

Local Public Health Agency Funding: Money Begets Money

Patrick Michael Bernet

Local public health agencies are funded through a mix of federal, state, and local revenue sources. There is a common belief that increases from one source will be offset by decreases in others, as when a local agency might decide it must increase taxes in response to lowered federal or state funding. This study tests this belief through a cross-sectional study using data from Missouri local public health agencies, and finds, instead, that money begets money. Local agencies that receive more from federal and state sources also raise more at the local level. Given the particular effectiveness of local funding in improving agency performance, these findings that nonlocal revenues are amplified at the local level, help make the case for higher public health funding from federal and state levels.

KEY WORDS: funding formulas, government budgeting, public health finance, public health programs

● Why Money Is Important

There is a commonly held belief that publicly funded activities may “rob Peter to pay Paul” by using increases in funds from one source as incentive to reduce revenues from other sources. To the extent that this may occur in public health, it is worth reviewing why funds are important in the first place before proceeding with a test to detect such fund-substitution beliefs. Like most businesses, revenues are important to the ability of local public health agencies (LPHAs) to fulfill their missions. Higher funded agencies perform a broader range of the 10 essential public health services, such as inspections, education, and monitoring.¹ The source of funding also appears to make a difference, with local health department spending found to be the most “consistent predictor of public health system performance across

the 10 essential services.”^{1(p527)} The importance of local spending is echoed in other studies that find agencies perform a broader range of services in areas with higher per capita local health department expenditures.²

● Where Money Comes From

LPHAs draw their funding from local, state, and federal sources. Federal monies constitute as much as 50 percent to 85 percent of state budgets.^{3,4} States themselves raise just about one half of their public health budget via state income taxes. Although states are mandated to provide many more services than the federal government,³ most do so through contracts with local agencies that are also required to contribute to the cost of services.

At the local level, the share of public health budgets “originating from local sources reflects in part county and city taxation policies and the importance local governments attach to public health.”^{4(p72)} “Local governmental public health agencies obtain an average of 44% of their funding from local governmental appropriations,”^(p523) with the remainder derived from states, direct federal appropriations, and fees for services such as inspections or direct patient care.¹ There is a potential downside to public health’s heavy reliance on local funding, as such revenues may be “vulnerable to shifting local priorities and economic fortunes.”^{4(p71)}

This study received no outside funding. However, data for this study were developed as part of a separate project in which Dr Bernet consults with the Missouri Department of Health and Senior Services analyzing public health funding formulas.

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● Missouri Revenue Sources Summary

Missouri's public health system employs accounting procedures that track funds by source. Table 1 shows a total of \$204 million flowing to LPHAs from various sources, with federal monies providing 18 percent and state sources another 5 percent. LPHAs generate 57 percent of their own funding, primarily through local taxes, wherein a share of county tax revenues is set aside for public health, fees for services such as inspections, and charges for vital records. An additional 20 percent of the LPHAs budget is derived from other activities that may not be directly linked to public health. For example, some LPHAs run home health and homemaker services, using profits to subsidize public health functions.

Like many states, Missouri disburses state funds using a formula.⁴ Of the \$8.9 million in core public health state allocations, approximately \$8.3 million is allocated to LPHAs on the basis of a share of the total that was established many years ago and has not been updated since. The remaining \$565,000 is allocated with a formula that includes population, poverty, service consolidation, and the level of local taxes dedicated to public health.⁵

● Shifting

Some studies suggest that federal, state, and local funding can be seen as substitutes for one another. For example, recent funding increases for bioterrorism preparedness have been used by LPHAs to hire epidemiologists,

