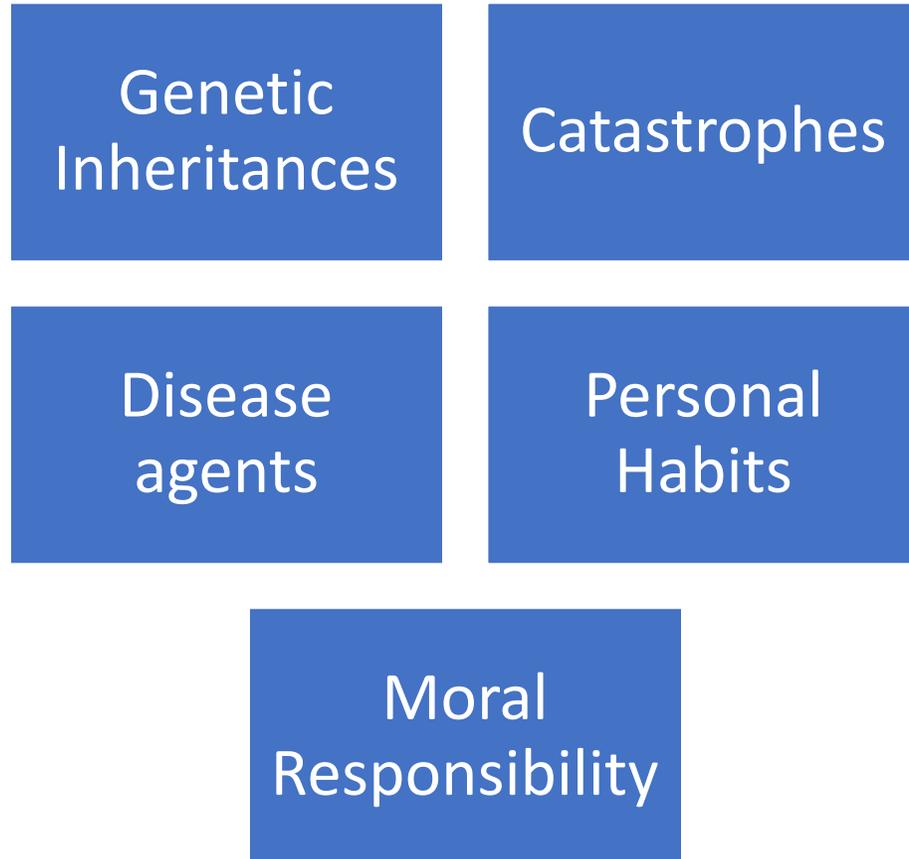
Catastrophes

Disease  
agents

Personal  
Habits

Moral  
Responsibility

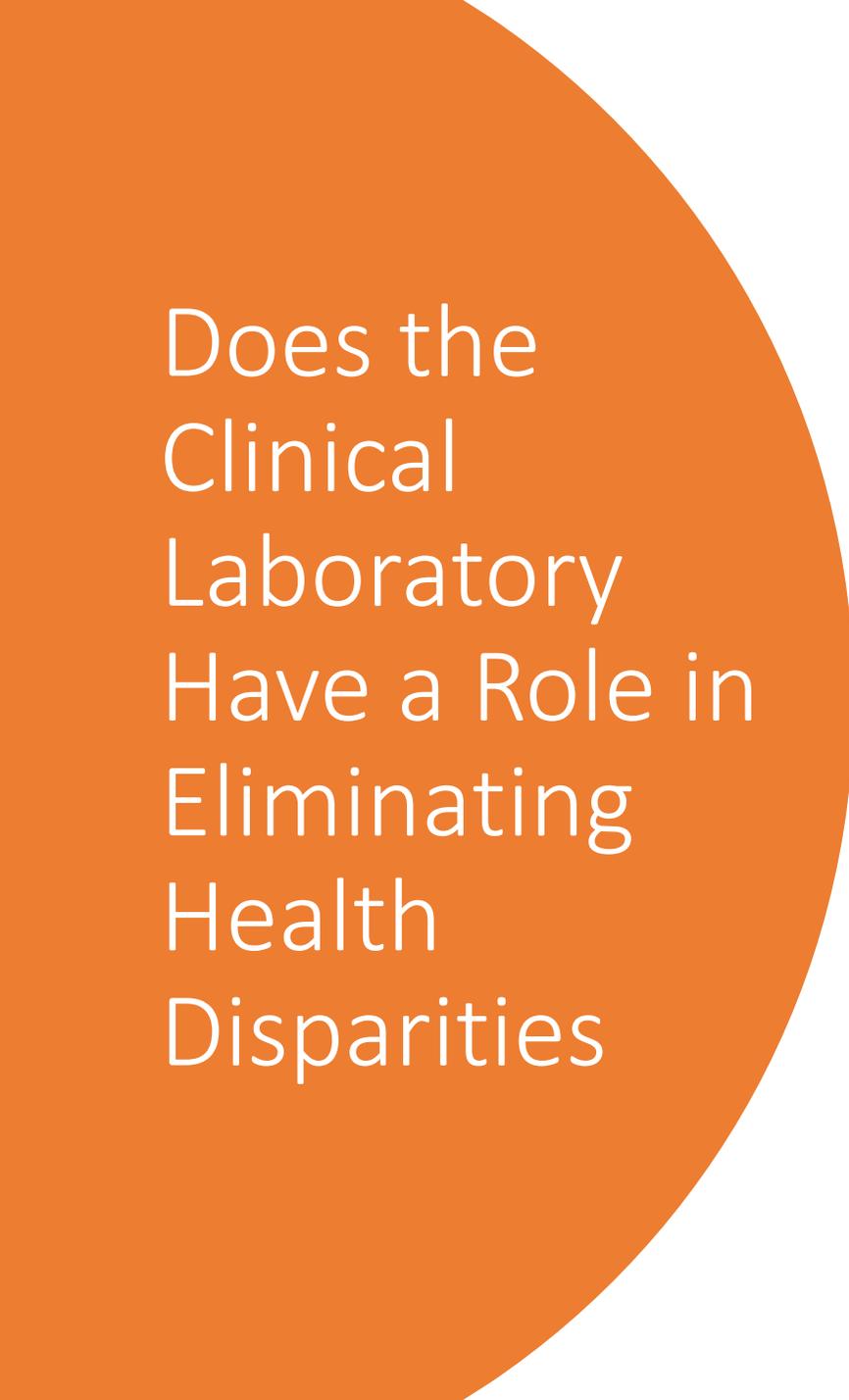
# What Determines Health?



Social Determinants of Health

# Health Equity and Health Justice

- Health Equity: everyone has a fair and just opportunity to be as healthy as possible.
- Health Justice: all persons have the same chance to be free from hazards that jeopardize health, fully participate in society, and access opportunity

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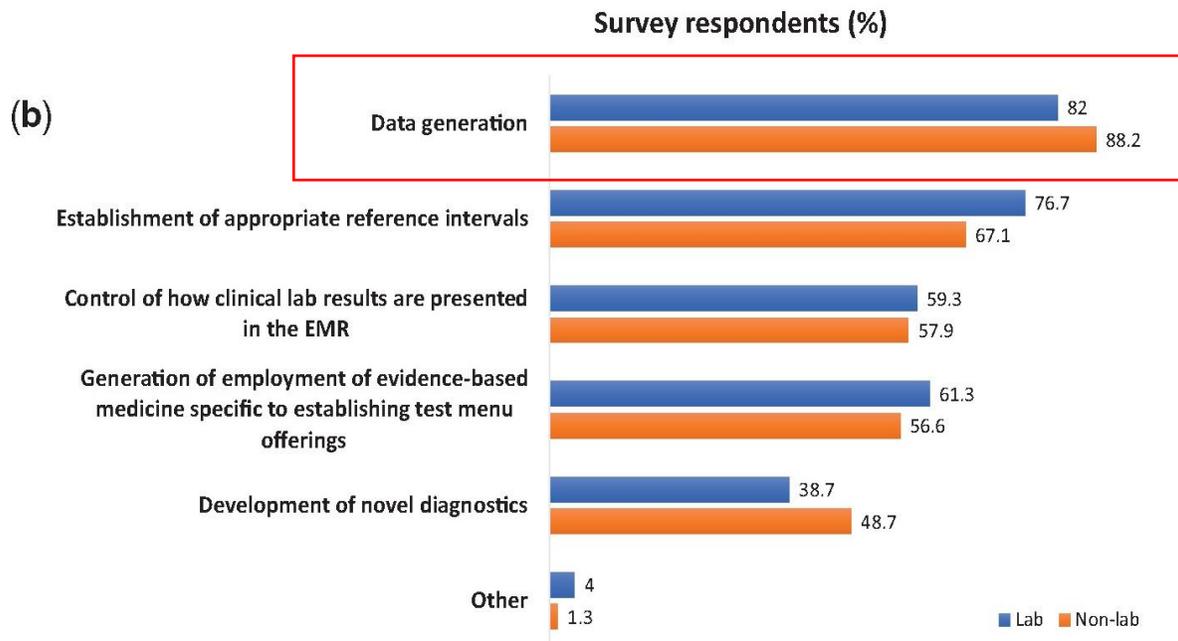
# Does the Clinical Laboratory Have a Role in Eliminating Health Disparities

ACLS 2013 Position Paper: **Clinical laboratory** services are the most cost effective, least invasive source of objective health information in disease prevention and diagnosis, improving patient outcomes, assuring patient safety, and fulfilling essential public health surveillance functions.

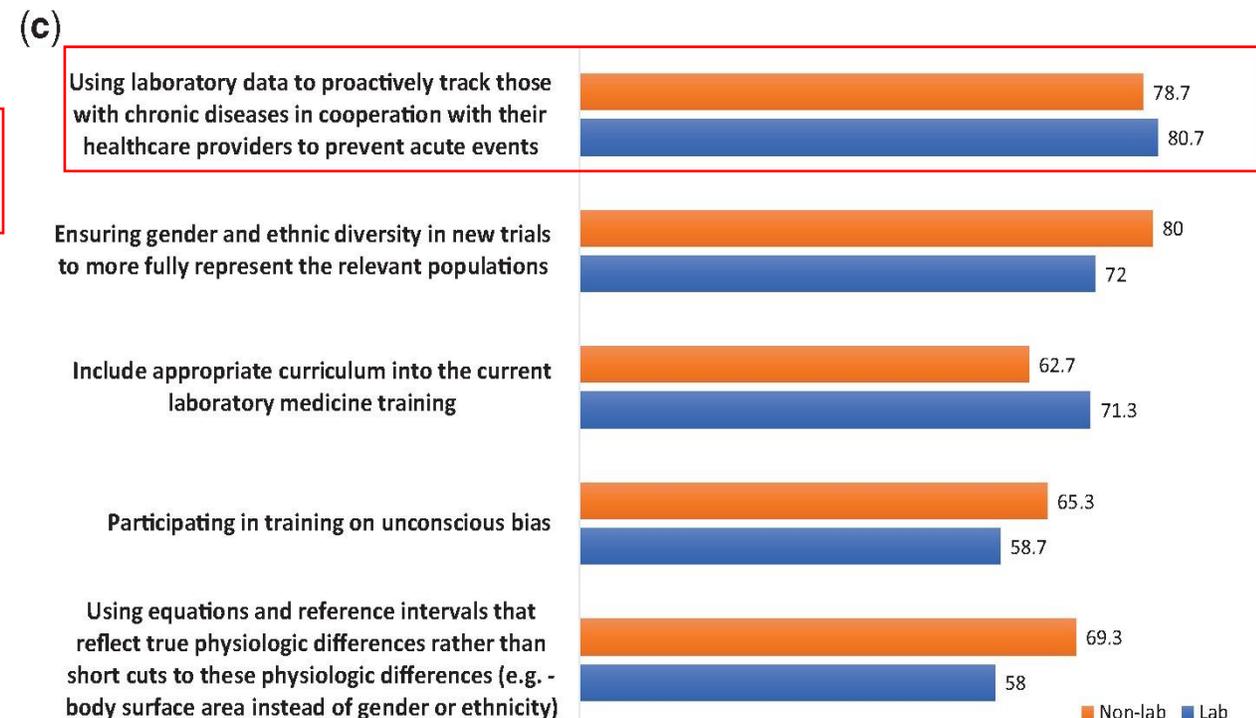
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# Does the Clinical Laboratory Have a Role in Eliminating Health Disparities

What skills and tools do you believe laboratorians have that can be employed to eliminate health disparities in diseases? (Select all that apply)



How do you think laboratorians can best take the first steps to eliminating health disparities? (Select all that apply)



# What Can the Clinical Laboratory Do?

- Diagnosing the disparity: identify health disparities that are amenable to interventions by laboratory medicine;
- Determining the specific variables to target that will have a direct impact on the health disparities;
- Develop a plan to address the specific variables in a standardized and systematic manner, and
- Identify governmental, professional societies, state, local, community-based initiatives, and private entities to partner with for significant impact.

