



COVID-19 AND MINORITY HEALTH ACCESS

ILLUSTRATING SYMPTOMATIC CASES FROM
REPORTED MINORITY COMMUNITIES AND
HEALTHCARE GAPS DUE TO COVID-19.

MARCH 2020 | INFECTIOUS DISEASE INSIGHTS



FROM THE CEO'S DESK

As the emerging novel coronavirus (COVID-19) infectious pathogen rapidly spreads globally and in the United States of America (USA), healthcare institutions and affiliated industry infrastructure have been challenged to respond and serve a growing number of patients in need of testing and treatment.

With the number of patients growing exponentially over time, COVID-19 continues to have far-reaching negative impacts on both public health and the economy.

Despite this, there has been lack of data transparency pertaining to underrepresented minorities and vulnerable populations who may be disproportionately affected by both the the illness as well as the economic fall-out. This report was created to explore the first steps in creating equitable access to testing, treatment, and the race for development of a vaccine.

***"We only have one mission:
Patient Innovation First.
Always"***



It is with the momentum of Rubix LS that we continue development efforts toward scientific advances that will directly drive improvement for minority health and access to effective therapies that are so critically needed.

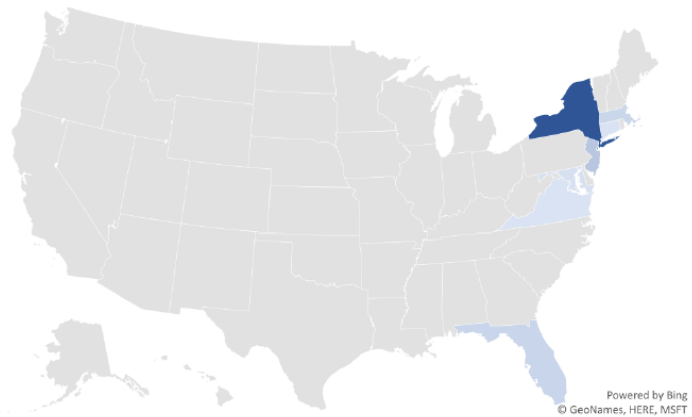
REGINALD SWIFT

Founder & CEO

BACKGROUND & METHODS

Health authorities in the United States are quickly responding to an outbreak of the novel coronavirus that was initially detected in China and subsequently detected internationally, including the United States. With this emerging threat, the outbreak now known as COVID-19 continues to stress the healthcare industry as well as patients that report symptoms. It also potentially exposes weakness in the United States' healthcare system—all patients may not gain quick or equitable access to care.

As the number of infected patients increases drastically, patient identification and access to testing options is paramount. Unfair rationing within distinct neighborhoods may be directly relevant to patient access to professional care during this time. With the current numbers greater than 370,000 (100,000 at time of data capture -03/20/20) confirmed cases in the US, COVID-19 has become the fastest-growing pandemic within the country since the Spanish Influenza of 1918.



Rubix LS has leveraged intelligent data networks that drives StarSense[®] as well as incorporating its own data machination from pulling data on Rubix's own system.

With the cooperation of 103 groups of healthcare institutions— Rubix LS has deployed a basic algorithmic log application in which patients have consented for in the following states:

