

Introduction

A comprehensive, accurate description of the activities, capacities, and needs of local public health agencies (LPHAs) is essential to understanding the role these agencies play in the nation's public health system. LPHAs provide a variety of services and programs, and they have a unique role in assessing and assuring the health of the communities they serve. Given the importance of LPHAs in strengthening and improving the health of communities across the country, there are surprisingly few national-level studies of local public health infrastructure.



With the support of the Robert Wood Johnson Foundation, the National Association of County and City Health Officials (NACCHO) carried out a study to advance our understanding of the current infrastructure and future needs of LPHAs and better understand the many ways these agencies contribute to keeping our nation's population and environment healthy.

The rapidity and magnitude of changes occurring in the nation's healthcare and public health systems call for current data to help understand LPHA capacities, and inform planning and policy development. The increase of managed care, reorganization of state health and social welfare agencies, new environmental burdens and hazards, and increasing numbers of residents without health insurance are just some of the factors prompting LPHAs and others to rethink and restructure their roles and develop new capacities to best serve their jurisdictions.

Given the changes and transformations to public health, there is a need for baseline and tracking information on LPHAs and the resources they need to create and maintain effective local public health systems. This *Chartbook* provides baseline data on local public health infrastructure, and helps to identify areas for improvement in local public health systems. Some of these data may contribute to national discussions of how to monitor the public health infrastructure, for example *Healthy People 2010* objectives on the public health infrastructure.²

Many public health officials have decried the lack of individual residents' understandings of what LPHAs do in the communities they serve. A 1999 study of public opinion about public health demonstrated there is confusion about what the term "public health" means. Less than half of those surveyed correctly identified public health as either "protecting the population from disease" or "policies and programs that promote healthy living conditions for everyone."³ This *Chartbook* is a resource that illustrates how LPHAs contribute to the health of their communities, and can be used to heighten public awareness about the important functions of local public health systems across the country.

Over the past decade, public health leaders have called on local health officials to make internal changes and reorient their activities to address a more clearly defined set of functions and partnerships in their communities. This call was articulated in the 1988 Institute of Medicine report *The Future of Public Health*, and continues over a decade later.⁴ The data presented in this *Chartbook* speak to the opportunities and challenges LPHAs face as they define these functions and relationships. By emphasizing the current features of the local public health landscape, this *Chartbook* will be used to celebrate the gains made by LPHAs in recent years, and to identify gaps and necessary enhancements to these systems in the future.

Public Health Infrastructure: A Review of the Literature

NACCHO's review of the literature on public health infrastructure generated two important findings. First, there has been little empirical study of public health infrastructure at the local level, although many have established the need for such research. Second, the term "public health infrastructure" has been interpreted in many different ways, confounding its definition and measurement. This definitional disarray has led to a fragmented body of literature and complicated attempts to synthesize and build consensus around public health infrastructure priorities. This *Chartbook* will assist in clarifying what "public health infrastructure" means relative to LPHAs, and add to the body of empirical work on public health agency capacities at the local level.

The lack of a common understanding of public health infrastructure has been recently addressed in a 1997 report prepared for the U.S. Department of Health and Human Services by the Lewin Group.⁵ The Lewin Group report broadly defines public health infrastructure as "the systems, competencies, relationships, and resources that enable the performance of the ten essential services of public health for every community."⁶ Though general in scope, this definition touches upon four central features of public health infrastructure that have been addressed in prior research: 1) partnerships or relationship building; 2) workforce training and education issues; 3) information management, surveillance, and research; and 4) finances and expenditures.

Studies of public health infrastructure have touched upon these four features despite the lack of agreement on how to best characterize or define infrastructure. For example, Turnock (1997) forwards a public health systems approach to infrastructure, focusing on the human, information, financial, and organizational resources that make the provision of public health services possible in a community.⁷

Like the research cited above, other investigators have defined infrastructure as the core LPHA capacities that make the provision of public health services possible,

including partnerships and collaborations, workforce and training resources, and financial resources.

In this sense, infrastructure is defined as the foundation of public health activities. For example, Hanlon and Pickett (1984) view infrastructure as "... the core of the [local health] agency, its nerve system, its presence."⁸ Roper, Baker, Dyal, and Nicola (1992) describe infrastructure as the capacity of principal components in the public health systems to support the core functions of public health.⁹ Gebbie (1993) defines infrastructure as a coordinated system of services, the sum total of which makes public health a reality in a community.¹⁰ Current interest in public health infrastructure at the national level was emphasized with two recent initiatives—the release of *Healthy People 2010*,¹¹ which includes 17 new objectives in an entire chapter on public health infrastructure and The Public Health Threats and Emergency Act of 2000—passed by Congress to improve public health capacity.¹²

In this *Chartbook*, public health infrastructure is defined similarly to the research cited above. Using the "Essential Service Framework" (see Text Box 1), public health infrastructure is understood to be the capacities and resources that make the provision of the essential public health services possible within a community.^{13, 14} This includes service provision, workforce needs, community involvement, partnerships, and other facets of contemporary public health practice.

Public health capacities vary widely within and between states. For example, several states have geographic areas without a local public health infrastructure, and few resources to provide local public health services to residents. In other states, every county and municipality is served by an LPHA. Sometimes LPHAs are part of large health and human service "super-agencies" where local public health services are provided alongside other social services for community members.

One aim of this *Chartbook* is to present this variation at the national level, and paint a picture of today's local public health infrastructure that can be used as a sounding board for new ideas and improvements to local

public health practice. As mentioned above, there are few sources of data on local public health infrastructure at the national level. One of the most useful sources of infrastructure data is NACCHO's *National Profile of Local Health Departments* series.^{15, 16, 17} NACCHO's *Profile* series provides information on LPHA characteristics such as staff size, budget, and services provided. These studies were used in the development of the current research project. To promote consistency with prior NACCHO *Profile* work, the research areas and survey questions used in this project were designed to be comparable to NACCHO *Profile* topics and survey questions whenever possible. Features of the public health infrastructure that are examined in this research include:

- Funding sources that support LPHAs
- Programs and services provided by LPHAs
- LPHA workforce and training needs
- Partnerships and collaborations developed by LPHAs
- LPHA community health assessment activities

The data presented in this *Chartbook* provide a snapshot of the current LPHA landscape that is consistent with prior NACCHO work, and also takes that work a step further. For example, the data collected on the public health workforce at the LPHA level used developmental *Standard Occupational Classifications (SOC)* for public health workers that have not been used in prior research on LPHAs.¹⁸ For the first time, an analysis of priorities, challenges and strengths is presented for a representative sample of all LPHAs nationwide. Thus this *Chartbook* provides information that adds to the existing literature on local public health infrastructure, and employs new research methods and techniques to advance our understanding of the country's local public health system.

