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The Resilient Local Health Department: Surviving the 2008 Economic Crisis

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The Resilient Local Health Department: Surviving the 2008 Economic Crisis

Abstract

The purpose of this study was to identify potential modifiable factors that can protect local health departments (LHDs) from job losses and budget cuts during periods of economic stress. This was a retrospective cohort study based on the 2005 and 2010 surveys of LHDs conducted by the National Association of County and City Health Officials. The outcome of interest – resiliency of the LHD – represented financial resiliency for maintaining budgets during the 2008 recession, and was based on the ratio of observed-to-predicted expenditures per capita for 2010. LHDs which successfully weathered the economic recession of 2008 represented smaller populations and were better resourced in 2005, were less likely to have had a board of health with the authority to hire/fire, and were less likely to be dependent on local resources compared to LHDs which experienced significant losses in funding by 2010. These results varied by size of the jurisdictional population.

Keywords

public health financing, local health departments

Cover Page Footnote

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Public health financing is one of the four primary domains of the recently developed public health services and systems research agenda.¹ It is arguably the most critical domain, as its relationships with both public health performance and health outcomes can have direct effects on the communities served by public health agencies.² One way in which the financial situations of local health departments (LHDs) have been assessed is through analyses of the impact of the national economic crisis in 2007-2008.³ In 2008, 27% of LHDs reported a decline in budgets compared to the previous year, with this figure increasing to 45% in August 2009 and again in July 2011. The financial crisis resulted in an estimated loss of 39,600 LHD jobs from 2008 to 2011, equating to over 21% of the estimated workforce size (184,000) in 2010.

A conceptual model of public health finance developed by Moulton *et al* considers both the public and private control over sources and uses of financial resources; the context within which this model functions – the local public health system – influences and reflects the organizational structures which facilitate or act as barriers to effective public health financing.⁴ This can serve as a useful framework for exploring why, despite such losses as described above, a sizable proportion of LHDs managed to preserve or even increase their funding. Willard et al reported that LHDs which served a smaller population size, were served by a board of health (BOH), obtained a higher proportion of revenues from clinical services and from local sources were less likely to experience budget cuts between 2009-2010.³ While these data provide clues to resiliency, they do not differentiate the LHDs which experienced substantial budgetary changes from those which experienced minimal changes. Therefore, the purpose of this study is to explore the financial situation of LHDs from a resilience standpoint, focusing specifically on two research questions: what are the organizational characteristics of LHDs that weathered the economic crisis of 2008, and are there potential modifiable factors - including public and private sources and uses of resources - that can protect LHDs from job losses and budget cuts during periods of future economic stress?

METHODS

This retrospective cohort study used data from the National Profile of LHDs surveys, conducted in 2005 and 2010 by the National Association of County and City Health Officials (NACCHO). Out of 2,300 responses in 2005 and 2,107 responses in 2010, a pooled dataset included 1,734 LHDs which responded to both surveys. LHDs were further excluded if they did not provide expenditure and revenue data in both surveys; if they represented cities only; and if they had changed jurisdictions between 2005 and 2010. This resulted in a final dataset of 987 LHDs. The 2005 Profile survey served as the source of data on organizational characteristics, revenue sources, and services. These characteristics reflect the conceptual model of public health finance in considering the sources and uses of financial resources, and the organizational context in which decisions on such resources takes place. Data on community characteristics were drawn from the 2010 American Community Survey, and included jurisdictional population size and other characteristics (e.g., poverty and education) that influence the local public health system and LHD performance and health outcomes. The outcome of interest – resiliency of the LHD – represented financial resiliency for maintaining budgets during the recession, and was based on the ratio of observed-to-expected (O/E)

expenditures per capita for 2010. This ratio was developed using both the 2005 and 2010 NACCHO survey data, in a two-step regression model. In the first step, LHD expenditures per capita for 2010 were regressed against expenditures per capita for 2005, controlling for the population size and community characteristics described above. This model provided the basis for predicted expenditures per capita for 2010, which were used to compute O/E expenditures per capita ratios. In a final step to account for variance in the O/E ratio, we dichotomized the ratio based on the lower tail of the CI interval for each agency's O/E ratio ($O/E - 1.96*SE$), where values > 1.0 represented *resilient LHDs* while values < 1.0 represented *non-resilient LHDs*. LHDs were stratified according to jurisdictional population size, as small ($<50,000$), medium (50,000-500,000), and large ($>500,000$) (hereafter referred to as LHD size). Bivariate analyses of the association between resiliency and LHD and community characteristics were carried out using the Wilcoxon-Mann-Whitney (rank sum) test for continuous data or chi-square for categorical data.

