HEALTH DISPARITIES
STORY MAP
Conception and Technical Implementation

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Goals of the Presentation

- Introduce the Health Disparity Interactive Map Journal
- Highlight the approach and link to community planning and policy
- Identify the technical and security challenges and solutions
Why Map Health Disparities?

- Disparities in health and health care limit continued improvement in overall quality of care and population health and result in unnecessary costs.

- Recent analysis estimates that 30% of direct medical costs for Blacks, Hispanics, and Asian Americans are excess costs due to health inequities with economic losses estimated at $309 billion per year due to the direct and indirect costs of disparities.

- As the population becomes more diverse, with people of color projected to account for over half of the population by 2050, it is increasingly important to address health disparities.
Health disparities are...

- differences in the relative health status of population groups defined by such characteristics as race/ethnicity, gender, socioeconomic status, and geographic location.

- driven largely by unequal population access to such life-enhancing resources (or social determinants of health) as food, housing, employment, education, transportation, and health care.
Medicaid Population Health High Need Areas

- Areas of South Carolina with a high prevalence of at least 3 select child health conditions AND at least 3 select adult health conditions among Medicaid enrollees
  - Select child conditions: ADHD, autism, asthma, diabetes, obesity, or sickle cell disease
  - Select adult conditions: cardiovascular disease (CVD), diabetes, end-stage renal disease (ESRD), hypertension, obesity, or stroke
Medicaid Recipients

- Recipients in 2013: 1,162,210
  - Increase of 13.8% from 2012
- Nearly 1 in 4 South Carolinians are enrolled in Medicaid
- Greatest number are in metropolitan areas
  - **BUT** the highest enrollment rates are in predominantly rural areas
    - Especially along the I-95 corridor
More than 50% of Medicaid recipients are children ages 0-18 years.
Notice that the highest rates (percentages) are found along the I-95 corridor (Extending from Marlboro County in the Northeast to Jasper County in the Southern portion of the state)
South Carolina Medicaid Enrollment

A look at where the SC Medicaid population lives.

Between 2011 and 2013, South Carolina Medicaid enrollment grew from 1,021,604 to 1,162,216, an increase of 13.8%. Currently, nearly one in four South Carolinians are enrolled in Medicaid. More than 50% of Medicaid participants are children ages 0–19 years. Although the greatest number of Medicaid recipients reside in the state’s largest metropolitan areas, the highest rates of Medicaid participation are found in peri-urban rural areas, especially along the South Carolina coast and extending from Marlboro County in the

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Swipe Example in Journal

- Text information on left
- Two related maps on the same page with swipe bar
- Ability to interact and retrieve data about spatial locations
Increased risk for poor health outcomes
Largest % of residents in areas along the I-95 corridor
1/3 of South Carolinians live in rural areas

Geographic isolation and socioeconomic disadvantage can increase risk for poor health
Poverty

- Associated with higher rates of mortality and morbidity
- Defined by US Census Bureau

Geographic areas in which 20% or more of population live below the federal poverty level are “poverty areas”

Geographic areas in which 40% or more of population live below the federal poverty level are “extreme poverty areas”
Notice more of the poverty areas are found along the I-95 corridor (Extending from Marlboro County in the Northeast to Jasper County in the Southern portion of the state)
Poverty and extreme poverty are more prevalent among children than adults.
More likely to suffer functional limitations, acute conditions, and chronic diseases

Can restrict access to health information and health care services, limit job opportunities, and diminish lifetime earnings potential
• Limits the financial means needed to acquire or access such resources as healthy food, safe housing, adequate clothing, reliable transportation, and continuous, coordinated health care
Diabetes prevalence is high along the I-95 corridor.
Enlarge Images to View

- Images on the left-hand side will enlarge when clicked
Hot Spot Maps

Reflect the degree to which high disease prevalence areas in the state are geographically clustered

- Adult hot spots represent clustered areas characterized by a high prevalence of any one of 22 conditions
  - Including asthma, breast cancer, cervical cancer, chronic obstructive pulmonary disease, depression, diabetes, end stage renal disease, hypertension, and obesity

- Child hot spots represent clustered areas characterized by a high prevalence of any one of 6 conditions
  - ADHD, autism, diabetes, obesity, and sickle cell disease
Combined Hotspot

High Need Areas

- Adult or Child Hotspot
  - Significant Adult OR Child
  - High Disease Hotspot
- Adult AND Child Hotspot
  - Significant Adult AND Child Disease Hotspot

Percent of the Population in a Hotspot

High Need Areas

- No Hotspot: 26%
- Adult Only Hotspot: 16%
- Child Only Hotspot: 2%
- Adult and Child Combined Hotspot: 57%

Rest of the State

- No Hotspot: 8%
- Adult Only Hotspot: 14%
- Child Only Hotspot: 8%
- Adult and Child Combined Hotspot: 71%
Health care resources are not evenly distributed across the state.

Rural residents typically must travel farther to advanced hospital-based services.

Percent in Medicaid Also Showing Trauma Level Hospitals

- Level 1
- Level 2
- Level 3
- No Trauma Rating
- High Need Areas

Percent Medicaid Recipients:
- 0.0
- 0.1 - 21.4
- 21.5 - 27.8
- 27.9 - 33.9
- 34.0 - 72.9
Low geographic access can prevent or limit appropriate utilization of health care, including preventive and acute care, and chronic disease management.
High Need Areas (symbolized in red on the map) have lower educational attainment, higher poverty rates, higher unemployment, and less access to health care.
Applying Shading Effects

- Ability to apply shading effects from desktop to final interactive map
High Need and Neighboring Areas

- Areas that border High Need Areas also experience critical community resource disadvantage.

- > 250,000 Medicaid enrollees live in High Need Areas and neighboring areas.
Strong spatial association exists between limited access to life-enhancing resources and poor health outcomes among state Medicaid participants.

Health interventions targeting these high-need communities can improve health and reduce health disparities among child and adult Medicaid recipients in South Carolina.
Technical Notes

- Use of ArcGIS Online Templates
  - Esri Story Map Journal
  - Esri Swipe

- Map development in Desktop

- Application hosted on local ArcGIS Server

- Application linked to existing website
Technical Notes (continued)

- Minimal text
  - Summary of key points
  - Use instruction

- Graphic Design
  - Adobe Photoshop
  - Adobe Illustrator
  - Stock photos, vector graphics, and original graphics
Technical Challenges and Solutions

© Challenges

- Presenting side-by-side interactive maps
- Mapping>Loading speed
- Title and legend tweaks

© Solutions

- Template download and integrative custom coding
  - Swipe template inside Map Journal
- Swipes use one map instead of two for loading speed
- Template pulls titles and legends from layer and service names
Security Issues

○ Concern with mapping protected health information
  ○ What’s online?
  ○ Restrict access?
  ○ Aggregate?

○ Verified ArcGIS Online and other Esri products met required security needs
  ○ ArcSDE and ArcGIS Server are behind the firewall
  ○ Webadaptor prevents direct access to ArcGIS Server based REST services
  ○ Ability to restrict access to no one or specific users via user names and passwords with ArcGIS Online
  ○ Aggregation of data is useful for public maps
QUESTIONS?

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Mapping the Story of Health Disparities
http://mapping.mpr.sc.edu/
healthdisparitiesmapjournal

SC HealthViz
http://www.schealthviz.sc.edu

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