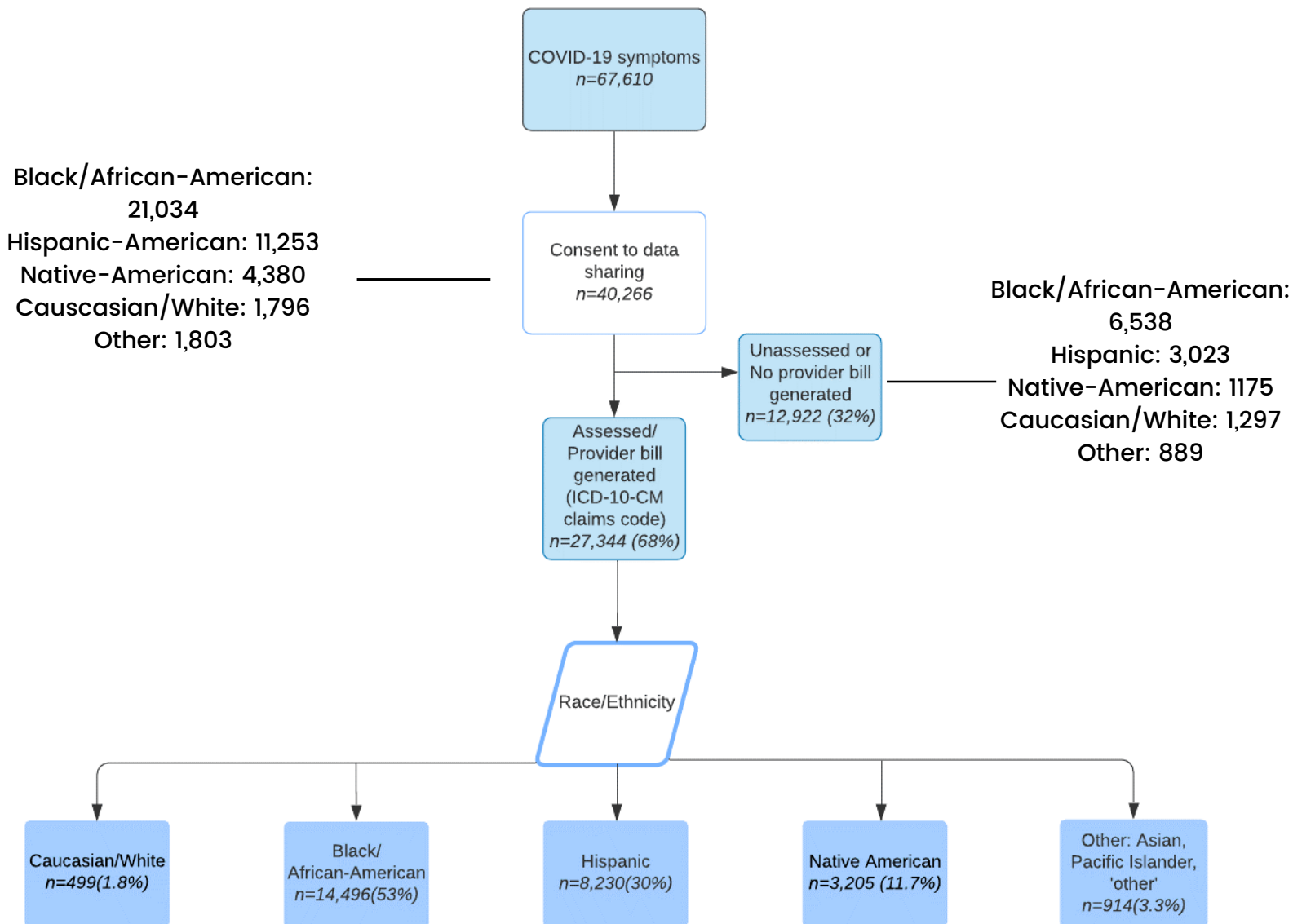
1. Massachusetts
2. Connecticut
3. New York
4. New Jersey
5. Maryland
6. Virginia
7. Florida

Underrepresented groups, as defined in this data characterization, involves the following groups:

- Black/African Americans
- Native Americans
- Hispanic Americans
- Other (Asian, Pacific Islander, patients that classify as 'other')

The scope of this data insight is to highlight patients that were flagged to have confirmatory testing done while capturing the billing of patients by providers. This data set does not capture whether patients were confirmed to have COVID-19.

We designed a 41 day data collection sprint (February 9, 2020- March 20, 2020) which included the aforementioned seven states. We started with a sample of 67,610 patients who screened positive for one or more symptoms related to COVID-19. Encountering, engaging, and recruiting minority communities for data aggregation took an episodic approach through "boots-on-the-ground", education and advocacy efforts. Patient consent was obtained for data collection, including symptom and location tracking. Patients who did not undergo a billable encounter (or received an assessment but no provider billing claim was submitted) were classified as "unassessed". If the patient had a billable encounter with a healthcare provider, we paired Rubix LS StarSense® data with corresponding hospital validated ICD-10-CM codes. Cases that generated a billable provider encounter were further characterized by race and ethnicity. Non-response bias may have contributed to low response rate amongst self-reported "White or Caucasian" patients.



