ANALYSIS: HOW TO USE APHL'S COMPENSATION SURVEY DATA

APHL Report

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APHL ASSOCIATION OF PUBLIC HEALTH LABORATORIES

The Association of Public Health Laboratories (APHL) is a national non-profit organization dedicated to working with members to strengthen governmental laboratories that perform testing of public health significance. By promoting effective programs and public policy, APHL strives to provide member laboratories with the resources and infrastructure needed to protect the health of US residents and to prevent and control disease globally.

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Note: the term “public health laboratories” is used in this document to refer to all governmental laboratories serving the public’s health, including environmental and agricultural labs.

INTRODUCTION

For many years, directors of public health laboratories have complained about noncompetitive salaries and blamed that for a shortage of competent laboratory scientists, an unacceptably narrow workforce pipeline, and high employee turnover. In 2010, the Association of Public Health Laboratories (APHL) began collecting reliable public health laboratory compensation data applicable to compensation analysis and improving public health laboratory salaries and salary structures. This paper is intended to show users of APHL salary data some ways they can use that data to carry out compensation analyses and help justify needed compensation improvements.

BACKGROUND

In 2009, APHL's Workforce Development Committee (WDC) initiated a broad, multi-year research program focusing on several challenges confronting the laboratory workforce including personnel standards and career paths, education and training needs, core competencies, workforce characterization, competitive compensation, professional certification, and career marketing. Ensuring equitable and competitive compensation remains ranked near the top of this research program even though recent data from a Public Health Foundation Council on Linkages Survey of Public Health Workers showed that the broad population of current public health employees ranked competitive salary 8th as a recruitment factor, well behind meaningful work, job security, and competitive benefits.[1] Forthcoming results from APHL workforce characterization surveys should show if those recruitment factors were given similar or different rankings by public health laboratory scientific and technical employees.

In most organizations when management asks, "Do our compensation practices and ranges need adjustment?" the response is usually "Yes." In the private sector, most organizations move salary ranges in response to changes in the market. However, in the public sector, where legislatures historically and purposely have set salaries at 80-90% of those in the private sector and salary adjustments may not have been made in many years, how does the director of a public health laboratory in state or local government approach the issue of conducting compensation analysis to help ensure equitable and competitive salaries? One way for a laboratory to see that laboratory salary ranges continue to meet ≥90% of those for equivalent positions in the private sector calls for him or her to request and undertake a salary adjustment project involving private-sector salary benchmarking and following rules set by his or her government entity. Another way would be to enlist the support of local unions to raise salaries across the board. Both of these actions can be effective and should be undertaken by a laboratory director as circumstances allow; however, both fall outside the purview of this paper. Here, we will emphasize analysis of a laboratory's existing salary structure and comparison of a laboratory's salaries to those of other public laboratories to identify inequitable or non-competitive salaries and to help justify correcting those compensation problems.

In 2010, APHL's Board of Directors supported the WDC and QUATT Associates (Washington, DC) in developing and conducting (between December 2010 and March 2011) a compensation survey of public health laboratory directors of the 50 states, five territories, and District of Columbia to help characterize the public health laboratory workforce and show how compensation data can be used to help ensure competitive salaries. The survey, survey data, methods, and results are readily available elsewhere[2,3] as references. In this paper, we present examples of several simple tools and methods public health laboratory directors and staff can use with APHL's 2010 and subsequent years' compensation survey data to conduct compensation analysis, identify structural salary inequities within their laboratories, justify correcting those inequities, monitor salary trends within and across laboratories, and ultimately adjust salaries to strengthen their laboratory workforce locally and throughout the country.

