Department of Family Medicine

A novel mixed method using Geographic Information Systems (GIS) and ethnographic methods to study disparities in cervical cancer mortality in Hispanic women

Autumn Kieber-Emmons MD, MPH
Lehigh Valley Health Network, Autumn.Kieber-Emmons@lvhn.org

William L. Miller MD, MA
Lehigh Valley Health Network, william.miller@lvhn.org

Benjamin F. Crabtree PhD

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A novel mixed method using Geographic Information Systems (GIS) and ethnographic methods to study disparities in cervical cancer mortality in Hispanic women

Autumn M. Kieber-Emmons, MD, MPH,[1,2] William L. Miller, MD, MA,[1,2] Benjamin F. Crabtree, PhD[3]

[1]Lehigh Valley Health Network Department of Family Medicine, Allentown, PA, [2]University of South Florida School of Medicine, [3]Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ

BACKGROUND

There are currently 16 million cancer survivors in the U.S. with many individuals having a history of cancer and living longer, healthier lives. However, disparities in cancer survivorship management, coordination and quality of care are apparent in the literature, including in primary care where many survivors access care

OBJECTIVE

To investigate cancer survivorship mortality disparities seen with cervical cancer in Hispanic women through the comparative study of three Texas counties

NEW METHODS

fRAP

Sequential mixed methods design using quantitative GIS and qualitative participant observation and key informant interviews to investigate cervical cancer disparities among cervical cancer survivors. Data used to create GIS maps for Phase I are drawn from large open-access census level repositories, as well as from the Texas level repositories.

Outcomes Measures: We seek to identify barriers and facilitators of high quality cancer survivorship care at three levels:

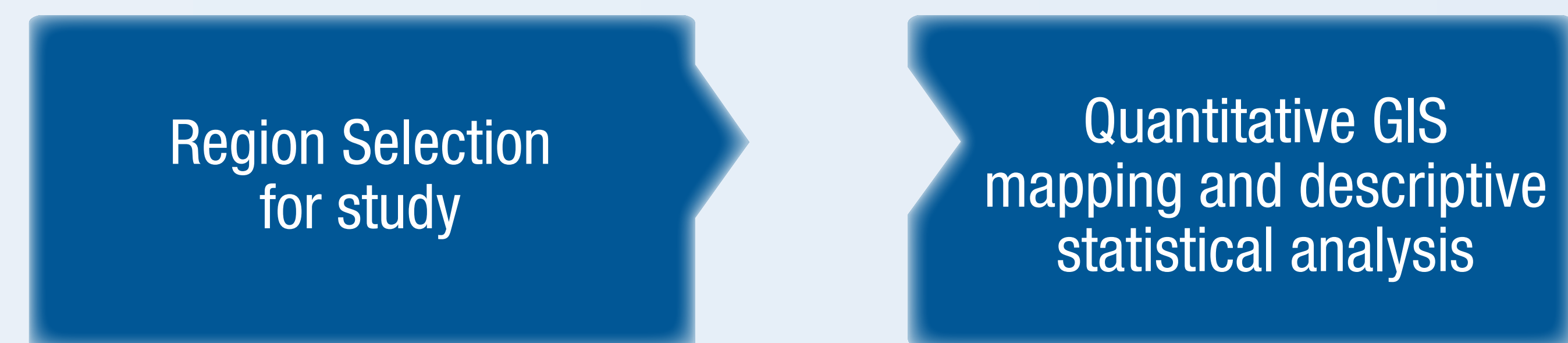1) community   2) care delivery (medical)   3) policy
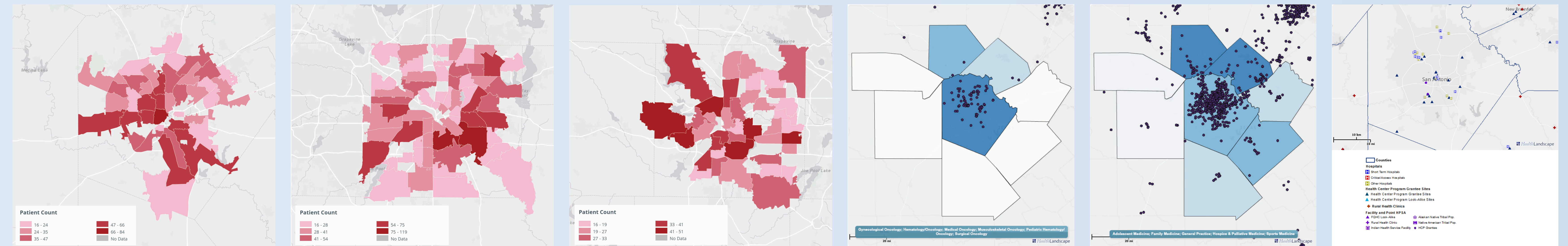
Bexar County All Cervical Cancer Cases   Dallas County All Cervical Cancer Cases   Tarrant County All Cervical Cancer Cases

