

# Changes in the Number of Public Health Nurses in Local Health Departments: 2005-2013

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# Disclosures

No conflicts of interest disclose.



# Background

- Public health nurses are an important component of workforce in local health departments (LHDs).
- Public health nurses work with individuals and communities to offer expertise in clinical care and health promotion.
- In particular, public health nurses are core providers of public health services in rural communities.



# Background

- The National estimate of the public health workforce seems to project a reduction in the number of registered nurses for public health practices.
- Possible reasons may include:
  - a. Decreased funding
  - b. Change of LHD services or activities
  - c. Shortage of qualified public health professionals

# Study Purpose

- To examine changes in number of LHD nurses per 100,000 population and rural-urban variation in the changes during 2005-2013.
- To assess how LHD funding and provision of clinical services are related to change in number of nurses per 100,000 population.

# Study Method

**Design:** This study employed a longitudinal cohort research design.

**Data:** Four National Profile of Local Health Departments study datasets (2005, 2008, 2010, and 2013) were linked.

**Sample:** 901 LHDs that reported number of nurses in all four surveys

**Dependent variable:**

Number of LHD Nurses per 100,000 population

**Independent variables:**

- Total count of clinical services
- Expenditure per capita

**Other variable:**

- Rural-urban indicator
- Size of population served
- Governance type



# Measures of Clinical Services

Composite Variable	Services Included
Clinical preventive services	Adult immunizations, childhood immunizations, HIV screening, STD screening, tuberculosis screening, cancer screening, cardiovascular disease screening, diabetes screening, blood pressure screening, family planning, EPSTD services
Medical treatment services	HIV treatment, STD treatment, tuberculosis treatment, prenatal care, obstetrical services, primary care services, home health care, school based clinics
Specialty care services	Dental services, mental health services, substance abuse treatment

Mays GP, Smith S. Geographic variation in public health spending: correlates and consequences. *Health Serv Res.* 2009;44(5):1796-1817.



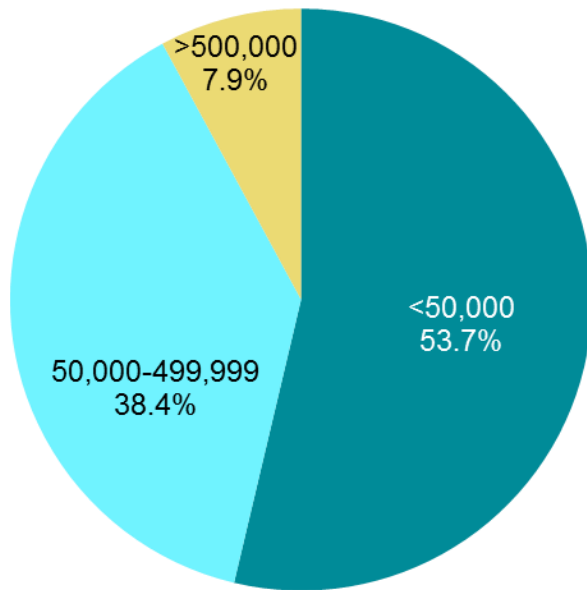


# Data Analysis

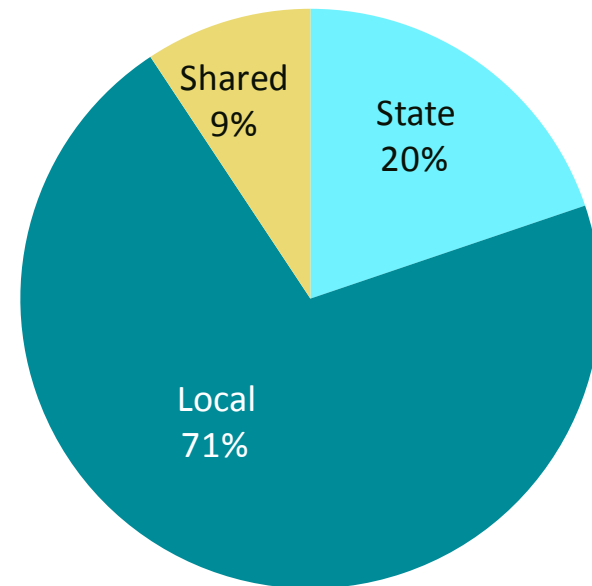
- Descriptive statistics
- Fixed effects model--to examine how changes in total count of clinical services and expenditure per capita may affect the number of nurses per 100,000 population

