Efficiency in Public Health Service Delivery: An Analysis of Clinical Health Services Provided by Local Health Departments in Florida

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Abstract
The ability of local health departments (LHDs) to provide public health services to improve the health of their communities depends to a large extent on their financial resources. More money by itself, however, does not necessarily translate into better population health. LHDs also have to use their resources in an efficient manner to achieve the best possible outcomes. This article first describes two techniques that LHDs can use to assess their efficiency at providing public health services: process costing, a technique used by management accountants, and stochastic frontier analysis, a technique used by economists. Using data for LHDs in Florida, both techniques are then applied to estimate the efficiency at which LHDs provide three types of clinical health services: adult, child, and dental health services. The results show that LHDs’ efficiency varies both within and across agencies. Few LHDs have consistently low costs for all three services examined. Being relatively efficient at providing one type of service therefore does not necessarily translate into being able to provide other, even closely related, services at a low cost.

Keywords
public health service delivery, efficiency, cost

Cover Page Footnote
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In its 2012 report “For the Public’s Health: Investing in a Healthier Future”, the Institute of Medicine recommended significant increases in federal funding for public health to ensure that public health departments have the resources to invest in building healthier communities. More money by itself, however, does not necessarily translate into better outcomes. The ability of public health departments to improve the health of the communities they serve also depends on how efficiently they are able to use their resources when engaging in public health activities. Not much is known currently about the efficiency at which local health departments (LHDs) produce public health services. This report aims to contribute to the literature by (1) presenting two techniques for assessing efficiency in public health service delivery and (2) examining empirically the efficiency of LHDs’ provision of clinical health services using data from the state of Florida. The results show that efficiency varies widely both across and within public health agencies. To public health policy makers and practitioners, these results suggest that being able to estimate and compare the efficiency at which LHDs produce public health services represents a key factor in their decisions to allocate resources so as to achieve the best possible population health outcomes.

METHODS

Data for this study came from the Florida Department of Health (FDOH) in the form of the “County Health Department Expenses, Staffing, Services, Visits and Clients” data set. This data set was prepared by members of the Florida Administrative Data Collaborative and represents a consolidation of multiple public health administrative data sets received from the FDOH. The data include annual information on services provided, personnel employed, and expenditures incurred, by service line, for each LHD in the state of Florida. Our sample included all 67 Florida LHDs for the years 2008 and 2010. We focused our analysis on three clinical health services provided by almost all Florida LHDs: comprehensive child health services, comprehensive adult health services, and dental health services. We chose to study these services because spending on individual health services represents one of the largest budget items for many LHDs in Florida and because the provision of clinical health services may allow LHDs to generate revenues that can be used to support other activities. Our analysis included two steps: First, we estimated the efficiency at which LHDs produce clinical health services using two separate approaches (see below). Then, we used descriptive analysis to describe LHDs’ efficiency at providing clinical health services and to study variations both across and within agencies.

Two approaches were used to estimate the efficiency at which LHDs produce services: (1) process costing, a technique developed by management accountants, and (2) stochastic frontier analysis (SFA), a technique developed by economists. Using process costing we defined efficiency in terms of an LHD’s costs required to produce a defined unit of service. Assuming that the outputs under consideration are relatively homogenous, unit costs can be estimated as total costs incurred divided by the number of units produced, where total costs include both direct and indirect costs. Lower unit costs are associated with greater efficiency. SFA defines efficiency in terms of an LHD’s proximity to a so-called production “frontier”. LHDs operating on the frontier utilize minimum inputs to produce a desired set of outputs while LHDs operating below the frontier are not always successful at doing so. Greater proximity to the frontier is associated with greater relative efficiency.
RESULTS

Irrespective of how efficiency was measured, our findings showed that LHDs’ ability to produce clinical health services efficiently varied substantially both across and within organizations. Using process costing, median costs per visit in 2010 amounted to $152 for child health services, $154 for adult health services, and $137 for dental health services. However, unit costs varied substantially (Table 1). Median costs per visit for both adult and child health services were 2.8 times greater among the least efficient LHDs (defined as the 20 percent of LHDs with the highest unit costs) compared to the most efficient LHDs (defined as the 20 percent of LHDs with the lowest unit costs). For dental health services, the variation in unit costs was somewhat smaller. Nonetheless, the least efficient LHDs incurred more than double the cost per visit compared to the most efficient LHDs.

