

**UNPUBLISHED**

**Evaluating the Impact of Reallocating Georgia's Funding for Local Public Health  
Infrastructure**

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**Objectives:** General Grant-in-Aid (GGIA) is the core funding allocation from the Georgia Department of Public Health to all 159 county health departments for public health infrastructure. This research study assesses the impact of recent changes in the GGIA allocation formula on county-level public health infrastructure spending and service-level outcomes.

**Methods:** Cross-sectional regression analyses were conducted on the change in per capita county-level expenditures and revenues, and select service-level outcomes from FY2011 to FY2012 and from FY2012 to FY2013. Regression analyses were also conducted on the top 10 counties experiencing the largest per capita change in GGIA during the same time periods. This quantitative analysis was supplemented with a survey of all local health departments to qualitatively determine the impacts of the GGIA funding changes on local public health services.

**Results:** From FY2011 to FY2012, GGIA had a statistically significant ( $p < 0.001$ ) relationship with both personnel and operating expenditures, with the top 10 counties in terms of the highest per capita increase in GGIA accounting for most of the rise in operating expenditures. Qualitative findings for FY2012 corroborate these results as only 4% of counties indicated an increase in operating expenses. From FY2012 to FY2013, GGIA was significantly ( $p < 0.001$ ) associated with personnel expenditures only.

**Conclusions:** Preliminary results indicate that additional GGIA funds have a transformative impact on expenditures for personnel and operating infrastructure categories. With continued implementation of the revised GGIA formula, sustained research efforts will help identify its impact on health services and health outcomes in a more tangible manner.

## **Introduction**

The state of Georgia has a hybrid public health governance system in which the responsibility for providing public health services is shared between the state government, district health offices, and the local county boards of health that serve each of Georgia's 159 counties. A district health director, who acts as a managerial link between the county board of health and the state, leads each of the 18 district health offices. This infrastructure offers a range of public health services to the citizens of Georgia including environmental services, infectious disease control and monitoring, immunizations, enforcement of health laws, infant and child health treatment services and health promotion, adolescent and adult health treatment services and health promotion, health needs assessments, injury prevention, and health surveillance through epidemiology and vital records reports.

To provide these services, county health departments receive funding from upwards of eight separate funding sources. The core funding allocation from the Georgia Department of Public Health (GADPH) to individual county health departments for the express purpose of strengthening public health infrastructure is called General Grant-in-Aid (GGIA). GGIA was established in the late 1930's and a funding formula was first implemented in 1967 to determine the allocation that each county health department would receive. This formula took into account each individual county's tax base share and population share, each applied to one half (50%) of the total available funds. The tax base share addressed the concept that it is more difficult for poorer counties to fund their own public health. Therefore, the formula allocated a larger relative share to poorer counties based on an index of the county's financial ability as determined by the Real Property Index published by the State Auditor. The population share was based on each county's population relative to the total state population and provided more money to counties

with higher populations recognizing that such counties have more citizens to cover with their public health services. However, the state froze the formula in fiscal year (FY) 1971 at the 1970 tax base share and population levels with no changes made to relative shares, except for special purposes, for more than four decades.

GGIA has played a vital role in the functioning of local health departments by ensuring adequate levels of personnel, materials, and equipment required to support local public health services. However, since 1971, the demographics in Georgia have dramatically changed with a few counties experiencing much greater population growth than others and a shifting of the relative poverty among counties. In 2006, a Study Committee on Public Health comprised of district health officers, state legislators, academics, and public health advocates provided recommendations for an updated GGIA allocation formula. Based on these recommendations, the GADPH began phasing in a revised GGIA allocation formula in FY2012. The revised GGIA funding formula is now based 40% on a county's population, 40% on a county's poverty share within the state, and 20% on a county's absolute poverty rate. Each year current estimates of a county's population and poverty rates from the United States Census Bureau are used to update the formula.

