Utilizing Geospatial Science and Technology to Advance Colorectal Cancer Prevention and Early Detection: Example Uses and Potential Future Applications
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Using Geospatial Data to Support San Diego’s Colorectal Cancer Screening Project

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Using Geospatial Data to Support San Diego’s Colorectal Cancer Screening Project

November 2023
Rebecca Dabbs, MPH
Associate Director, Community Partnerships

My role engages with and supports primary care clinics, federally qualified health centers, community clinics, coalitions and collaboratives to increase cancer screening rates and cancer prevention through:

- Evidence-based interventions
- Quality improvement efforts
- Public awareness campaigns
- Patient and provider education

*Data is really the foundation for most of the work we do, as it should be.*
Previous Efforts Using Geospatial Data & GIS

2022 California Lung Cancer Screening Environmental Report

California County Level Lung Cancer Related Data
San Diego CEOs Against Cancer

Project Goals:

Engage primary care and community clinics in year-long colorectal cancer screening improvement cohort to increase screening among underserved adults age 45-75 in the San Diego area, by:

1. Identifying primary care and community clinic (FQHCs) in San Diego and partner with for CRC screening project;
2. Launching colorectal cancer screening initiative at selected primary care and community clinic site;
3. Assisting health system in identifying and addressing system and patient level barriers to colorectal cancer screening and implement evidence-based interventions to increase screening rates; and
4. Increasing public awareness of the value of CRC screening among eligible population.
San Diego County Demographics

San Diego County, California

In this area, there are an estimated 3,213,232 people (±3,154) for whom poverty is determined.

Of those, an estimated 344,458 people (±8,168) are below the federal poverty line (approximately 10.7% ±0.3%).

An estimated 93,094 are children (<18) in poverty (±3,278).

Population Below Poverty
344.5k
(in the past 12 months)

Rural Population
102.1k

Population Aged 65+
464.9k

Unemployed People Seeking Work
141.8k

Total Population (2020)
3.3M

One Race Alone Not Hispanic or Latino vs Hispanic or Laino

- Hispanic or Latino 34.3%
- Black or African American 4.6%
- Asian 11.7%
- Other 1%
- Native, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races

Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS | Centers for Disease Control and Prevention/... Powered by Esri
Race and Language Variables
Education Attainment Variables

CMSApprovedFacilities FS
Federally Qualified Health Centers

ACS Educational Attainment Variables - Boundaries
Tract

Percent of Population 25 Years and Over whose Highest Education Completed is Less Than High School

- > 21%
- 11% - national average
- < 1%
- No Value
Poverty Status Variables

CMSApprovedFacilities F5
Federally Qualified Health Centers

ACS Poverty Status Variables - Boundaries
Tract
Percent of Population whose income in the past 12 months is below poverty level
- > 24%
- 13% - national average
- < 1%
- No Value
Application of Data

Our efforts are more likely to succeed when we recognize and consider the diversity of the community we are trying to reach. The geospatial data will help to:

• Identify patient population & primary care clinic in areas with highest need.
• Use language that is accessible and meaningful to the target population.
• Tailor our intervention and communications efforts.
• Identify structural barriers that can be addressed to best serve different populations.
• Support storytelling to increase fundraising efforts.

“The data maps that have been provided by the GIS Data Science team have been crucial to our project because they clearly and effectively highlight the need for our work. The CEO’s that we work with are extremely data driven and having these maps as a resource to share as we are having conversations has strengthened our pitch because it allows people to get a very clear visual of the story we are telling.”

Chelsy Clark, ACS Corporate Relations Director
Thank You
Thank You
Employing Data Mapping to Inform Targeting of Colorectal Cancer Prevention Efforts in Rhode Island

Matthew Boudreau
Program Manager, Colorectal Cancer Prevention Program
Rhode Island Department of Health
Employing Data Mapping to Inform Targeting of Colorectal Cancer Prevention Efforts in Rhode Island

Matthew Boudreau
Rhode Island Department of Health (RIDOH)
Colorectal Cancer Control Program
Rhode Island

