Amy Sonnichsen – Position Statement – July 2019

CASE STUDY: Mapping Community Health Data with PolicyMap and Hispanic & Latinx populations in Los Angeles County

Summary of Research

Increasingly more and more medical professionals and policy makers rely on health data visualizations to make decisions about the kind of medical care patients may need or have access to. Also, the increasing availability of mapping tools such as SimplyAnalytics, PolicyMap, Simply Map, or Social Explorer allow researchers and professionals alike to create powerful data visualizations with relatively little background knowledge. As academic libraries provide access to these applications, they may be expected to help users navigate the nuances of creating visualizations with these powerful tools.

In an attempt to fill the knowledge gap between academics, students, professionals, and everyone in between, I have begun a set of guidelines that I hope to develop into best practices for teaching and creating data visualizations. I have also begun a literature review to aid in this development.

More Areas of Research in Connection to this Project
I have identified a number of areas which require further research to complete a comprehensive literature review on this subject:

BROAD AREAS OF FOCUS • Data Literacy • Visual Literacy • Data Ethics • Social Constructs (maps, race, class, morality) • Digital Humanities Pedagogy • Data Visualization - General • GIS and Cartography • Health Data Visualization	**TOPICS IN GIS & HEALTH** • Choropleth maps • Mapping health disparities • Health services accessibility • Spatial epidemiology • Spatiotemporal clustering & analysis • Small area estimation • Bayesian analysis • Geo-coding
VARIABLES & VULNERABILITIES FOR CONSIDERATION (From *Critical Issues in Health & Medicine Series*) • Race • Gender • Ethnicity • Sexuality • Culture	**PERSPECTIVES** (From *Critical Issues in Health & Medicine Series*) • Political • Legal • Historical • Sociological • Comparative

Cast Study/Pilot Project –

Analyses of PolicyMap Strengths and Shortcomings
PolicyMap is very easy to use, however without some background knowledge, and some idea of data literacy it would be equally easy to create confusing and/or uninteresting visualizations. Additionally, if

the maps are somehow misrepresentative, there may be complications with the notions of "group privacy" and consequently group discrimination. (Floridi & Taddeo, 2016)

Guidelines
Briefly, I have started a detailed list of guidelines which include topics such as visual storytelling to aid decision making, mapping as a social construct, the issues around "cherry-picking" datasets. I then break them out into sections such as "Do your research: Become data literate!", "Make it pretty! Visual literacy is equally important!", "Know your populations!", "Know your geography!", "Adjust strata according to your knowledge" "Identify geographical and topographical anomalies to avoid error" "Choose data points that illustrate the story you aim to convey…" and so on.

Implications for Library Visualization Instruction

There is plenty of detailed literature dedicated to the analysis of GIS and health data, as well as to various kinds of maps and charts used, but there is very little in the way of teaching for instructors or librarians. These guidelines are intended to bring undergraduate students up to speed with an introduction that will allow them to use mapping tools with confidence, while still acknowledging that the topics that they attempt to represent are varied and complex.

One-Shot-Instruction Sessions and/or Single Workshops
I have identified a need to synthesize several metaliteracies with the practice of data visualization to aid students and professionals alike who may not yet have expert data skills.

Continuing Series Workshops & Classroom Adoption
I plan to develop a continuing series of library workshops on data skills and data visualization for spring of 2020. I also anticipate creating classroom assignments which use PolicyMap or Tableau to target the nursing, health policy management, psychology, and political science departments. These guidelines will be a helpful framework for developing a standard for instruction in data visualization.

Future Work (Research, Teaching, Organization)

Research
I will complete my much-expanded literature review and consider writing an article for publication. I have a working topic/title of: *Pedagogical Approaches to Mapping Health Disparities: Exploring how librarians and teachers can aid the novice data visualization creator.*

Teaching
I intend to develop a "crash course/bite-size/101" for both data and visual literacies in order to prepare students to create reliable and effective data visualizations. Additionally, I will develop similar guidelines for Tableau. I will need to reconcile guidelines that are for specific applications and software versus general types of visualizations.

Organization
I am in the process of developing a new library site for my institution, which will launch in August 2019. This fall I will add pages devoted to data visualization, data literacy, visual literacy, and working with health data.

References

Börner, K. (2015). *Atlas of Knowledge : Anyone Can Map*. Cambridge, Massachusetts: The MIT Press. Retrieved from eBook Collection (EBSCOhost) database.

