

Using Geographic Information Systems to Investigate the Relationship Between Local Health Department's Workforce Cuts and Vulnerable Populations

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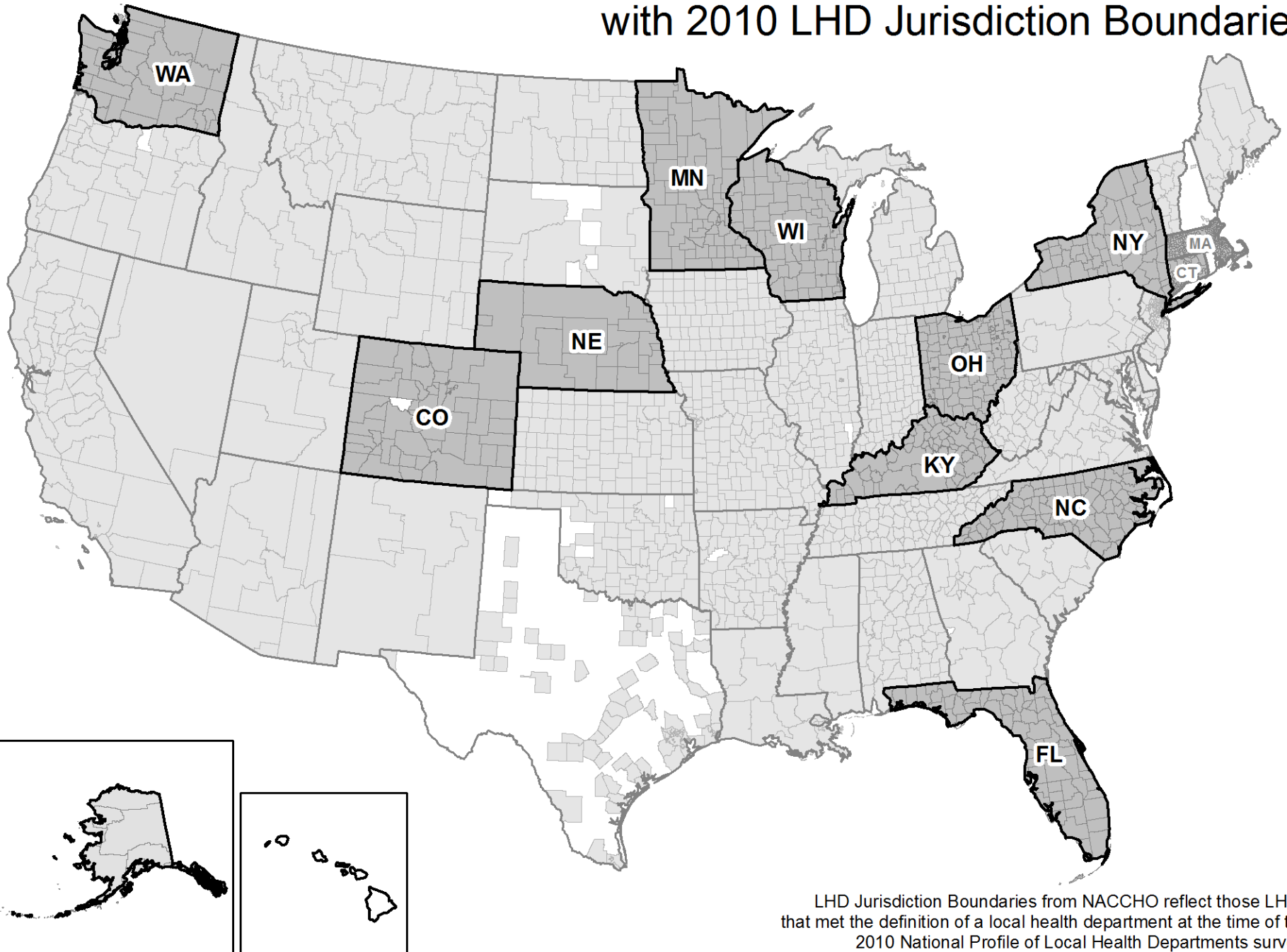
Introduction

- The nation's financial crisis has forced local, state, and federal public health agencies to make dramatic service and system cuts.
- Since 2008, local health departments (LHDs) in the United States (US) have cut nearly 40,000 workers (NACCHO, 2012).
- In the second half of 2011, more than half of LHDs in 17 states lost staff (NACCHO, 2012).
- Forty-four percent of LHDs lost at least one staff to layoffs or attrition in 2011, and 62% of the US population lives in a jurisdiction impacted by these cuts (NACCHO, 2012).