State in: United States

Population: 1,095,610
1,033.9 square miles
1,059.7 people per square mile

Census data: ACS 2021 1-year unless noted

NOT ACTUAL SIZE!
# Rhode Island Census Data, 2021

## Population by ZIP Code Tabulation Area (ZCTA)

### Race and Hispanic Origin Distribution

<table>
<thead>
<tr>
<th>Race and Hispanic Origin</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>White alone</td>
<td>82.8%</td>
</tr>
<tr>
<td>Black or African American alone</td>
<td>9.1%</td>
</tr>
<tr>
<td>Asian alone</td>
<td>3.7%</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>3.1%</td>
</tr>
<tr>
<td>American Indian and Alaska Native alone</td>
<td>1.2%</td>
</tr>
<tr>
<td>Native Hawaiian and Pacific Islander alone</td>
<td>0.2%</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>17.6%</td>
</tr>
<tr>
<td>White alone, not Hispanic or Latino</td>
<td>69.9%</td>
</tr>
</tbody>
</table>
### 7 of 8 Federally Qualified Health Centers (FQHCs)*

<table>
<thead>
<tr>
<th>FQHC</th>
<th># Clinics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive Community Action Program (CCAP)</td>
<td>4</td>
</tr>
<tr>
<td>East Bay Community Action Program (EBCAP)</td>
<td>3</td>
</tr>
<tr>
<td>Providence Community Health Centers (PCHC)</td>
<td>8</td>
</tr>
<tr>
<td>Thundermist Health Centers (Thundermist)</td>
<td>3</td>
</tr>
<tr>
<td>Tri-County Health Center (Tri-County)</td>
<td>1</td>
</tr>
<tr>
<td>WellOne Primary Medical and Dental Care (WellOne)</td>
<td>4</td>
</tr>
<tr>
<td>Wood River Health Services (Wood River)</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>25</strong></td>
</tr>
</tbody>
</table>

*NOT Partnered with Blackstone Valley Community Health Care
Health System and Clinic Partners – CSNCs & IHS

2 Community Safety Net Clinics (CSNCs)

- Clinica Esperanza / Hope Clinic (CEHC)
- Rhode Island Free Clinic (RIFC)

1 Indian Health Service (IHC)

- Narragansett Indian Health Center (NIHC)
Our partners comprise a total of 28 clinic locations throughout Rhode Island.
Uniform Data System (UDS) Colorectal Cancer Screening Rates, 2018-2022

- **Rhode Island**
  - 2018: 56.6%
  - 2019: 55.9%
  - 2020: 54.0%
  - 2021: 54.5%
  - 2022: 57.5%

- **National Average**
  - 2018: 44.1%
  - 2019: 45.6%
  - 2020: 40.1%
  - 2021: 41.9%
  - 2022: 42.8%
What we know

• FQHCs serve populations at high risk for being unscreened
• The Rhode Island Colorectal Cancer Control Program (RI CRCCP) has partnered with 7 of the state’s FQHCs
• RI FQHC screening rates have increased since 2017, yet there’s still more work to be done

BUT...

• What about individuals who are not established FQHC patients? Who are they?
• Where do they live?
• How can we reach them?
Mapping is for everyone!

- Sophisticated Geographic Information System (GIS) options include ArcGIS and QGIS, but these require specialized training and software.

- Often, in-house GIS teams are overloaded with requests and projects.

- Another viable option is to create maps by employing readily available programs, such as Microsoft Excel, with only minimal mapping experience.
1. Identifying Underserved Communities
   • CDC PLACES
   • CDC/ATSDR Social Vulnerability Index (SVI)

2. Identifying Community Characteristics
   • Census Bureau QuickFacts
   • American Community Survey (ACS)

3. Identifying Appropriate Partners
   • UDS Mapper
   • Google Maps
Colorectal Cancer Screening by Census Tract, 2021

CDC PLACES
https://www.cdc.gov/places/index.html
Social Vulnerability Index, 2021