Cohen, G. H., ghcohen@bu. edu, Ross, C. S., Cozier, Y. C., & Galea, S. (2019). Census 2020—A Preventable Public Health Catastrophe. *American Journal of Public Health*, *109*(8), 1077–1078. https://doi.org/10.2105/AJPH.2019.305074

Cromley, R. G., & Cromley, E. K. (2009). Choropleth map legend design for visualizing community health disparities. *International Journal Of Health Geographics*, *8*, 52–52. https://doi.org/10.1186/1476-072X-8-52

Floridi, L., & Taddeo, M. (2016). What is data ethics? *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*. https://doi.org/10.1098/rsta.2016.0360

Gómez, L. E., & López, N. (2013). *Mapping "Race": Critical Approaches to Health Disparities Research*. Retrieved from eBook Collection (EBSCOhost) database.

Ricker, B., & Thatcher, J. (2017). Evolving technology, shifting expectations: Cultivating pedagogy for a rapidly changing GIS landscape. *Journal of Geography in Higher Education*, *41*(3), 368–382. https://doi.org/10.1080/03098265.2017.1315533

Data Visualizations (Maps)

Case Study: Mapping Community Health Data with PolicyMap and Hispanic & Latinx populations in Los Angeles County

These visualizations are intentionally simple for the sake of introduction to undergraduate students and would play upon each other to draw meaningful comparisons. Note: Most 2010 data is too out of date to be of use.

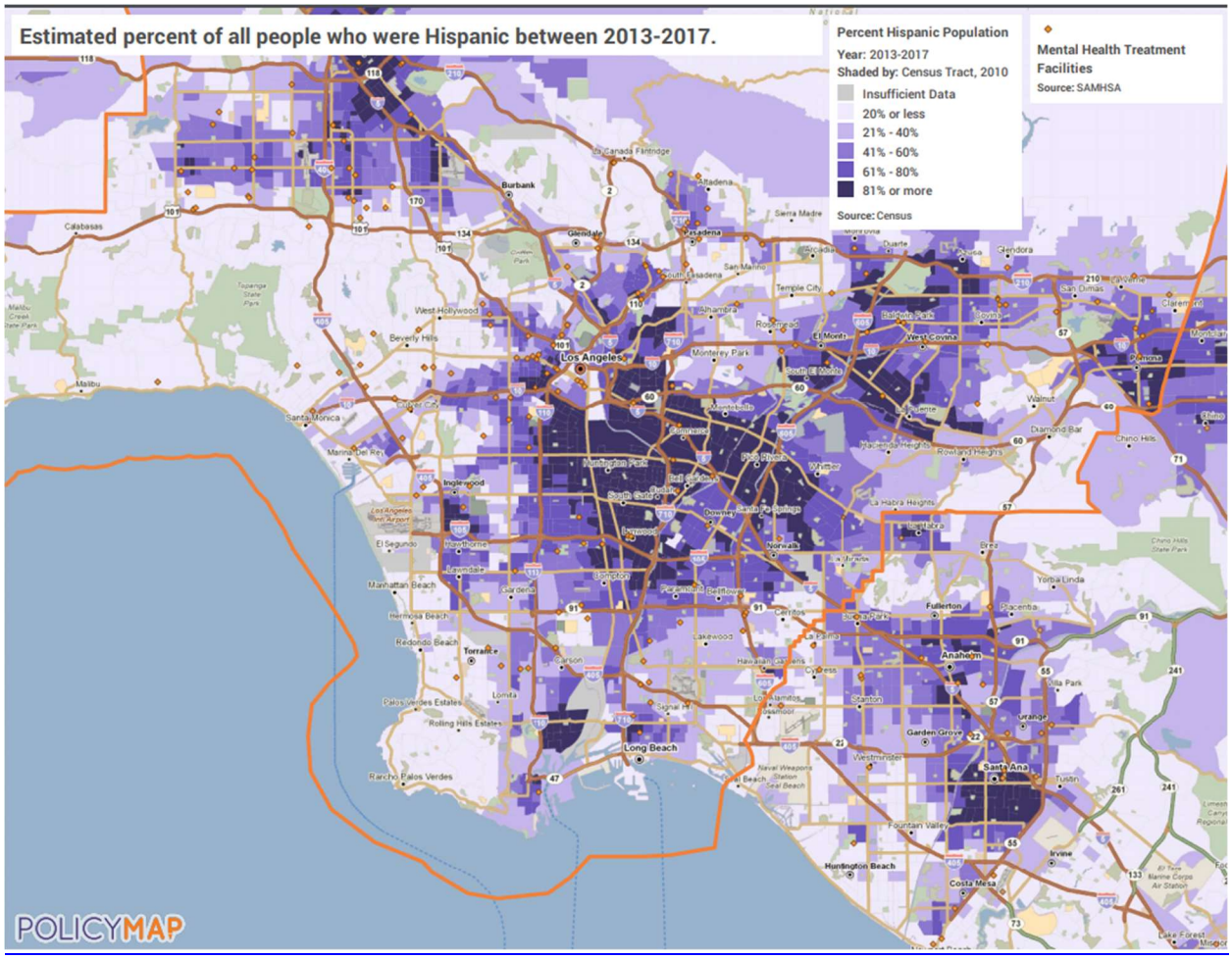

Figure 1. Mapping Mental Health Treatment Facility Locations and Hispanic Population (estimated 2013-2017)