# Sample Description

Jurisdiction Population Categories

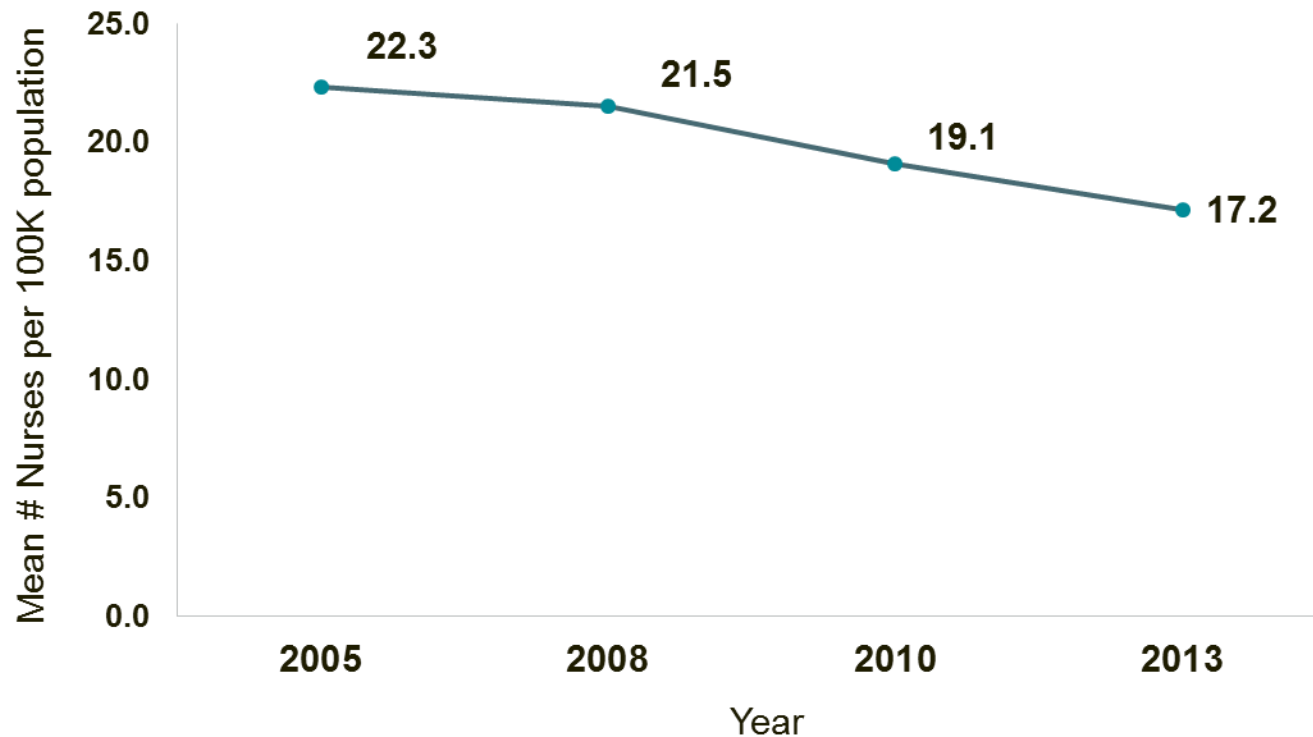


Governance Types



N=901

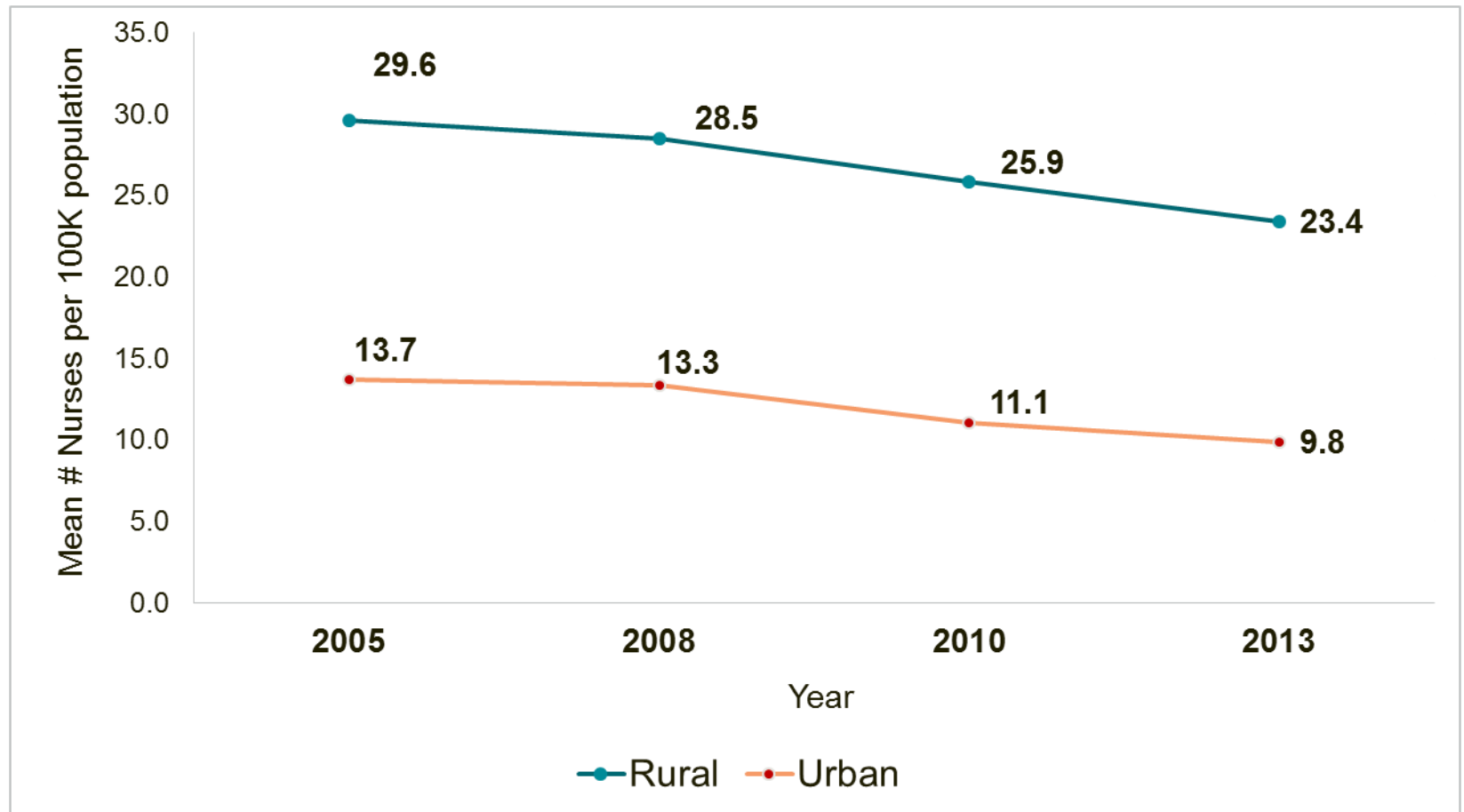
# The Number of LHD Nurses per 100,000 Population Declined from 2005 to 2013