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# The COVID-19 Pandemic as a model

# COVID-19 Hospitalization and Death by Race/Ethnicity

Rate ratios compared to White, Non-Hispanic persons	American Indian or Alaska Native, Non-Hispanic persons	Asian, Non-Hispanic persons	Black or African American, Non-Hispanic persons	Hispanic or Latino persons
Cases <sup>1</sup>	1.6x	0.6x	1.0x	1.6x
Hospitalization <sup>2</sup>	3.3x	0.8x	2.6x	2.5x
Death <sup>3</sup>	2.2x	0.9x	1.9x	2.1x

Race and ethnicity are risk markers for other underlying conditions that affect health, including socioeconomic status, access to health care, and exposure to the virus related to occupation, e.g., frontline, essential, and critical infrastructure workers.

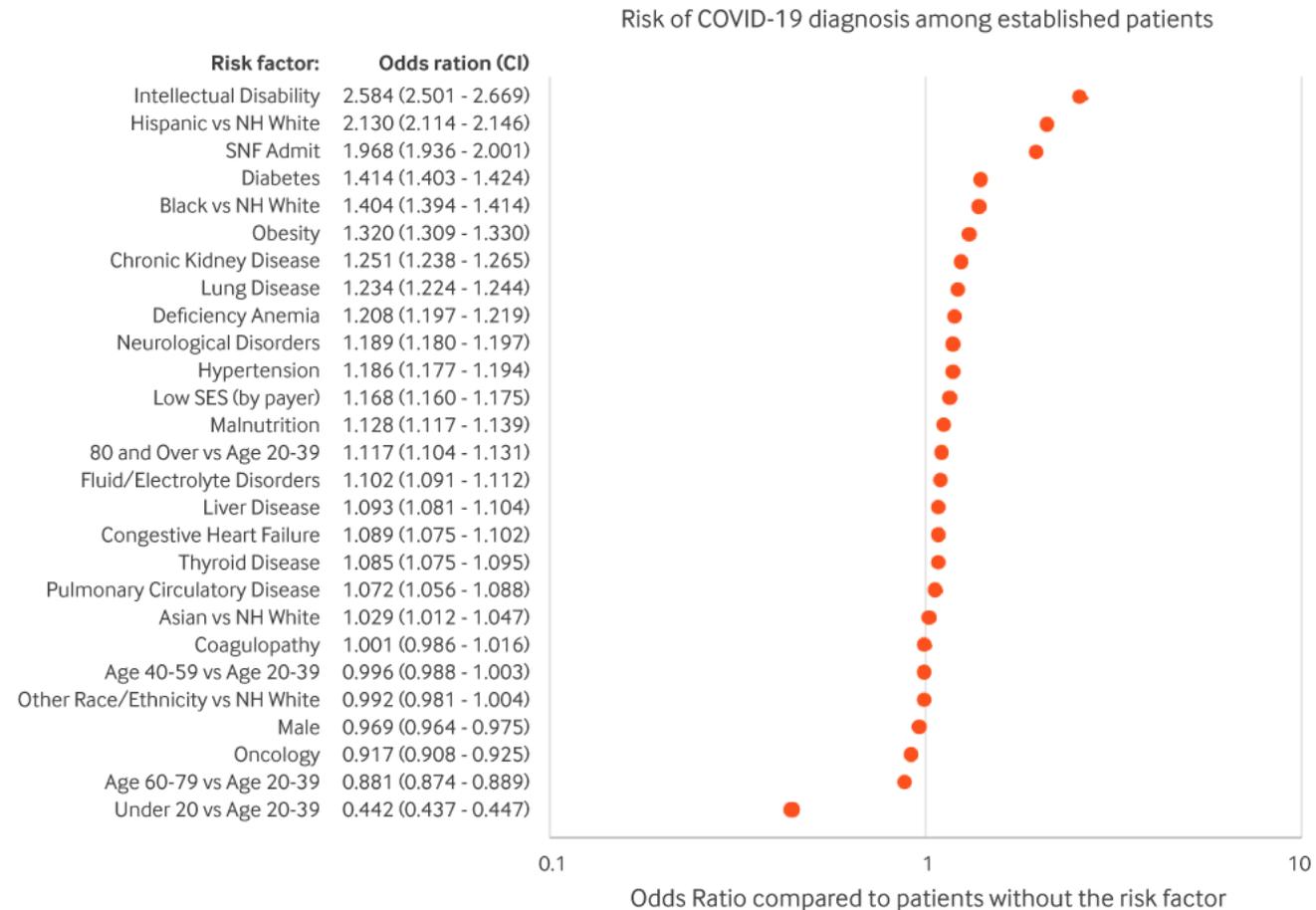
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# Risk Factors for COVID-19 Diagnosis

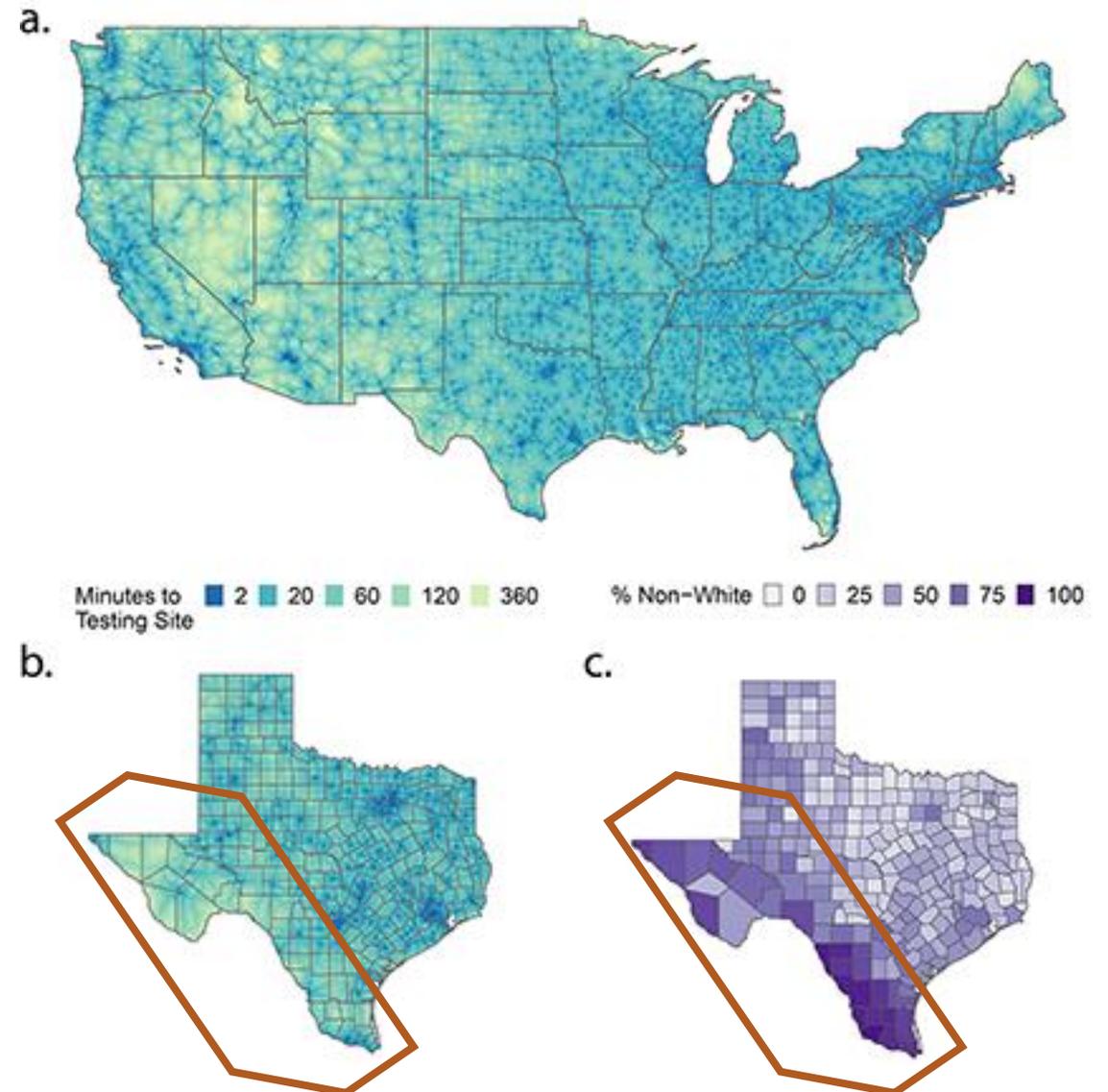
## Risk of Covid-19 Diagnosis Among Established Patients

- Study across 547 U.S. health care organizations (~65 million patients)
- Based on diagnosis code at presentation with COVID-19 at the provider institution