PHASE I: quantitative phase of the methods - county and zcta level differences through GIS mapping

Region Selection for study → Quantitative GIS mapping and descriptive statistical analysis

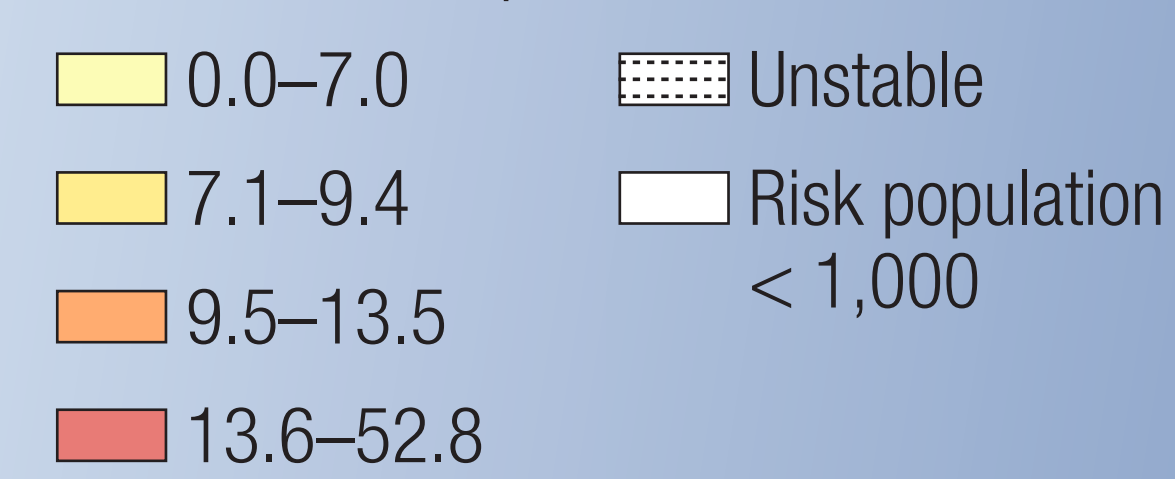Region selection for the study determined by the public health issue under investigation

GIS Mapping to county level for both social determinants of health and access points for medical care

Total Population	Dallas County 2,618,148	Tarrant County 2,054,475	Bexar County 1,958,578	Texas 28,304,596
Cervical Cancer Mortality Rate – Hispanic (2009–2013)*	3.7%	5.2%	3.4%	3.3%
Cervical Cancer Mortality Rate – White Non-Hispanic (2009–2013)*	3.0%	2.6%	1.7%	2.3%
Cervical Cancer Incidence Rate – Hispanic (2009–2013)**	13.8%	13.3%	11.1%	11.2%
Cervical Cancer Incidence Rate – White Non-Hispanic (2009–2013)**	9.1%	8.1%	8.4%	8.3%

