



PHAST Finance: Assessing effectiveness of local public health services in improving population health

Research Brief
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The many public health services provided by local health departments (LHDs) have dwindled during severe funding reductions. Yet little is known about the impact of these reductions on the public's health. The consequences of economic recession and shrinking local public health resources are likely compounded by an extremely underdeveloped evidence base regarding the impacts of public health service investments on population health. Few studies have helped provide evidence regarding how public health resources and services should be allocated to improve the health of marginalized populations, whether existing resources are distributed relative to local needs, and the degree to which these resources have had their intended impacts. This lack of evidence undermines the decision-making capacity of public health officials in responding effectively to local community need and maximizing the skills and capacity of their public health systems. Mays and Smith (2009) suggest that this lack of evidence has resulted in an unnecessarily high level of variation among public health systems, creating "wasteful, harmful, and inequitable" inefficiencies in public health practice.

The purpose of this Public Health Activities and Services Tracking (PHAST) study was to examine the effects of changes in LHD resources and services on population health and the allocation of services according to local need. PHAST is a multi-state collaboration that has been studying the outcomes associated with variation and change in public health financing, infrastructure, and service delivery at the local level. PHAST works closely with public health practice partners participating in the national consortium of Public Health Practice-Based Research Networks (PBRNs) to collaborate around research questions of interest to public health practice leaders and policy makers.

KEY FINDINGS

- Higher LHD spending on MCH services has a beneficial relationship with reduced rates of low birth weight, particularly in counties with high levels of poverty.
- Higher LHD spending on Food Safety and Facility Sanitation activities is related to a lower incidence of restaurant-related food-borne disease in WA and a lower incidence of facility inspection-related water-borne disease in NY.
- Underlying patterns in the constellation of services LHDs provide demonstrate a predictable mix of individual- and population-focused services and fall into 3 classes that can be used to depict varied approaches to local public health service delivery.
- Public health administrative data can be used to support rigorous empirical research in the examination of service delivery and health outcomes.
- Standardized public health service-related data are crucial to the research needed in support of evidence-based decisions and policy-making regarding public health service delivery in communities.

METHODS

In “PHAST Finance” we examined spending by local public health departments on services related to Maternal and Child Health (MCH), Food Safety and Facility Sanitation, and Communicable Disease (CD) Control and the relationships between this community-level spending and population health. We partnered with PBRN members in 5 states to identify, compile, clean, harmonize, and interpret detailed local public health department service-specific annual expenditure data. Service-specific data sets and analyses were developed and conducted to examine analytic models specific to MCH, Food Safety and Facility Sanitation, and CD Control expenditures and health outcomes—outcomes that could reasonably be expected to be associated with spending and related preventive efforts by local health departments. Complementary data were included to control for other community, health department, and local health resource factors in all of our analyses.

FINDINGS

Our study generated results specific to several areas of public health practice. Our findings also produced evidence regarding the nature of existing detailed data and its utility for research.

MCH — In examining 11 years (2000-2010) of annual MCH expenditures by 102 LHDs in 2 states (FL and WA), we found strong beneficial relationships between these expenditures and

Percent Low Birth Weight Expenditure Per Capita								
State	All		Top 1/3 for Poverty					
			All		FL		WA	
n	885		290		191		99	
LHD Expenditure Per Capita	Coeff	p	Coeff	p	Coeff	p	Coeff	p
LHD Total	-0.012	0.028	-0.011	0.069	-0.002	0.671	-0.158	0.000
MCH Total	-0.030	0.038	-0.013	0.663	-0.013	0.537	-0.284	0.005
WIC	-0.024	0.490	-0.029	0.541	0.002	0.934	-0.667	0.007
MICA	-0.049	0.025	-0.020	0.653	-0.026	0.355	-0.474	0.016
FP	-0.029	0.431	-0.026	0.637	-0.004	0.913	-0.600	0.000

county-level rates of low birth weight. This was particularly apparent in high poverty counties. Despite this beneficial relationship between these LHD resources and related health

outcomes, we also found that LHD expenditures specific to MCH were not distributed in relation to local need, such that some MCH expenditures were significantly decreasing in communities with increasing local need among pregnant women in poverty.