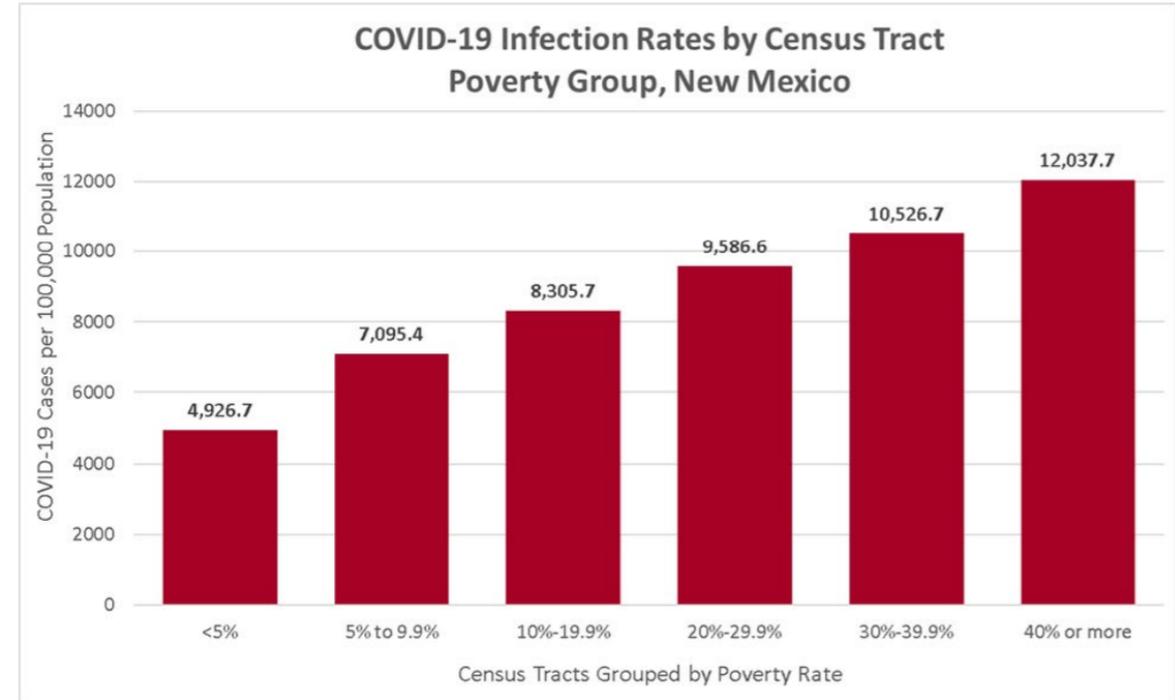
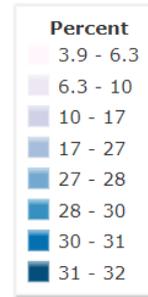
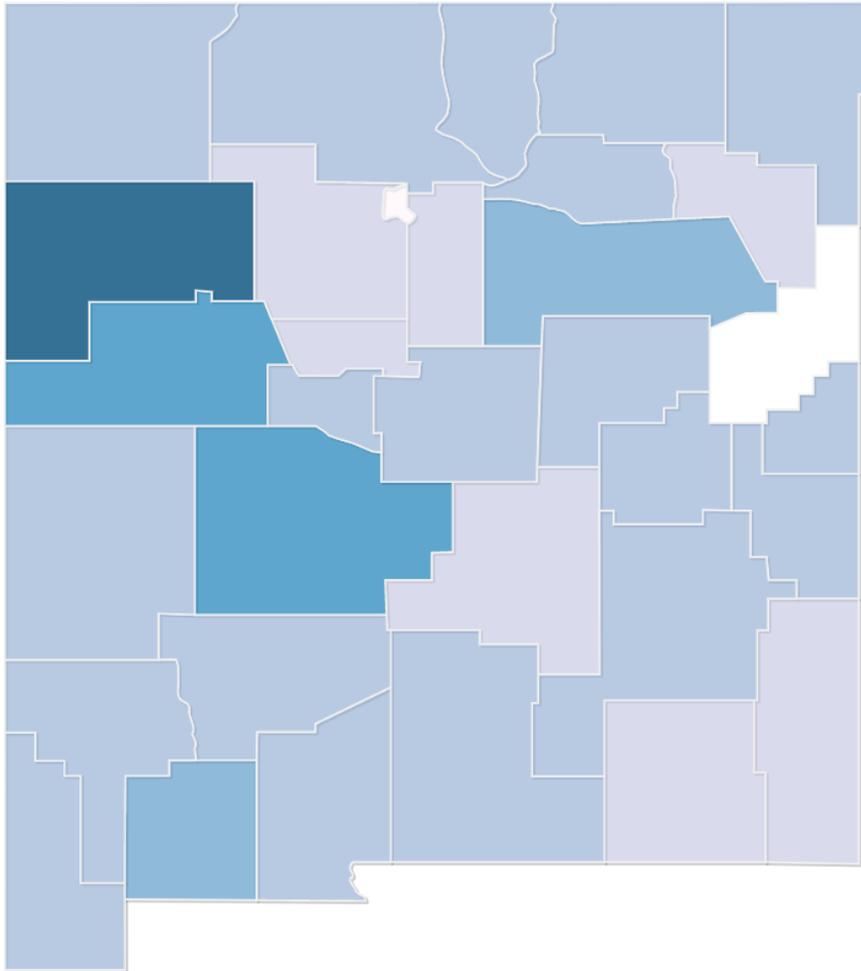


# Intentional Access to Testing: Zip Code

- April 2020 median travel time to a testing site was 20min
  - Percent minority was associated with an increase in travel time to a testing site
  - Percent uninsured associated with an increase in travel time to testing site
- Rural plus uninsured → higher incidence of increased travel time to a testing site
- Decreased access to testing sites, increased demand for testing in communities of color