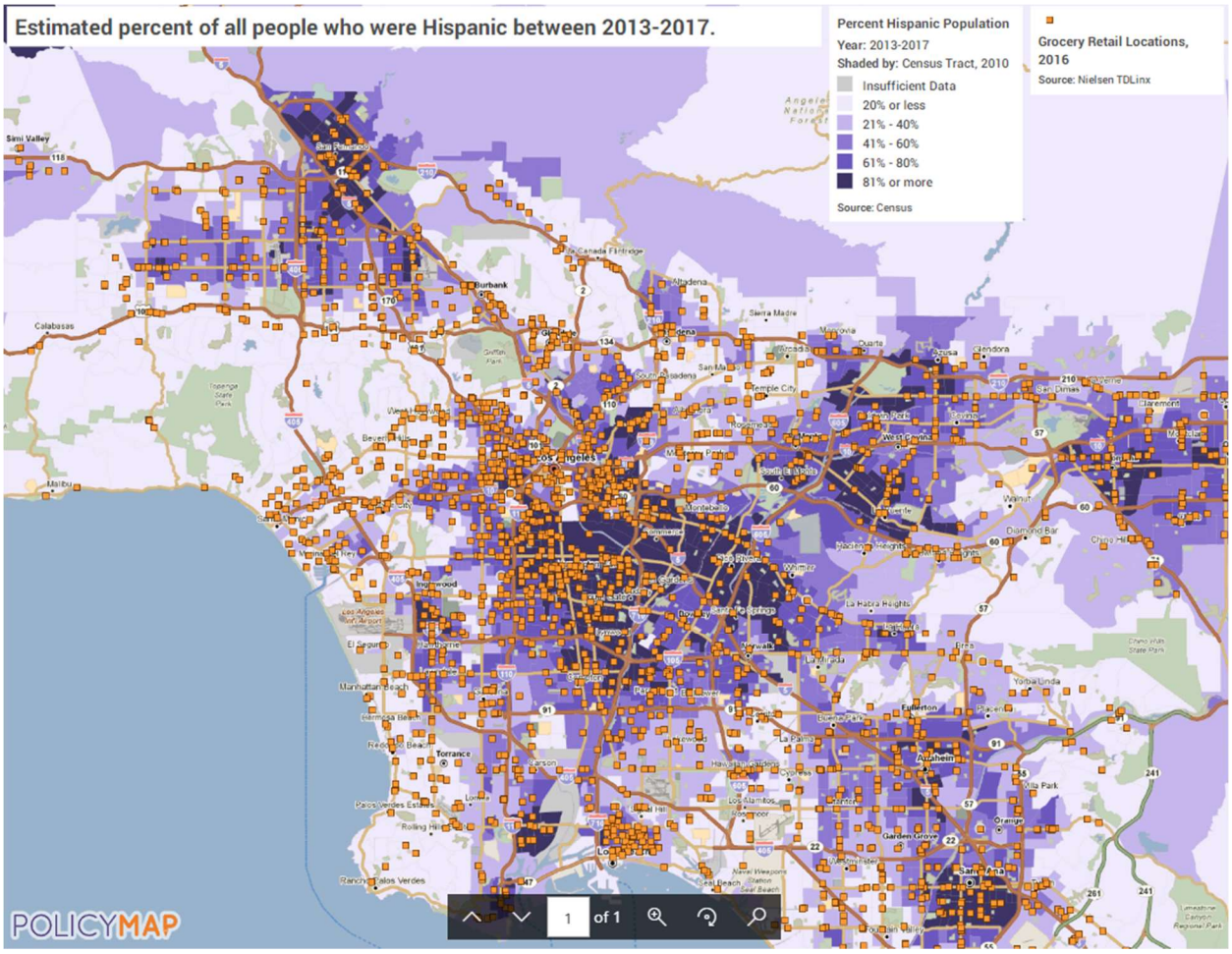

Figure 2. Identifying Food Deserts – Mapping Grocery Retail Locations (all types) and Hispanic Population (estimated 2013-2017)