The revised GGIA formula will be phased in over a 7-year period, such that 15% of the change is phased-in every year for six years, with the final 10% phased-in during FY2018. This phase-in period allows health departments that are losing funding based on the new formula to adjust their budgets gradually. Additionally, to prevent a debilitating impact on counties that were set to lose GGIA funding beginning with the FY2012 implementation, the Governor of Georgia passed an executive order in 2011 known as the 'hold harmless' provision. This

provision holds all counties that were at risk of losing GGIA funding due to the change in the funding formula at pre-GGIA change funding levels for FY 2012 and FY2013.

The reallocation of the GGIA funding from the state to the local health departments is the first to occur in more than forty years and provides a natural experiment to evaluate how state funding reallocation decisions impact local public health infrastructure. These changes are significant because states rarely provide a transparent formula for allocation of public health funds, whereas in Georgia the process is explicit and updated annually. Second, the average percentage of county health department funding to which GGIA contributes (on average 27% to 37% across all 159 counties) is larger than state infrastructure support to public health in many other states. In this study, we provide preliminary results of the impact that the GGIA formula change has had on the local public health infrastructure for the first two years of implementation. We also assess impacts on selected public health activities and we supplement our findings with a survey of all local health departments. This information will inform state leaders, including the senior management of the state health department and the congressional leaders in the state, on the effectiveness and efficiency of the allocation decisions and recommendations for future practice and sustainability.

## **Methods**

### *Quantitative Analysis*

The study population consisted of 159 county health departments that form the primary apparatus for provision of public health services in the state of Georgia. Annual revenue and expenditure data were obtained from the GDPH for each county from FY2008 to FY2013: four years pre-GGIA formula change and two years post-GGIA formula change. Expenditure data

consisted of three main categories: Personnel, Operating, and Equipment. The original revenue data consisted of several line items which were then collapsed, on the basis of their respective fund source definitions and in consultation with the GDPH, into the following categories: Local, Federal, Fees, GGIA, and Other (see Table 1). Service-level outcomes were collected for mammography screenings, Pap screenings, immunizations, infectious disease outbreaks, tuberculosis (TB) treatment, newborn metabolic screening, gonorrhea-chlamydia rates, pregnancy rates, and HIV screening and treatment rates. However, county-level data were unavailable for newborn metabolic screening and HIV screening rates, data for FY2012 were unavailable for gonorrhea-chlamydia rates and pregnancy rates, and data for infectious disease outbreaks and TB treatment were too meager to be considered in the analyses. Therefore, mammography, Pap screenings and immunizations from FY2008 to FY2012 were the only service-level outcomes that were included in the analyses. All revenue and expenditure categories and select service-level outcomes were converted to per capita estimates based on the population estimate for each respective county during a fiscal year. For revenue and expenditure categories, the total population estimate was used, while for service-level outcomes an estimate based on a relevant subpopulation in each county was used. For example, for a per capita estimate of mammography screenings, the total number of screenings in each county was divided by the county-level estimate of the female population aged 45 to 74 years.

In order to evaluate the impact of the revised GGIA allocation formula at the county-level, a series of cross-sectional regression analyses were performed on the change in per capita revenues and expenditures from FY2011 to FY2012 and from FY2012 to FY2013. In these analyses, the change in each per capita expenditure category (Personnel, Operating and Equipment) was a dependent variable, while the changes in the per capita revenue categories

(Local, Federal, Fees, GGIA and Other) were the independent variables. Additionally, regression analyses were conducted to determine if the top 10 counties by gain in GGIA revenue differed from all other counties from FY2011 to FY2012 and from FY2012 to FY2013. In these analyses an interaction variable which was the product of per capita change in GGIA and an indicator variable designating the top 10 counties as “1” and all other counties as “0” was added to each regression. All analyses were conducted using STATA version 13.<sup>1</sup>