CDC/ATSDR SVI
Social Vulnerability Index, 2021
Providence County

Geographic Unit: Counties

Geographic Unit: Census Tract
Uninsured Men and Women, ACS 2021

6,657 uninsured men

5,755 uninsured women
<table>
<thead>
<tr>
<th>Census Bureau QuickFacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2017-2021 ACS 5-year estimates)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Population Estimates, July 1, 2022 (V2022)</th>
<th>Pawtucket city, Rhode Island</th>
<th>Central Falls city, Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population estimates base, April 1, 2020 (V2022)</td>
<td>75,066</td>
<td>22,490</td>
</tr>
<tr>
<td>Population, percent change - April 1, 2020 (estimates base) to July 1, 2022, (V2022)</td>
<td>-0.3%</td>
<td>-0.4%</td>
</tr>
<tr>
<td>Population, Census, April 1, 2020</td>
<td>75,604</td>
<td>22,583</td>
</tr>
<tr>
<td>Population, Census, April 1, 2010</td>
<td>71,148</td>
<td>19,376</td>
</tr>
</tbody>
</table>

### Race and Hispanic Origin

<table>
<thead>
<tr>
<th>White alone, percent</th>
<th>55.8%</th>
<th>42.4%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black or African American alone, percent</td>
<td>17.6%</td>
<td>8.9%</td>
</tr>
<tr>
<td>American Indian and Alaska Native alone, percent</td>
<td>0.5%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Asian alone, percent</td>
<td>2.0%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander alone, percent</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Two or More Races, percent</td>
<td>12.7%</td>
<td>13.3%</td>
</tr>
<tr>
<td>Hispanic or Latino, percent</td>
<td>25.2%</td>
<td>71.9%</td>
</tr>
<tr>
<td>White alone, not Hispanic or Latino, percent</td>
<td>46.7%</td>
<td>19.6%</td>
</tr>
</tbody>
</table>

### Families & Living Arrangements

| Households, 2017-2021 | 29,666 | 7,074 |
| Persons per household, 2017-2021 | 2.52 | 3.04 |
| Living in same house 1 year ago, percent of persons age 1 year+, 2017-2021 | 89.7% | 81.1% |
| Language other than English spoken at home, percent of persons age 5 years+, 2017-2021 | 39.5% | 66.6% |

### Income & Poverty

| Median household income (in 2021 dollars), 2017-2021 | $58,427 | $40,235 |
| Per capita income in past 12 months (in 2021 dollars), 2017-2021 | $30,246 | $37,962 |
| Persons in poverty, percent | 14.9% | 24.9% |
RI Behavioral Risk Factor Surveillance System (BRFSS), 2018

White, non-Hispanic adults have fewer barriers to access healthcare than other racial/ethnic groups.

The prevalence of being uninsured, having no doctor, and experiencing cost barriers to seeing a doctor are highest among Hispanic adults compared with all other racial/ethnic groups.

https://health.ri.gov/data/healthcareaccess/
3 Community Safety Net Clinics

• Clinica Esperanza / Hope Clinic (CEHC)
• Rhode Island Free Clinic (RIFC)
• Jenks Park Health Clinic (JPHC)

1 Indian Health Service

• Narragansett Indian Health Center (NIHC)
Our partners comprise a total of 29 clinic locations throughout Rhode Island.
Next Steps for Central Falls & Pawtucket

1. Decrease barriers to screening (and increase screening rates) for Jenks Park Health Clinic patients
2. Work with RI Public Health Association and other partners to create culturally and linguistically appropriate small media materials
3. Meet with identified non-profit community organizations, including Progreso Latino, Inc. and YWCA Central Falls
4. Work with The Ministers Alliance of RI on faith-based community outreach
5. Participate in Central Falls and Pawtucket community activities and events
Targeted Outreach

Future Goal:
To mirror the RI BCCEDP (Breast and Cervical Cancer Early Detection Program) initiative in adding QR Codes to small media materials, linking users to a program landing page and dashboard. Data on the number, duration, and location of views can be collected.
Lessons Learned

1. Utilize multiple sources of data
2. Understand the accuracy and limitations of your data
3. Choose appropriate tools and techniques
4. Remember: A map won’t speak for itself!
Thanks to Will and Steve for their help!

Steve Williamson, PhD  
Planning and Programming Specialist  
Rhode Island Department of Health

Will Goedel, PhD  
Assistant Professor of Epidemiology  
Brown University School of Public Health
Thank you!
Thank You
Utilizing Geospatial Science and Technology to Advance CRC Cancer Prevention and Early Detection

Liora Sahar, PhD, GISP
Senior Director, GIS Data Science
American Cancer Society (virtual)
Thank You

nccrt.org   @NCCRTnews   #80inEveryCommunity