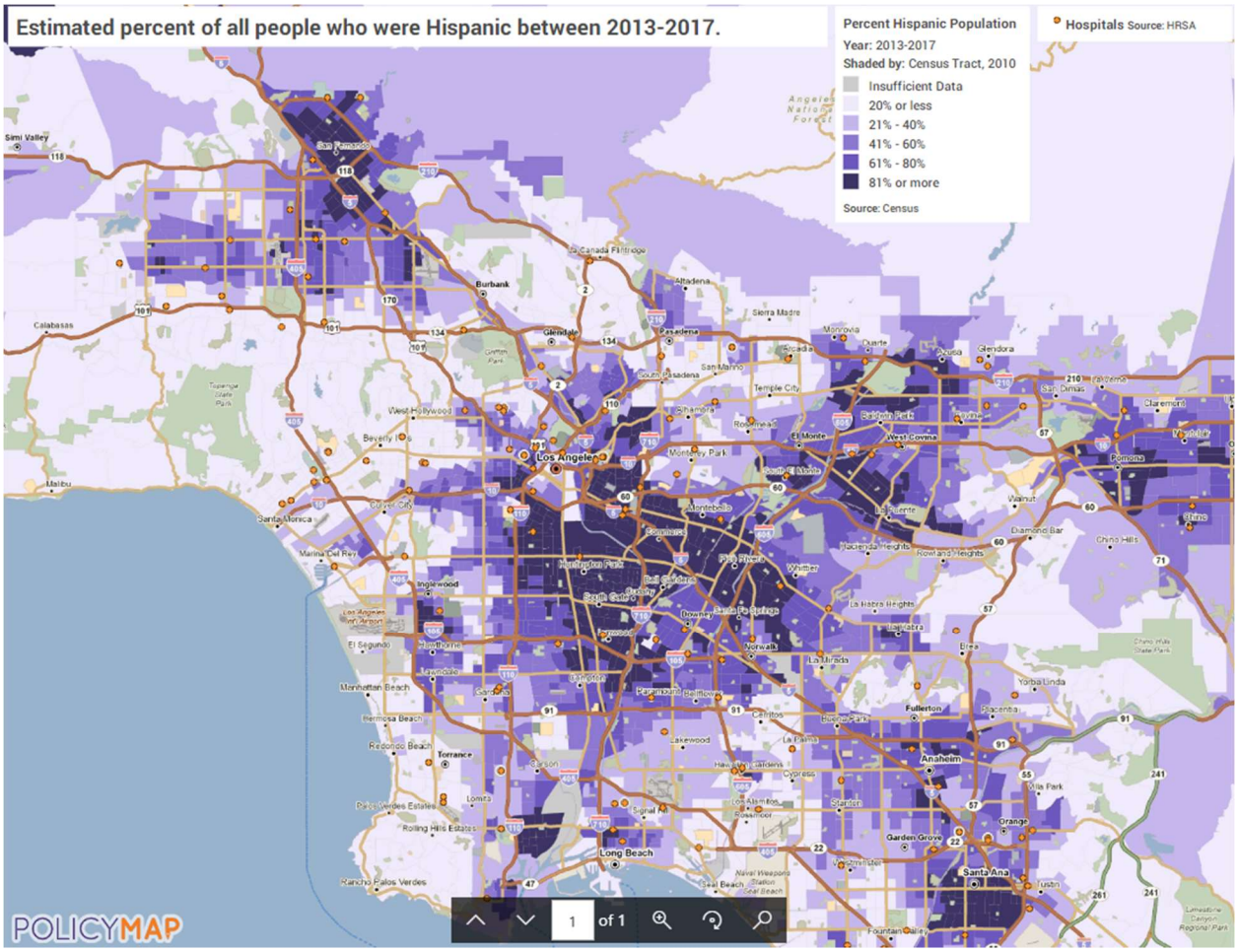

Figure 3. Hospital Locations and Hispanic Population (estimated 2013-2017)

