EXPLORING HEALTH EQUITY IN SAN DIEGO COUNTY THROUGH SPATIAL ANALYSIS

Maria D. Peña, MPH
Epidemiologist
County of San Diego, Health and Human Services Agency, Public Health Services, Community Health Statistics Unit
July 22, 2015
The Live Well San Diego initiative focuses on creating an environment that encourages all San Diego County residents to live healthy, safe, and thriving lives.
DEFINITIONS

VOCABULARY TO KEEP IN MIND

Health equity is achieved when every person has the opportunity to “attain his or her full health potential” and no one is “disadvantaged from achieving this potential because of social position or other socially determined circumstances.”

Health inequities are “types of unfair health differences closely linked with social, economic or environmental disadvantages that adversely affect groups of people.”

Urbanicity refers to the degree of population density, size of city, and location relative to a metropolitan area.

CDC, Healthy Communities Program

CDC, Health Communities Program

ESRI
OBJECTIVES

1. Identify the urbanicity of communities at the subregional level within San Diego County.

2. Identify areas, using urbanicity, with higher or lower burden of disease and injury in San Diego County.

3. Use ESRI Tapestry data to look into population characteristics within these sub-regional Areas (SRAs) to explore possible venues for interventions.
SNAPSHOT OF SAN DIEGO COUNTY

- 5th largest county in the U.S. with very diverse communities from rural to very urban areas covering 4,200 sq. miles
- 41 Sub-regional Areas (SRAs)
- 3.14 million residents (2012)
- Median household income: $70,926 (2012)

Race/Ethnicity Distribution among San Diego County Residents, 2012

*API includes Asian, Pacific Islander, and Native Hawaiian
OVERALL METHODS

- Using ESRI’s Tapestry Segmentation Urbanization Groups, sub-regional areas (SRAs) were aggregated into one of six categories of urbanicity: rural, semirural, suburban periphery, metro cities, urban periphery, principal urban centers.

- Chronic disease, communicable disease, and injury rates were calculated for each urbanicity category.

- One-sample T-tests (alpha=0.05) were conducted to determine urbanicity areas with rates of disease higher or lower than the county rates.

- ESRI Tapestry Urbanization groups were used to look into population characteristics to explore possible venues for interventions.
HEALTH OUTCOMES & DISEASES

CHRONIC DISEASE
2012 Death data:
• Coronary Heart Disease
• Stroke
• Diabetes
• Asthma
• Chronic Obstructive Pulmonary Disease (COPD)
• Cancer

COMMUNICABLE DISEASE
2012 Incidence of:
• Tuberculosis
• Chronic Hepatitis C
• Chlamydia
• Gonorrhea
• Syphilis

2012 Death data:
• Pneumonia
• Flu

INJURY OUTCOMES
2012 Death data:
• Unintentional Injury
• Homicide
• Suicide

Note: Pendleton, Miramar, and Harbison Crest sub-regional areas were not included in analysis due to statistical instability.
DATA USED


- Death Statistical Master Files (CDPH), County of San Diego, Health & Human Services Agency, Public Health Services, Epidemiology & Immunization Services Branch; SANDAG, Population Estimates, 10/2012.

- County of San Diego, Health & Human Services Agency, HIV, STD and Hepatitis Branch, Morbidity Database; SANDAG, Population Estimates, 10/2012.

- County of San Diego, Health & Human Services Agency, Tuberculosis Control Program, County TB Registry; SANDAG, Population Estimates, 10/2012.

- County of San Diego, Health & Human Services Agency, Epidemiology & Immunization Services Branch, Communicable Disease Data; SANDAG, Population Estimates, 10/2012.
RESULTS: CHRONIC DISEASE

Chronic Disease Burden
From an Urbanicity Perspective, 2012

Chronic Disease Burden
San Diego County, 2012

- Green: Lower than County
- Light Gray: No difference
- Orange: Higher than County
- Slanted Stripes: Not Included in Analysis

Map Data: July, 2016
Map/Analysis by Marie Pelle, BMS/CHSU
Contact Marie Pelle, Leslie Ray 619.235.0525
RESULTS

- **Significantly higher:**
  - Metro Cities
  - Urban Periphery

- **Significantly lower:**
  - Suburban Periphery

- **No difference:**
  - Rural
  - Principal Urban Center
RESULTS: COMMUNICABLE DISEASE