RESULTS

Table 1 includes summary statistics on the outcome of interest - O/E expenditures per capita ratio. Thirty-three percent (328) of LHDs were categorized as resilient, and 66% (659) as non-resilient. Table 2 includes descriptive data by resiliency category, values for LHD and community characteristics, and bivariate analyses, stratified by LHD size. Overall, resilient LHDs tended to serve smaller jurisdictions and be better resourced in 2005 compared to non-resilient LHDs, but statistical significance was not maintained when stratified by LHD size. The presence of a BOH was negatively associated with resiliency for smaller LHDs; having a BOH with authority to hire/fire the LHD Director was negatively associated with resiliency for both small and medium-size LHDs. Greater revenues from non-local sources (including state and federal sources) were positively associated with LHD resiliency for small LHDs; similar (but non-significant) trends were seen for medium-size LHDs. Resilient larger LHDs tended to obtain a greater share of revenues from Medicaid and Medicare, and a lesser share from federal pass-through funds and regulatory fees compared to non-resilient large LHDs. A broader array of services – particularly screening and treatment services – were positively associated with resiliency for small and large LHDs, while this was the opposite for medium-size LHDs. Community characteristics – including poverty, education, and insurance coverage – did not distinguish resilient from non-resilient small LHDs; however, almost all of these factors were negatively associated with resiliency for medium-size LHDs, and most show similar (but non-significant) trends for large LHDs.

Table 1: Summary statistics of Observed-to-Expected Expenditures per capita ratio for 2010

| Observed-to-Expected Expenditures per capita ratio (n=987) | |
|--|-------------|
| Mean | 0.99 |
| Median | 0.92 |
| Range | 0.15 - 5.52 |
| Standard deviation | 0.44 |
| 95% CI | 0.96, 1.02 |
| SE | .0140 |
| Resilient LHDs (O/E-1.96*SE)>1.0 | n=328 |
| Non-Resilient LHDs (O/E-1.96*SE)<1.0 | n= 659 |

1 **Table 2: Bivariate analyses of Resilient vs. Non-Resilient Local Health Department, by LHD organization, revenues, services, and**
 2 **community characteristics.**

