

GIS Automated Delineation of Cancer Service Areas: Implications for Cancer Control in the U.S.



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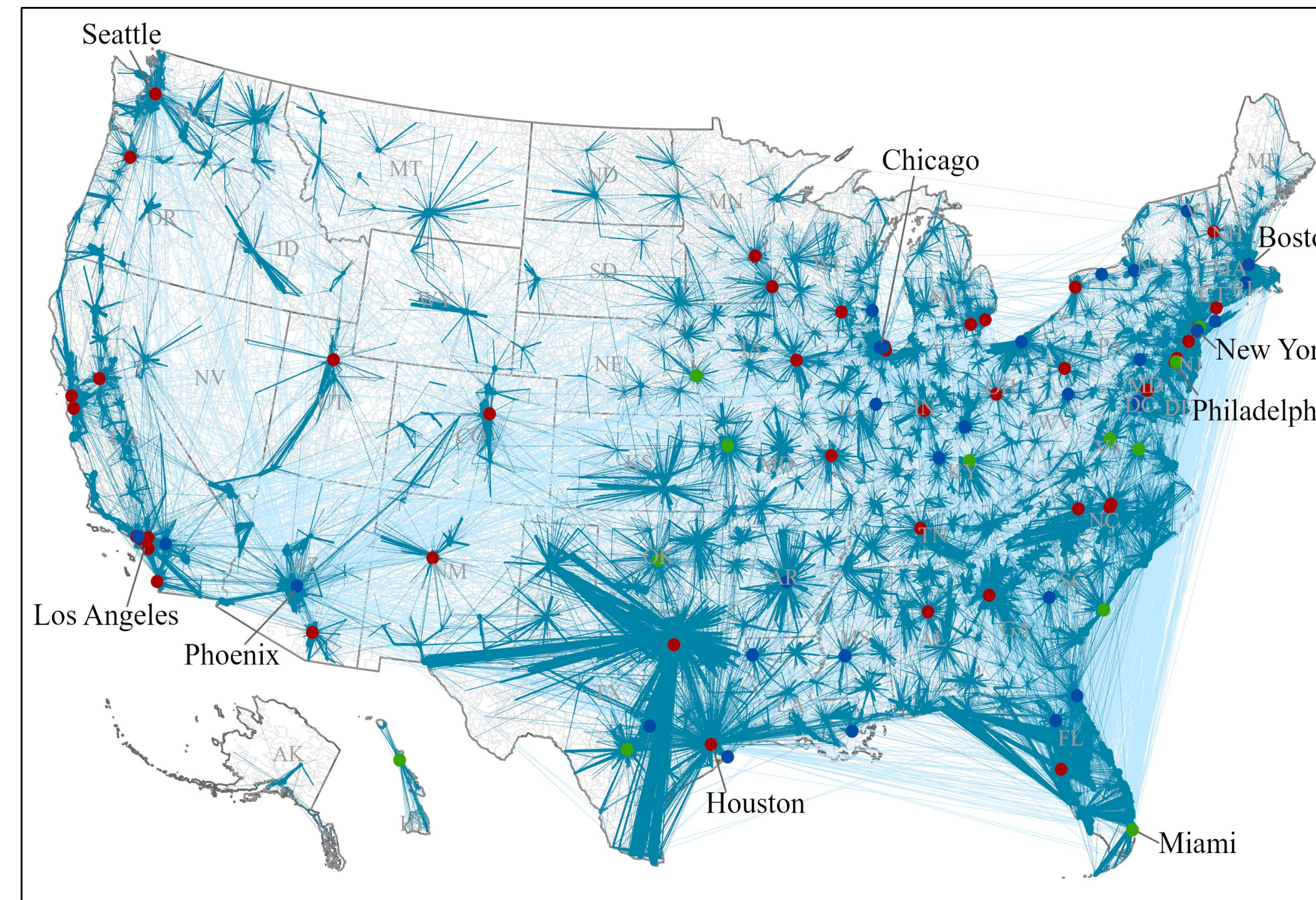
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Overview

- **Background:** The NCI catchment areas (CAs) and the popular Dartmouth hospital service areas (HSAs) have some methodological limitations, are not representative of all highly specialized cancer care markets, or fail to address where discrete or overlapping service areas form in the context of increasingly interwoven and integrated cancer care markets in the U.S.
- **Questions:**
 - 1) How to define discrete cancer service areas (CSAs)?
 - 2) Do overlapping CSAs exist? Where are they?
- **Contributions:**
 - 1) Develop two efficient and effective GIS methods and tools to delineate discrete and overlapping CSAs.
 - 2) Discrete CSAs are reliable and effective geographic units that can be used to study cancer care.
 - 3) Overlapping CSAs are formed in highly urbanized areas and help inform areas that need collaboration.