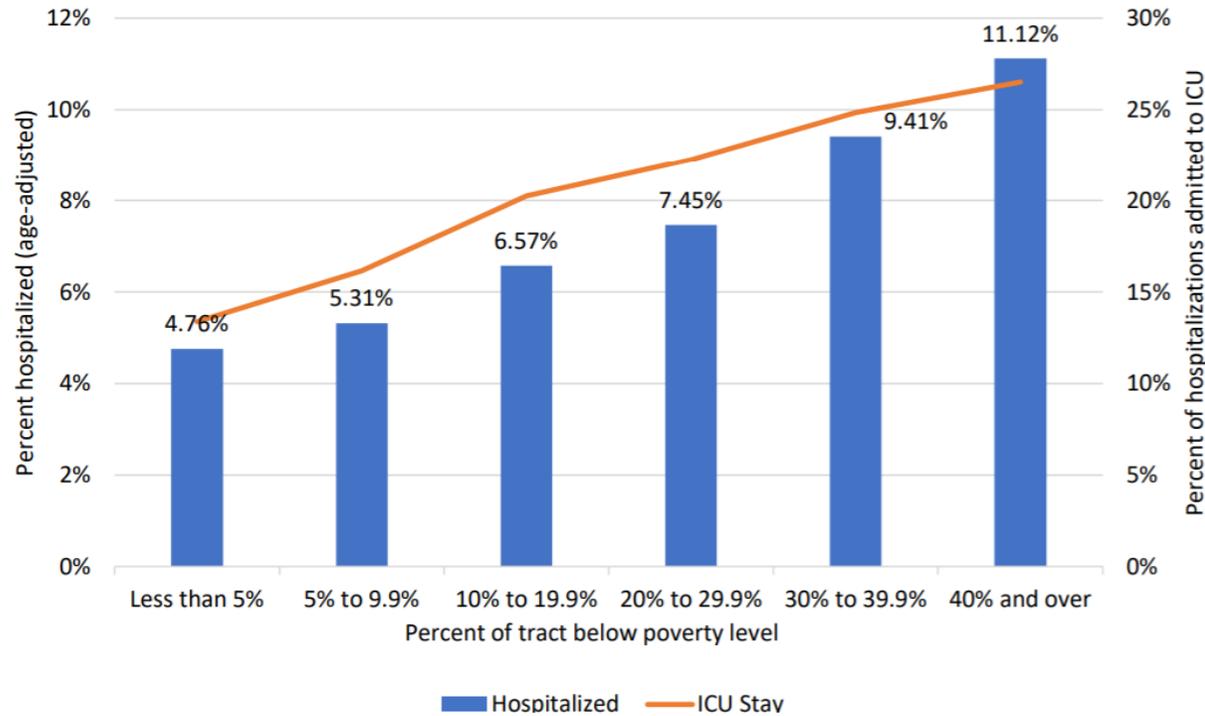


# COVID-19 and Poverty

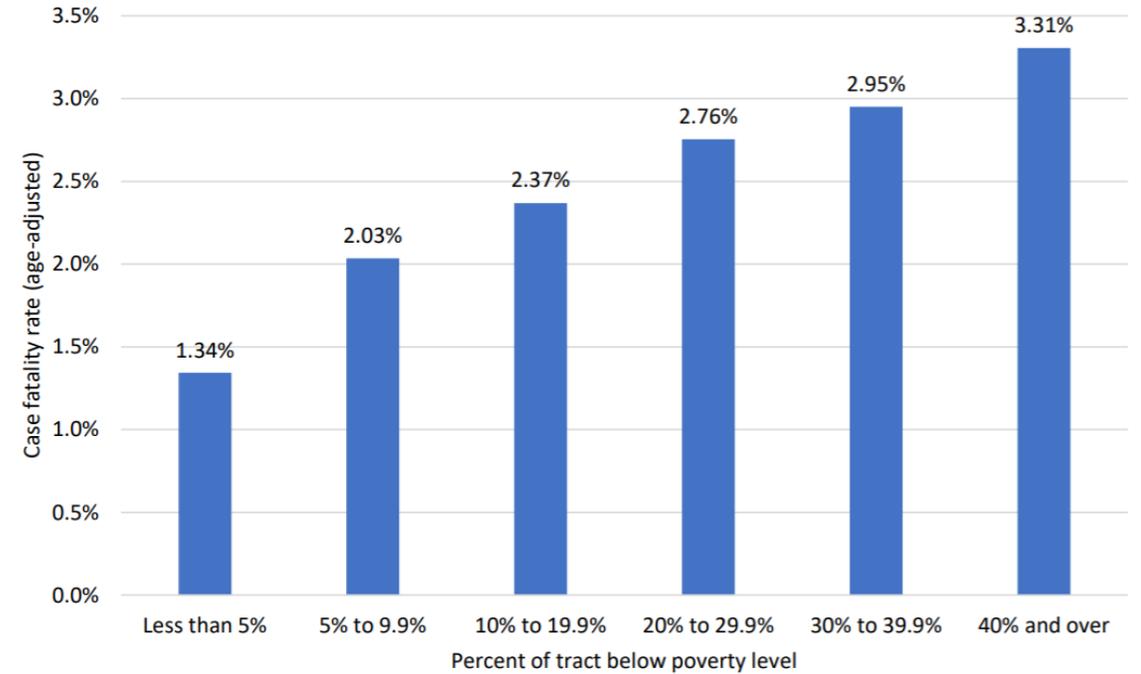


# COVID-19 and Poverty

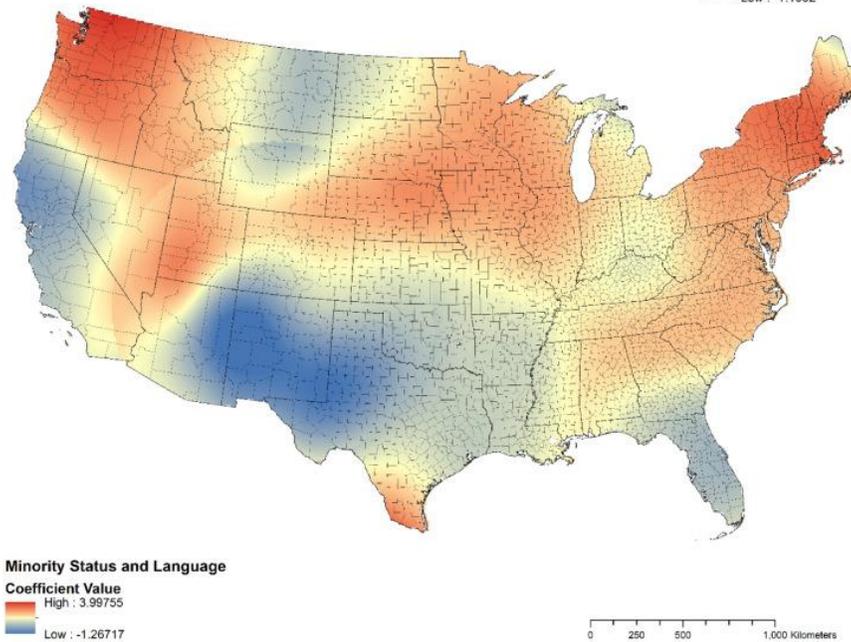
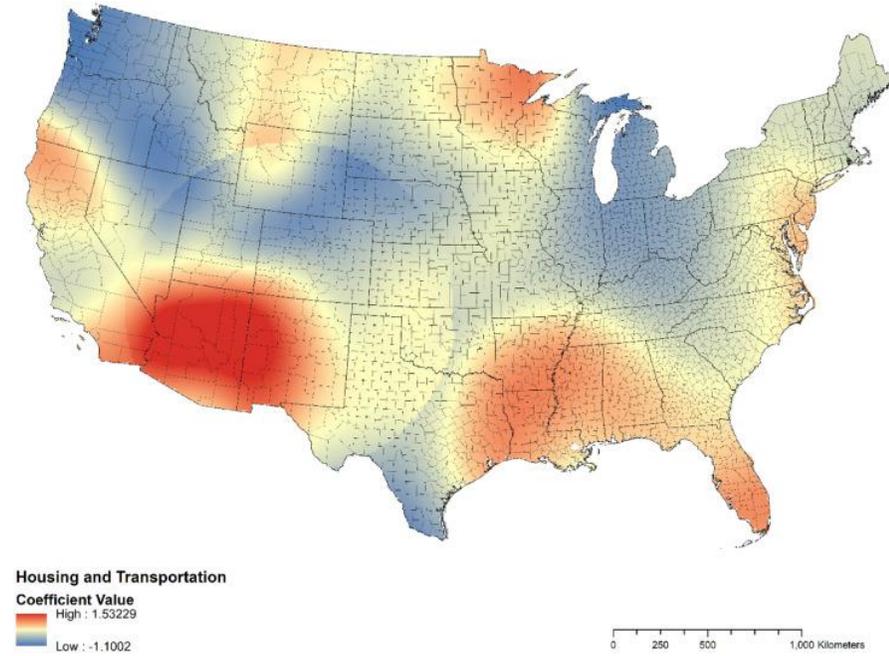
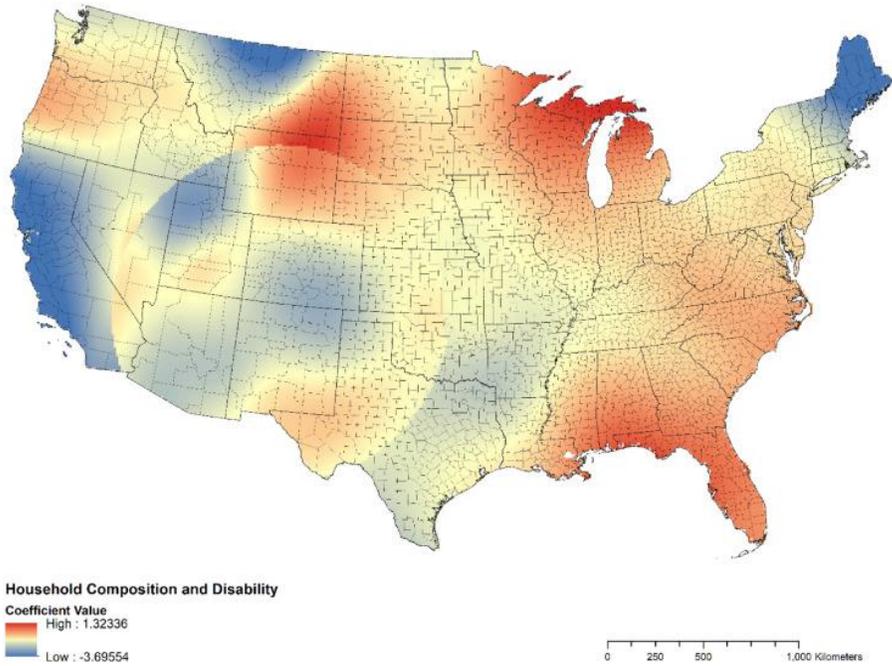
Hospitalizations and ICU stay by poverty level



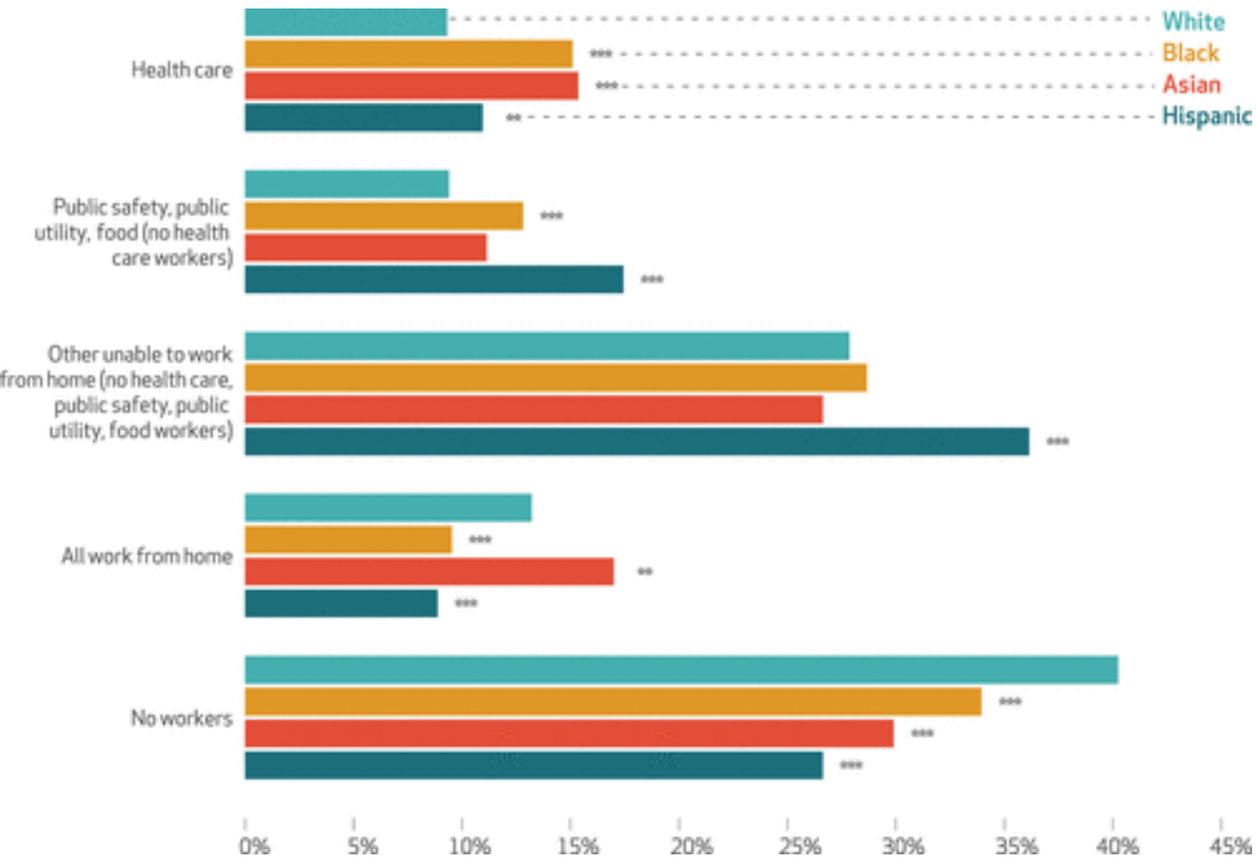
Case fatality rate by poverty level



# Regional Social Vulnerability for COVID-19 Risk



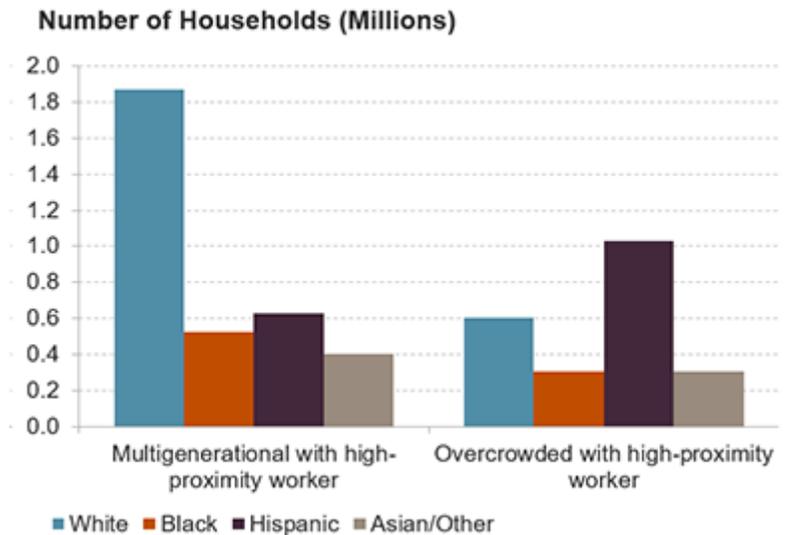
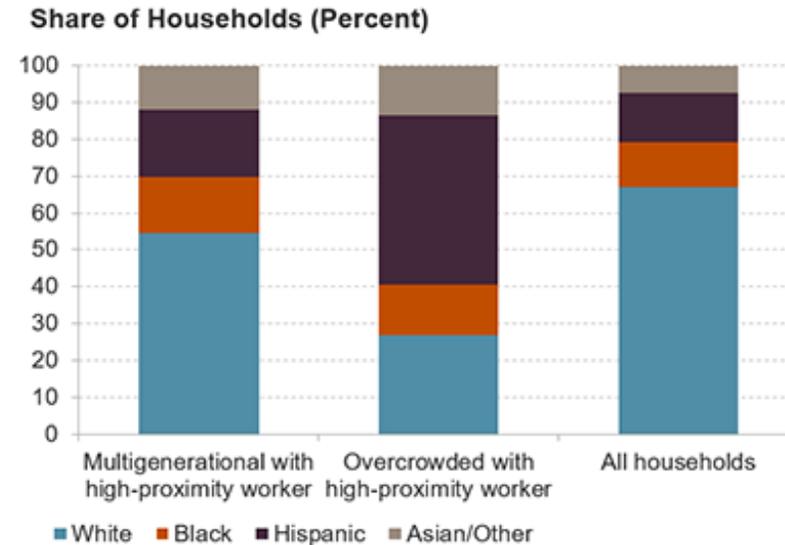
# Occupational Risk for COVID-19