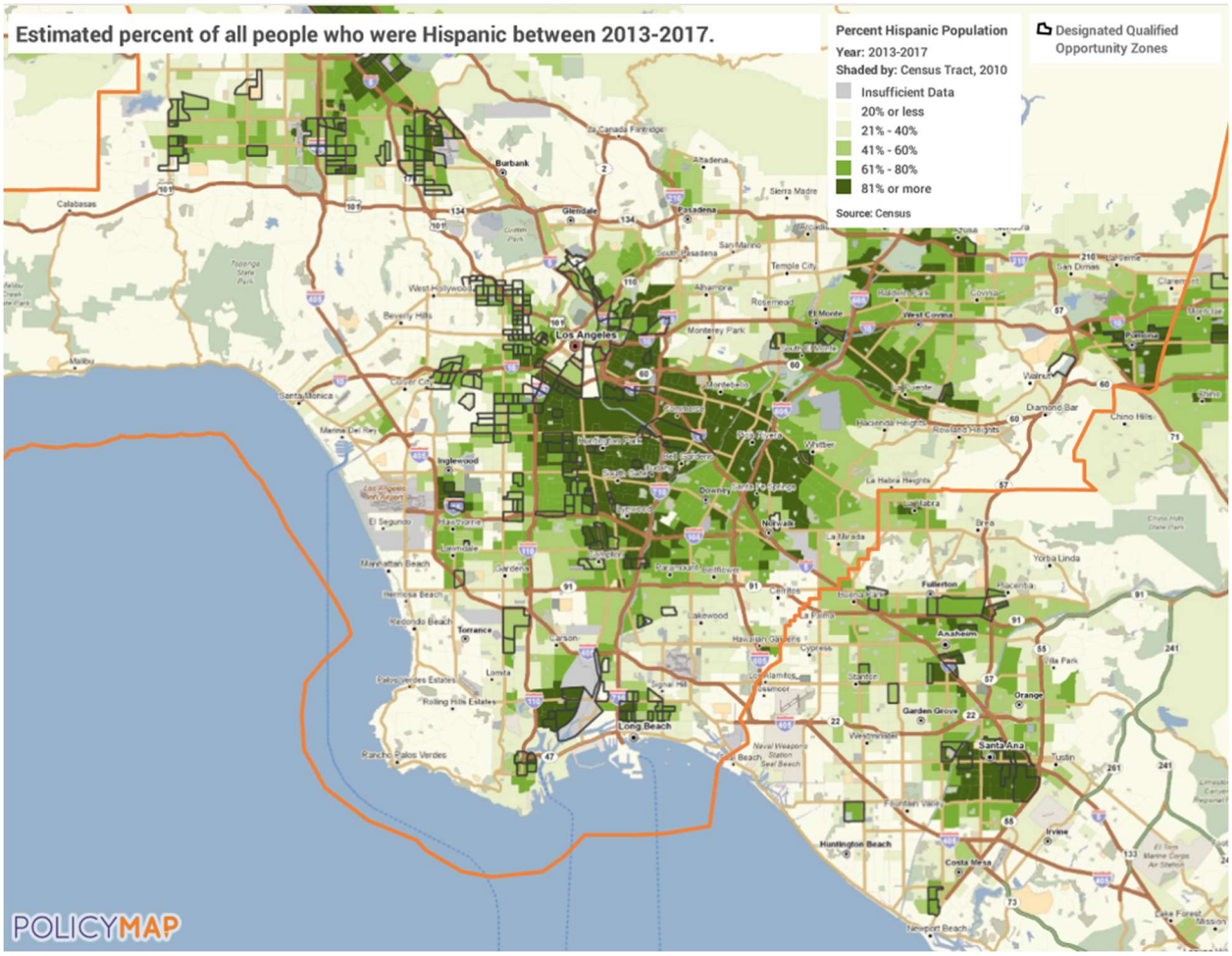

Figure 4. Designated Qualified Opportunity Zones (economic) and Hispanic Population (estimated 2013-2017)