Communicable Disease Burden From an Urbanicity Perspective, 2012

Map Data: July 2015
Map Analysis by Maria Pena, EMS/CHSU
Contact Maria Pena: Leslie Rey 619.355.6525
RESULTS:
COMMUNICABLE DISEASE

RESULTS

- Significantly higher:
  - Urban Periphery
  - Principal Urban Center

- Significantly lower:
  - Rural
  - Suburban Periphery
  - Metro Cities
RESULTS: INJURY

Injury Burden
From and Urbanicity Perspective, 2012

Injury Burden
San Diego County, 2012

- Orange: Higher than County
- Gray: No difference
- Light Gray: Not included in Analysis

Map Data: July, 2015
Map Analysis by María Peña, EMS/CHSU
Contact Maria Peña, Leslie Ray at 619.265.8525
RESULTS: INJURY

- Significantly higher:
  - Rural
  - Principal Urban Center
- No difference:
  - Suburban Periphery
  - Metro Cities
  - Urban Periphery

INJURY BURDEN, 2012
**DISCUSSION**

We can use ESRI Tapestry data to explore the characteristics of these communities which could help explain the difference in chronic and infectious disease burden and injury.

<table>
<thead>
<tr>
<th>Urbanicity</th>
<th>Chronic Disease</th>
<th>Communicable Disease</th>
<th>Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>↔</td>
<td>↓</td>
<td>↑</td>
</tr>
<tr>
<td>Suburban Periphery</td>
<td>↓</td>
<td>↓</td>
<td>↔</td>
</tr>
<tr>
<td>Metro Cities</td>
<td>↑</td>
<td>↓</td>
<td>↔</td>
</tr>
<tr>
<td>Urban Periphery</td>
<td>↑</td>
<td>↑</td>
<td>↔</td>
</tr>
<tr>
<td>Principal Urban Centers</td>
<td>↔</td>
<td>↑</td>
<td>↑</td>
</tr>
</tbody>
</table>

↑ Significantly higher than county
↓ Significantly lower than county
↔ No significant difference from county

**WHO LIVES IN THESE NEIGHBORHOODS?**
### INSIGHT INTO PREVENTION

<table>
<thead>
<tr>
<th>Chronic Disease</th>
<th>Communicable Disease</th>
<th>Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metro cities</strong></td>
<td><strong>Urban Periphery</strong></td>
<td><strong>Rural</strong></td>
</tr>
<tr>
<td>College students, Gen x couples, retired</td>
<td>Young families with children</td>
<td>55+ older</td>
</tr>
<tr>
<td>Rely on internet and cellphones</td>
<td>Leisure focus on children activities</td>
<td>Married w/o children at home</td>
</tr>
<tr>
<td>City life</td>
<td>Smartphones are popular for social contacts, shopping, music</td>
<td>Self-employed, retired, or receiving SS</td>
</tr>
<tr>
<td><strong>Urban Periphery</strong></td>
<td><em>Principal Urban Centers</em></td>
<td>Satellite TV, Landline phones</td>
</tr>
<tr>
<td>Young families with children</td>
<td>Crowding</td>
<td></td>
</tr>
<tr>
<td>Leisure focus on children activities</td>
<td>Full access to urban amenities</td>
<td></td>
</tr>
<tr>
<td>Fast food and family restaurants</td>
<td>1 in 2 use public transportation, bicycles or walk to work</td>
<td></td>
</tr>
<tr>
<td>Smartphones are popular for social contacts, shopping, music</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

*Principal Urban Centers*
- Crowding
- Full access to urban amenities
- 1 in 2 use public transportation, bicycles or walk to work
CONCLUSIONS

- Using ESRI Tapestry Urbanization to assess the burden of disease and injury within communities can provide valuable insights on health inequities among populations.

- With this information, potential social and economic factors can be further explored to explain these health disparities.

- Using this information, the County of San Diego can outline and prioritize public health efforts to eliminate health inequities.
LIMITATIONS

- Urbanicity classification for each sub-regional area (SRA) was based on the ESRI Urbanization category with the highest percentage.
- Not all health diseases and/or outcomes were included in this analysis.
- Using 2014 tapestry data to look at population characteristics while using 2012 health outcome data.

NEXT STEPS: Utilize the paired lifestyle, disease, and injury data to identify target interventions and health promotion activities.
FOR MORE INFORMATION

Maria D. Peña, MPH
Epidemiologist
Maria.Pena@sdcounty.ca.gov
www.sdhealthstatistics.com