Variable	White (%)	Black or African American (%)	Asian (%)	Hispanic (%)
Likely employed in essential industry	26.89	37.75	26.16	27.20
Healthcare and social assistance	12.76	19.82	14.62	11.11
Hospital	4.36	6.13	6.45	2.89
Animal slaughtering and processing	0.32	0.66	0.32	0.75
Likely and possibly employed in essential industry	35.41	44.64	35.16	33.00
Employed in occupations with frequent exposure to infections	11.28	14.73	13.02	11.37
Respiratory therapist	0.08	0.17	0.13	0.04
Registered nurse	2.60	2.60	3.98	1.06
Licensed practical and vocational nurse	0.49	1.20	0.30	0.43
Employed in occupations with frequent close proximity to others	25.10	29.03	24.26	25.81
Physical therapists	0.25	0.12	0.57	0.06
Personal care aids	0.93	2.37	1.63	1.44
Medical assistants	0.47	0.59	0.38	0.79
Employed in occupations with frequent exposure to infections and close proximity to others	8.12	10.75	9.95	6.23
Bus drivers	0.39	0.96	0.23	0.37
Flight attendants	0.09	0.12	0.08	0.08

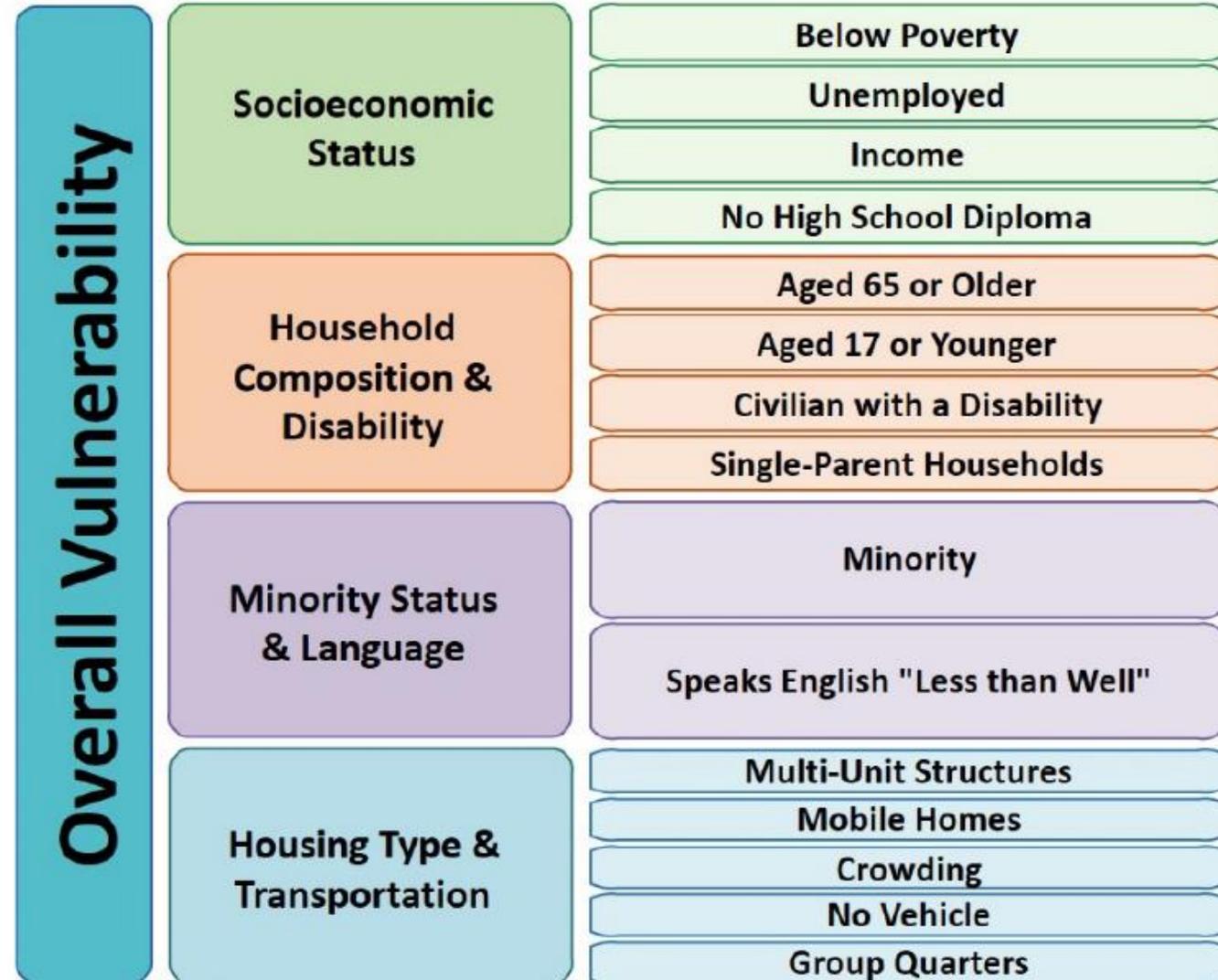
# Housing

- CDC Study: 67% infected household members reported symptoms with 7 days of index case
- Infection from household contact
  - 3x higher than for “close contact”
- Individuals >60 years old most susceptible to household infection
- Secondary infections are more likely in exposure to symptomatic individuals



# Social Vulnerability Index

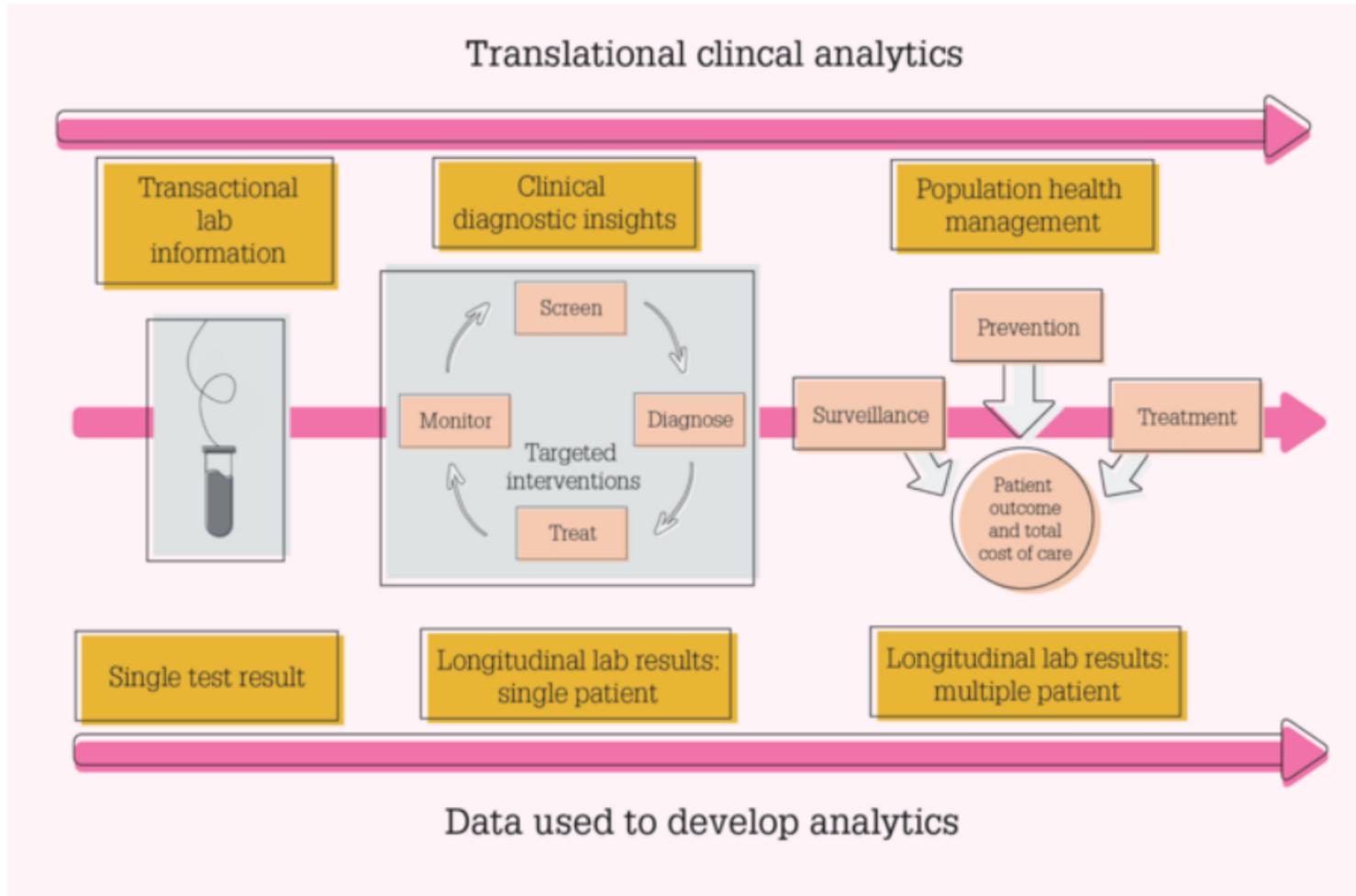
- A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.
- The four summary theme ranking variables, detailed in the Data Dictionary are:
  - Socioeconomic
  - Household Composition & Disability
  - Minority Status & Language
  - Housing Type & Transportation
- Overall tract rankings: summed the sums for each theme, ordered the tracts, and then calculated overall percentile rankings.



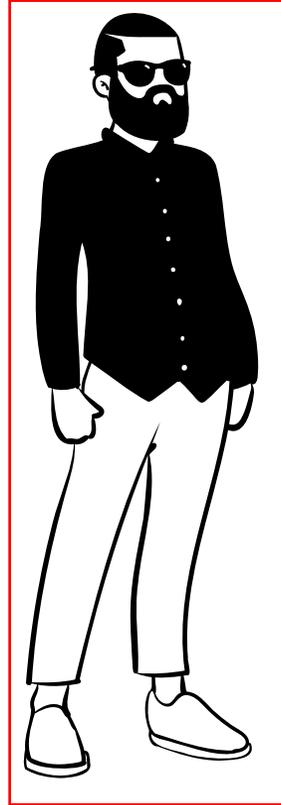
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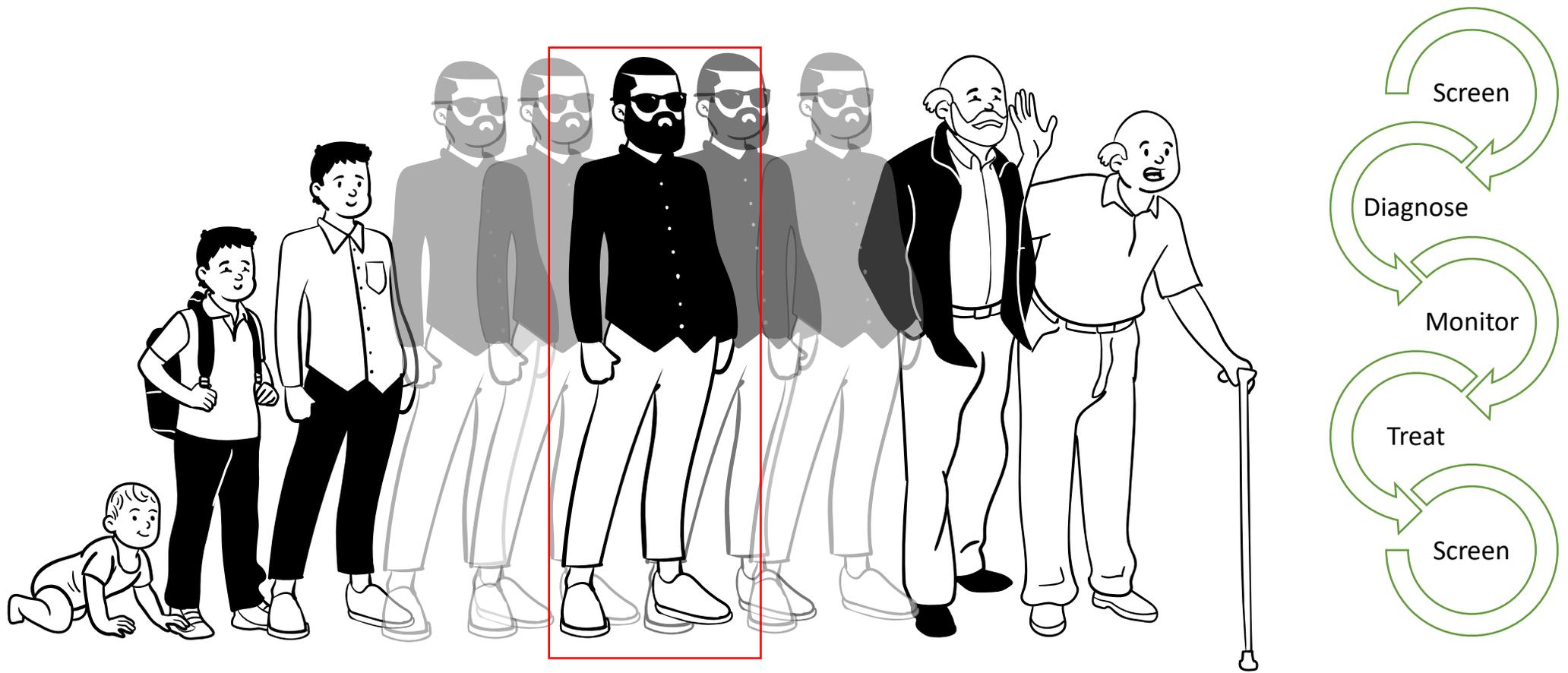
# The Role of the Clinical Laboratory in Population Health