Introduction (cont'd)

- It is unclear how changes in the size of LHD workforce due to cuts may have impacted the distribution of workers in geographic areas with the most vulnerable populations.
- Exploring the relationship between LHD workforce cuts and sociodemographic characteristics across geographic areas is of particular salience to Public Health Systems and Services Research and practice-based research regarding LHD workforce, social determinants of health, and health disparities.

Workforce Study subset of PHAST States with 2010 LHD Jurisdiction Boundaries

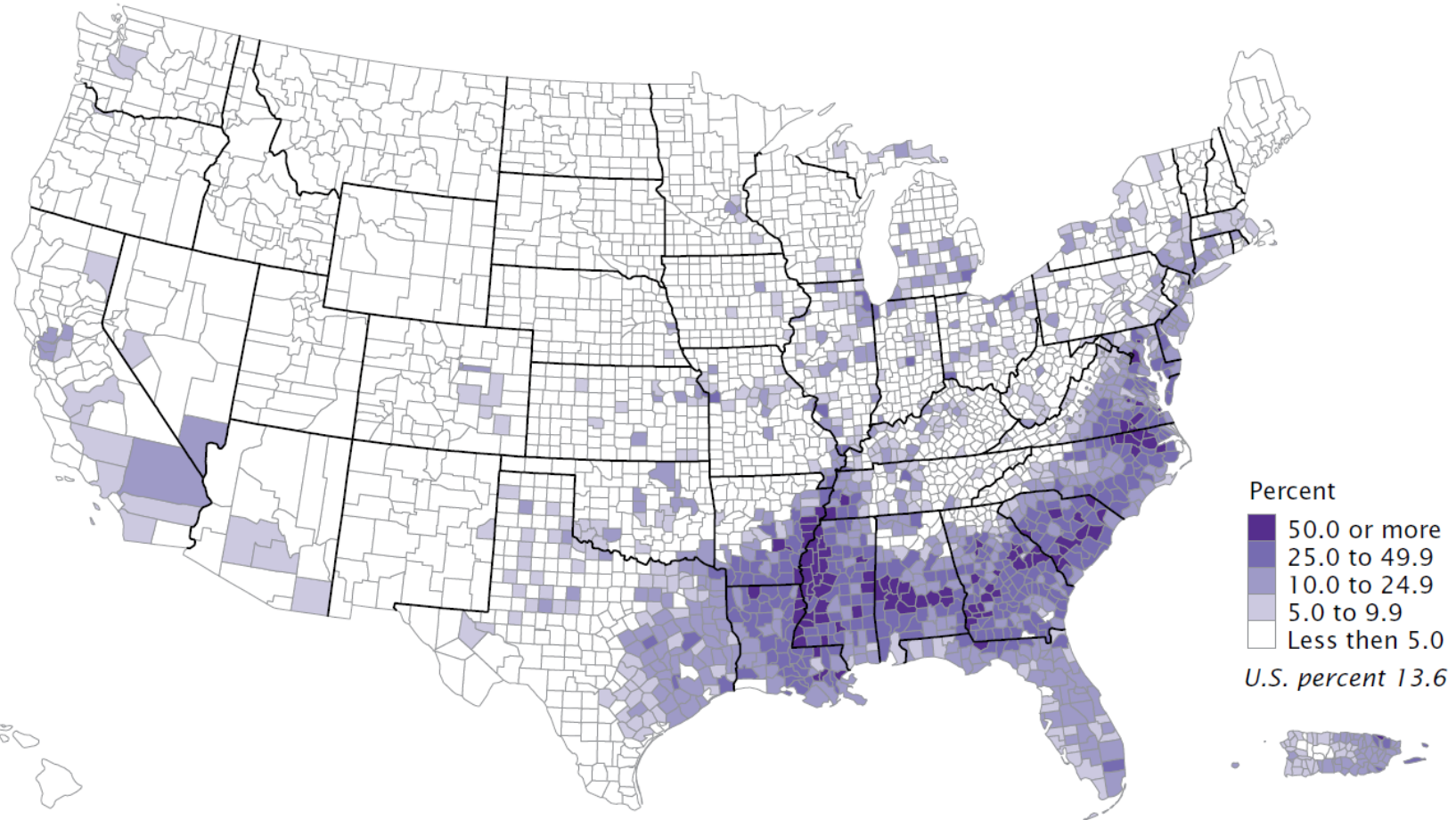


LHD Jurisdiction Boundaries from NACCHO reflect those LHDs that met the definition of a local health department at the time of the 2010 National Profile of Local Health Departments surveys

Black or African American Population as a Percent of County Population: 2010

(For information on confidentiality protection, nonsampling error, and definitions, see www.census.gov/prod/cen2010/doc/pl94-171.pdf)

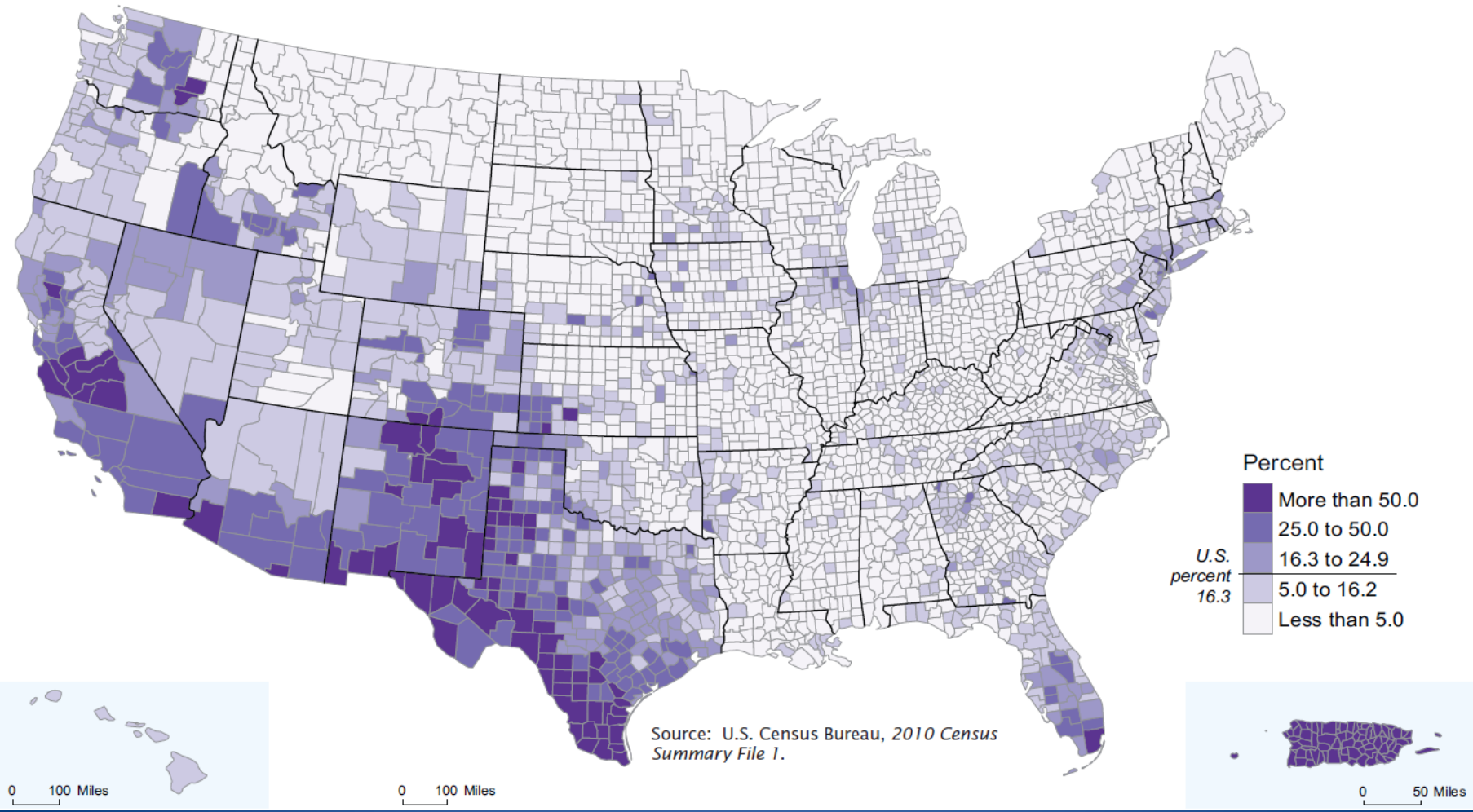
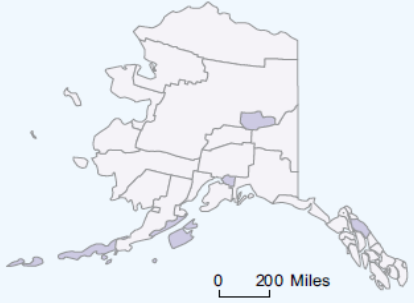
Black or African American Alone or in Combination