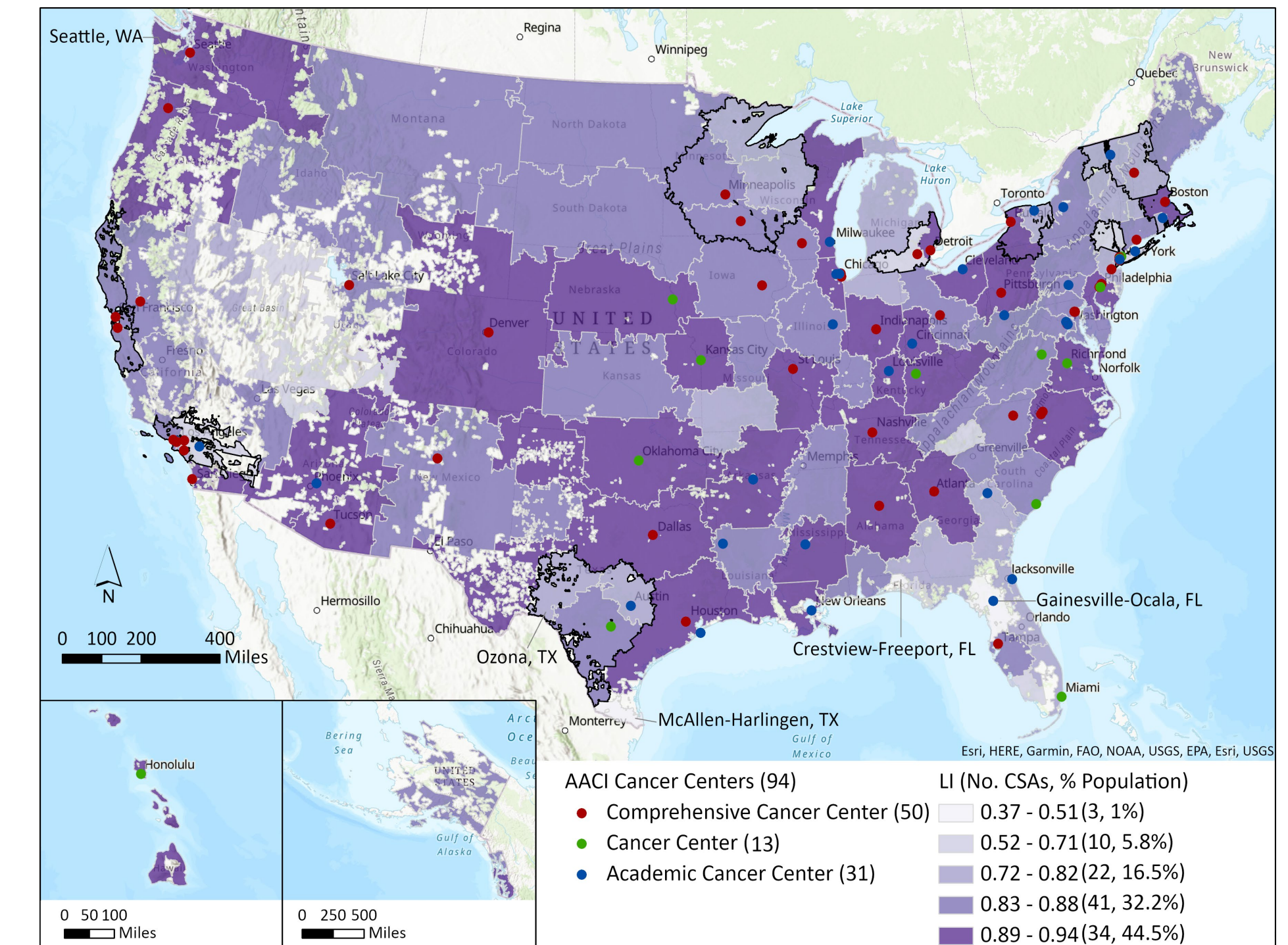
Medicare Data

- 94 AACI cancer centers, including NCI-designated.
- Medicare enrollment and claims data (2014-2015).