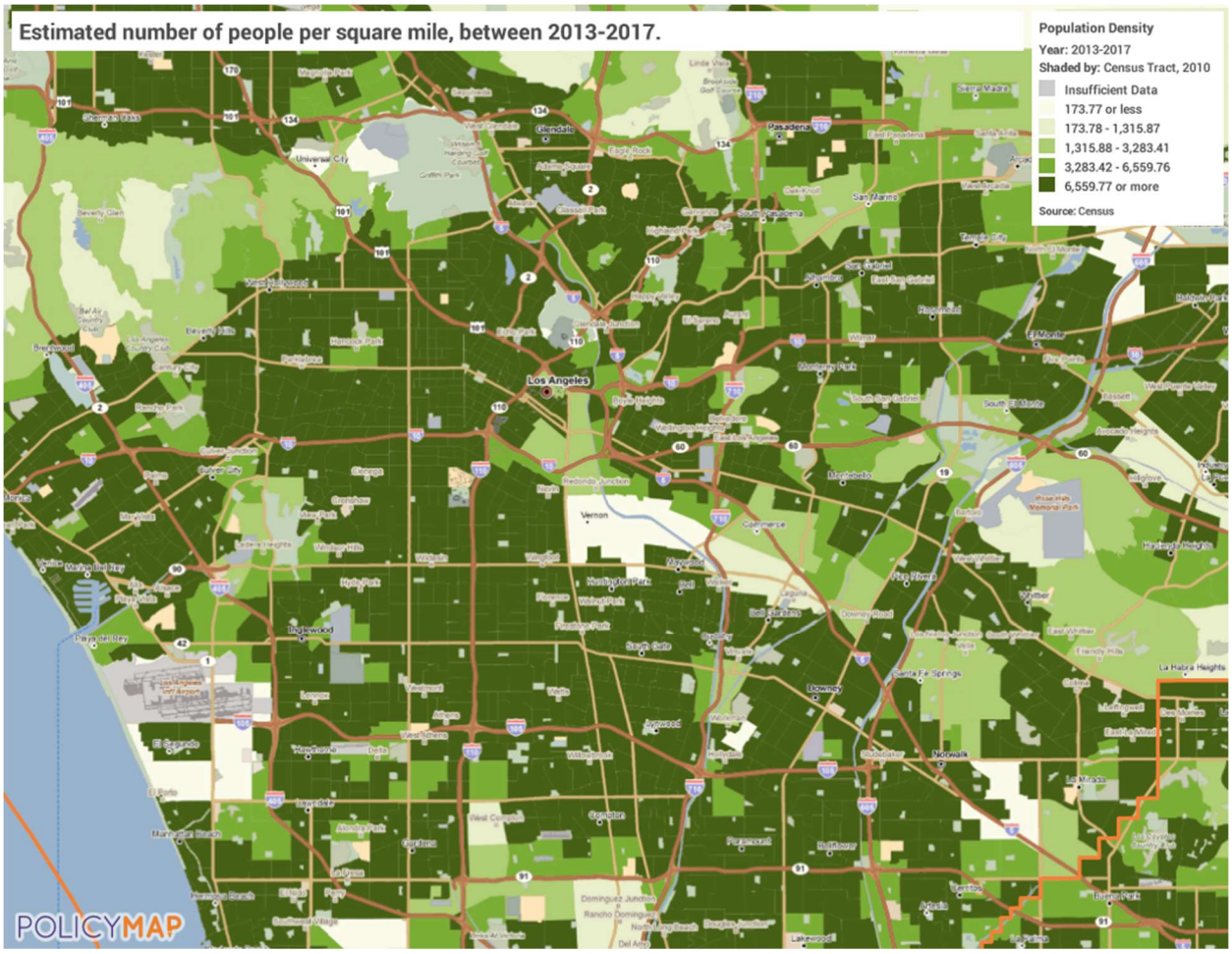

Figure 5. Comparison Map: Population Density – All Demographics (estimated 2013-2017)