### *Qualitative Analysis*

A qualitative survey was implemented in the last quarter of FY2012 and was directed towards counties that received additional GGIA funds for FY2012 and FY2013 based on the revised GGIA allocation formula. The survey was administered to a total of 108 of 159 counties for FY2012 and 100 of 159 counties for FY2013. The survey instrument covered all aspects of public health infrastructure under three broad categories – Personnel Services, Operating and Equipment. ‘Personnel Services’ included survey items on the number of full-time employees (FTEs), salaries and, contract / part-time labor. ‘Operating’ incorporated questions regarding programs/services and supplies/materials. The ‘Equipment’ category consisted of questions about equipment and physical/rental space. Representatives from county health departments were requested to identify the impact of additional GGIA funding for each category. For example, under ‘Personnel Services’, respondents were asked whether there was an increase, decrease or no change in the number of FTEs during FY2012. Similar questions were asked for the other survey items outlined above. A fourth category was added to collect information on the steps taken by each county health department to alleviate the fiscal burden caused by the overall decrease in funding. This category was named ‘Other’ and respondents could select from four

options – ‘Increased efforts to recoup insurance reimbursement’, ‘Increase in patient/client fees’, ‘Use of reserve funds to offset decrease in GGIA funding’, and ‘Use of increased GGIA to halt the spend down of reserve funds’. Reserve funds or ‘rainy day funds’ pertain to monies set aside by county health departments in order to meet expenditures during fiscal exigencies.

The surveys were forwarded to the health districts in the summer of 2012 and 100% responded within two weeks. All the completed survey instruments were collated into a master list, crosschecked and verified against the original survey responses by a second member of the research team.

## Results

### *Quantitative Analysis*

Figure 1 shows state-level trends in revenue and expenditures from FY2008 to FY2013. Per capita personnel expenditures steadily decreased during this period, whereas per capita expenditures on operating and equipment increased during FY2012 and FY2013. With the exception of GGIA, most of the revenue sources decreased beginning in FY2010. GGIA funding increased from \$6.2 million in FY2011 to \$7.2 million in FY2012, and \$7.7 million in FY2013. This increase, subsequent to the implementation of the revised GGIA allocation formula, can be attributed to the ‘hold harmless’ provision as the state increased the total amount of GGIA funding to make up for the counties slated to lose GGIA funding.

Table 2 reports the results of the cross-sectional regression analyses. The patterns of association differed between the two time periods. For FY2011 to FY2012, statistically significant and positive relationships were found between the change in per capita GGIA revenue and both personnel ( $p < 0.05$ ) and operating ( $p < 0.001$ ) expenditures. From FY2012 to FY2013, a

statistically significant ( $p < 0.001$ ) association was found between the change in per capita GGIA revenue and personnel expenditures only.

Similar regression analyses with the change in per capita service-level outcomes (mammography, Pap screening and immunizations) from FY2011 to FY2012 as the dependent variable did not provide any significant results.

Table 3 reports the results of the cross-sectional regression analyses with the indicator variable for the 10 counties with the largest increase in GGIA funding based on the new formula. For the change from FY2011 to FY2012, the top 10 counties directed a statistically significant ( $p < 0.01$ ) amount of additional GGIA funds towards Operating expenses as compared to the rest of the county health departments. On the other hand, the top 10 counties spent significantly less ( $p < 0.01$ ) on Personnel Services as compared to the other county health departments during the same time period. For the change from FY2012 to FY2013 however, the top 10 counties did not exhibit any significant GGIA spending patterns as compared to the rest of the counties.

#### *Qualitative Analysis*

Qualitative results for FY2012 indicate that additional GGIA funds received by 108 of 159 counties would be utilized in the following manner:

Personnel - 9 counties (8%) reported an increase in the number of FTEs, 28 counties (26%) reported a decrease in the number of FTEs, and 71 counties (66%) indicated that there would be no change in FTEs.

Operating – Only 4 counties (4%) indicated an expansion and/or addition of programs and services, and 8 counties (7%) reported an increase in supplies and materials.

Equipment - 9 (8%) counties reported purchase of new equipment.