Source: U.S. Census Bureau, 2010 Census Redistricting Data (Public Law 94-171) Summary File, Table P1.

Figure 5.
Hispanic or Latino Population as a Percent of Total Population by County: 2010

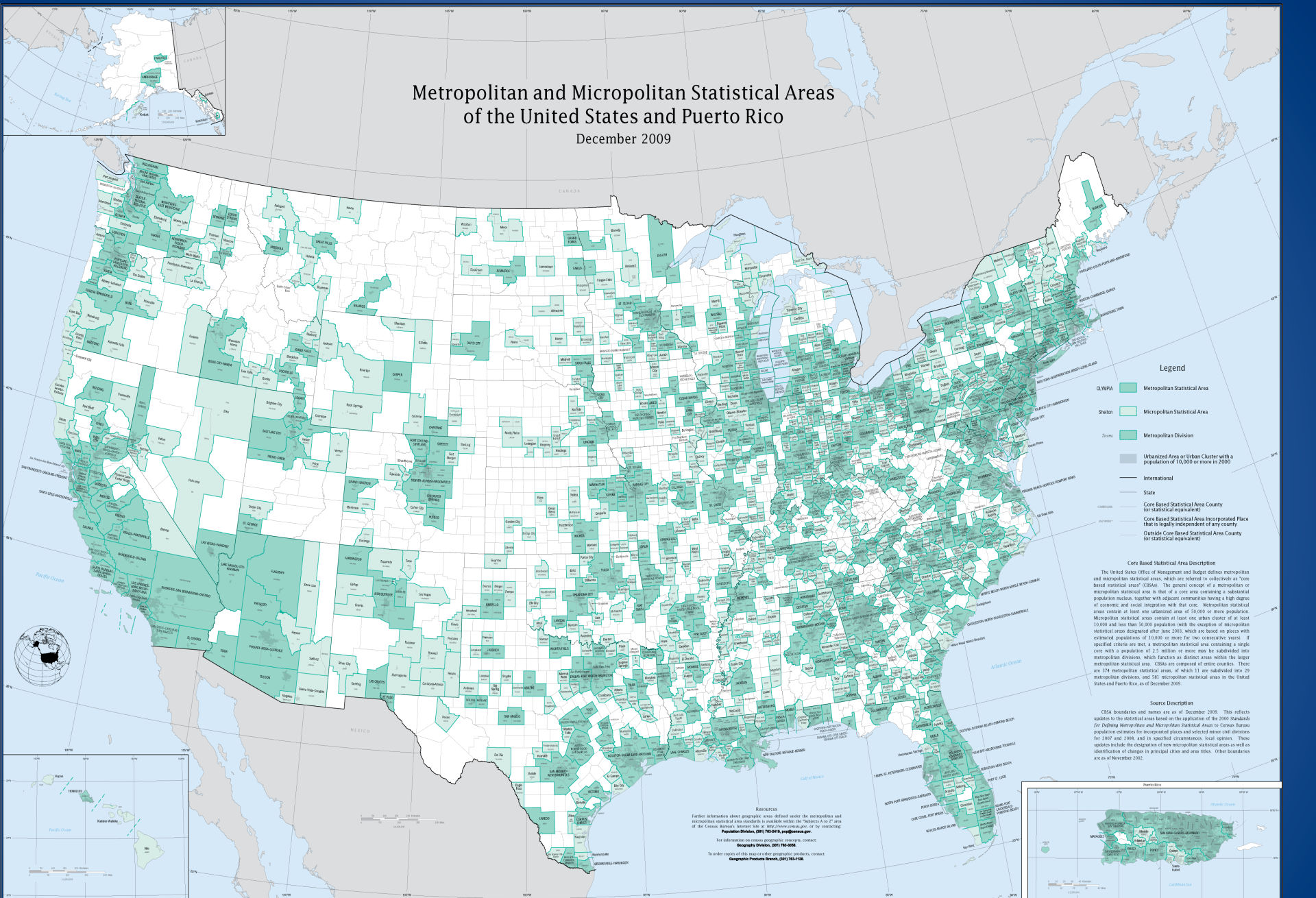
(For information on confidentiality protection, nonsampling error, and definitions, see www.census.gov/prod/cen2010/doc/sf1.pdf)