Source: National Cancer Institute, State Cancer Profiles https://statecancerprofiles.cancer.gov/index.html

*Mortality Rates are Age-Adjusted, Annual per 100,000
**Incidence Rates are Age-Adjusted, Annual Cases per 100,000
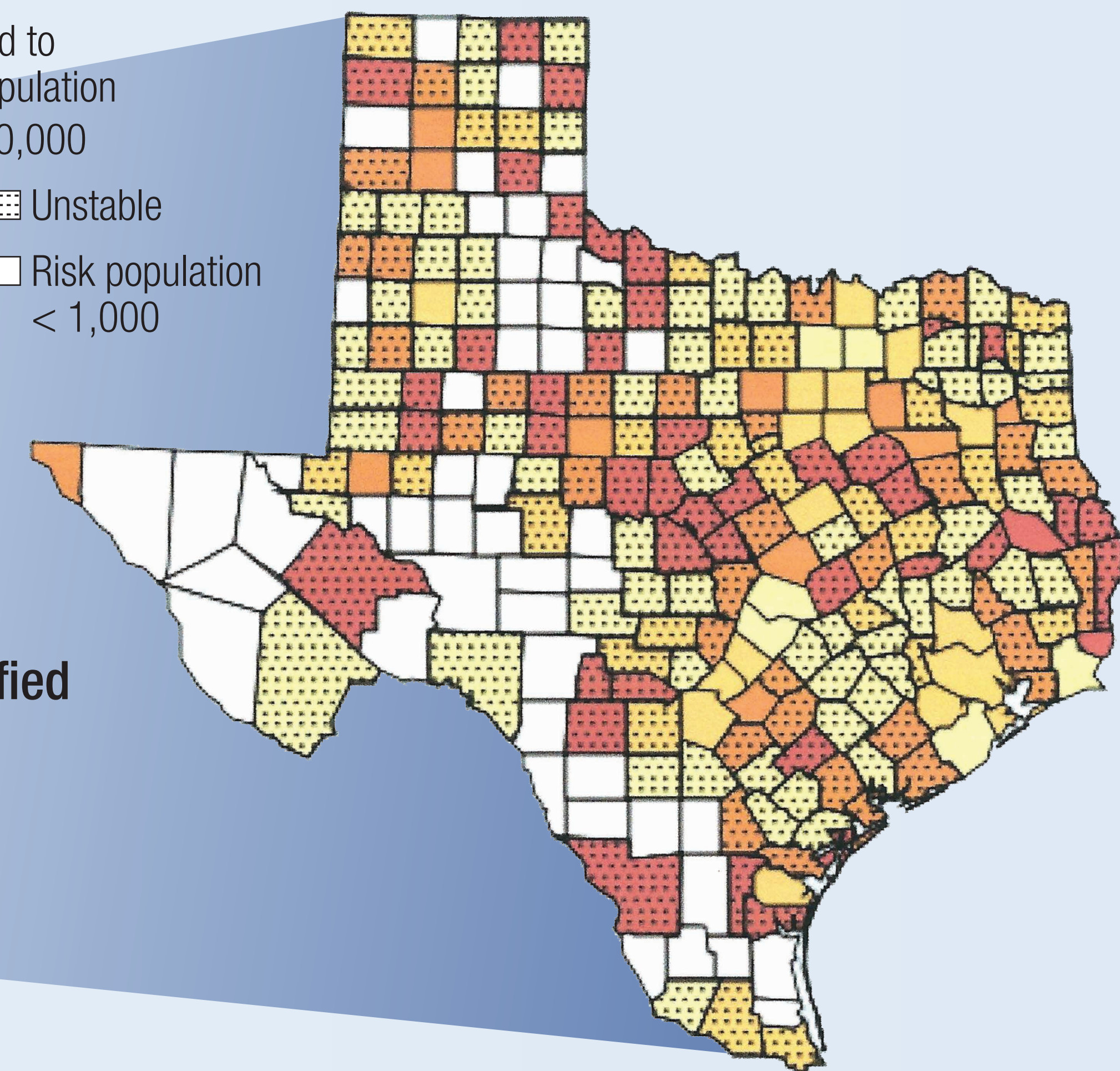
Examples of Quantitative Phase to Identify County and ZCTA level differences through GIS Mapping:

Age-Adjusted Invasive Cancer Incidence Rates in Texas
Cervix Uteri, NH White, 2010–2014

By County, Age-adjusted to 2000 U.S. Standard Population
Texas Rate: 8.5/per 100,000

- 0.0–7.0
- 7.1–9.4
- 9.5–13.5
- 13.6–52.8
- Unstable
- Risk population < 1,000

3 Counties with Different Disparity Profiles were Identified

PHASE II: qualitative phase of the methods investigating cancer survivorship and identifying potential change targets

Qualitative Data Collection → Qualitative Data Analysis
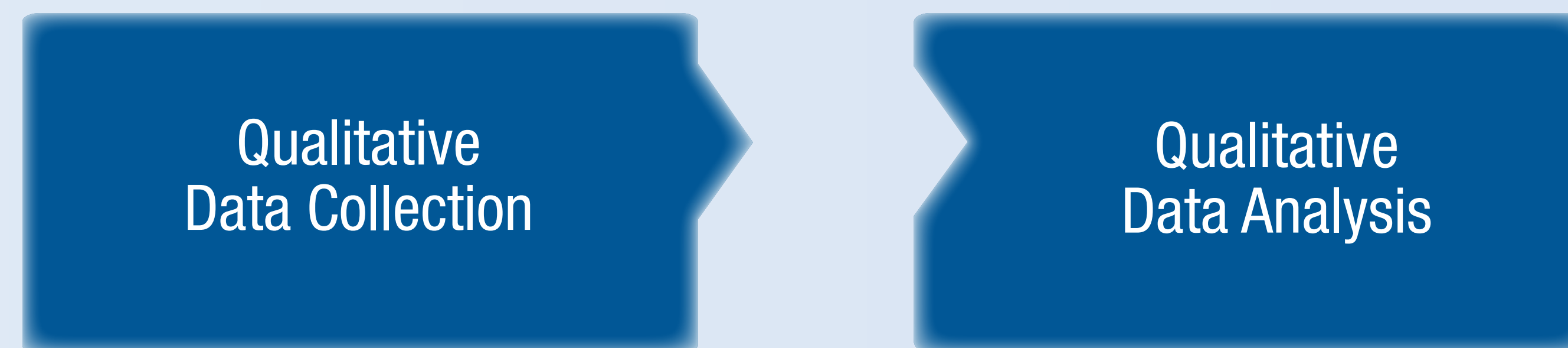
Community exploration
Key informant interviews
- neighborhood   • medical
- community   • policy
Participant observation time in each community

Immersion/crystallization
Thematic development
Cross-level and cross-region comparisons

Examples of Phase II qualitative phase procedures:
- Qualitative Week-long Immersion visits to each county
- Key Informant Interviews
- Participant Observation
- Community Drive-Throughs
- Field Notes

RESULTS

Within three counties in Texas, variability exists in the cervical cancer survivorship care delivery and coordination. Community Assessment Profiles (CAP) of these differences were created for each county using different mapping tools. CAPs then serve to guide the qualitative Phase II of the methods utilizing on the ground participant observation and key informant interviews in Dallas, Fort Worth, and Bexar counties. Development of this method has included learning throughout the quantitative phase regarding how best to utilize the GIS maps to pinpoint targets of interest (i.e. hot spots, cold spots, ZCTA, county level queries) with a low incidence disease like invasive cervical cancer.

CONCLUSIONS

GIS can help to showcase differences at county and ZCTA-level data related to cervical cancer care delivery. Quantitative CAPs can help focus qualitative research to best understand cervical cancer mortality disparities seen in Hispanic women.

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