THE COVID-19 COMMUNITY VULNERABILITY INDEX

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Science Responds Meeting
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Strained Resources

Home / Finance

Cities face massive budget shortfalls due to COVID-19

21st April 2020 Jonathan Andrews

Top Stories

States Projecting Big Budget Cuts Due To COVID-19

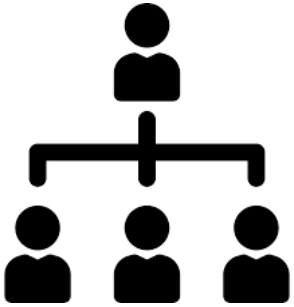
editor@aashto.org May 1, 2020 0 COMMENTS

- Cities with populations of 50,000-500,000, 98% expect a budget shortfall

Faster Decisions

A need for **quicker**, more **informed** decisions about resource distribution

Policy Makers



Non-Profit Organizations

Healthcare administrators

BUT

- COVID impact info not easily accessible/understandable
- Current community needs assessment tools not prepared for COVID
- Many teams lack in-house data expertise

A Unique Solution

A centralized dashboard capturing metrics to determine a community's vulnerability to COVID-19 at the county level

Interactive map

Vulnerability index

Predictive models

Severe COVID Complication Score

Food Access

Risk of Economic Harm

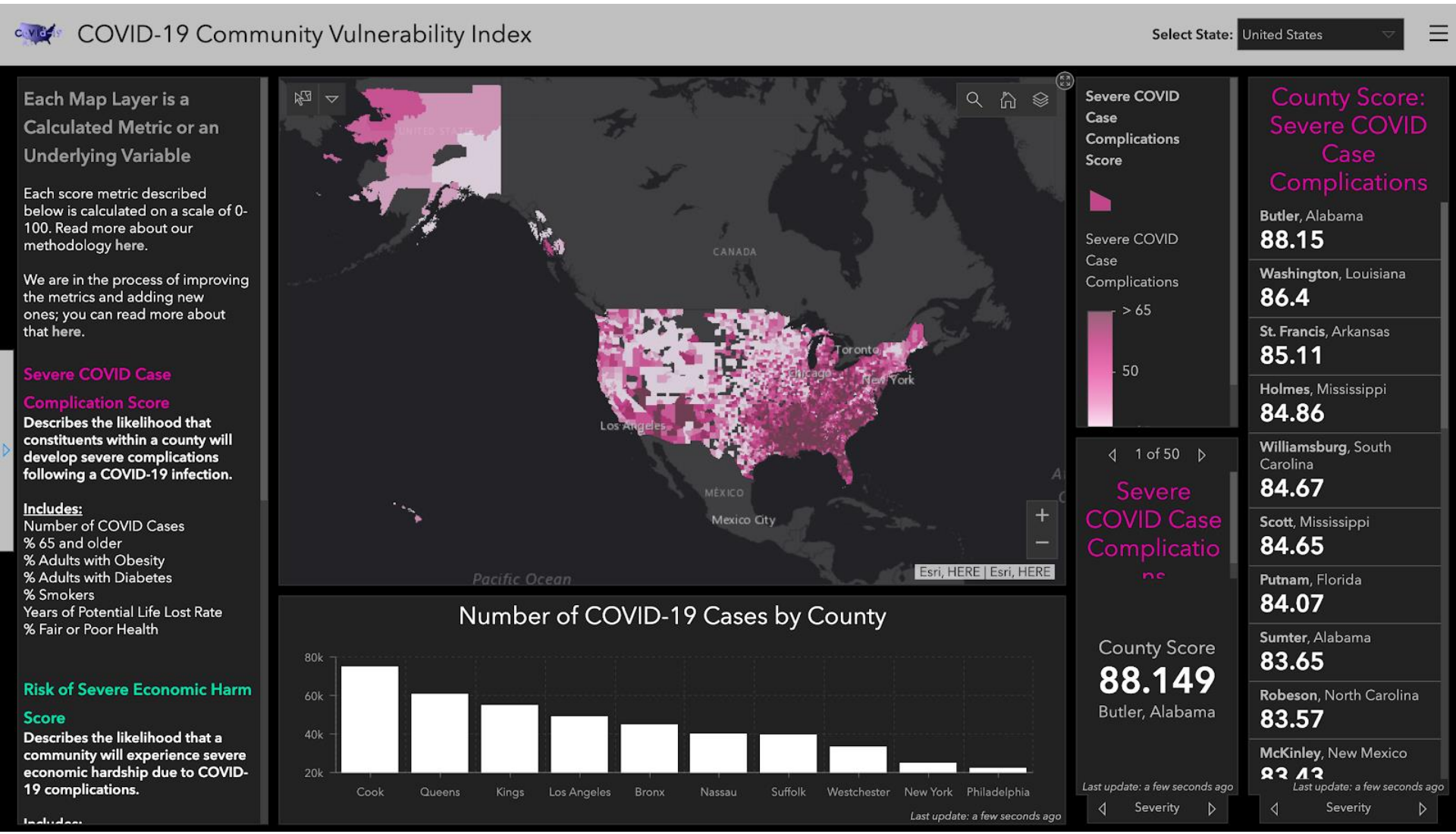
Community Connectedness

Mental Health Needs

Mobile Health Needs

Overwhelming Health Care Systems

Info Deserts


COVID-19 Community Vulnerability Index
Select State: United States
Each Map Layer is a Calculated Metric or an Underlying Variable
Each score metric described below is calculated on a scale of 0-100. Read more about our methodology here.
We are in the process of improving the metrics and adding new ones; you can read more about that here.
Severe COVID Case Complication Score
Describes the likelihood that constituents within a county will develop severe complications following a COVID-19 infection.
Includes:
Number of COVID Cases
% 65 and older
% Adults with Obesity
% Adults with Diabetes
% Smokers
Years of Potential Life Lost Rate
% Fair or Poor Health
Risk of Severe Economic Harm Score
Describes the likelihood that a community will experience severe economic hardship due to COVID-19 complications.
CANADA
Toronto
Chicago
New York
Los Angeles
MÉXICO
Mexico City
Pacific Ocean
Esri, HERE | Esri, HERE
Number of COVID-19 Cases by County
80k
60k
40k
20k
Cook
Queens
Kings
Los Angeles
Bronx
Nassau
Suffolk
Westchester
New York
Philadelphia
Last update: a few seconds ago
Severe COVID Case Complications Score