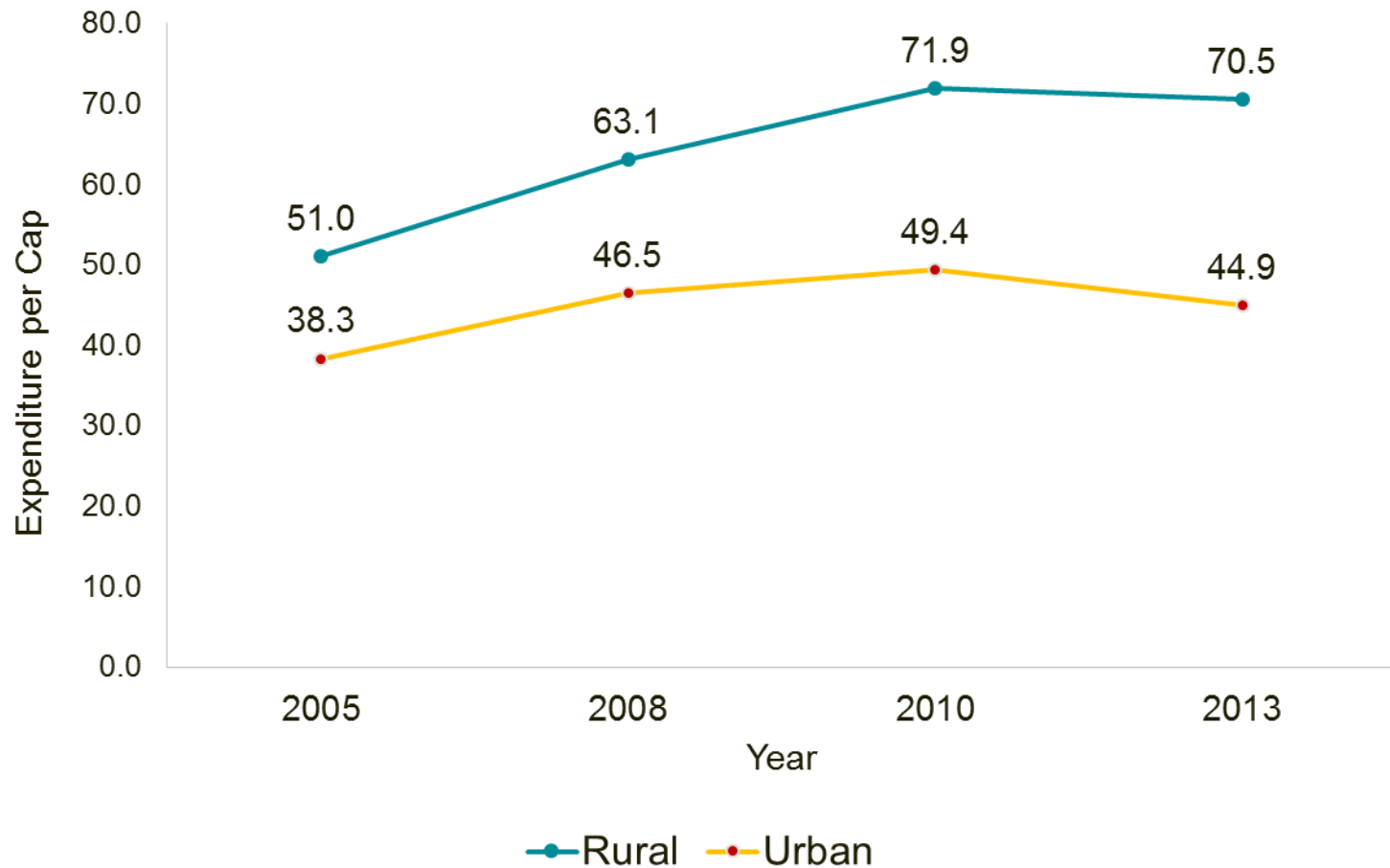
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