TABLE 1 ● LPHA funding sources*

Revenue source	FY 2004 budget	% Of total	Comments
Federal			Most such funds are channeled through MDHSS
WIC	9,490,545	5	
AIDS funding	8,596,694	4	
Regional ER planning	7,189,667	4	
MCH	3,902,464	2	
Other	7,775,572	4	
Total federal	36,954,942	18	
State			Funds appropriated by legislature and approved by the governor; MDHSS allocates these funds
Core public health	8,853,260	4	
Other	1,787,396	1	
Total state	10,640,656	5	
Local			
Taxes	96,033,595	47	Counties may assess a property valuation tax of up to 0.4% for public health purposes
Interest	1,484,295	1	
Vital records	5712,246	3	LPHAs can charge fees by issuing birth and death certificates
Fees	8,254,347	4	LPHAs can establish fees for enforcement of public health rules and ordinances
Donations and other	4,209,370	2	
Total local	115,693,854	57	
Others			Most other revenue is generated at the local level through LPHA efforts to provide other services
Home health	10,453,210	5	Some LPHAs have certified home health agencies that may bill Medicare, insurers, and individuals for their services
Homemaker	6,847,103	3	
Medicaid	3,622,518	2	LPHAs can become providers for state Medicaid programs and bill for services provided
MC+	2,771,958	1	
Medicare	1,327,158	1	
Other	15,724,277	8	
Total other	40,746,223	20	
Grand total revenue	204,035,675	100	

*WIC indicates women, infants, and children; MCH, Maternal and Child Health; ER, emergency response; MDHSS, Missouri Department of Health and Senior Services; LPHA, local public health agency; and MC+, Managed Care Plus. The table summarizes total funds budgeted to Missouri LPHAs during fiscal year 2004. Data are from *FY 2004 Green Book (MDHSS, 2006A)*, MDHSS, 2002.

preparedness coordinators, and others. "Because their expertise can be applied to other functions, some health departments report that the new staff have helped offset staff cuts in other public health programs resulting from state and local budget shortfalls."^{6(p950)} Other researchers note that increases in federal funds may "compensate for deficits in state support."^{4(p69)} Although federal grants are not intended to encourage state spending reductions, they may have that unintended consequence.

Evidence from the education sector reinforces the perceived need to offset funding shortfalls on state or federal mandates with higher local taxes. For example, although the No Child Left Behind program brings additional federal dollars, those amounts cover only a small fraction of the cost of compliance. In order to cover this shortfall, many states and local governments must increase local spending through higher taxes or reduce services in other areas.^{7,8}

These observations are all consistent with the common perception that funding sources are used as offsets for one another. But does such balancing actually occur? The hypothesis of this article asks whether LPHAs that receive lower funding from federal and state sources compensate by raising more money locally.

The strong association between local funds and the provision of a broader range of essential services^{1,2} provides one reason to examine the relationship between federal, state, and local funding levels. If it is found that shifting occurs, then higher state and federal funds may result in lower relative levels of local funding, which might have the unintended consequence of reducing the range of services. Researchers have also pointed to the importance of tracking and evaluating changes in public health funding as part of a package of tools used to measure agency effectiveness.⁹

● Data and Methods

Data

Missouri public health services are delivered through 114 LPHAs.¹⁰ Most LPHAs cover a single county; although several cover two or three rural counties with low population, and some cities have their own LPHA separate from the one for the surrounding county. The state maintains a comprehensive database that tracks revenue by source down to the LPHA level.¹¹ Fiscal year 2004 figures, already summarized in Table 1, show that local taxes totaled \$96 million for all 114 Missouri LPHAs, constituting 47 percent of their total budget. The LPHA-level data behind this cross-sectional study are augmented with demographic, geographic, and economic variables from the US Census.

Many factors can be used to measure the appropriateness of funding levels, including measures of program need, effectiveness, or even ability to provide services through alternative sources. Rather than getting tangled in judgments of minimum funding levels or appropriate measures of equity, this article focuses on relative allocations based on three metrics commonly associated with public health funding: population, facilities requiring inspection, and area.