Severe COVID Case Complications
> 65
50
1 of 50
Severe COVID Case Complicatio
County Score
88.149
Butler, Alabama
Last update: a few seconds ago
Severity
County Score: Severe COVID Case Complications
Butler, Alabama
88.15
Washington, Louisiana
86.4
St. Francis, Arkansas
85.11
Holmes, Mississippi
84.86
Williamsburg, South Carolina
84.67
Scott, Mississippi
84.65
Putnam, Florida
84.07
Sumter, Alabama
83.65
Robeson, North Carolina
83.57
McKinley, New Mexico
Last update: a few seconds ago
Severity

The Dataset

Combines information about:

- Public health
- Healthcare infrastructure
- Physical infrastructure
- Socio-demographics
- Economies
- COVID-19

At the county level for the entire US

Variable Name	Description	Source
% Smokers	Percentage of adults that report currently smoking	2020 County Health Rankings
% Uninsured	Percentage of people under age 65 without insurance	2020 County Health Rankings
% Adults with Obesity	Percentage of the adult population (age 20 and older) that reports a body mass index (BMI) greater than or equal to 30 kg/m2.	2020 County Health Rankings
% Home Internet Access	Residential, non-residential, and total fixed Internet access connections over 200 kbps in at least one direction (as of December 31, 2017, the most recent FCC County data on Internet Access Services)	Form 477 County Data on Internet Access Services
% Children in Poverty	Percentage of children (under 18) living in poverty	2020 County Health Rankings
Income Ratio	Ratio of household income at the 80th percentile to income at the 20th percentile	2020 County Health Rankings
% Unemployed	Percentage of the population ages 16+ unemployed and looking for work	2020 County Health Rankings
Years of Potential Life Lost Rate	Age-adjusted Years of Potential Life Lost (estimate of the avg. years a person would have lived if he or she had not died prematurely) rate per 100,000	2020 County Health Rankings
Number of Covid Cases	The number of laboratory confirmed Covid-19 cases only	NY Times COVID-19 Data Repository
High School Graduation Rate	Graduation rate	2020 County Health Rankings

Current sources: FCC, NYT, CHRRP

The Metrics

Each metric is a linear combination of representative indicators

1. Each variable is normalized across all counties
2. Initial weights are determined from preliminary lit review
3. Metrics are scaled to give score on scale 0-100