110 Discrete CSAs

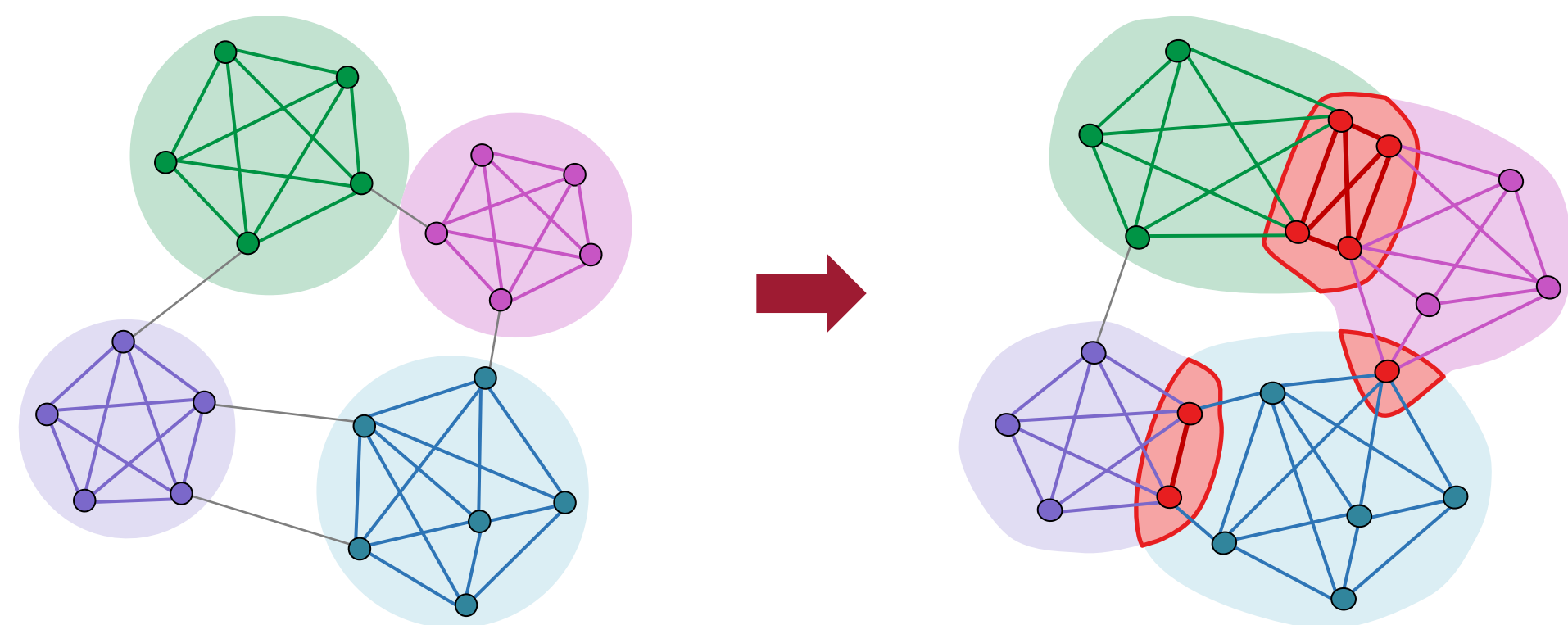
- Mean LI = 0.83 and average travel time = 112 minutes.
- 73 CSAs have ≥ 1 cancer centers and 84% of population.