Source: U.S. Census Bureau, 2010 Census Summary File 1.

Metropolitan and Micropolitan Statistical Areas of the United States and Puerto Rico

December 2009



Legend

- Metropolitan Statistical Area
- Micropolitan Statistical Area
- Metropolitan Division
- Urbanized Area or Urban Cluster with a population of 10,000 or more in 2000
- International
- State
- Core Based Statistical Area County (or statistical equivalent)
- Core Based Statistical Area Incorporated Place that is health independent of any county
- Outside Core Based Statistical Area County (or statistical equivalent)

Core Based Statistical Area Description

The United States Office of Management and Budget defines metropolitan and micropolitan statistical areas, which are referred to collectively as "core based statistical areas" (CBSAs). The general concept of a metropolitan or micropolitan statistical area is that of a core area containing a substantial population nucleus, together with adjacent communities having a high degree of economic and social integration with that core. Metropolitan statistical areas contain at least one urbanized area of 50,000 or more population. Micropolitan statistical areas contain at least one urban cluster of at least 10,000 and less than 50,000 population with the exception of micropolitan statistical areas designated after June 2003, which are based on places with estimated populations of 10,000 or more for two consecutive years. If specified criteria are met, a micropolitan statistical area containing a single core with a population of 2.5 million or more may be subdivided into metropolitan divisions, which function as distinct areas within the larger metropolitan statistical area. CBSAs are composed of entire counties. There are 174 metropolitan statistical areas, of which 11 are subdivided into 29 metropolitan divisions, and 181 micropolitan statistical areas in the United States and Puerto Rico, as of December 2009.

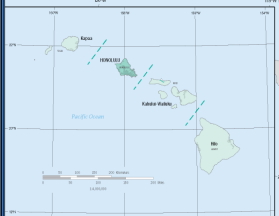
Source Description

CBSA boundaries and names are as of December 2009. This reflects updates to the statistical areas based on the application of the 2000 Standards for Defining Metropolitan and Micropolitan Statistical Areas to Census Bureau population estimates for incorporated places and selected census tract cores for 2007 and 2008, and in specified circumstances, local options. These updates include the designation of new micropolitan statistical areas as an identification of changes in principal cities and area titles. Other boundaries are as of November 2002.

Resources

Further information about geographic areas defined under the metropolitan and micropolitan statistical area standards is available under the "History" or "C" area of the Census Bureau Internet Site at <http://www.census.gov/ipeds/www/> or by contacting:
Geography Division, (202) 755-2800
Population Division, (202) 755-2810, ipeds@cen.gov

For information on census geographic concepts, contact:
Geography Division, (202) 755-2800
 To order copies of this map or other geographic products, contact:
Geographic Products Branch, (202) 755-1100



Specific Aims

- 1) Describe nationwide patterns of decline in the LHD workforce by mapping changes in full-time equivalents per capita.
- 2) Examine distribution of LHD FTE cuts relative to distribution of vulnerable populations.
- 3) Determine whether there are significant clusters of changes in per capita LHD FTEs associated with changes in sociodemographic characteristics across selected contiguous states.