Other - 59 counties (55%) indicated that the additional GGIA funds would be used to halt the spend down of reserve funds.

Qualitative results for FY2013 indicate that additional GGIA funds received by 100 of 159 counties would be utilized in the following manner:

Personnel - 8 counties (8%) reported an increase in the number of FTEs, 22 counties (22%) reported a decrease in the number of FTEs, and 70 counties (70%) indicated that there would be no change in FTEs.

Operating – 5 counties (5%) indicated an expansion and/or addition of programs and services, and 7 counties (7%) reported an increase in supplies and materials.

Equipment - 9 (9%) counties reported purchase of new equipment.

Other - 10 counties (10%) indicated that the additional GGIA funds would be used to halt the spend down of reserve funds.

## **Discussion**

A number of studies have found a significant relationship between public health spending, public health infrastructure, and service-level/health outcomes. Mays & Smith conducted an aggregate analysis of spending by reviewing data from census surveys in 1993, 1997, and 2005. From these data, the authors estimated a drop in mortality rate between 1.1 percent and 6.9 percent for each 10 percent increase in public health spending. They concluded that a correlation exists between increases in public health spending and reductions in mortality.<sup>2</sup> In a second study, Erwin, et al. investigated the association between changes on health outcomes and changes in financial resources, aggregated to the state level. The authors gathered data from surveys conducted by the National Association of County and City Health Officials and America's Health Rankings, produced by the United Health Foundation. They found that

increases in local health department expenditures were significantly associated with decreases in most negative health indicators, including smoking, infectious disease morbidity, infant mortality, mortality from cardiovascular disease (CVD) and cancer, and years of potential life lost.<sup>3</sup> Erwin, et al. also found that an increase in staffing in local health departments was correlated with a decrease in negative health indicators, CVD in particular. For each 10 percent increase in number of employees per capita, CVD decreased by 0.65 percent. There was an average staffing increase of 21.4% among states that gained employees, which decreased overall CVD mortality by 6.6%.<sup>3</sup> In another study, Mays, et al. did not test specifically for direct effects of funding in health system outcomes but found evidence that “spending levels” among other factors “were associated with the availability or perceived effectiveness” of the 20 public health activities identified as being important for maintaining and improving public health at the community level.<sup>4</sup>

Despite the compelling empirical evidence to date, there has not been much focus on the impact of funding specifically for the public health infrastructure at the local level. Further, most of the published literature consists of retrospective studies of funding changes using aggregate data. A unique aspect of our project is the ability to evaluate, in a prospective manner, funding changes using data from all participating counties within a state.

A key finding of this study is the transformation in public health infrastructure spending due to the revised GGIA allocation formula observed during the first 2 years of its implementation (FY2012 and FY2013). On average, for each additional dollar of GGIA funding, per capita changes from FY2011 to FY2012 indicate that counties spent an additional \$0.25 on personnel expenditures and an additional \$0.79 on operating expenditures. For per capita change from FY2012 to FY2013, counties on average spent an additional \$1.07 on personnel

expenditures for each additional dollar of GGIA funding. In other words, from FY2011 to FY2012, most of the additional GGIA funding was directed towards operating expenditures whereas from FY2012 to FY2013, majority of the additional GGIA funds were focused on personnel expenditures. Furthermore, the emphasis on operating expenditures from FY2011 to FY2012 seems to be primarily driven by the top 10 counties with the highest per capita change in GGIA revenue. In contrast, the increase in per capita personnel expenditures from FY2012 to FY2013 seems to be similar among all counties.

