Leveraging Community-level Risk Information and Geo-mapping to Assess Vulnerability for HCV and HIV

December 3, 2019

NASTAD
2019 National HIV and Hepatitis Technical Assistance Meeting
Washington, DC

Johnnie (Chip) Allen, MPH
Presentation Goals

• Create a new way of thinking about equity.

• Use geospatial mapping to understand the convergence of different disparities and their root causes.

• Discuss implications for program collaboration.
“When you control a man's thinking you do not have to worry about his actions.

You do not have to tell him not to stand here or go yonder. He will find his 'proper place' and will stay in it. You do not need to send him to the back door. He will go without being told.

In fact, if there is no back door, he will cut one for his special benefit. His education makes it necessary.”

Columbus City
Where do these health outcomes exist at their highest levels?
Performing the Convergence Analysis. Using relational database technology to determine which health outcomes simultaneously occur in the same census tract.
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Columbus Ohio. Census Tracts with More Than Four (4) Health Conditions at the Worst Levels in the Proper Context. Claritas Demographic Analysis

Columbus City

- 37 Census Tracts
- 114,835 Population
- 54% Black (29% in Columbus)
- 36% White (60% in Columbus)
- 2% Asian
- 0.45% Native Amer/AN
- 0.17 Native Hawaiian/PI
- 3% Some Other Race
- 5% Two or More Races
- 6% Hispanic/Latino

- 0.02% Armed Forces
- 48% Employed
- 7.5% Unemployed (4.70 % in Columbus)
- 44 % Not in Labor Force
Understanding Health Equity

New tools are needed to promote intersectionality among interventions designed to improve health.
The HOI is developed using the statistical technique of **Principal Component Analysis (PCA)**.

- This technique analyzes and simplifies data on SDOH into four into smaller categories (or Components).
- Enables communities to come together and focus on solutions.
- For Ohio, these components include **Environmental, Consumer, Mobility and Economic**.
Health Opportunity Index (HOI)

- A composite measure of various Social Determinants of Health (SDOH)

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<table>
<thead>
<tr>
<th>Component</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
<th>Component 4</th>
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<tr>
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<tr>
<td>Healthcare Access</td>
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<tr>
<td>Job Participation</td>
<td></td>
<td>X</td>
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<td>Walkability</td>
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<tr>
<td>Townsend</td>
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</table>
Health Opportunity in Franklin County, Ohio

Composite Index by Equal Ranges

Geography by Census Tract (TRA)
- Count (0.622 ~ 0.752)
- Count (0.493 ~ 0.622)
- Count (0.363 ~ 0.493)
- Count (0.234 ~ 0.363)
- Count (0.104 ~ 0.234)

High Health Opportunity
Low Health Opportunity
Health Opportunity Index. Understand The Impact of Root Causes

Columbus
Convergent Analysis

- Income Inequality
- Low Job Participation
- Spatial Segregation
- Food Access
- Townsend Index
- Education

Composite Index by Equal Ranges
Geography by Census Tract (TRA)
- Count (0.622 - 0.752)
- Count (0.493 - 0.622)
- Count (0.363 - 0.493)
- Count (0.234 - 0.363)
- Count (0.104 - 0.234)
Consistent Patterns of Superconvergence: A Focus on Cuyahoga County?

Cuyahoga County, Ohio. Census Tracts with More Than Four (4) Health Conditions at the Worst Levels.

- 25 Census Tracts
- 36,404 Population
- 94% Black (30% in Cuyahoga County)
- 3% White (61% in Cuyahoga County)
- 0.2% Asian
- 0.30% Native Amer/AN
- 0.1% Native Hawaiian/PI
- 0.41% Some Other Race
- 1.78% Two or More Races
- 1% Hispanic/Latino
- 0% Armed Forces
- 35% Employed
- 12% Unemployed (5% in Cuyahoga)
- 53% Not in Labor Force
Health Opportunity in Cuyahoga County, Ohio

High Health Opportunity

Low Health Opportunity
The Effects of Racists Housing Policy on Health. The Connection Between Health Opportunity & Redlining

High Health Opportunity

Low Health Opportunity
Visualizing Convergence & Thinking in More than One Dimension

### Cleveland Convergence by HOI

<table>
<thead>
<tr>
<th>Census Tract FIPS Code</th>
<th>PLACE</th>
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<tbody>
<tr>
<td>39035113600</td>
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</tbody>
</table>

**Composite Index**: 0.207<br>
- **Quintile**: 1<br>
- **Life Expectancy**: 55

**Environmental Profile**<br>
- Affordability: 0.665<br>
- Healthcare Access: 0.678<br>
- Walkability: 0.679<br>
- Employment: 0.906<br>
- Pop Density: 0.679

**Consumer Profile**<br>
- Education: 0.278<br>
- Food Access: 0.538<br>
- Segregation: 0.108<br>
- Income Inequality: 0.359

**Economic Profile**<br>
- Job Participation: 0.521<br>

**Population Mobility Profile**<br>
- Population Churning: 0.710

**Material Deprivation**
- Economically active residents unemployed, households without cars, private households not owner occupied, overcrowded homes.

**Health Conditions**
- High Blood Pressure
- Coronary Heart Disease
- Diabetes
- Stroke

**Social Determinants**
Visualizing Convergence & Thinking in More than One Dimension

<table>
<thead>
<tr>
<th>PLACE</th>
<th>Composite Index</th>
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<td>Quintile</td>
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<td></td>
<td>Life Expectancy</td>
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Census Tract FIPS Code
39035114700

Health Opportunity Index

<table>
<thead>
<tr>
<th>Health Outcome(s) simultaneously at their worst levels:</th>
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</thead>
<tbody>
<tr>
<td>High Blood Pressure</td>
</tr>
<tr>
<td>Poor Mental Health</td>
</tr>
<tr>
<td>Prematurity</td>
</tr>
<tr>
<td>Diabetes</td>
</tr>
<tr>
<td>Asthma</td>
</tr>
<tr>
<td>Stroke</td>
</tr>
<tr>
<td>Coronary Heart Disease</td>
</tr>
</tbody>
</table>

Material Deprivation:
Economically active residents unemployed, households without cars, private households not owner occupied, overcrowded homes.

Social Determinants
Equity requires we map social determinants that are difficult to talk about.....
What types of data can we map?

Hate crimes/anti-sexual orientation bias
What types of data can we map?

Anti-gender or anti-gender identify bias
What types of data can we map?

Hate crimes/anti-race, anti-ethnicity or anti-ancestry bias
Where do we go from here?

- Make the distinction between disparities, equality, and equity.
- Any data-set that is geographically referenced can be used.
- Equity requires we map social determinants that are difficult to take about (e.g. hate crimes).
- Understand the cost of telling the truth with data and maps.
Special thanks to:

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