Table 1: Variation in Costs per Visit for Select Clinical Health Services across Local Health Departments in Florida, 2010

<table>
<thead>
<tr>
<th>Service line</th>
<th>Quintile 1</th>
<th>Quintile 2</th>
<th>Quintile 3</th>
<th>Quintile 4</th>
<th>Quintile 5</th>
<th>Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child health services</td>
<td>$93</td>
<td>$136</td>
<td>$152</td>
<td>$184</td>
<td>$354</td>
<td>2.8</td>
</tr>
<tr>
<td>Adult health services</td>
<td>$90</td>
<td>$114</td>
<td>$154</td>
<td>$184</td>
<td>$343</td>
<td>2.8</td>
</tr>
<tr>
<td>Dental health services</td>
<td>$104</td>
<td>$120</td>
<td>$137</td>
<td>$161</td>
<td>$236</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Note: Table displays median costs per visit. * indicates the ratio of the highest quintile to the lowest quintile.

Few LHDs had consistently low costs per visit across all clinical health services. Being relatively efficient at providing one type of service therefore does not necessarily translate into being able to provide other, even closely related, services at a low cost. Even for adult and child health services—two service lines that are very similar in terms of their production processes—only 39 percent of the LHDs with costs per adult visit in the lowest quintile also had costs per child visit in the lowest quintile. When examining all three services lines together, no single LHD in Florida incurred costs per visit that would have placed the LHD among the most efficient agencies (i.e., in the lowest quintile) for all three services.

Our second approach to estimating efficiency—measuring the proximity of each LHD to the production frontier using SFA—resulted in estimates of LHDs’ efficiency that were highly positively correlated with unit costs, our first measure of efficiency. SFA indicated that the median Florida LHD produced child health services with about 53 percent relative efficiency, adult health services with about 88 percent relative efficiency, and dental health services with about 94 percent relative efficiency. Again, LHDs’ efficiency varied widely. For child health services, the bottom 25 percent of LHDs operated at less than 35 percent relative efficiency while the top 25 percent operated at 71 percent or more relative efficiency (Figure 1). We observed less variation in relative efficiency across LHDs for adult and dental health services. For adult health services, 90 percent of LHDs operated within 80 to 90 percent relative efficiency while for dental health service, 90 percent of LHDs operated within 80 to 95 percent relative efficiency. On possible explanation for this finding is that demand for these services has increased significantly since the 2008 recession thus forcing many LHDs to utilize their resources more efficiently than before.

Florida’s LHDs and their service delivery systems vary considerably, which may explain some of the variation in efficiency described in this study. In addition, efficiency may be affected by a LHD’s
case mix. Some Florida health departments serve predominantly older adults with chronic diseases by operating combined primary care/disease management clinics. Unit costs for these patients are likely higher than the unit costs for LHDs serving younger, healthier populations. Moreover, variations in efficiency may result from differences in the quality of services provided as higher quality frequently increases costs. Finally, variation in efficiency can occur if large expenditures associated with non-clinical services (such as local grants for public education campaigns or outreach activities) are charged to specific clinical service lines. Some high-cost LHDs may thus not necessarily be inefficient from a clinical standpoint. Rather, the numerator in our efficiency calculation may be inflated by significant non-clinical expenditures. Future studies of LHDs’ efficiency will be needed to understand more fully what drives variations in efficiency both across and within organizations.

**Figure 1: Relative Efficiency of Local Health Departments in Florida at Providing Child Health Services, 2008 and 2010**

**IMPLICATIONS**

In times of budget cuts and funding shortfalls, the efficiency at which LHDs produce public health services plays a crucial role in their efforts to improve the health of the communities they serve. As a first step toward improved performance, local health officers need to be able to estimate the efficiency at which they operate and benchmark themselves against other LHDs. This study presented two techniques that practitioners can use to do so. While our analysis focused on clinical health services, these techniques can easily be applied to other public health activities. A better understanding of LHDs’ efficiency of service provision can help public health policymakers and practitioners to allocate resources to those services that a health department can operate most efficiently and to decide whether to produce services in-house, provide them jointly with other
agencies, or use external contractors. Improved performance, in return, may allow public health practitioners to better address the health needs of a community and thus contribute to improving the health of the population.

**SUMMARY BOX:**

**What is Already Known about This Topic?** To date, only one study has examined empirically the efficiency at which LHDs in the United States produce public health services. This study found that, in 2005, the typical LHD operated with about 28% inefficiency although inefficiency was as high as 69% for some LHDs.

**What is Added by this Report?** This report presents two additional techniques to estimate LHDs’ efficiency of service production. Irrespective of the approach used, the findings show that efficiency varies both across and within agencies. Few LHDs are consistently able to achieve high efficiency across service lines.

**What are the Implications for Public Health Practice, Policy, and Research?** In times of budget cuts and funding shortfalls, public health practitioners can use the techniques presented in this report to assess the efficiency at which their agencies provide specific public health services. The results can inform decisions about how to allocate financial resources so as to achieve the best possible population health outcomes.

**REFERENCES**