Text Box 1. PUBLIC HEALTH IN AMERICA

Vision

Healthy People in Healthy Communities

Mission

Promote Physical and Mental Health and Prevent Disease, Injury and Disability

Public Health

- Prevents epidemics and the spread of disease
- Protects against environmental hazards
- Prevents injuries
- Promotes and encourages healthy behaviors
- Responds to disasters and assists communities in recovery
- Assures the quality and accessibility of health services

10 Essential Public Health Services

- Monitor health status to identify community health problems.
- Diagnose and investigate health problems and health hazards in the community.
- Inform, educate, and empower people about health issues.
- Mobilize community partnerships to identify and solve health problems.
- Develop policies and plans that support individual and community health efforts.
- Enforce laws and regulations that protect health and ensure safety.
- Link people to needed personal health services and assure the provision of health care when otherwise unavailable.
- Assure a competent public health and personal health care workforce.
- Evaluate effectiveness, accessibility, and quality of personal and population-based services.
- Research for new insights and innovative solutions to health problems.

Source: Reprinted from *Public Health Functions Steering Committees, Public Health in America*. July 1995

Study Methodology and Analysis Techniques

Because of the detailed nature of the research topic, and the need for specific data on many different aspects of local public health infrastructure, a mail-back survey was seen as the most appropriate and efficient data collection strategy for this project. In the spring of 1998, NACCHO convened an expert panel (see Appendix A) to inform the development of the project and generate ideas for the survey questionnaire.

DATA COLLECTION AND SAMPLING STRATEGIES
NACCHO maintains a database of the nation's known LPHAs, and this database was used to form the study's sampling frame. For the purposes of this and other NACCHO studies, local public health agency was defined as "an administrative or service unit of local or state government concerned with health, and carrying some responsibility for the health of a jurisdiction smaller than the state." At the time of sample selection, NACCHO's database was used to identify 2,912 LPHAs. The survey used stratified, probability sampling, without replacement, to sample LPHAs. The sampling frame was stratified using eight strata defined by the population size of the jurisdiction served by the LPHA, a strategy that has traditionally been used by NACCHO. The sampling technique also was designed to select at least one LPHA from each of the 49 states with LPHAs.¹⁹

Mathematica Policy Research, Inc., the project contractor, selected a sample of 1,100 LPHAs to receive a survey questionnaire.²⁰ In consultation with the project contractor, a survey questionnaire was pre-tested with 23 health directors in August 1999. Fifteen questionnaires were returned and analyzed. Responses were used to improve the survey instrument prior to the full-scale study.

The final 26-page survey questionnaire (see Appendix B) was mailed by Mathematica Policy Research, Inc., to the health officers/directors in the LPHAs selected in the sample, with the request that they or a designee familiar with all aspects of the LPHA complete the survey. An incentive to complete the survey was included with the

mailing: responding LPHAs were entered into a drawing to receive an expense-paid trip to the NACCHO Annual Meeting in Los Angeles.

Mathematica Policy Research, Inc., also conducted data entry and cleaning activities, prepared the final dataset, and prepared the response rate analysis. Follow-up data suggest that in almost all cases, the LPHA director completed the survey.

Unlike the *Profile* studies conducted by NACCHO in previous years, the current study relies upon a sample of LPHAs to make generalizations and inferences about all LPHAs. Please note that the population of LPHAs across the country is not "normally distributed" in the statistical sense of the term. Over 50% of all LPHAs serve small populations (0 to 24,999 residents), while 3% serve populations of a million or more.

RESPONSE RATES AND NON-RESPONSE ADJUSTMENT

The data presented in this *Chartbook* were collected between November 1999 and April 2000. After reminder letters, telephone calls and emails to non-responding cases and a second mailing of the survey questionnaire, the project contractor closed data collection with an overall response rate of 63% (n=694). Responses were received from LPHAs in 48 states. Four percent (4%) of the survey sample notified the project contractor that they refused to participate. Most of these cases cited the time burden imposed by the questionnaire as their reason. The sample sizes, response and refusal rates are presented in Table 1 (p.9).

As shown in Table 1, response rates varied from a high of 73.3% in the 500,000 to 999,999 stratum to a low of 56.1% in the 0 to 24,999 stratum. The lower response rate in this stratum is most likely related to the comparatively small size of these LPHAs. With fewer staff, services, and expenditures to report, these LPHAs may have had less incentive to complete the questionnaire. Similar non-response patterns among smaller LPHAs have been reported in prior NACCHO *Profile* work. Overall, the analysis of the survey response pattern does

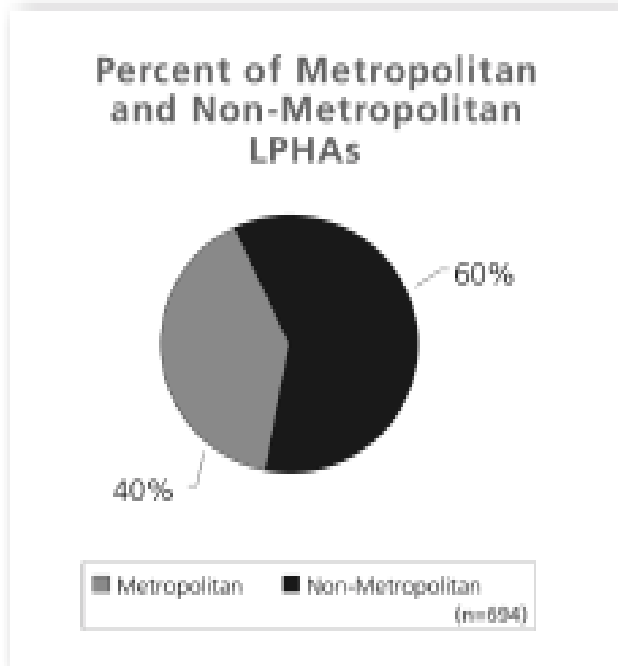
not suggest any significant non-response bias within the study sample. The data presented in this *Chartbook* are adjusted for non-response and weighted to produce population estimates for LPHAs nationwide, not individual states or regions of the country.²¹