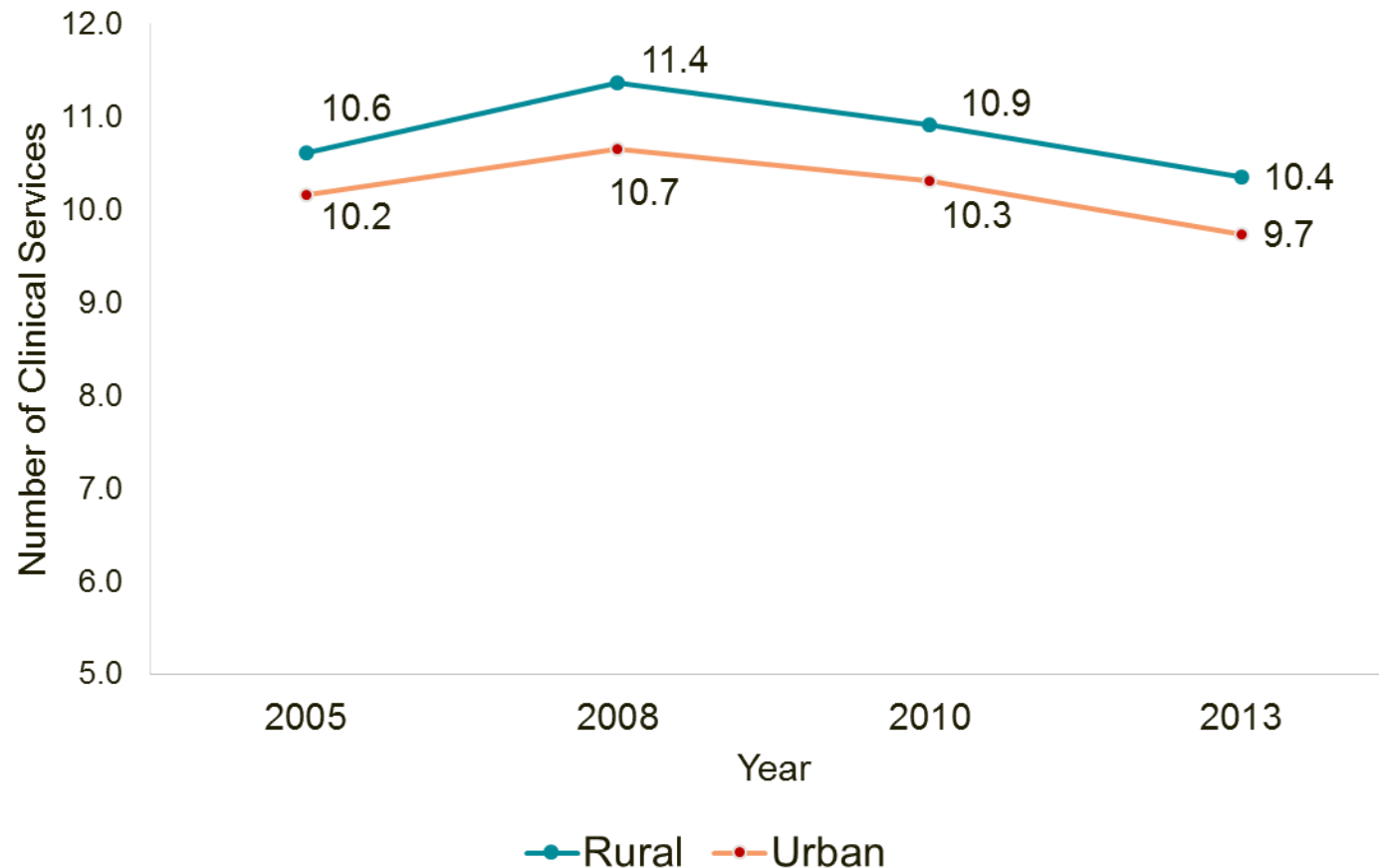
# A Reduction in the Number of LHD Nurses per 100,000 Population in Rural and Urban Areas