Risk of Severe Economic Harm Score

Variable Name	Description	Weighting Factor
% Unemployed	Percentage of the population ages 16+ unemployed and looking for work	3
% Children in Poverty	Percentage of children (under 18) living in poverty	3
Income Ratio	Ratio of household income at the 80th percentile to income at the 20th percentile	1
% Single-Parent Households	Percentage of children living in single parent households	2
% Severe Housing Problems	Percentage of households with at least 1 of 4 housing problems: overcrowding, high housing costs, or lack of kitchen or plumbing facilities	1
High School Graduation Rate	Graduation rate	1
% Enrolled in Free or Reduced Lunch	Percentage of children enrolled in public schools that are eligible for free or reduced price lunch.	2
% Uninsured	Percentage of people under age 65 without insurance	1
Number of Covid Cases	The number of laboratory confirmed Covid-19 cases only	1
% Severe Housing Cost Burden	Percentage of households with high housing costs	3

Literature Review + Improvements

The Lit Review Team (public health and urban development researchers) have identified key data gaps and mis-weightings

Severity Index (Phase 2)						
INDEX Methodology Recommendations	**Indicators**	**Potential Weight**	**Lit Review**	**Data Source**	**Link**	**Methodology Notes for Indicator**
- hypertension, diabetes, obesity weight the most	number of covid cases		n/a	*note: needs updated numbers*		
- followed by weight of cardiovascular conditions	% adults 65 and older			(% over 65)	!	
- respiratory conditions should weight the least	[comorbidities]					
	hypertension			National Vital Statistics System	!	QX - QX; Average annual rates per 100,000 (by county)
- interaction with age?	diabetes			(% of adults with Diabetes)	!	
	obesity			(% adults with obesity)	!	
	cardiovascular conditions			National Vital Statistics System	!	QX - QX; Average annual rates per 100,000 (by county)
	respiratory conditions			BRFSS/Census	!	QX - QX; %
	note: remove health outcomes		*see Parrish RG and County Health Rankings in here or in here*			
	Index Wish list					
	gender and interaction with gender					
	% smokers					
	Chronic Kidney Disease (undergoing dialysis)					
	Liver Disease					
	Immunocompromised (cancer, HIV/AIDS)					
	People in a nursing home					
	People in a long-term care facility (not only the elderly)					

Data team is adding data sets and exploring new models for metric improvement and additional analyses

User Testing

Have developed user survey and task testing guide

User Tasks:

We should let the users take a second to play with the instrument, then we can prompt them for the questions.

Record the No of clicks and No of Seconds

1. What is the Aim of this project?
To open the sidebar menu and read and understand the Aim

2. What are the 3 parameters our project is based on?
To understand what the 3 basic parameters

3. What value of the weighing factor have we assigned to the % of Unemployed?
To open the Nav Bar, Go To Methodology and Search for the specific Parameter

4. What is the lowest county score for Need for Mobile Health Resources?
Do we have that functionality? If not, then all answers are wrong

5. What is the % of Adults with Diabetes for Oklahoma - Caddo?
To interact with the Search Bar Functionality

6. How many parameters are we considering under 'Risk of Severe Economic Harm Score?

COVID 19 - Community Vulnerability Index - Survey and User Testing

Our Aim is to provide a variety of indices to assess community vulnerability to COVID-19 infections, adverse health outcomes, and disparate socio-economic harms.

We are carrying out this survey to test the Usability and to get to know our Users better

This survey is divided into 3 parts:

1. Basic Demographic Details
2. Quantitative User Tests
3. Qualitative User Insights

Analysis of the survey results would help us improve our product

- Over the weekend, tested with 7 individual users from key areas: healthcare, data research, community organizations
- Developing partnerships with key organizations for detailed feedback over the next month: NYC Open Data, North Carolina community groups, etc

Phase 2 Scale Up

- Working with the Creative Destructive Lab Recovery Program to scale up
- Mentors Ray Muzyka, Eve Blossom, Laura Rosella, and Alexandre Nossovskoi
- Considering options for incorporation (non-profit, partnership, charity, open-source)
- Looking for additional funding sources and to grow team

Our Team

- Savannah Thais: Founder, Data Lead
- Cassandra Durkee: Project Manager
- Annina Christensen: Design Strategist
- Nataly Rios: User Experience Lead
- Stephanie Santo: Methodology Lead
- Olga Karabinech: Dashboard Lead
- Alexandra Passareli: Literature Review Lead
- Sarah Boufelja: Data science/ML
- Matthew Moroney: Data science/ML
- Diep Hoang: Intern, web platform dev