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## Local Health Department Provision of WIC Services Relative to Local “Need” – Examining 3 States and 5 Years

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## Local Health Department Provision of WIC Services Relative to Local “Need”— Examining 3 States and 5 Years

### Abstract

Great variation exists in the nature of LHD service delivery and it varies, in part, relative to jurisdiction population size. Larger LHD jurisdictions may achieve an economy of scale in WIC service delivery that is not matched in smaller areas. Overall, we found that WIC service provision appears relatively consistent across study states and in the presence of increasing need, with greater responsiveness to need in urban areas. As demand for some preventive services increases LHDs in rural areas may need greater support than LHDs in large jurisdictions for meeting local demand. Unlike WIC, LHD-provided services that have less consistently maintained service-delivery guidelines may have a harder time responding to increasing need. The relative consistency of a federally-funded program such as WIC may serve as a good baseline for further study of less consistently delivered programs among LHDs. LHD service statistics can serve as useful data sources in measuring volume of service delivery relative to need.

### Keywords

local health departments, public health services, WIC, public health systems, maternal and child health

### Cover Page Footnote

This study was supported by efforts of state public health practice personnel in CO, FL, and WA who provided data and responded to questions that helped assure data quality. Additional University of Washington (UW) researchers and students were influential in this study, including Y. Yang, J. Herting, G. Whitman, E. Abu-Rish, and S. Petz. Study funding was provided by RWJF through the Nurse Faculty Scholars Program (#68042) and the Public Health Practice-Based Research Networks Program (#69688), and by the UW's NIH-supported Institute of Translational Health Science Funding Program.

## Introduction\*

Dramatic variation in local health department (LHD) services is well documented.<sup>1</sup> The lack of accessible and consistent data that measure the “output” or volume of specific services by LHDs creates barriers to producing evidence needed for service-related decisions and for reducing unnecessary practice variation, when this variation is not tightly linked to need.<sup>2</sup> Unlike many LHD services, the federal Supplemental Nutrition Program for Women, Infants, and Children (WIC) program has strict federal eligibility requirements and guidelines. Therefore, this program can be expected to have greater consistency in service delivery and responsiveness to local need than other LHD programs, which tend to “vary substantially” in type of service and population served.<sup>1</sup> We worked with data from three states, analyzing relationships between one specific service (WIC) provided by LHDs and apparent local need (Medicaid births). We regressed the number of WIC clients served on Medicaid births in a LHD jurisdiction. Results showed increases in the number of WIC clients served relative to Medicaid births, particularly among LHDs in Metropolitan regions. The relative consistency of a federally-funded program such as WIC may serve as a good baseline for study of less consistently delivered programs among LHDs and support evidence needed by practice leaders and policy makers regarding the ability of LHDs to meet local needs.

## Methods

We linked unpublished LHD data obtained from WIC offices in three states (Colorado [CO], Florida [FL], Washington [WA]) into comparable measures of unduplicated WIC clients (women, infants, and children) served by each LHD for each year from 2005-2009. After cleaning and adjusting for slight differences in data definitions of service across states, we linked these data with variables from the Census and other national data sets. The CO, FL, and WA state health departments also supplied additional data, including the annual number of Medicaid births per county and the availability of WIC services from other non-LHD providers in a county. Medicaid births per jurisdiction were used as a proxy for local “need,” given links between WIC eligibility and maternal/infant poverty. Data were organized as spatial units and merged at the LHD level. Each LHD was classified based on USDA Economic Research Service defined Rural Urban Commuting Area (RUCA) code categories, according to its status as metropolitan, micropolitan, or rural. The study sample included 149 LHDs covering 163 counties. In these states, most LHDs (94%) provide WIC services to single county-level jurisdictions and the remaining LHDs serve multiple counties. The study sample was screened to remove LHDs in each year they provided no WIC service.

The number of Medicaid births was smoothed by averaging across 3 years, except for

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2005 and 2009 where data limited smoothing to two years. The association between WIC clients served and smoothed Medicaid births was modeled using General Estimating Equations.<sup>3</sup> To capture differences in the association between Medicaid births (“need”) and WIC services provided over time, a model using three way interactions of year, births, and RUCA code was estimated.

## **Results**

Descriptive statistics illustrate differences in LHD service provision between states (Table 1). Of the jurisdictions sampled, 130 had at least some WIC service provided by LHDs (35 CO, 67 FL, 28 WA). Among LHDs active in WIC service, 42% were classified as metropolitan and 41% were rural.

The mean number of smoothed Medicaid births across all three states increased each year (from 1143 to 1210 per LHD), as did the number of WIC clients served (from 6780 to 8563 per LHD) from 2005 through 2009. Table 2 shows the test of differences in association between these increases in Medicaid births and WIC clients across RUCA status. In 2005, on average, a one unit change in Medicaid births in metropolitan regions was associated with a change of an additional 6.38 WIC clients served. This average change in WIC clients served per unit change in Medicaid births increased each year, rising to 7.86 in 2009. This monotonic increase is consistent for micropolitan regions as well. Among rural regions, the average change in WIC clients served did not increase between 2005 and 2006. However, this association did increase substantially for rural regions in 2007, 2008 and 2009 from 2.94 to 3.56. Within each year, this association was largest among urban regions and smallest among rural regions. A test for differences in means across the three levels of urbanization showed that differences were significant within each year.