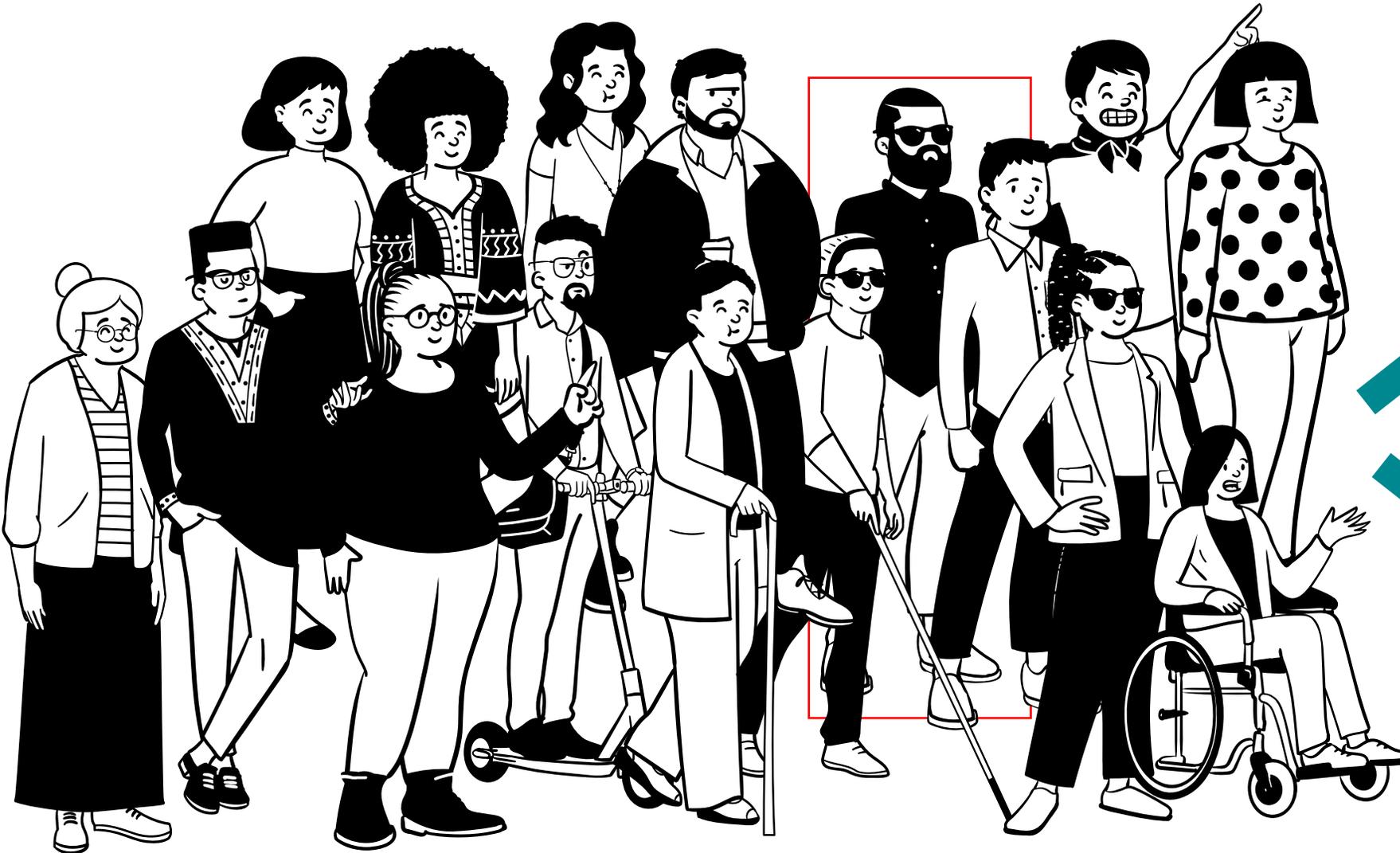
Remodeling of laboratory information to provide clinical diagnostic insights using longitudinal data (3).