Findings from the qualitative survey for FY2012 enhance the quantitative results by providing further insight as to how the gaining counties utilized the additional GGIA funds. The majority of the counties surveyed indicated that the additional GGIA funds would be used to halt the spend down of reserve funds whereas only a small number of counties specified an increase in personnel (FTEs) or operating (expansion/addition of programs and services) expenditures. These findings are in line with the quantitative results which show that most of the surge in operating expenditures can be attributed to the top 10 counties with the highest per capita change in GGIA revenue. Findings from the qualitative survey for FY2013 however, are not in line with the quantitative analyses. While quantitative results show that a majority of additional GGIA funds were directed towards personnel expenditures in FY2013, survey results indicate that only 8 counties (8%) reported an increase in the number of FTEs for FY2013. This discrepancy can be attributed to the fact that the FY2013 survey was conducted prospectively, prior to county health departments being notified of their exact GGIA allocations for FY2013. The uncertainty regarding GGIA allocations for FY2013 may have led county health departments to be conservative in their response. It is also interesting to note that the percentage of counties utilizing additional GGIA funding to shore up their reserve funds dropped significantly from

55% in FY2012 to 10% in FY2013 demonstrating that majority of the counties were prepared to channel the additional finances towards infrastructure spending in FY2013.

There are several limitations to this study. First, even though GGIA revenue was not significantly associated with any of the service-level outcomes, it is important to note that GGIA funding is exclusively directed towards supporting public health infrastructure, which is primarily meant for providing core public health services such as surveillance, infectious disease investigation, and environmental health services. Therefore, establishing a direct causal link between GGIA funding and the select service-level data available in this study may not be appropriate. Second, one of the major drawbacks is that current public health accounting systems in Georgia do not separate GGIA dollars from other fund sources at the local level. All revenue streams essentially flow into a single ‘account’ from which capital is allocated for various public health expenditures. A revenue source is not followed as a separate entity in order to delineate the destination and nature of its consumption making it difficult to make any concrete judgments regarding its impact on public health infrastructure. Third, information about reserve funds held by the county health departments was unavailable. With increasing budget constraints faced by the counties, reserve funds play a key role in the maintenance of public health infrastructure spending and these data, if available, could have helped further refine the conclusions of this study. It is also important to note that a considerable time lag exists between funding changes and an observable impact on health outcomes. In future research, we hope to define the impact of funding changes on health outcomes in a more tangible manner.

A vital component of this research project has been the support and cooperation extended to us by the GADPH in terms of providing complete access to the budget and service-level outcomes data. As the revised GGIA allocation formula takes full effect over the next few

years, we will continue to work with the GADPH in an effort to fully capture the impact of reallocating Georgia's funding for local public health infrastructure.