Conceptual Model

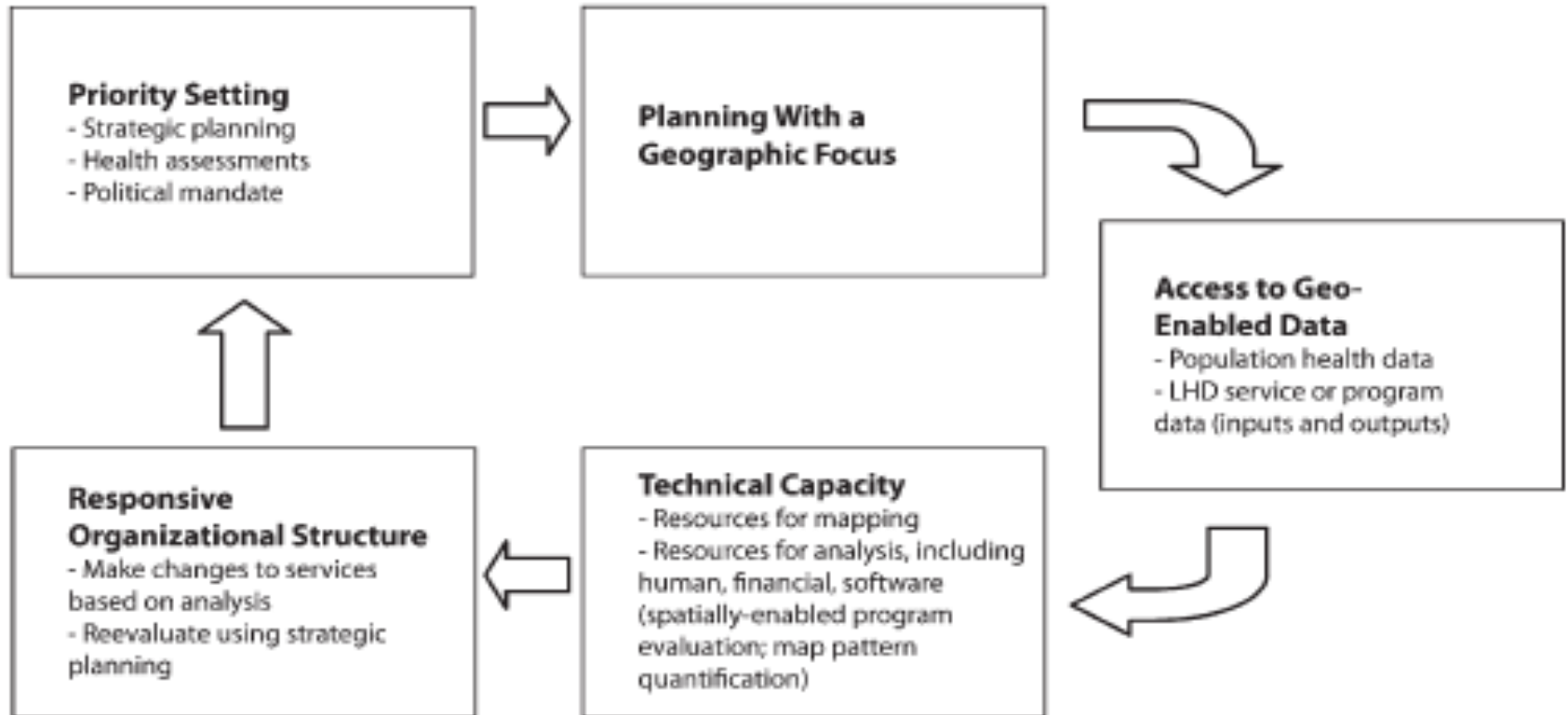


FIGURE 1—Critical factors enabling local health departments (LHDs) to map population health needs and public health program efforts.