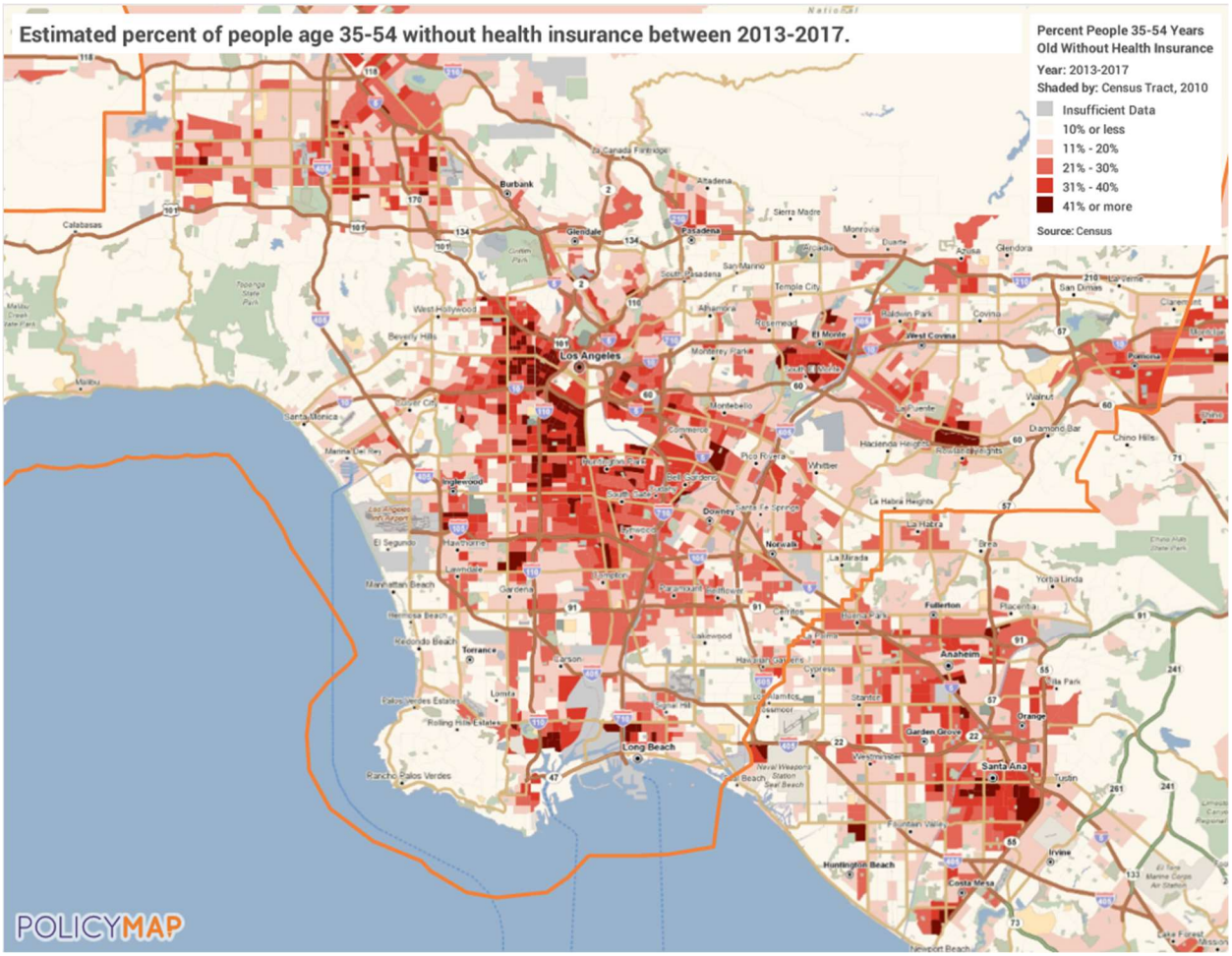

Figure 6. Comparison Map: All demographics: Estimated percent of people age 35-54 without health insurance between 2013-2017