# Expenditures per Capita in Rural and Urban LHDs



# Number of Clinical Services Provided by Rural and Urban LHDs



# Fixed Effects Results

Variable	Coefficient	t	P Value
Expenditure per Capita	0.08	7.91	<0.001
Total Number of Clinical Services	0.33	2.92	<0.01

# Fixed Effects Results

## Rural LHDs Only (n=487)

Variable	Coefficient	t	P Value
Expenditure per Capita	0.07	3.66	<0.001
Total Number of Clinical Services	0.28	1.42	0.16

## Urban LHDs Only (n=401)

Variable	Coefficient	t	P Value
Expenditure per Capita	0.09	10.13	<0.001
Total Number of Clinical Services	0.38	3.75	<0.001





# Discussion

- The supply of public health nurses shows a greater reduction in rural LHDs than urban LHDs.
- Changes in funding and the number of clinical services affect the number of LHD nurses per 100,000 population.

# Limitations

- The sample size is small and may not be representative.
- The expenditure data and FTE data do not line up exactly in time.
- The number of clinical services could not account for changes in level of services.

# Implications

- Reforms in health care delivery system and decrease in public health funding at local level have contributed to a reduction of public health nurses.
- With fewer nurses in workforce, LHDs may have to depend more on partner organizations or volunteers to provide certain kinds of health care services during a public health emergency.
- Future research may focus on:
  - a). what other infrastructural factors affect the number of nurses in LHDs.
  - b). how the reduction of number of nurses may affect the delivery of essential public health services and health outcomes of the population.



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