ANALYSIS TECHNIQUES

The analysis of the data presented in this *Chartbook* was designed to be easily interpreted by readers of various backgrounds and statistical expertise. Readers will find overall frequency distributions and two-way tables for most of the major variables of interest. Sample weights were used when analyzing the data; therefore weighted data are presented in this *Chartbook*. Data were analyzed by NACCHO staff using the statistical software package *STATA* Version 6 and 7.²² Data are presented by population size of the jurisdiction served, metropolitan versus non-metropolitan area, and LPHA type (county, city, combined city-county, township, or multiple county-district-regional LPHA). Readers should note that tests of statistical significance are not reported in the charts and tables presented. These data, however, are available from NACCHO for interested readers.²³ Readers also should note that totals presented in some figures do not add to 100% due to rounding.

POPULATION SIZE

The population size of the jurisdiction served category is derived from NACCHO's database of LPHAs. Population size is annually reported by member LPHAs to NACCHO. Non-member LPHA population sizes are from Bureau of the Census population estimates for each jurisdiction. Five population categories are used in the analysis for consistency with prior NACCHO *Profile* studies. These are: 0 to 24,999; 25,000 to 49,999; 50,000 to 99,999; 100,000 to 499,999; and 500,000 or more. As NACCHO's prior research has shown, a jurisdiction's population size often influences the types of services provided and resources available to the LPHA; this variable is included in most of the charts and figures presented in this document.



METROPOLITAN AND NON-METROPOLITAN AREA LPHAs

There is interest in and discussion about differences between LPHAs that serve rural versus urban areas of the United States. There are two commonly used definitions of “rural” available to researchers and policy makers. The one used in this *Chartbook* was established by the Office of Management and Budget (OMB) and defines counties as metropolitan or non-metropolitan. This county-based designation is based on population size and integration with large cities.²⁴ The OMB's listing of metropolitan/non-metropolitan counties was obtained from the Health Resources and Services Administration's 1999 Area Resource File.²⁵

It is important to consider the methodological caveat to this definition of metropolitan versus non-metropolitan counties. Because these data are only available at the county level, health departments that serve sub-county jurisdictions, such as cities or townships, were coded according to the county in which they were located. In states where the majority of LPHAs are not county-based, for example, Connecticut, Massachusetts, New Jersey, and New Hampshire, this definition does not effectively describe the nature of the jurisdictions served.

Furthermore, for LPHAs that serve both rural and urban areas in one county, the true nature of the county is not effectively captured. This methodology is not ideal for these areas, but it represents the best technique available to the project team at the time of analysis. Recently, a new methodology using census tracts has been released.²⁶ The research team plans to incorporate the new methodology in future rural-urban research. The percent of metropolitan and non-metropolitan LPHAs in this study is shown in the figure on page 7.

LOCAL PUBLIC HEALTH AGENCY TYPE

NACCHO has identified five major categories used to describe the variation in LPHA type: county, city, city-county, township, and multi-county/district/regional. County LPHAs are the most common type of LPHA, and serve individual counties throughout the country. County LPHAs range in size from small rural counties to large metropolitan counties such as Los Angeles County. County LPHAs may or may not serve all geographic areas within the county, for example a city within a county may be served by a municipal LPHA. City public health agencies are municipal public health departments that serve the geographic boundaries of their cities. These may be small cities, as well as large urban areas such as Kansas City, MO, or New York City. City-county public health agencies represent jurisdictions where a city and its surrounding county are joined together to form a LPHA, for example Wichita-Sedgwick Health Department, KS, or Seattle-King County Health Department, WA. City-county public health agencies often have a dual reporting structure, where the LPHA director is accountable to both a city council and a county commissioner/county executive.

Township health departments serve townships across the U.S., and are usually located in states with strong “home-rule” or “town-meeting” political systems such as Connecticut, Massachusetts and New Jersey.

“Multi-county” health departments are LPHAs serving more than one county, and often span large geographic areas in the western United States. For example, Northeast Colorado Health District serves six counties in the

northeastern part of Colorado. The geographic area of this LPHA is roughly equivalent in square miles to the state of Vermont. The multiple county LPHA category also includes regional or district LPHAs. These are health departments that serve multiple counties, and health directors may be responsible to multiple county boards of health, or a combined board of health representative of all the counties in the district. The multiple county category also includes regional offices of the state health department that act as the LPHAs in their areas. Examples of this type of LPHA are found in several states including Alabama, Arkansas, Mississippi, New Mexico, Tennessee, and Vermont.²⁷

LIMITATIONS

Recognizing the limitations of the data presented in this *Chartbook* will assist the reader with interpretation and explanation of findings. All data presented in this document, with the exception of some population data and the metropolitan/non-metropolitan designation, are self-reported by survey respondents. These data were not formally tested for reliability, although considerable care was taken to validate the dataset by contacting LPHAs for missing data and to confirm survey responses. Other self-reported local public health research has demonstrated a high degree of reliability, and there is no reason to believe that these data are an exception.^{28, 29, 30}

It is extremely difficult to derive an exact case definition for all LPHAs across the country. Studies using other definitions of a LPHA will generate a different sample frame of LPHAs and result in findings that differ from the numbers presented herein. Changes over time and new information collected by NACCHO cause the number of LPHAs in the nation to vary over time. The sample frame of 2,912 in this study is close to prior studies of LPHAs, but does differ from the 2,888 reported in NACCHO’s *1992-1993 Profile* and the 2,834 in NACCHO’s *1997 Profile*.