**Table 1: Expenditure and Revenue categories for local health department spending in Georgia**

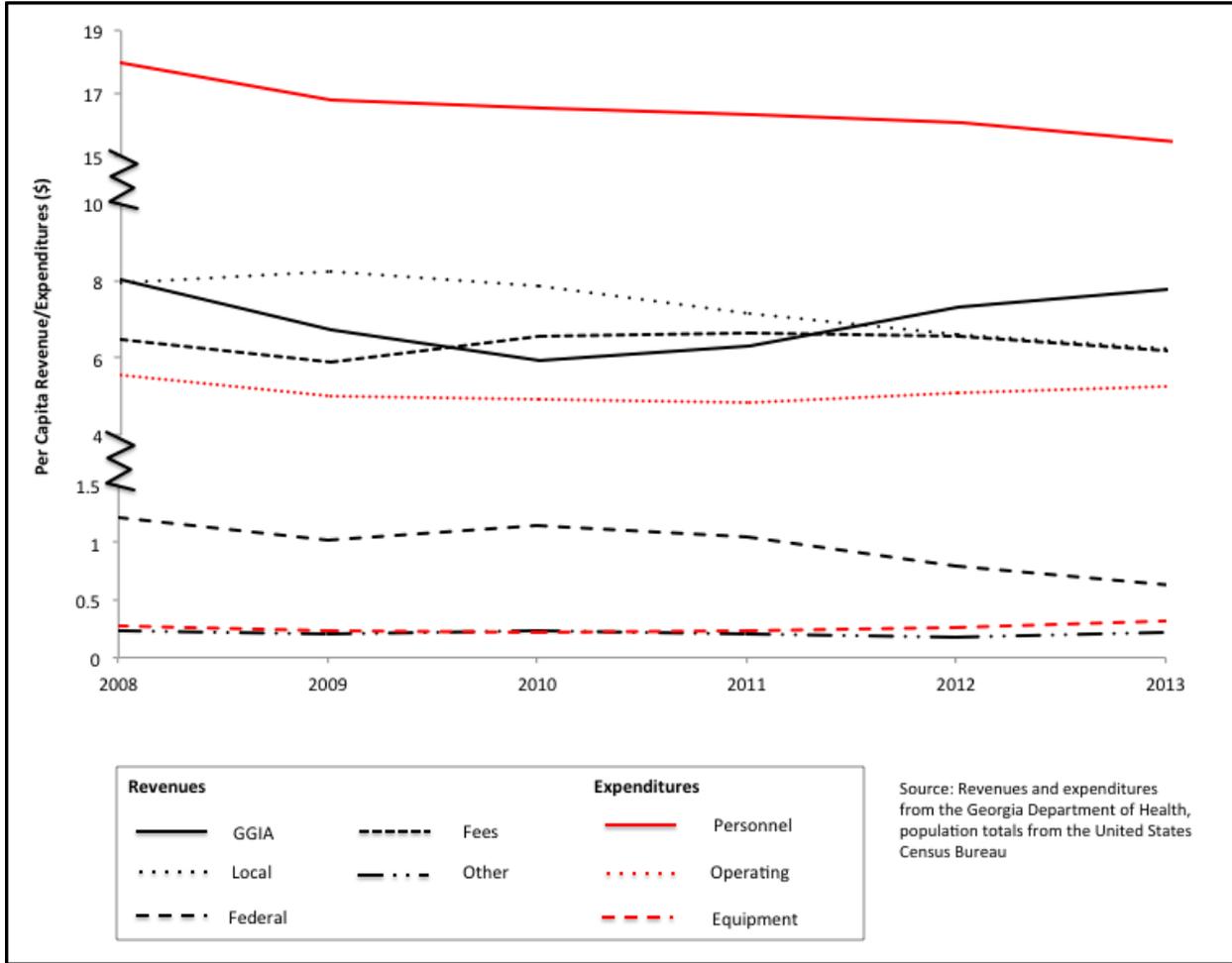
**Expenditures**

<b>PERSONNEL SERVICES</b>	
<i>SCOA Code</i>	<i>Description</i>
511.001	Salaries
511.002	Local Salary Supplement
513.001	Hourly Labor
514.001	FICA
514.002	FICA - Local Supplement
515.001	Retirement
516.001	Health Insurance
516.002	Health Insurance - Local Supplement
517.001	Personal Liability Insurance
<b>EQUIPMENT</b>	
<i>SCOA Code</i>	<i>Description</i>
641.001	Motor Vehicle Equipment Purchases
643.001	Equipment (\$5,000 or more)
644.001	Lease Purchase of Equipment
645.001	Rental of Equipment
646.001	Equipment (\$1,000-\$4,999.99)
661.001	Computer Equipment
<b>REGULAR OPERATING</b>	
<i>SCOA Code</i>	<i>Description</i>
612.001	Motor Vehicle Expenses
614.001	Supplies & Materials
614.018	Pharmaceuticals
615.001	Repairs & Maintenance
617.001	Utilities
618.001	Printing
619.001	Rents Other Than Real Estate
620.001	Insurance and Bonding
622.001	Direct Benefits to Clients
627.001	Other Operating Expenses
633.001	Computer Software
640.001	Travel
640.002	Travel Supplement
648.001	Building Rent
651.001	Per Diem & Fees
653.001	Contracts
653.040	Intra/Inter Agency Transaction
673.001	Telecommunications
681.001	Postage
761.001	Indirect Costs