Food Safety and Facility Sanitation — Similarly, we found strong beneficial relationships between higher annual Food Safety and Facility Sanitation expenditures by 72 LHDs over 11 years and in 2 states (NY and WA) and a lower incidence of certain food-related (i.e. salmonellosis) and sanitation-related (i.e. cryptosporidiosis) enteric disease.



Per Capita Food & Sanitation Expenditure														
State	Campylo-bacter		Crypto-sporidiosis		Giardiasis		Hep A		Shigellosis		E. coli		Salmonellosis	
	coeff	p	coeff	p	coeff	p	coeff	p	coeff	p	coeff	p	coeff	p
NY & WA (controlling for NYC)	-0.040	0.372	-0.011	0.408	0.002	0.938	-0.011	0.119	-0.003	0.896	-0.017	0.093	<u>-0.041</u>	<u>0.038</u>
NY (controlling for NYC)	-0.050	0.306	<u>-0.091</u>	<u>0.007</u>	0.048	0.346	-0.010	0.279	0.051	0.359	0.002	0.859	0.011	0.753
WA	-0.032	0.597	0.005	0.671	-0.013	0.646	-0.011	0.309	-0.013	0.365	-0.018	0.205	<u>-0.053</u>	<u>0.029</u>

CD Control — Data limitations led to us identify less consistent and interpretable results from our analyses of CD Control in terms of Tuberculosis, Immunization, and general CD Control spending by LHDs in FL, NY, and WA. Nonetheless we found weak relationships that would likely be stronger and more easily detectable with more years of consistent data. Regarding Tuberculosis (TB) service expenditures by LHDs in our sample, we found that TB incidence had a very strong contemporaneous relationship with LHD’s in terms of increasing TB expenditures.

Data — In order to support our analytic approach, we constructed a means to classify LHDs based on the constellation of personal- and population-health services they provided. Using national data from the National Association of County and City Health Officials (NACCHO) Profile of Local Health Departments, we developed a 3-class solution that strongly fit LHDs nationally (and in our sample) in terms of their more narrow or broad-based approaches to service delivery. These LHD classifications were merged with our LHD data and used as a control variable in our analytic models. Our process also provides a new method for categorizing LHDs that appears unrelated to LHD size and urbanity and can be used for future research.

Our work with these LHD data, our practice partners, and in-depth analyses also demonstrate that consistent administrative, research-quality data can be used to provide a strong analytic basis for research regarding critical public health services and their outcomes in communities.

DISCUSSION

Our study showed that detailed, annual data across many LHDs could be adequately compiled and harmonized into rigorous research-quality data that depict a level of service delivery. These data were then used to demonstrate links between the preventive services of LHDs and some of the important health outcomes they are focused on improving. In particular, our findings showed that LHD expenditures in MCH and in Food Safety and Facility Sanitation have an important beneficial relationship with related health outcomes that likely help reduce community-level burdens of poor birth outcomes and of certain enteric diseases. These findings highlight the value of monitoring changes in public health service-related investments and activities so that local funding is allocated appropriately to assure public health prevention, equity, and responsiveness. The assurance of an effective and consistent public health delivery system is particularly critical, as public health activities remain threatened and underfunded.

Limitations — Our findings are limited in scope by the narrow areas of service that we were able to harmonize across states and in scale by the few numbers of states we were able to include in each analysis. Limitations of these data and the potential for rigorous research

support the critical need for research and for standardized data that measure the cost, performance, and outcomes of public health prevention efforts.

RECOMMENDATIONS

We identified the following recommendations, based on our findings:

- Changes in LHD service delivery expenditures and activities must be monitored for their impact on related health outcomes and to assure that effective care delivery systems continue to support the beneficial impacts of public health preventive activities.
 - Standardized data systems must be developed and routinized, that measure and monitor the availability, reach, capacity, volume, and quality of public health expenditures and services delivered. Standardized data depicting LHD service data could be used to support a wide range of rigorous inferential research regarding public health systems.
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RELATED PUBLICATIONS

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