Methods

- Retrospective, secondary data
- National Association of City and County Health Officials (NACCHO) Profile Survey
- Geographic Information Systems (GIS)
 - Census
 - Black/African American
 - Hispanic/Latino
 - Minority
 - Poverty
- Public Health Activities and Services Tracking (PHAST)

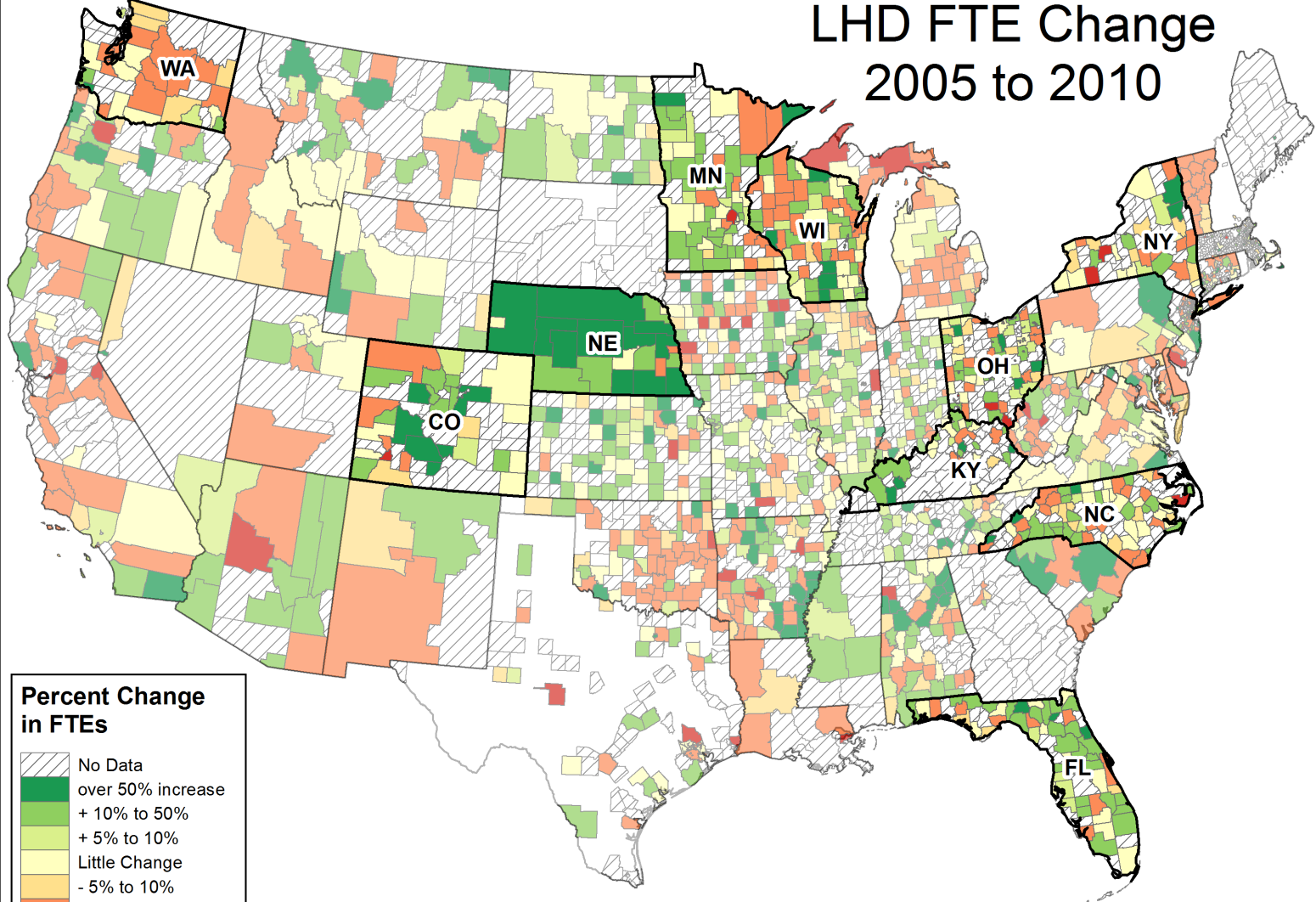
Methods (cont'd)