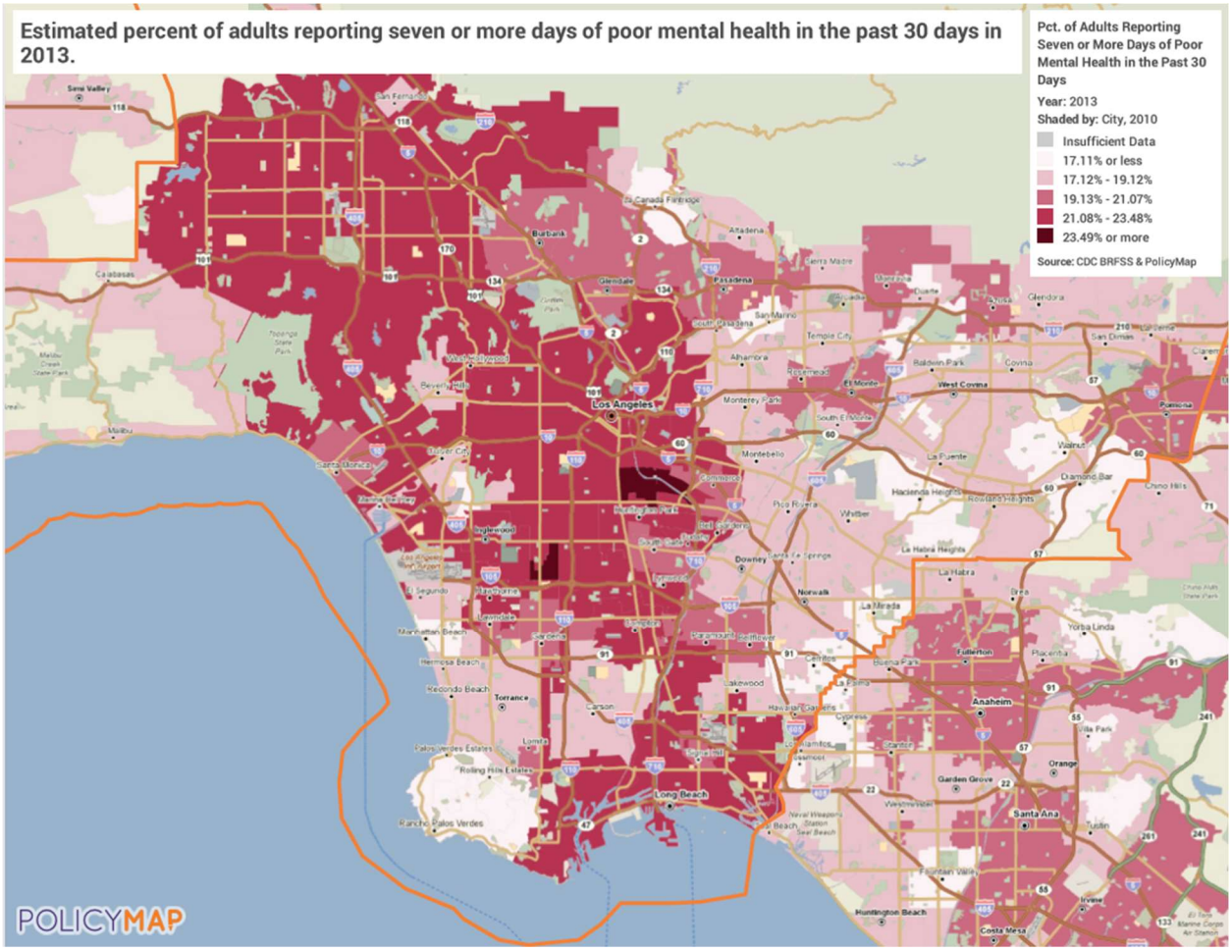

Figure 7. Comparison Map: Poor Mental Health – All Demographics – 2013

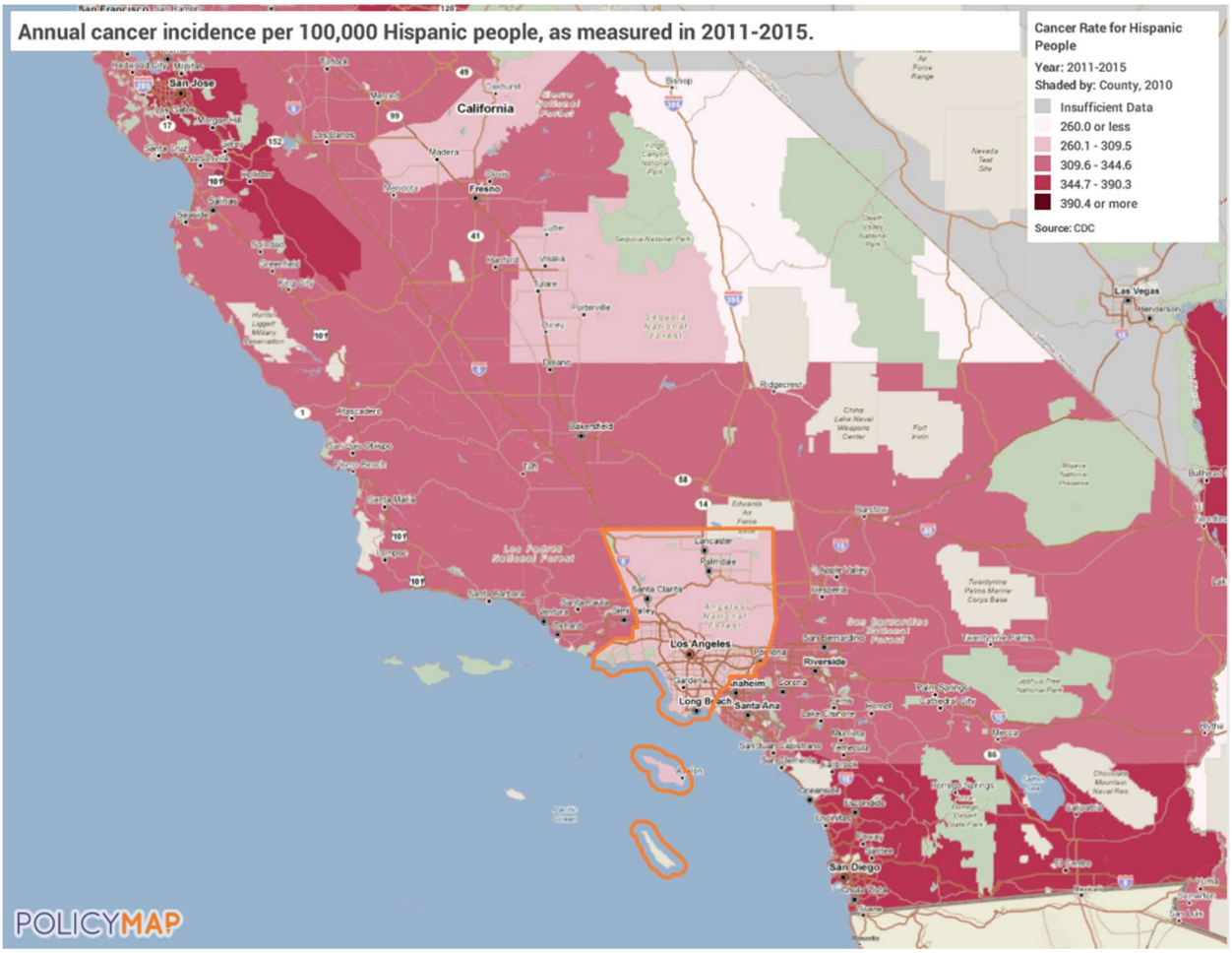

Figure 8. Annual Cancer Incidence by County for Hispanic Population (2011-2015)