The population surveyed in this study is not identical to prior NACCHO work, and this study relies upon a stratified, randomly selected sample. Comparisons of the results, including longitudinal analyses, of this survey

with prior work on LPHAs, such as NACCHO's *Profile* studies, should be conducted cautiously as the population in this survey differs from other surveys. Comparisons also should take into account changes in question wording and format. With these cautions in mind,

however, the data presented in this study contribute to a comprehensive picture of local public health infrastructure. Data from the *1992-1993 Profile* and the *1997 Profile* are presented in various places throughout this document for illustration and explanation purposes.

Table 1. RESPONSE RATES

Sampling Strata	Frame Count (N)	Sample Count (n)	Response Rate (%)
0 to 24,999	1,464	326	56.1
25,000 to 49,999	565	180	63.9
50,000 to 74,999	234	127	66.9
75,000 to 99,999	141	111	65.8
100,000 to 249,999	293	141	61.7
250,000 to 499,999	110	110	70.9
500,000 to 999,999	75	75	73.3
1 million +	30	30	60.0
Total	2,912	1,100	63.1

Overall Characteristics

This section presents some of the basic characteristics of LPHAs nationwide. From the outset, readers will observe that LPHAs are extremely diverse organizations. The themes of diversity and variation carry into subsequent sections of the report.

POPULATION SERVED

NACCHO data on the population size of LPHA jurisdictions show that over two-thirds (69%) of LPHAs serve jurisdictions with less than 50,000 people. By contrast, 4% of LPHAs serve jurisdictions with 500,000 persons or more. Efforts to improve public health

infrastructure should consider this variation, in that a single, uniform improvement program cannot be applied equally to all LPHAs.

LPHA TYPES

Survey data demonstrate that 60% of LPHAs are county-based. The remaining are city/municipal (10%), city-county (7%), town/township (15%), and multi-county/district/regional (8%). These percents are similar to data collected in NACCHO's *1992-1993 Profile* studies, suggesting that there have been few changes over the past eight years in the types of jurisdictions LPHAs serve.

REPORTING RELATIONSHIPS

When asked what “best describes the organization or office to which your local health department reports directly,” 56% of LPHA directors selected local boards of health. Many local boards of health commonly have oversight over the LPHA’s activities, and set LPHA policy. In some cases, however, local boards of health are purely advisory boards, and the LPHA reports directly to other parts of local or state government. State health directors accounted for 13%, followed by county commissioners or county executives (12%), city or county councils (9%), and city or town managers (6%). Of the remaining four (4%) percent, 3% reported a dual-reporting structure, while 1% reported directly to a hospital board or other organization not mentioned above.

LPHA EXPENDITURES

LPHA expenditures are an important part of research on the public health infrastructure. Annual agency expenditures were collected in this survey, and adjusted for inflation to constant 1999 dollars using Consumer Price Index rates and calculations recommended by the Bureau of Labor Statistics.³¹ It should be noted that arithmetic means or “averages” are affected by extremely large or extremely small values, and there are several extreme values in the expenditure data. Therefore, both median and average values are presented so the readers can better interpret expenditure data. Because the data on population size are categorical, per capita expenditures for LPHAs in the study were not calculated.

Annual LPHA expenditures are extremely varied, ranging from \$0 to over \$836 million. The \$0 expenditure data were verified and reflect volunteer health officials in very small population jurisdictions, who may conduct a few inspections per year. The median annual LPHA expenditure was \$621,100 in constant 1999 dollars. The average annual LPHA expenditure was \$4,505,096 in constant 1999 dollars.

Variation in local public health expenditures is illustrated by presenting expenditure data for metropolitan and non-metropolitan area LPHAs, and by the population of the jurisdiction served. These figures demonstrate that metropolitan areas have much larger annual expenditures

(average of \$8,930,091) than non-metropolitan areas (average of \$1,195,632), a finding that is echoed in the analysis of expenditures by the population of the jurisdiction served.

When examining the expenditure data, it is important to remember that these expenditures provide varied services, programs, and LPHA facilities. For example, in some areas LPHAs run county hospitals and their expenditure data include these healthcare facilities. In others, the LPHA is only responsible for septic system and restaurant inspections. While both are counted as LPHAs in the analysis, their scope of work, and budgets, are vastly different.

LPHA FUNDING STREAMS

Funding for local public health activities comes from several different sources, including local, state, and federal government programs, grants from foundations, reimbursements from insurance companies, and patient and regulatory fees. On average, funding for LPHAs came predominately from local sources (44%), and state sources (30%), which included federal pass through dollars. Three percent (3%) of funding came directly from federal sources. On average, 19% came from service reimbursement, which included fees, Medicaid, Medicare, and insurance reimbursements.

Analysis of the funding stream data by metropolitan versus non-metropolitan areas revealed different funding profiles. Metropolitan areas receive more funding from local sources (58%) than non-metropolitan areas, which received equal percents of funding from state (35%) and local sources (34%).

The overview of LPHA characteristics presented demonstrates the variety and diversity within the population of LPHAs nationwide. Attempts to define an “average” LPHA are difficult given their heterogeneity. Thus, throughout this report, data are presented for different groupings of LPHAs, for example metropolitan versus non-metropolitan area LPHAs, so that the reader can observe the characteristics of specific kinds of LPHAs, and compare those to LPHAs with different characteristics.