Variables

Higher populations are associated with higher public health spending.¹² Agencies perform a broader range of services in communities with larger populations.² Population is also "positively associated with performance for all but 3 of the 10 essential services."^{1(p527)} Areas with low populations may face barriers that make activities "such as health risk investigation and regulatory enforcement more difficult and costly."^{1(p524)} One explanation for such findings is the economies of scale that large public health systems may realize by spreading fixed costs for activities such as disease surveillance and health education over a larger population.¹ Alternatively, larger systems might "benefit from larger pools of organizations in the community that may be enlisted to participate in public health activities."^{1(p523)}

When Missouri LPHA budgets are viewed by population (Figure 1), total revenue per capita first decreases with population only to increase again at higher levels. Such a pattern is not uncommon, as it is also found in California.¹³ Economies of scale may help explain initial drops, with diseconomies setting in at higher levels, as the complexities of coordinating multiple locations impairs efficiency. Alternatively, this pattern could also emerge if the political clout of rural areas and large cities

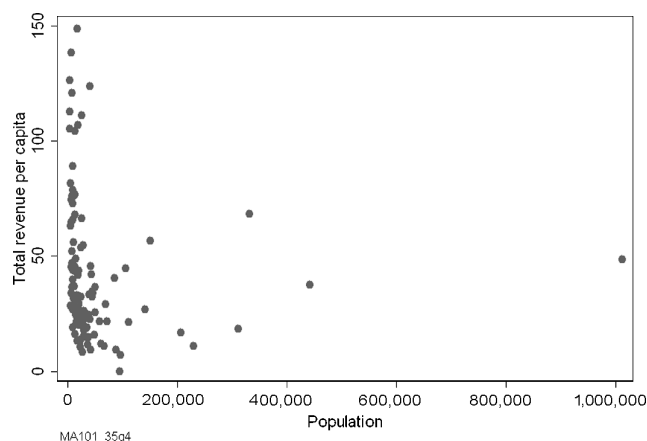


FIGURE 1. Missouri revenue per capita. This graph shows the relation between LPHA population and total revenue per capita (equal to the sum of federal, state, and local revenues divided by population). Data from Missouri Department of Health and Senior Services, 2006.

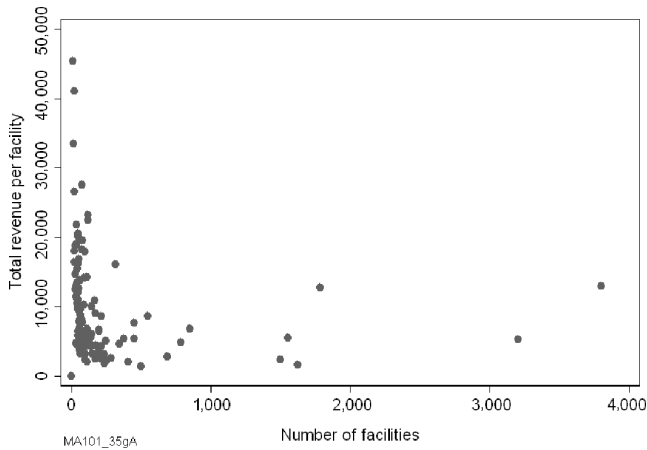


FIGURE 2. Total revenue per facility. This graph shows the relation between the number of facilities requiring inspection (per LPHA) and total revenue per facility (equal to the sum of federal, state, and local revenues divided by the number of facilities). Data from Missouri Department of Health and Senior Services, 2006.

surpassed that of suburbs and small cities. Whatever the reason, there is a fairly obvious relation between funding and population.

While many public health services are related to the general population, inspections and licensing are more related to the number of facilities requiring such certification. A recent study of public health spending by essential service shows “enforcement” averaging 4 percent of total budgets, with some local health districts spending as much as 21 percent.¹⁴ For some public health activities, then the number of facilities serves as an alternate measure of expected workload. Figure 2 shows the relationship between revenue per facility and the number of facilities requiring inspection.