DATA

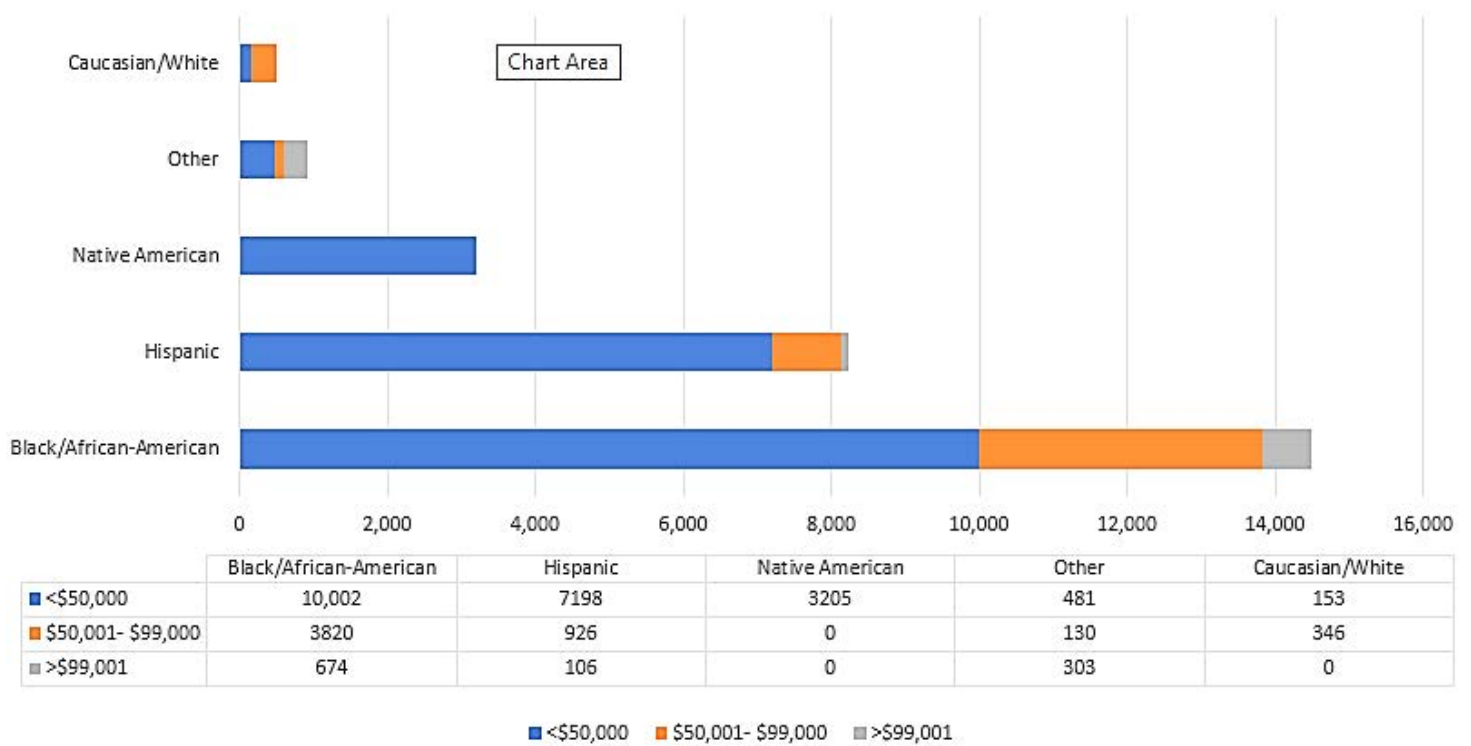
We were able to match 27,344 symptomatic patients with their final diagnosis using billing (claims) codes. Variation in final diagnosis is noted below. Individual testing, treatment and mortality data were not readily available for this cohort at the time of the report.

ICD-10-CM Codes	Percentage Response (%)	Expanded
B34.2	9.6	Coronavirus infection, unspecified
B97.21	0.8	SARS-associated coronavirus as the cause of diseases classified elsewhere
B97.29	0.3	Other coronavirus as the cause of diseases classified elsewhere
J12.89	3.2	Other viral pneumonia
J20.9	0.9	Acute bronchitis, unspecified
J22	2.2	Unspecified acute lower respiratory infection
J40	1.6	Bronchitis (non-acute or chronic)
J80	4.3	Acute respiratory distress syndrome
J98.8	0.6	Other specified respiratory disorder
J98.9	0.6	Respiratory disorder, unspecified
R05	22.1	Cough
R06.02	16.8	Shortness of Breath
R50.9	0.9	Fever unspecified
U07.1	6.1	COVID-19
Z03.818	28.7	Observation for suspected exposure to other biological agents ruled out
Z20.828	1.3	Confirmed exposure of viral communicable diseases

DATA

We estimated income of our cohort using intelligent data based on patient’s reported zip code, Rubix LS’s StarSense® track-in-motion, and neighborhood housing values.

Race/Ethnicity by Estimated Household Income



P-value: 0.0488

INSIGHT

Launched as a pilot project, the data aggregated herein is to provide a catalytic opportunity for comprehensive and automated national data collection. This will provide clarity on the state of health care access and how health providers, sponsors, industry and federal agencies define specificity to create data driven solutions for health equity.