Figure 1. PERCENT OF LPHAs:
Population Size and LPHA Type

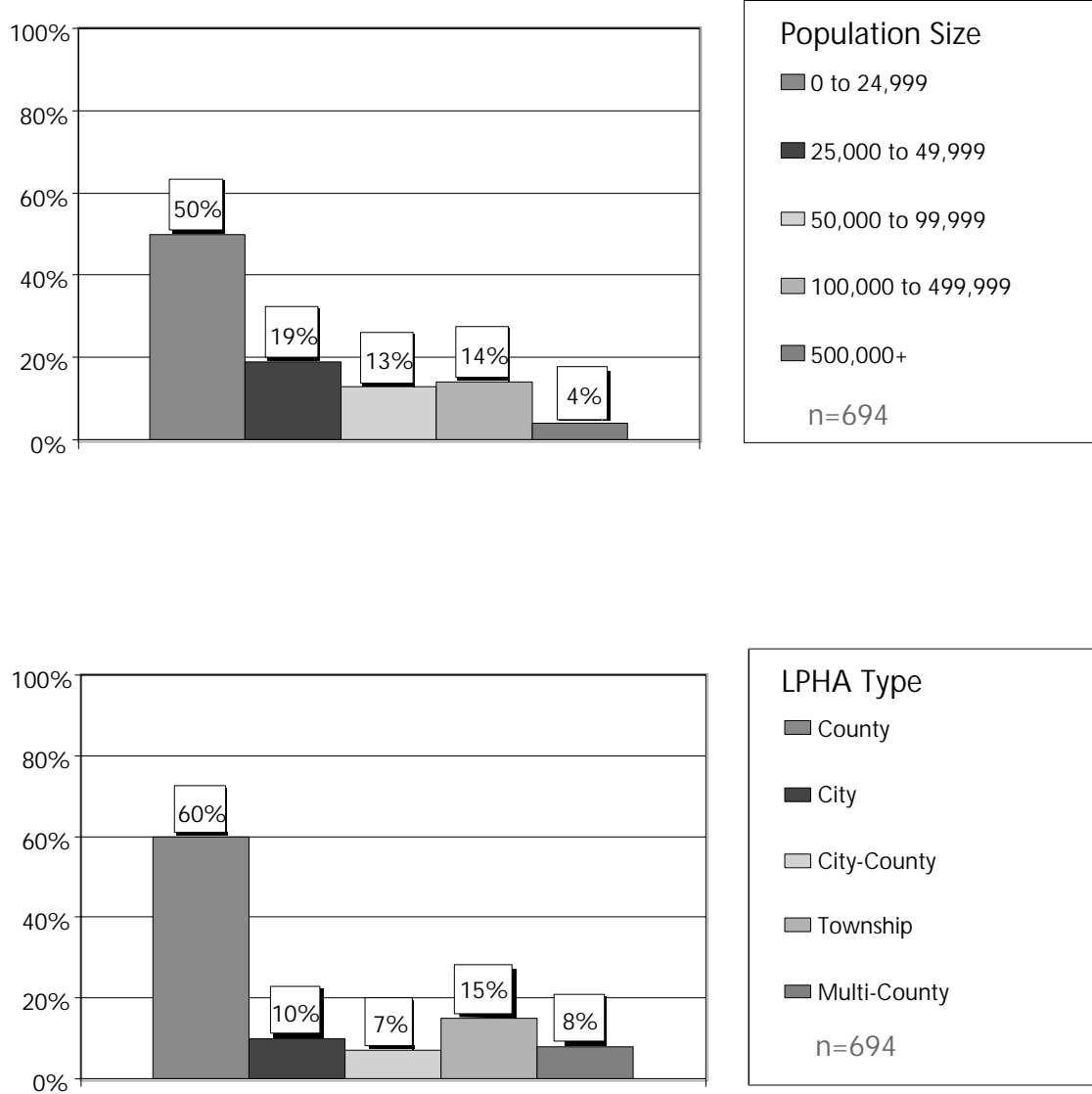


Figure 2. REPORTING RELATIONSHIPS: LPHA Type

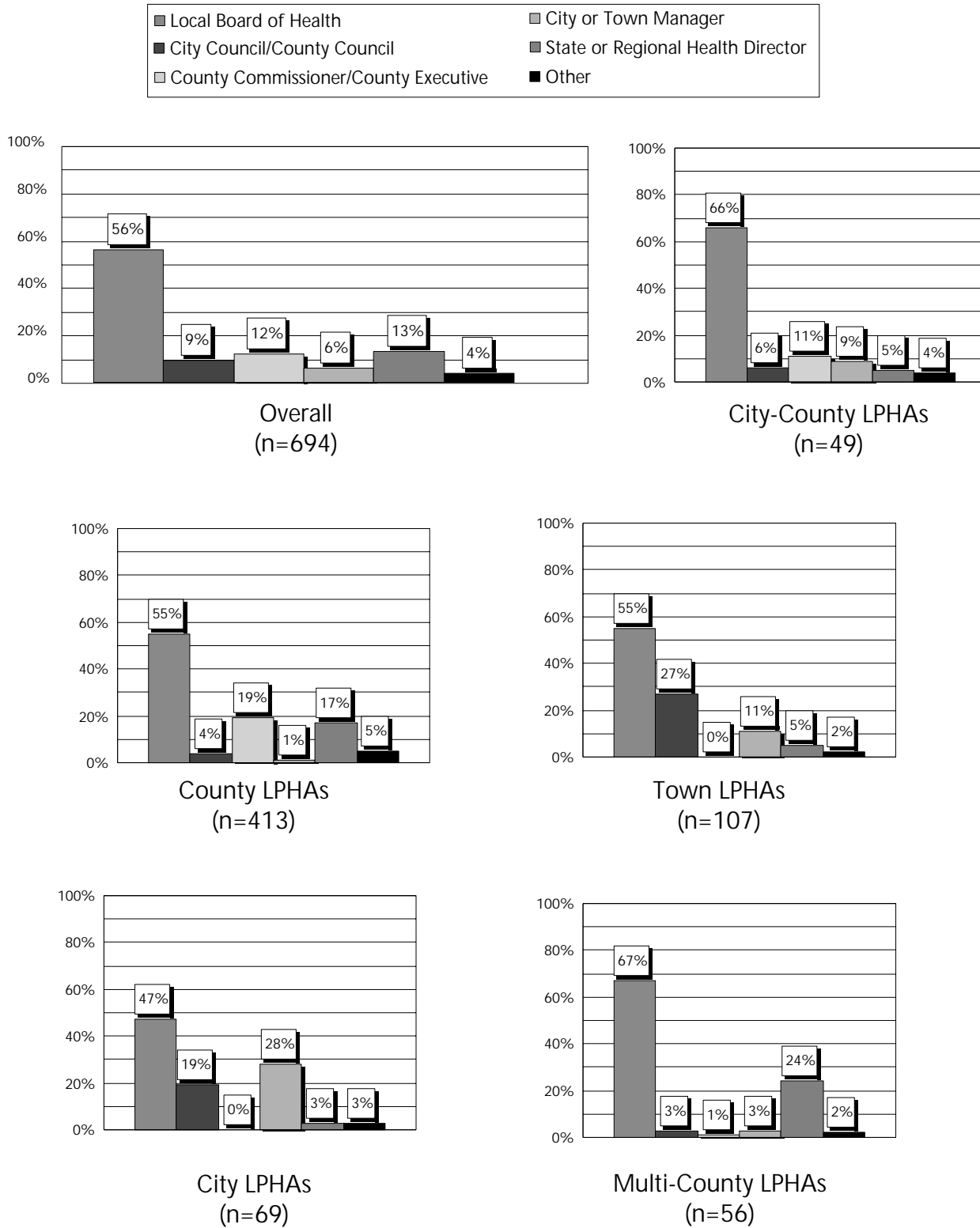