## **Implications**

While the sample states have very different models of provision of WIC by LHDs and/or by alternative providers, LHDs providing WIC services appear to meet local demand consistently and as expected, relative to established federal guidelines directing eligibility and general service delivery requirements. Findings also indicate that as Medicaid-funded births increase, the associated level of WIC service provided by LHDs is increasing even more rapidly. In metropolitan areas this service increase, relative to Medicaid births, is consistently far greater than associated increases in micropolitan and rural areas. Our results suggest observable economies of scale might be occurring in WIC programs among LHDs in metropolitan jurisdictions. Alternatively, WIC demand may differ in rural areas versus urban areas where economic shock may play out differently on WIC participation. In light of an apparent increasing local need for preventive health services among the populations served by LHDs and rural/urban differences,<sup>4</sup> LHDs in rural areas may need particular monitoring by public health practitioners, researchers, and policy-makers to assure their ability to be responsive to local need. WIC services may also serve as a useful comparison in studies of other LHD programs with greater variability (and, therefore, potential for less reliable responsiveness) than the federally-funded WIC

program, which may be more consistently able to meet demand.

This research was conducted through the Robert Wood Johnson Foundation (RWJF)-funded Public Health Activities and Services Tracking (PHAST) Study and in association with the national network of state-wide public health Practice-Based Research Networks (PBRN). PHAST efforts support examining the effectiveness of using existing LHD service data, gathered through local and state health departments, for representing changes and variation in the “output” of a specific LHD service as it links to service need. This is one of the first publications of findings from the growing PHAST Study database, with results suggesting that LHD service statistics and “need” data can serve as useful resources in examining the nexus between service delivery and its distribution. Complex methods being developed through PHAST for gathering, merging, validating, and analyzing these data have application for ongoing and related studies to examine other LHD services, LHD service provision in other states, local area demand, and ultimately the outcome of service variation and change on the public’s health. A 2011 report by the Institute of Medicine called for efforts such as PHAST to develop systems that measure “inputs contributed” by local public and private sector organizations in order to ultimately track the impact of these services on population-health.<sup>5</sup> The IOM’s call to action, and findings from this PHAST Study, underscore the need and opportunity for active engagement with LHD data and practice-based researcher networks to provide the evidence necessary to advance practice.

Data inconsistencies limited this study. We mitigated these limitations through inquiries with data owners and strict management protocols for data quality, documentation, and histories. Inferences were limited by skewed distributions of WIC clients served and only three states. Models with logarithmic transformations were explored with results consistent with the conclusions presented.

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<b>TABLE 1. LHD WIC provision by State for 2005-2009</b>				
	<b>CO</b>	<b>FL</b>	<b>WA</b>	<b>Total</b>
Number of LHD Jurisdictions	47	67	35	149
WIC service provided by:LHD only / non-LHD only / Both	35/12/0	65/0/2	11/7/17	111/19/19
Number of LHD Jurisdictions after Screening <sup>a</sup> (Total Observations)	35 (175)	67 (335)	28 (138 <sup>b</sup> )	130 (648)
Percentage Metro/Micro/Rural <sup>c</sup>	29/11/60 %	51/18/31 %	39/21/40 %	42/17/41 %
Mean Smoothed Medicaid Births <sup>c</sup>	618	1531	1037	1179
Mean WIC Clients Served <sup>c</sup>	2516	11225	5495	7653

<sup>a</sup> Jurisdictions were screened to include only those with LHDs that provided WIC service

<sup>b</sup> Two LHDs did not provide WIC service for one year during the five year period

<sup>c</sup> Results provided are based on the screened sample

<b>TABLE 2. Association between number of WIC clients served and smoothed Medicaid births</b>					
<b>Year</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Metropolitan <sup>a</sup> (n = 274)	6.38	6.57	6.98	7.36	7.86
Micropolitan (n = 109)	2.93	3.11	3.46	3.88	4.46
Rural (n = 265)	2.78	2.74	2.94	3.45	3.56
P-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

<sup>a</sup> Rural Urban Commuting Area (RUCA) code categories (1-10) = Metropolitan (1-3), Micropolitan (4-6), or Rural (7-10)

Notes: Results provided are based on estimates from a GEE model of Number of WIC Clients Served against a three-way interaction between Smoothed Medicaid Births, Year, and RUCA status. The model was adjusted for repeated observations within LHD's and for variation due to State and the presence of a Non-LHD alternative. The estimates can be interpreted as the marginal response effect in the number of WIC clients served for a change in demand (Medicaid birth). The p-values for the tests for difference in means across RUCA status within each year are provided.