LABORATORY DIRECTOR AS COMPENSATION CHAMPION

Laboratory directors are best qualified to initiate and undertake compensation analyses and adjustments for their laboratories. They are more familiar with their laboratories' technical job classifications, workforce needs, and salary requirements than their departments' personnel staff. Directors also should be more highly motivated than others to support equitable and competitive laboratory compensation. Most personnel officers' lack of expertise in technical job classifications and salary structures often means they seldom undertake laboratory compensation analyses on their own and, when asked or required to support such actions, readily welcome the laboratory director who is willing to serve as the project champion, data collector and analyzer, and resident expert. Over time, no governmental bureaucracy is too large or too entrenched to prevent a truly motivated laboratory director from getting laboratory salaries adjusted.

ANALYZING COMPENSATION DATA

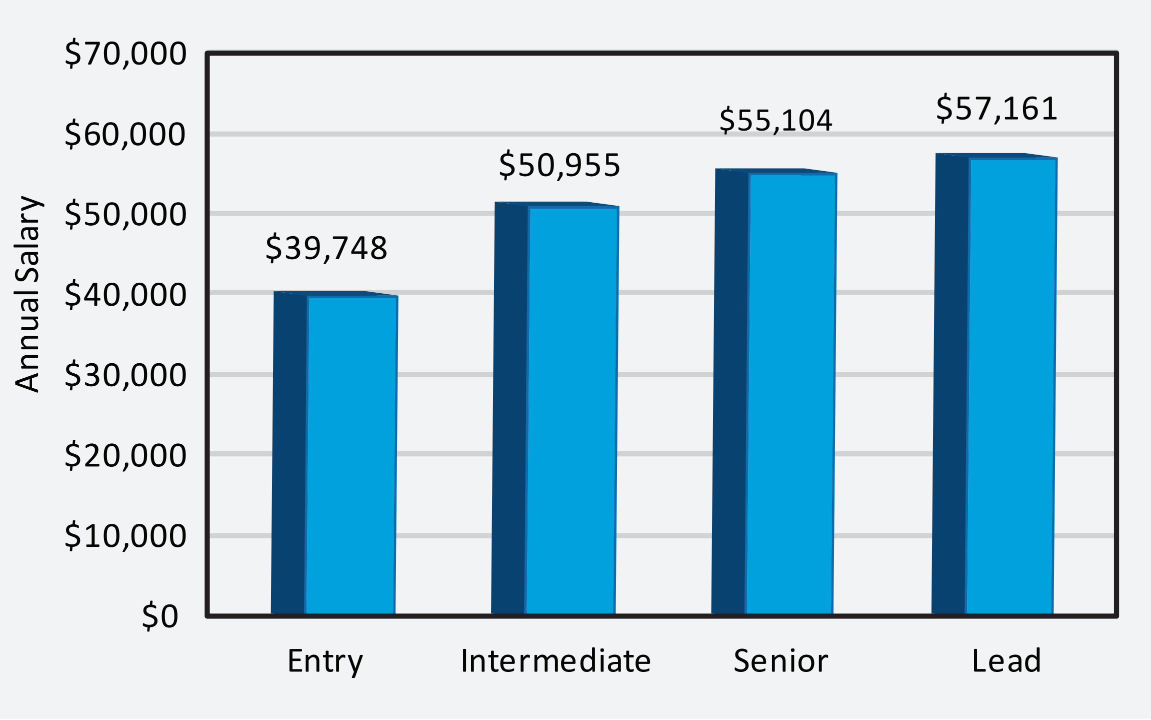
The more time that has passed since a salary structure was initially implemented, the more likely a laboratory's compensation program and salary structure have incurred job-classification and payscale inequities, have lost ground compared to the private sector, and have suffered through multiple recessionary budget cuts. If ten or more years have passed since a laboratory has undergone a major job classification and salary structure revision, such a revision is probably overdue. In between major revisions, reviews and analyses of laboratory compensation should be undertaken every 3-5 years to look for a range of problems.

Salary Flattening refers to a leveling off of salaries in moving up a classification path from "entry" to "lead" level. It is a structural compensation inequity that is easily recognized where it exists. It results from inequitable salary differences between salary steps. This inequity can be easily identified using a simple graph such as that in Figure 1, which shows how the median base salary of bench scientists (n=36 entry, 45 intermediate, 41 senior, 25 lead) across the country flattened in moving from entry-level to lead scientist.