3

| | Total (n=987) | | | LHD jurisdictional population | | | | | | | | |
|---|----------------------|------------------|-----|-------------------------------|------------------|-----|------------------------|------------------|-----|---------------------|-----------------|-----|
| | Non-resilient, n=659 | Resilient, n=328 | p | < 50,000 (n=538) | | | 50,000-500,000 (n=384) | | | > 500,000 (n=65) | | |
| | | | | Non-resilient, n=339 | Resilient, n=199 | p | Non-resilient, n=271 | Resilient, n=113 | p | Non-resilient, n=49 | Resilient, n=16 | p |
| Full Time Equivalents (FTEs) 2005 | 79.9 | 68.9 | | 18.1 | 21.8 | * | 87.5 | 82.4 | | 464.8 | 558.5 | |
| Full Time Equivalents 2010 | 76.4 | 75.6 | | 16.9 | 25.6 | *** | 83.6 | 92.4 | | 448 | 579.7 | |
| Expenditures 2005 ¹ | \$6,301,811 | \$6,789,793 | | \$1,033,967 | \$1,213,488 | | \$5,939,394 | \$7,578,862 | | \$44,800,000 | \$70,600,000 | |
| Expenditures 2010 | \$6,951,882 | \$9,491,313 | ** | \$1,136,754 | \$2,018,217 | *** | \$6,671,125 | \$11,600,000 | * | \$48,700,000 | \$87,300,000 | * |
| Jurisdictional Population 2005 | 162,364 | 108,736 | ** | 23,058 | 22,770 | | 159,231 | 144,068 | | 1,143,457 | 928,408 | |
| Jurisdictional Population 2010 | 167,939 | 108,254 | ** | 23,045 | 22,694 | | 165,661 | 145,480 | | 1,182,970 | 909,505 | |
| FTE/pop 2005 (per 10000) | 7.37 | 8.68 | ** | 8.8 | 10.3 | ** | 6.1 | 6.3 | | 4.4 | 5.5 | |
| FTE/pop 2010 (per 10000) | 6.93 | 10.52 | *** | 8.4 | 12.8 | *** | 5.6 | 7.1 | * | 4 | 6.2 | ** |
| Expenditures per capita 2005 | \$50.68 | \$60.67 | * | \$55.94 | \$61.72 | | \$46.12 | \$56.83 | | \$39.47 | \$74.78 | |
| Expenditures per capita 2010 | \$48.73 | \$89.40 | *** | \$54.46 | \$98.10 | *** | \$43.85 | \$74.56 | *** | \$36.12 | \$85.93 | *** |
| Organizational Characteristics 2005 | | | | | | | | | | | | |
| Jurisdiction | | | | | | | | | | | | |
| % County | 75.4 | 79 | | 85.5 | 84.4 | | 63.5 | 71.7 | | 71.4 | 62.5 | |
| % City or City/County | 13.7 | 11 | | 9.7 | 8 | | 17 | 14.2 | | 22.5 | 25 | |
| % Multi-County/District | 10.9 | 10.1 | | 4.7 | 7.5 | | 19.6 | 14.2 | | 6.1 | 12.5 | |
| % with Board of Health | 78.3 | 79 | | 84.7 | 77.4 | * | 75.6 | 83.2 | | 49 | 68.8 | |
| % BOH with hire/fire authority | 52.4 | 43.3 | ** | 66.7 | 55.1 | * | 67 | 54.4 | * | 62.5 | 36.4 | |
| Tenure of Director | 8.1 yrs | 7.2 yrs | * | 8.2 yrs | 7.2 yrs | | 8.3 yrs | 7.3 yrs | | 6.9 yrs | 5.6 yrs | |
| % Director with MPH | 21.7 | 16.5 | * | 10.9 | 8.5 | | 31.4 | 27.4 | | 42.9 | 37.5 | |
| % Changed Director 2005-10 | 39.1 | 38.1 | | 67 | 63.3 | | 55.7 | 61.1 | | 46.9 | 50 | |
| % completing Community Health Assessment past 3 yrs | 58.4 | 66.2 | * | 55.5 | 65.3 | * | 59.8 | 69 | | 71.4 | 56.2 | |
| Revenues 2005 | | | | | | | | | | | | |
| % revenue from Medicaid | 9.8 | 11.9 | * | 10.6 | 12.5 | | 9.5 | 11.2 | | 6.4 | 8.9 | |
| % revenue from Medicare | 5.3 | 6.1 | | 7 | 6.9 | | 3.9 | 5.2 | | 0.7 | 3.7 | |