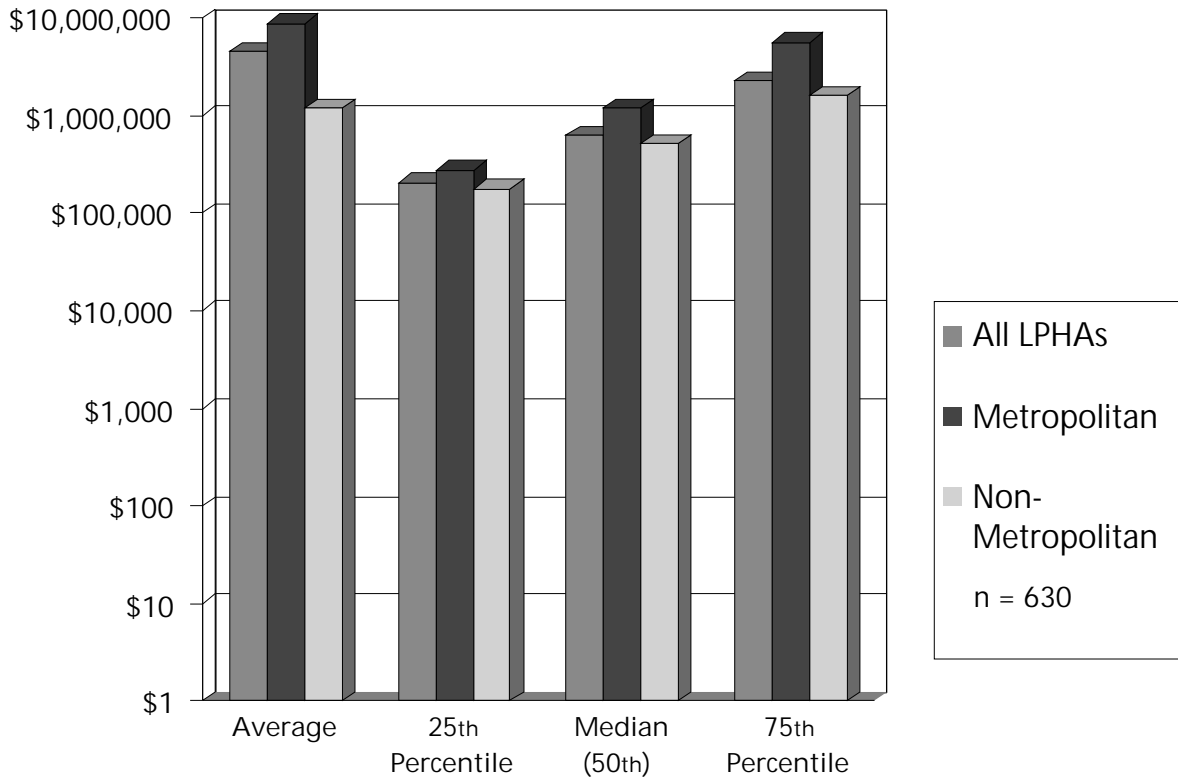


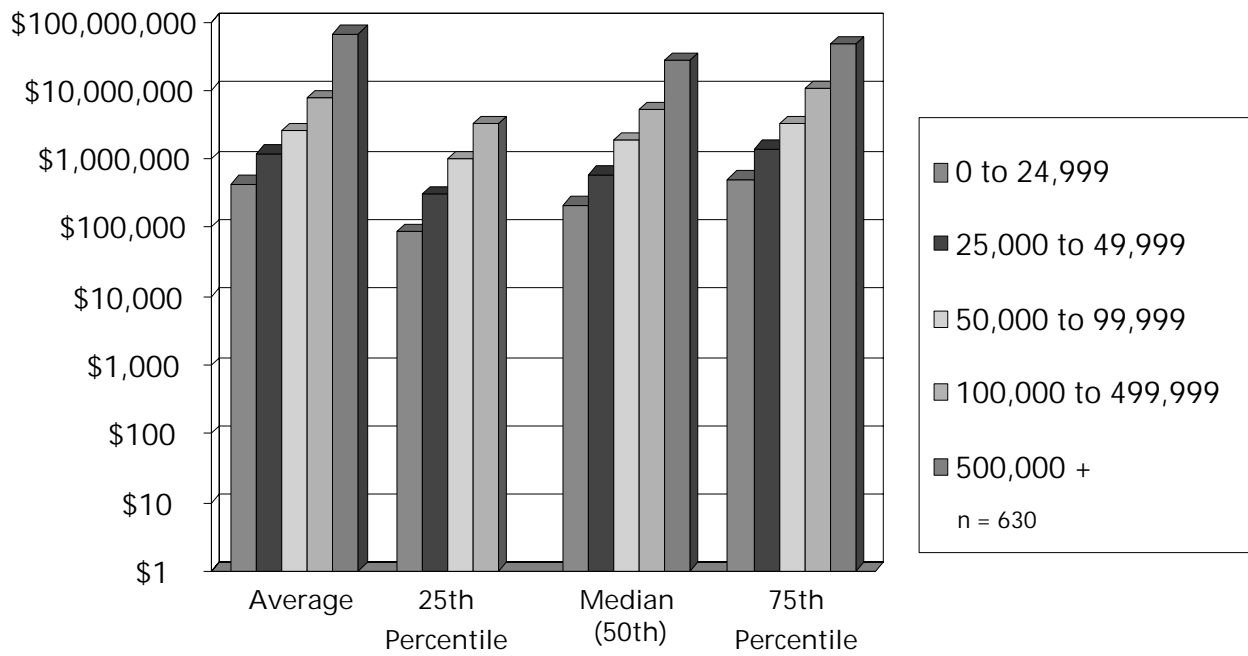
Figure 3. AVERAGE AND MEDIAN ANNUAL LPHA EXPENDITURES:
All LPHAs, Metropolitan and Non-Metropolitan LPHAs