**Revenues**

<b>LOCAL</b>	
<i>Acc/Fund Source</i>	<i>Categories (County &amp; State)</i>
6001	County participating
6004	County non-participating
6006	Municipal
6021	Other local funds
6040	Intra/Inter Agency
6051	Qualifying Local Funds
6052	Non-Qualifying Local Funds
6058	County Non-Participating Capital Improvement
7040	Intra/Inter Agency WIC
8003	State - Other
<b>FEDERAL</b>	
<i>Acc/Fund Source</i>	<i>Categories</i>
6008	Out pt Medicare
6009	Out pt Medicaid
6014	In-pt Medicaid fees
6022	Health check
6026	Family planning fees
6028	Medicaid - pharmacy
6033	Medicaid - case mgmt
6034	Medicaid - DSPS
6035	Medicaid - Pregnancy services
6036	Medicaid Perinatal Case Mgt
6037	Medicaid CMS
6038	Medicaid - Family Support services
6043	ICTF Funds
6060	Non-Qualifying Contracts
7014	Other Federal Funds
<b>FEES</b>	
<i>Acc/Fund Source</i>	<i>Categories</i>
6010	Out pt client fees
6016	Private insurance
6017	Other fees
6024	Prior yr program income
6029	NP fees
6031	Environmental fees
6041	Vital Records
6045	Rabies Fees
6049	Administrative Claiming Income
6057	Medicaid Client Co-Pay
6050	Prior Year Administrative Claiming Income
<b>OTHER</b>	
<i>Acc/Fund Source</i>	<i>Categories</i>
6005	Donations
6018	Contracts
6020	Hospital authority
6053	Qualifying Donations
6054	Non-Qualifying Donations
6059	Qualifying Contracts

**Figure 1: Longitudinal trends in per capita expenditure and revenue utilization from FY2008 to FY2013**



**Table 2: Results of cross-sectional regression analyses for change in per capita revenue and expenditures (n=157)**

Exp \ Rev	FY11 to FY12			FY12 to FY13		
	Personnel <i>Coefficient</i>	Operating <i>Coefficient</i>	Equipment <i>Coefficient</i>	Personnel <i>Coefficient</i>	Operating <i>Coefficient</i>	Equipment <i>Coefficient</i>
<b>GGIA</b>	<b>0.25*</b>	<b>0.79†</b>	-0.06	<b>1.07***</b>	-0.07	0.00
<b>Local</b>	1.04***	-0.07	0.03*	0.64***	0.33***	0.03
<b>Federal</b>	1.22***	-0.22	0.00	0.98***	0.05	-0.03
<b>Fees</b>	0.78***	0.14	0.07†	0.72***	0.24*	0.04
<b>Other</b>	1.08***	-0.05	-0.03	-0.08	0.97*	0.11

\* p < 0.05

\*\* p < 0.01

\*\*\* p<0.001

**Table 3: Regression of revenue categories on each expenditure category for change in per capita revenues and expenditures - Top 10 counties vs. all other counties (N=157)**

Exp \ Rev	FY11 to FY12			FY12 to FY13		
	Personnel <i>Coefficient</i>	Operating <i>Coefficient</i>	Equipment <i>Coefficient</i>	Personnel <i>Coefficient</i>	Operating <i>Coefficient</i>	Equipment <i>Coefficient</i>
<b>GGIA</b>	0.75***	0.34	-0.10	0.80**	0.18	0.03
<b>GGIA*top 10</b>	<b>-0.58**</b>	<b>0.53**</b>	0.04	0.33	-0.30	-0.03
<b>Local</b>	1.05***	-0.08	0.02*	0.64***	0.34***	0.03
<b>Federal</b>	1.24***	-0.24	-0.01	0.99***	0.04	-0.03
<b>Fees</b>	0.75***	0.18	0.06**	0.70***	0.25**	0.04
<b>Other</b>	1.10***	-0.08	-0.03	-0.03	0.92*	0.11

\* p < 0.05

\*\* p < 0.01

\*\*\* p<0.001

## References

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