- 1) Mapping
- 2) Regression
- 3) Spatial analyses of clusters

Results

- Response rates:
 - 2005=82%
 - 2008=84%
 - 2010=82%
 - All 3 years=60%

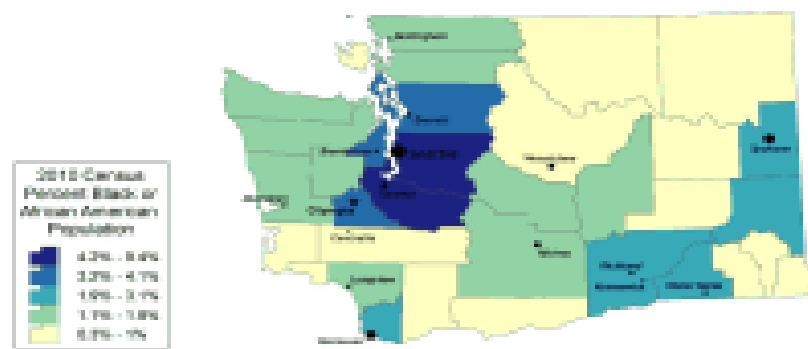
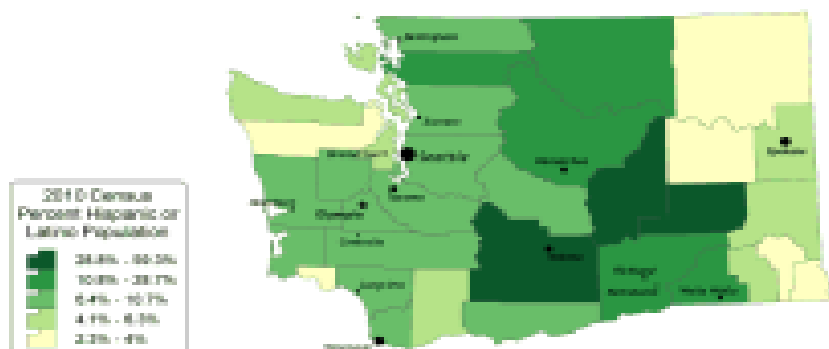
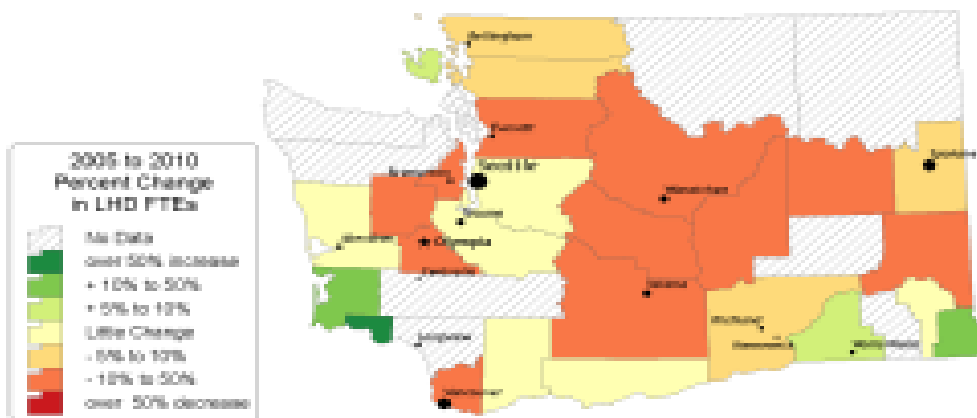
LHD FTE Change 2005 to 2010



Results

N=422	Model 1		Model 2		Model 3	
	Simple regression		Control for CBSA		Control for CBSA +States	
	Coefficient	P	Coefficient	P	Coefficient	P
% Black	-.448	.072	-.361	.152	-.573*	.026
% Hispanic	.841*	.008	.942*	.003	.748*	.024
% Minority	.009	.957	.082	.642	-.068	.710
% Poverty	.594	.288	.325	.569	-.005	.994

Washington State - %Change in LHD FTE and Race



Conclusions

- Variation in percent change in FTEs among LHD workforce nationwide
- Substantial amounts of missing data

Conclusions

- Disproportionate reduction in percent change in FTEs among jurisdictions with high percent Black population when controlling for state factors and CBSA.
- Increase in percent change in FTEs among jurisdictions with high percent Hispanic population when controlling for state factors and CBSA.

Discussion

- Limitation: Missing data
- Continued, consistent data collection on LHD workforce warranted
- Additional practice-based research needed to explore:
 - Disproportionate impact on LHD workforce cuts among jurisdictions with high percent Black population
 - Growth of LHD workforce among jurisdictions with high percent Hispanic populations despite trends of decrease nationwide

Acknowledgements

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