	Average Annual Expenditures	25th Percentile	50th Percentile (Median)	75th Percentile
All LPHAs	\$4,505,096	\$203,905	\$621,100	\$2,250,000
Metropolitan	\$8,930,091	\$280,000	\$1,185,433	\$5,560,876
Non-Metropolitan	\$1,195,632	\$177,130	\$509,540	\$1,614,228

Figure 4. AVERAGE AND MEDIAN ANNUAL LPHA EXPENDITURES

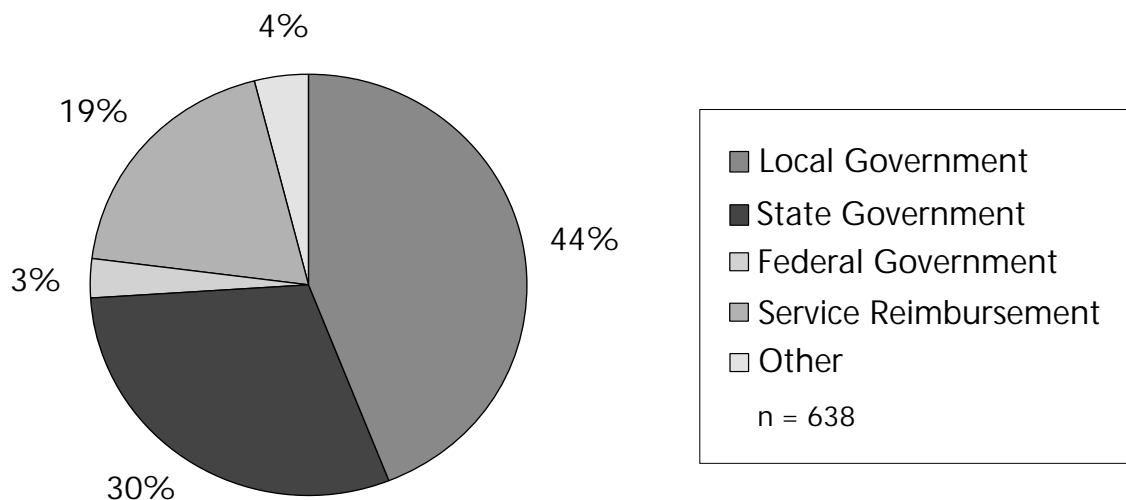
Population Size



Population Served	Average Annual Expenditures	25th Percentile	50th Percentile (Median)	75th Percentile
0 to 24,999	\$437,637	\$86,500	\$214,658	\$507,283
25,000 to 49,999	\$1,227,538	\$302,000	\$600,000	\$1,400,000
50,000 to 99,999	\$2,552,669	\$1,011,221	\$1,827,526	\$3,250,000
100,000 to 499,999	\$7,671,500	\$3,167,936	\$5,100,000	\$10,500,000
500,000 or more	\$66,200,000	\$16,500,000	\$27,000,000	\$46,800,000

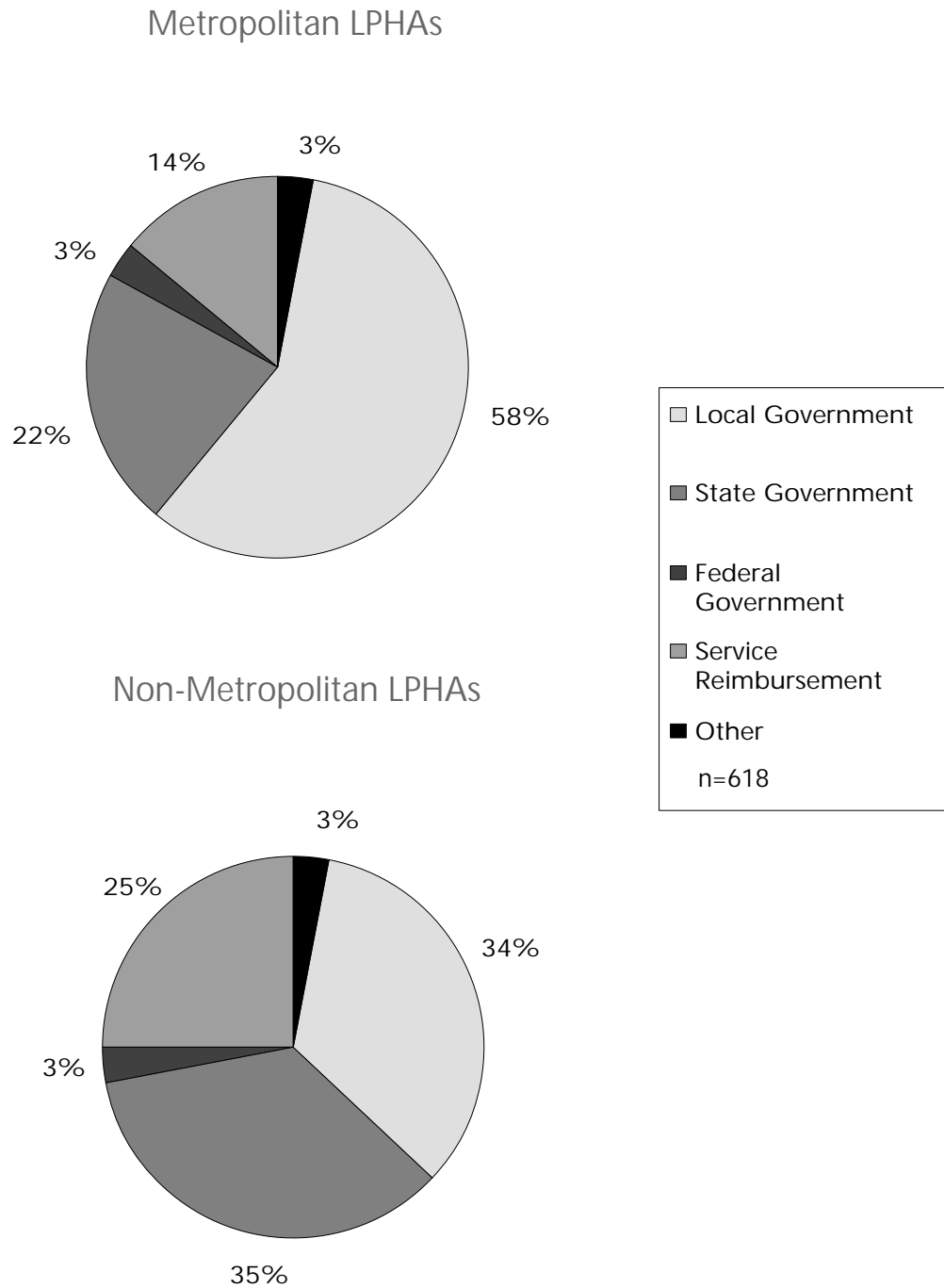
Notes: Expenditures in constant 1999 dollars.