GIS Methods and Tools

ScLeiden to delineate discrete CSAs

ScSLPA to delineate overlapping CSAs



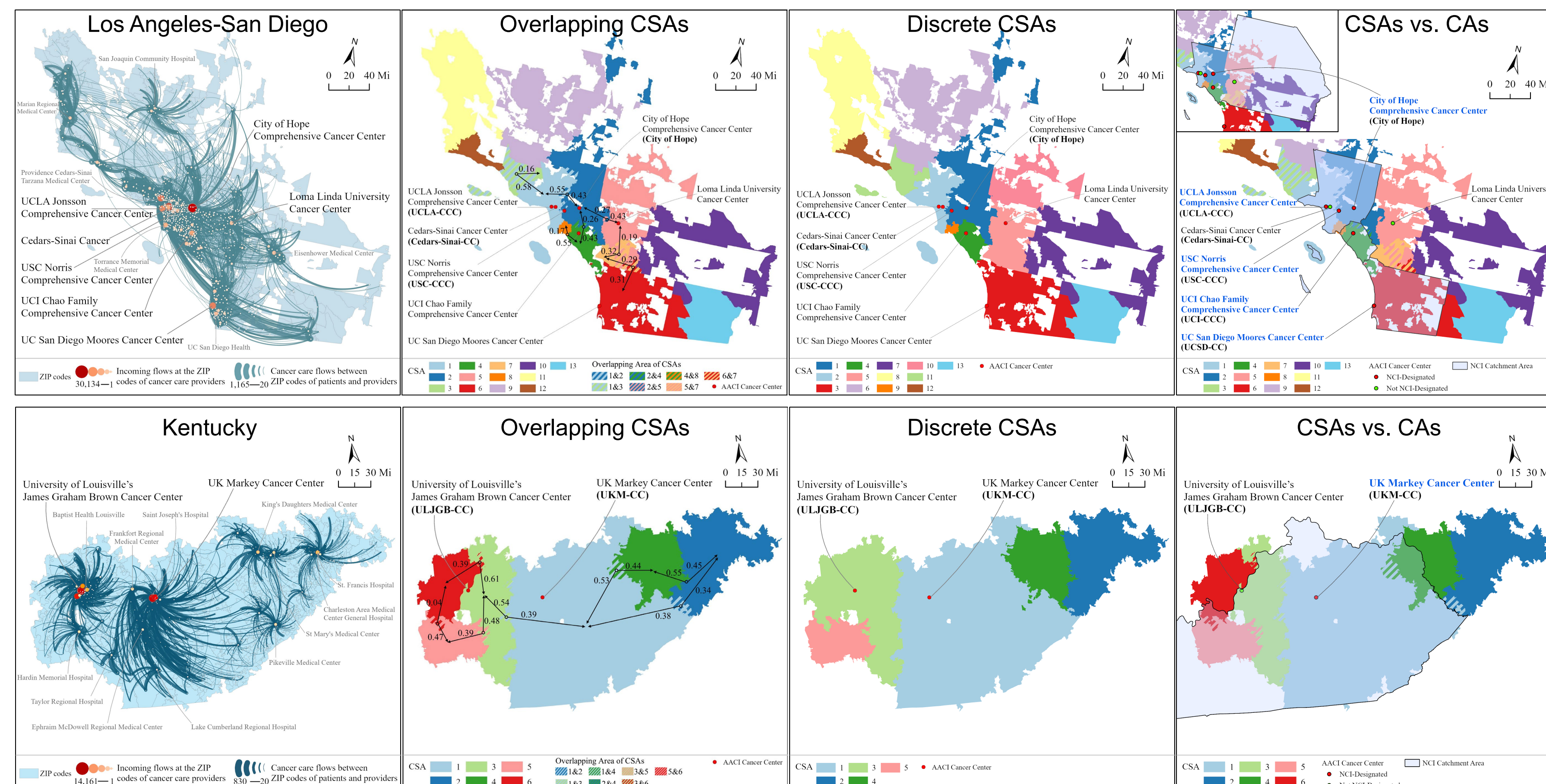
Legend
 ● Node (i.e., ZIP code of patients or care facilities)
 — Edge (e.g., number of care claims)

➤ GIS tools and CSAs data can be found on my website (Scan QR code on the top right!)

Acknowledgments

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Overlapping CSAs in Highly and Lesser Urbanized Areas



- Overlapping CSAs tend to form in highly urbanized areas, with higher LI, larger populations, and shorter travel times.
- Discrete CSAs tend to form in lesser urbanized areas.
- Only two CSAs in Los Angeles-San Diego are consistent with the NCI CAs, and other CSAs are much smaller.