The costs of travel time and multiple office locations make land area an important consideration in evaluating public health budgets. Because Missouri created some LPHAs to just cover municipalities separate from the counties in which they are located, there is a broad range of sizes. As a result, most LPHAs with large areas are rural. Dealing with a large area presents geographic barriers that can “make activities such as health risk investigation and regulatory enforcement more difficult and costly.”^{11(p524)} With regard to the smaller, urban areas, the unique role of large metropolitan health districts requires “different and separate financing strategies.”^{15(p422)} Several counties in Missouri have consolidated services, perhaps in response to funding formula incentives.⁵ These economies provide yet another reason to include land area as a possible determinant. Some states, such as Utah, explicitly include land area in their public health funding formulas,¹⁶ adding further justification to include this variable in analyses of funding levels. Figure 3 shows smaller areas receiving much higher revenues per square mile.

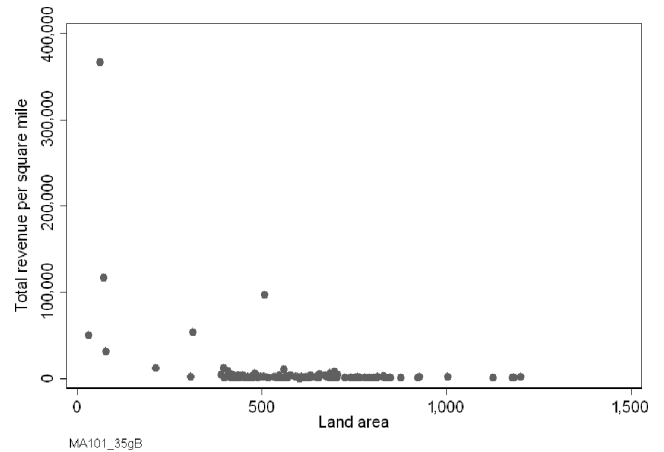


FIGURE 3. Total revenue per square mile. This graph shows the relation between the number of square miles of land area in an LPHA and total revenue per square mile (equal to the sum of federal, state, and local revenues divided by the number of square miles). Data from Missouri Department of Health and Senior Services, 2006.

Model

This study employs ordinary least squares regression, modeling per capita local public health funds as a function of per capita federal plus state funds. If shifting does occur, the coefficient on federal plus state funds should be negative, indicating that LPHAs that receive relatively higher funding from federal and state sources respond with a reduction to their own local revenue contributions. Per capita revenues are used instead of total revenue because the large-scale differences between big LPHAs and small ones makes relative comparisons more meaningful. The model incorporate variables for population, area, and number of facilities to compensate for variations in funding that might result for reasons already discussed above, such as economies of scale. In addition, the model includes second-order effects for population, area, and number of facilities to allow for the curved relations observed in Figures 1 to 3.

Findings

Results of the test, in Table 2, show the coefficient on per capita state and federal revenues to be significant and positive. For each \$1.00 increase in state and/or federal funding, LPHAs increase their own funding by \$0.50. This is opposite of the expectation that LPHAs would reduce their own funding when they received more outside money. In rejecting the first hypothesis, it appears that money begets money, to borrow a gamblers expression. LPHAs that are better funded from combined federal and state sources do not, as expected, reduce their own locally generated funds, but actually increase them. The upward slope of data points in Figure 4 clearly demonstrates this relation and adds weight to statistical findings.

TABLE 2 ● Per capita local revenue as a function of federal and state spending*

	Coefficient	Standard error	t
Per capita federal + state revenue	0.485528 [†]	0.147315	3.30
Area	0.000466	0.015324	0.03
Area ²	-0.000009	0.000011	-0.82
Facilities	0.018226 [‡]	0.008756	2.08
Facilities ²	-0.000004 [§]	0.000002	-1.72
Population	-0.000085 [§]	0.000044	-1.91
Population ²	1.01e-10 [‡]	3.90e-11	2.60
Constant	13.883780 [‡]	6.258329	2.22

*Results from ordinary least squares regression modeling per capita local public health revenue as a function of the variables in the table above. N = 115. F_{7,107} = 6.02. P > F = 0.0000. R² = 0.2826; adjusted R² = 0.2356.