Figure 5. AVERAGE PERCENT OF LPHA BUDGET BY FUNDING SOURCE: All LPHAs



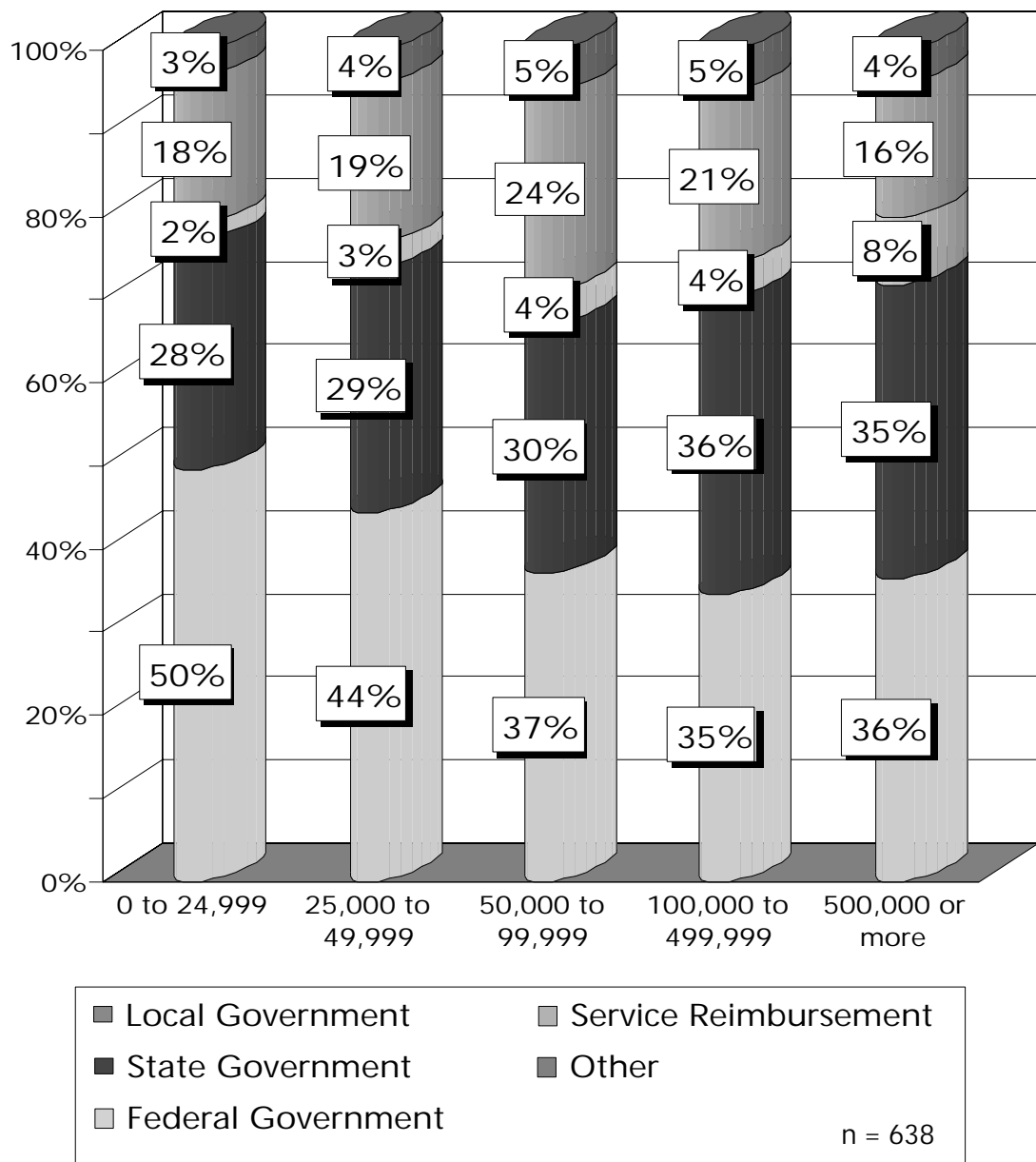
Note: In this figure, "Local Government" includes city/town and county sources. "State Government" includes federal pass-throughs. "Federal Government" includes direct grants to locals (not state pass-throughs). "Service Reimbursement" includes Medicaid, Medicare, patient and regulatory fees, and private health insurance reimbursements. "Other" includes private foundations and other sources.

Figure 6 AVERAGE PERCENT OF LPHA BUDGET BY FUNDING SOURCE



Note: In this figure, "Local Government" includes city/town and county sources. "State Government" includes federal pass-throughs. "Federal Government" includes direct grants to locals (not state pass-throughs). "Service Reimbursement" includes Medicaid, Medicare, patient and regulatory fees, and private health insurance reimbursements. "Other" includes private foundations and other sources.

Figure 7. AVERAGE PERCENT OF LPHA BUDGET BY FUNDING SOURCE: Population Size



Note: In this figure, "Local Government" includes city/town and county sources. "State Government" includes federal pass-throughs. "Federal Government" includes direct grants to locals (not state pass-throughs). "Service Reimbursement" includes Medicaid, Medicare, patient and regulatory fees, and private health insurance reimbursements. "Other" includes private foundations and other sources.