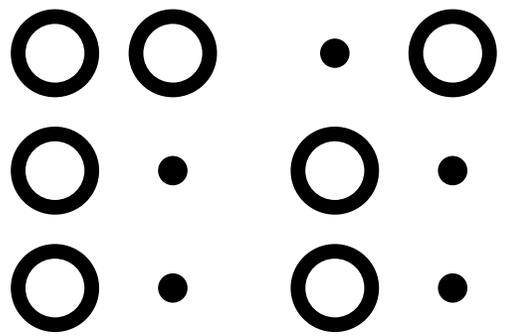
Single laboratory result



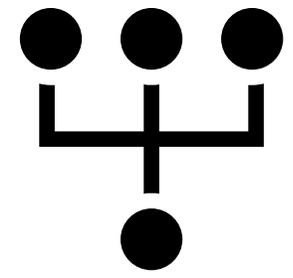
Longitudinal laboratory results



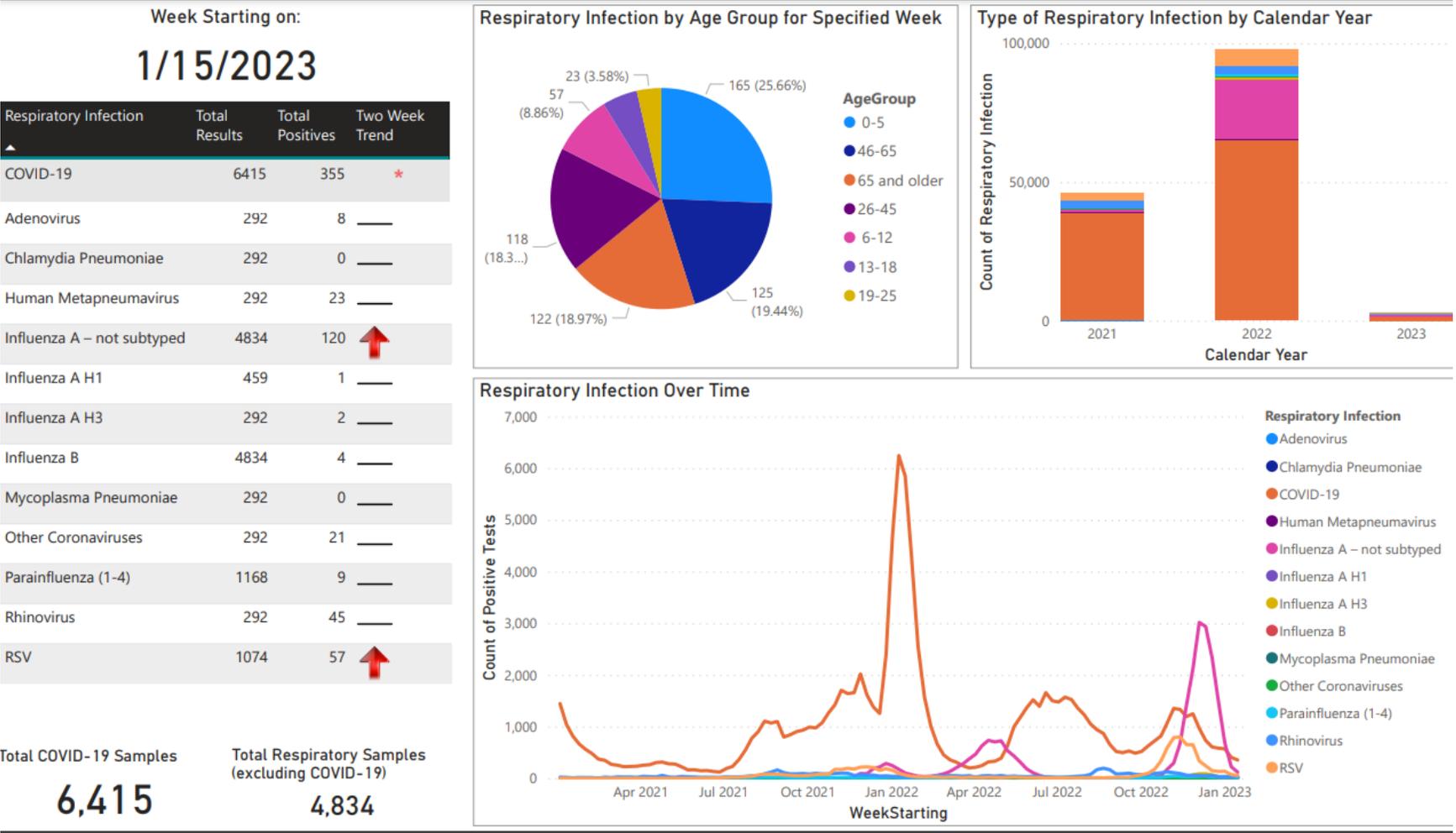
Surveillance



Prevention



# Population-Based Surveillance



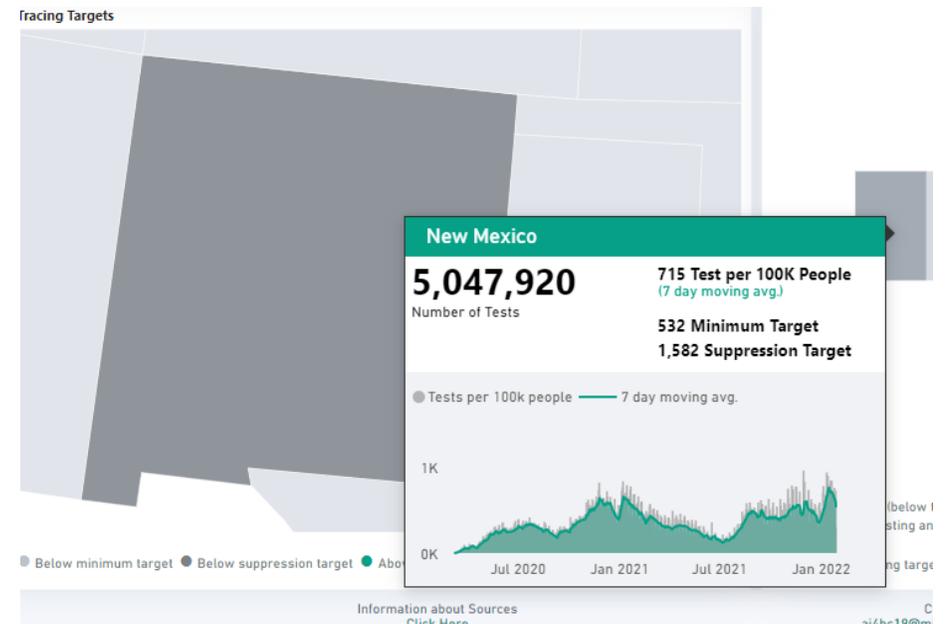


# Laboratory Analytics-Driven Population Health

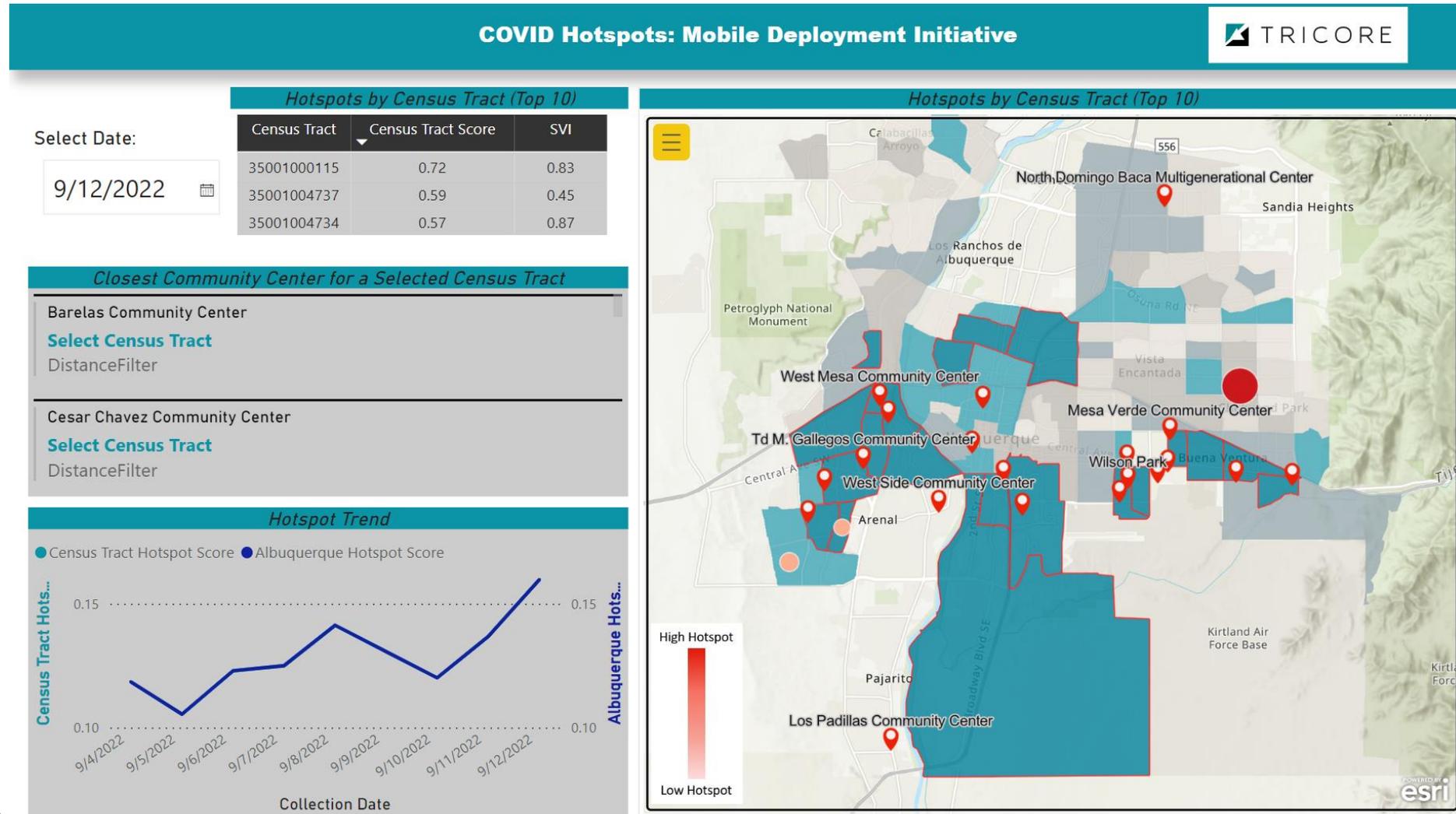
- CDC County Hot Spot Definition
  - 1) >100 new COVID-19 cases in the most recent 7 days,
  - 2) an increase in the most recent 7-day COVID-19 incidence over the preceding 7-day incidence,
  - 3) a decrease of <60% or an increase in the most recent 3-day COVID-19 incidence over the preceding 3-day incidence, and
  - 4) the ratio of 7-day incidence/30-day incidence exceeds 0.31. In addition, hotspots must have met at least one of the following criteria: 1) >60% change in the most recent 3-day COVID-19 incidence, or 2) >60% change in the most recent 7-day incidence

- Necessary Testing Levels

- Locations with insufficient testing to contain the pandemic
- Minimum Target: 532 tests/100K
- Suppression Target: 1,582 tests/100K



# Community-Based Insights



- Hot Spots
- Locations with or at risk of active and on-going COVID spread
- Modified from CDC Hot Spot definitions

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# Community-Based Insights



## COVID Testing Deserts: Mobile Deployment Initiative

### Testing Deserts by Census Tract (Top 10)

Census Tract	Testing Desert Score	SVI
35001004300	1.97	0.97
35001003733	1.95	0.95
35001000904	1.93	0.93

Select Date:

9/12/2022

### Closest Community Center for a Selected Census Tract

Barelas Community Center

Select Census Tract

DistanceFilter

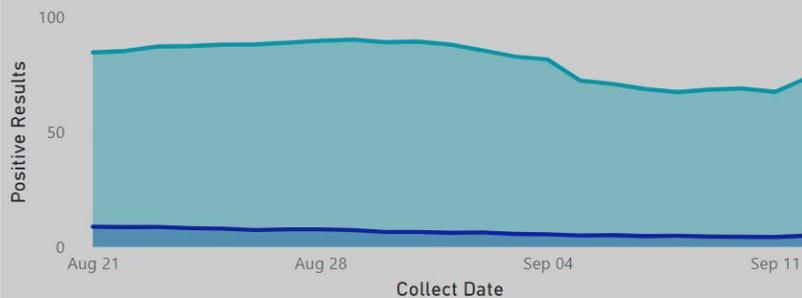
Cesar Chavez Community Center

Select Census Tract

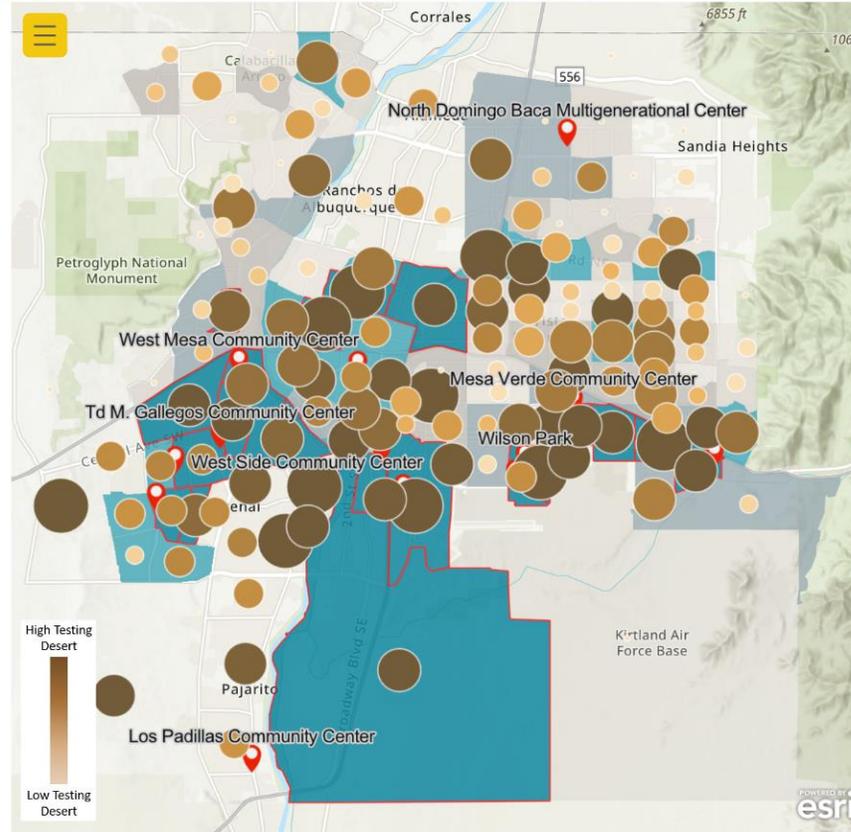
DistanceFilter

### COVID-19 Testing (Rolling 7-day Average)

Positive Results Samples Tested



### Testing Deserts by Census Tract



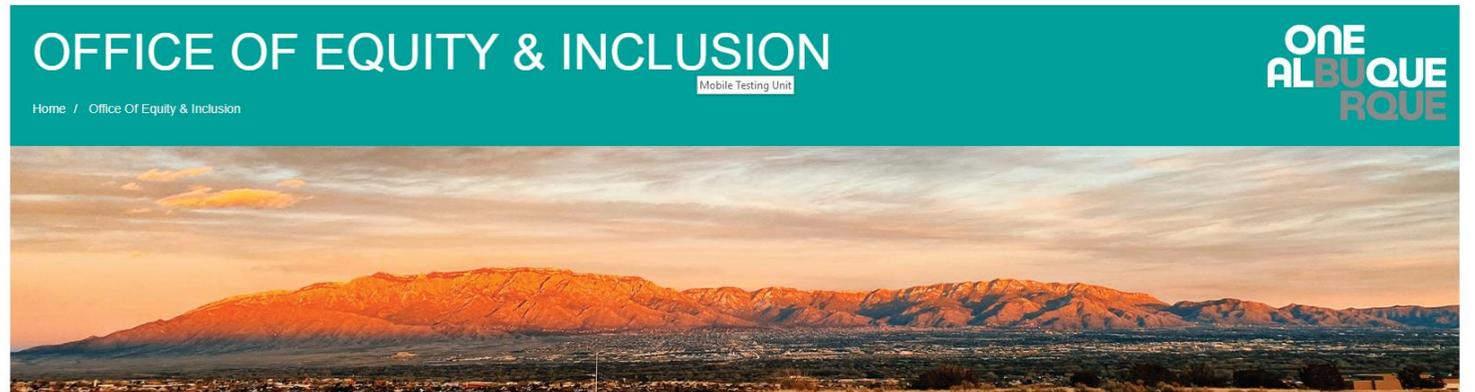
## Deserts

- Locations with insufficient testing to contain the pandemic

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- Diagnosing the disparity: identify health disparities that are amenable to interventions by laboratory medicine;
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# Mobile Testing Unit