[†] P > |t| < .01.

[‡] P > |t| < .05.

[§] P > |t| < .10.

In addition to demonstrating a new way to view funding offsets, this model shows local funding decreasing with population at first, but eventually going up at even higher levels, consistent with Figure 1. There is no significant relation between LPHA area and funding. The relation between funding and the number of facilities appears to be opposite of expectations established in Figure 2. This is not necessarily inconsistent because the graph looks at total revenue from all sources and the regression models just from local revenues, but is still worth future research.

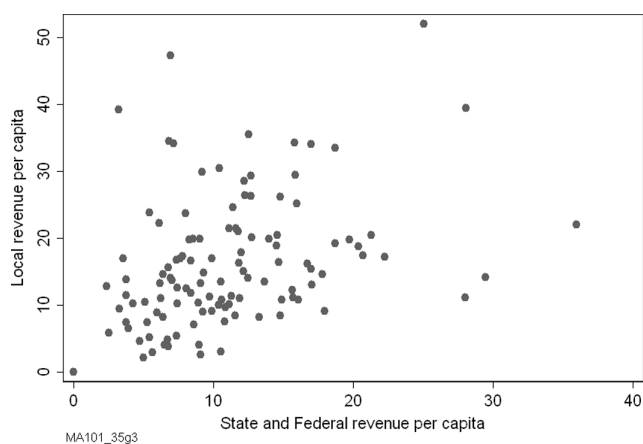


FIGURE 4. Local, state, and federal revenues per capita. This graph shows the relation between the combined state and federal public health revenue per capita (equal to the sum of federal and state revenues divided by population) and the local revenue per capita (equal to local revenues divided by population). Data from Missouri Department of Health and Senior Services, 2006.

● Conclusions and Recommendations

A common belief with regard to public health funding, or just about any government program for that matter, is that higher revenues from one source will be used to offset the need for funds from other sources. Rather than observing such an offset, this study finds that Missouri LPHAs receiving higher federal and state funds also generate higher levels of local revenues. This is surprising, since LPHAs have some control over their own revenue generation, yet do not use higher outside funds as an excuse to let their constituents off cheap.

As this is one of the first studies of this kind, more work is needed to better understand observed behaviors, but several tentative explanations can be offered. LPHAs may not want to offset higher federal and state spending with lower local spending because Missouri’s public health spending is fifth lowest in the county,^{12,17} and they may feel that the total being spent is still not adequate to ensure the public’s health. Alternatively, it is possible that higher federal and state money results in better management at the local level, which may also make them more effective at cultivating local funding options.

There are several improvements to this study that should be addressed in future research. The inclusion of information on matching funds required by some programs would help net out the pure voluntary local revenue component. Although the coefficients in this study are twice as high as even a dollar for dollar match would yield, it would nonetheless be instructive. Rather than rely on funding per capita, future studies should try alternative measures of equity, such as need or poverty rates. Incorporation of measures for effectiveness and efficiency can help test theories suggesting that managers faced with constraints are more motivated to increase efficiency in order to make the most of their limited resources.¹⁸ The model could also be replicated in other states and with time series to allow a more precise evaluation of cause and effect. Additional attention to the relationship between number of facilities and funding is warranted. The data used by this study can also be employed to determine whether shifting also occurs within the local level, where an LPHA receiving high tax support might be less aggressive in other revenue sources, such as Medicaid or inspection fees. There are also a number of additional explanatory variables that might be considered, including the use of the natural logarithmic scale on population and total spending figures,² per capita income,¹⁹ proportion of not-for-profit hospitals,²⁰ and health maintenance organization competition.²¹

Findings that higher local public health revenues are associated with higher levels of federal and state funding are especially important in light of the effectiveness

of local funds in public health agency effectiveness.² If more external revenue inspires more local funding, it helps build a stronger case for higher levels of public health funding from federal and state levels. This is noteworthy in an environment where the range of services offered by local agencies seems to be less influenced by standards imposed and more driven by budget.²²

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