Erwin et al.: The Resilient Local Health Department

| | | | | | | | | | | |
|---|------------------|------------------|----------|-----------------|-----------------|-----|------------------|------------------|--------------------|------------------|
| % revenue from City/County | 26.9 | 21.6 | *** | 26.6 | 19.3 | *** | 27 | 24.4 | 28.9 | 31.3 |
| % revenue from Federal pass-through funds | 20.4 | 22.6 | | 20 | 24.2 | * | 21 | 20.9 | 20.5 | 14.7 |
| % revenues direct Federal | 1.4 | 1.4 | | 0.8 | 1 | | 1.6 | 2 | 5 | 2.2 |
| % revenues from State | 21.8 | 24.3 | | 23.2 | 25.3 | | 19.9 | 22.1 | 23 | 26.8 |
| % revenue Federal pass-through, Federal direct, State | 43.7 | 48.3 | ** | 44 | 50.5 | * | 42.5 | 45 | 48.5 | 43.6 |
| % revenues from Patient Fees | 4.1 | 3.6 | | 4.4 | 3.8 | | 4 | 3.4 | 2.8 | 2.7 |
| % revenues from Regulatory fees | 4.6 | 3.1 | | 2 | 1.9 | | 7.4 | 5 | 6.8 | 4.9 |
| Bioterrorism-Preparedness Funding 2005 | \$230,983 | \$140,963 | * | \$47,397 | \$41,546 | | \$194,272 | \$182,259 | \$1,558,126 | \$854,293 |
| Bioterrorism-Preparedness Funding per capita 2005 | \$1.78 | \$1.79 | | \$2.26 | \$2.17 | * | \$1.33 | \$1.34 | \$1.06 | \$0.95 |
| FTEs hired with Bioterrorism-Preparedness Funding | 1.9 | 1.2 | * | 0.5 | 0.4 | | 2.1 | 1.7 | 10 | 6.9 |
| Number of LHD Services 2005² | | | | | | | | | | |
| Screening (8) | 5.4 | 5.1 | | 5.3 | 5 | | 5.5 | 4.9 | 5.7 | 6.6 |
| Treatment (13) | 5.3 | 5.5 | | 4.7 | 5.3 | ** | 5.9 | 5.3 | 6.2 | 7.9 |
| Epidemiology (6) | 3.4 | 3.2 | | 3.1 | 2.9 | | 3.5 | 3.5 | 4.3 | 3.8 |
| Population (7) | 3 | 3.3 | * | 2.8 | 3.2 | ** | 3.1 | 3.4 | 4.1 | 4.2 |
| Regulatory (19) | 7.3 | 7.4 | | 6 | 6.5 | | 8.7 | 8.7 | 8.4 | 9.9 |
| Total Services (53) | 24.2 | 24.6 | | 21.8 | 23.2 | | 26.4 | 25.7 | 28.7 | 33.1 |
| Community Characteristics 2005 | | | | | | | | | | |
| % below poverty | 14.7 | 14 | ** | 15.3 | 15.1 | | 14.3 | 12.4 | 12.8 | 10.3 |
| % with less than high school education | 7.8 | 7.4 | * | 8.5 | 8.3 | | 7 | 6 | 7.5 | 5.8 |
| % uninsured | 16.9 | 16.2 | ** | 17.2 | 17.3 | | 16.3 | 14.3 | 17.9 | 15.3 |
| % African-American | 7.8 | 6.3 | * | 5.4 | 6.5 | | 9.1 | 5.4 | 17.3 | 10 |
| % above 65 years of age | 15.7 | 15.5 | | 17.1 | 16.9 | | 14.5 | 13.6 | 11.9 | 12.4 |

4 * p<.05; ** p<.01; *** p<.001

5 ¹ 2005 dollars adjusted to 2010 dollars

6 ² Number of services surveyed in parentheses

7

IMPLICATIONS

Since BOH authority, revenue mix, and array of services may all be modifiable characteristics, the findings suggest possible means for LHDs to attain resiliency in the face of future economic crises. It is clear, however, that factors influencing resiliency operate differently according to LHD jurisdictional size. The differences in revenues by resiliency category are primarily categorized in the Moulton *et al* model as “Type A” – where the government “controls the sources and uses of financial resources”.⁴ Smaller LHDs which were less reliant on local local sources of revenue – which would have been hardest hit during the recession – were more likely to be resilient. Among large LHDs, those which obtained a greater share of revenue from Medicare and Medicaid were more likely to be resilient – a finding that is also reflected in the services (e.g. more treatment) provided by these resilient larger LHDs. Further refinements in clarifying financial resiliency may be enhanced through wider use of the Public Health Uniform Data Systems, a Web-based financial data collection and analysis portal hosted and maintained by NACCHO, and the Public Health Finance & Management web site (<http://www.publichealthfinance.org/>), as described by Honore.⁵ Further analyses of this project’s data will need to make use of multiple regression models which examine the outcome of resiliency as a function of the the numerous independent and control variables considered simultaneously.

SUMMARY BOX:

Local Health Departments were negatively impacted by the economic crisis of 2008, losing significant revenues and jobs.

Local Health Departments which successfully weathered the economic recession of 2008 represented smaller populations and were better resourced in 2005, were less likely to have had a board of health with the authority to hire/fire, and were less likely to be dependent on local resources compared to local health departments which experienced significant losses in funding by 2010.

Characteristics of resiliency vary significantly by the size of the Local Health Department jurisdictional population.

Local Health Departments’ capacity for resiliency is also dependent on factors that may indicate the overall economic health of the community.

Several of the factors associated with financial resiliency may be modifiable characteristics that Local Health Departments have some control over, thus having potential protective effects against future economic threats.

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