TRICORE

# TriCore Mobile Testing Unit

- COVID-19 Dashboards are reviewed weekly and used to determine a regional hotspot and nearest community center to conduct testing
- Mobile Testing Unit deploys for 2-4 hours for up to 3 days to provide free, rapid, PCR-based testing with results on site or emailed to patients
  - Testing is for SARS-CoV-2 or SARS-CoV-2/Influenza A/B depending on regional prevalence
- Patients complete a survey based on their prior testing experience and experience with the mobile unit

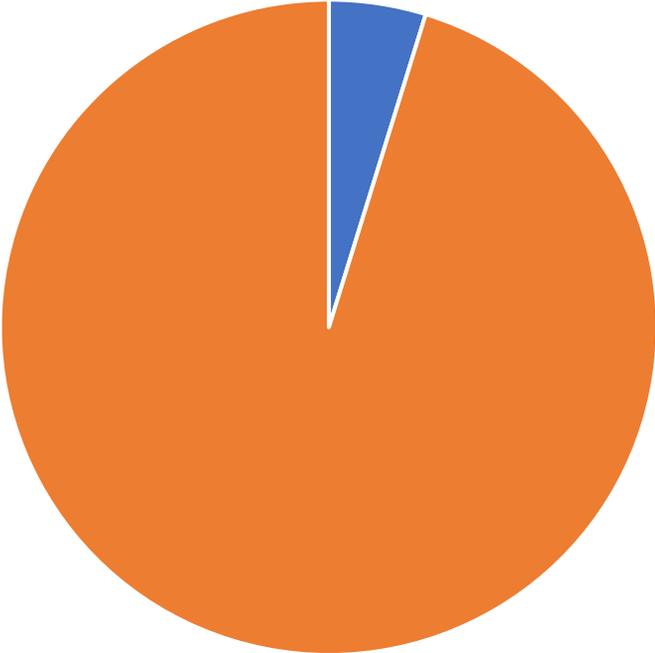
# TriCore Mobile Unit

- Staffed by existing employees
- Deploys weekly based on identification of a hot spot or testing desert
- Scheduled deployments to communities of need
- Provides on site testing and results



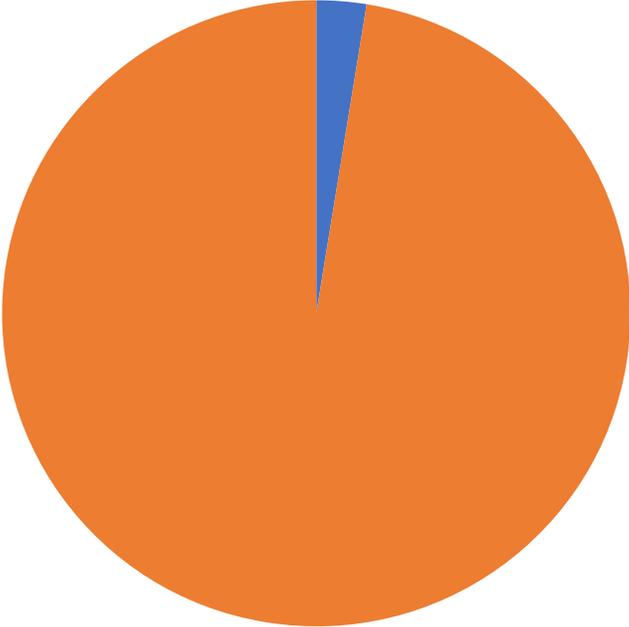
# Test Results

Influenza A



■ Detected ■ Not detected

SARS-CoV-2

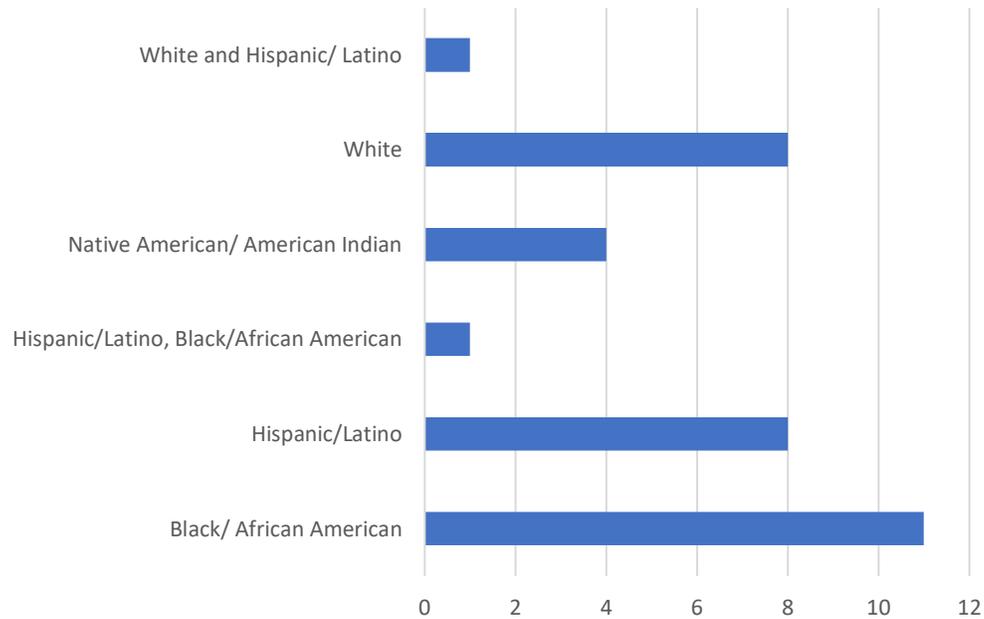


■ Detected ■ Not detected

\*No Influenza B has been detected throughout the study

# Population Demographics

Count of Race/Ethnicity

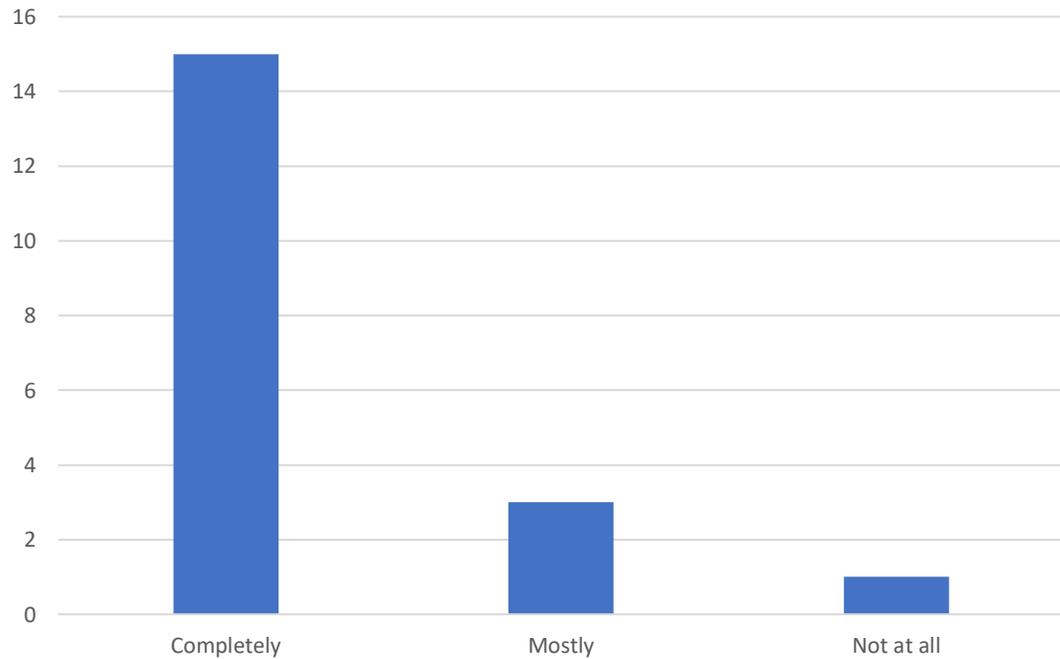


Count of What best describes your housing situation?

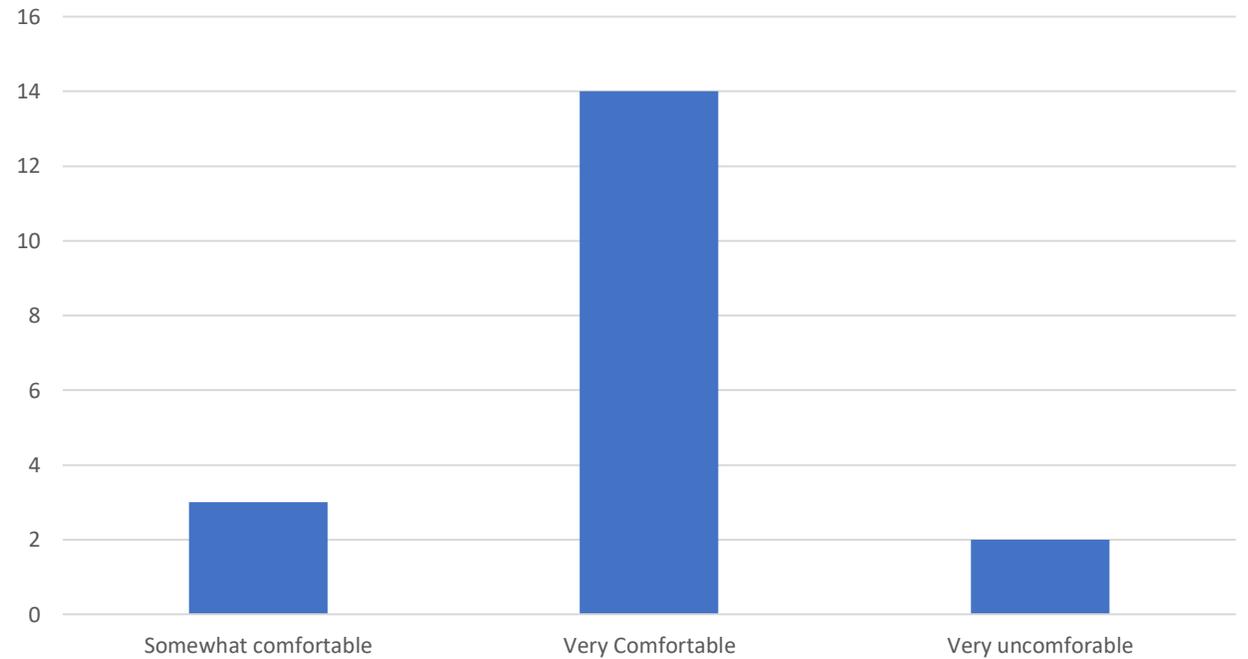


# Patient Experience

Level of Trust in the Results



Indicate how comfortable you were with participating today



What's Next?

# TriCore Mobile Unit

- Currently expanded the algorithm to include Influenza hot spot monitoring
- Evaluating opportunities to engage other community stakeholders to support vaccination and treatment
- Evaluating algorithms for other infectious and non-infectious health disparities with clear opportunity for laboratory intervention
  - STI
  - Hepatitis C
  - Diabetes

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