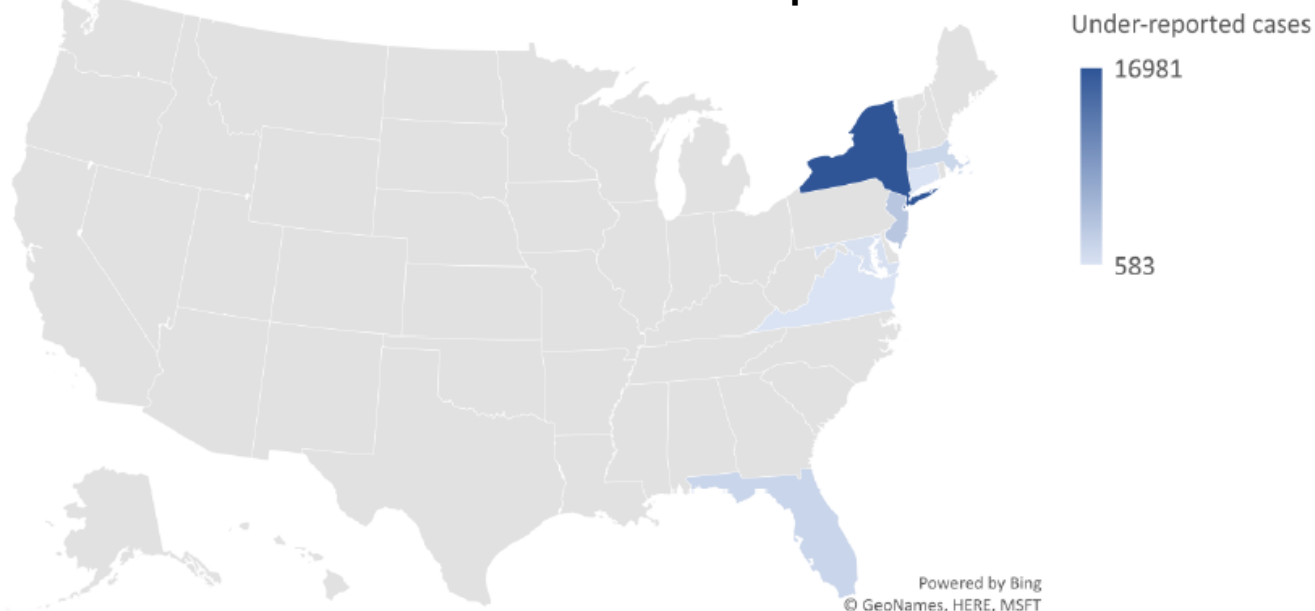
Our data of over 27,000 patients illustrates that African-Americans and Hispanics with an estimated household income of under \$50,000 per year may be at higher risk for COVID-19 or related symptoms. If COVID-19 disproportionately affects underrepresented minorities, particularly those with lower socioeconomic status, this could potentially contribute to increased COVID-19 transmission and economic damage in already vulnerable communities. Further research needs to be done in this area.

Historically, both healthcare provider bias and structural inequities have amplified health disparities in minority communities. The need for vigilant policy and practices targeted toward already vulnerable groups is paramount. As healthcare systems become more strained and public anxiety rises, a coordinated network of industry, academia, federal agencies, and non-profits need to drive collaboration to expeditiously address potential health inequities during the COVID-19 crisis.

Additionally, Rubix LS has taken initial steps to design data collection programs targeting potential discrepancies of what local, state, and national organizations may be reporting versus data that has the potential to be comprehensive and more accurately reported through an interconnected platform of sensors, applications, and algorithms in which raw data is supplied daily. We looked at publicly available data for confirmed COVID-19 cases during the same time period as our data sprint (February 9, 2020 through March 20, 2020).

Despite the small number of total hospital groups (103) in our pilot study, the trajectory projected will track along some of the national and global data models that are predicted. This can be attributed to a number of possible factors including but not limited to testing availability, subjectivity of testing criteria, inequities in testing and treatment, and variability in presentation of COVID-19 symptoms. Currently, there is limited information available regarding COVID-19 symptom tracking using local and state information. Using an automated network of data tracking may more accurately account for the both tested and untested cases of COVID-19 both in the USA and globally.

COVID-19 7-state Underreported Cases



State	Publicly Reported Cases*	Rubix LS StarSense® COVID-19 symptom tracker
Virginia	391	6,572
Maryland	423	5,714
Connecticut	875	3,212
Massachusetts	1,838	2,755
Florida	1,977	4,083
New Jersey	4,402	7,193
New York	33,037	38,081
Total	42,943	67,610

Data as of 03/20/2020