To show that these differences between salary levels are not due to sampling error, we used the variance ratio or F-test to show salary variation among the four average base salaries is larger than that within each individual group (e.g., senior scientist) of salaries ($F = 4.27$, $p < .01$). Stated another way, the inference is that salary in the four scientist levels varies more than the salary in a single salary level.

Because salary flattening is generally accompanied by a concurrent increase in job-related expertise and responsibilities, it can significantly reduce the benefits to an employee of ascending a career path within a job classification while also potentially undermining larger workforce retention strategies. Low entry-level salaries also were common and not only contribute to salary flattening but also can be a major obstacle to recruitment and workforce pipeline development efforts. This is an easy inequity to look for and identify.

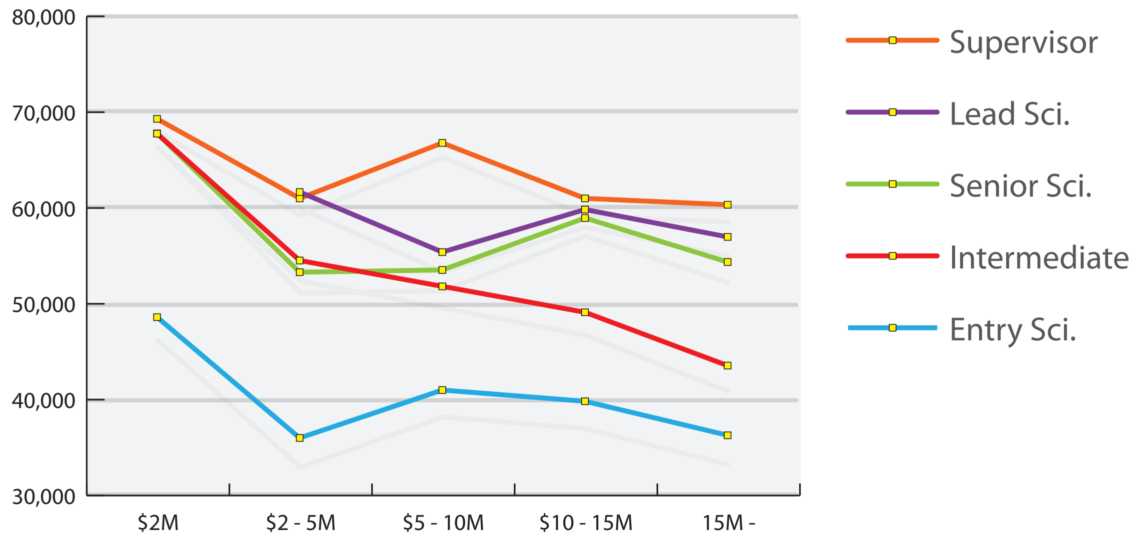
Figure 1. Salary Flattening of Median Base Salaries for Bench Laboratory Scientists in 2010 ($F = 4.27$, $p < .01$)



Gross Operating Budget refers to the annual operating budget for each of the 66 public health laboratories in 2010. Looking at Figure 2, in which median base annual salaries for five job titles are compared to gross operating budget, we see that median base salaries for laboratory scientists and scientist supervisors generally appear to decrease as laboratory gross operating budgets increase. This finding should not be surprising if we consider that smaller laboratories often must offer higher salaries to recruit and employ more highly cross-trained laboratorians. In addition, smaller laboratories appear to retain staff for long periods (fewer turnovers), hence have more staff near the top of pay scales than large state laboratories in big metropolitan areas. Similar graphs can be constructed for any job classifications and salary levels for which there are sufficient data to provide statistical reliability.

Using Laspeyres' weighted aggregate index formula [$\Sigma p_n q_o / \Sigma p_o q_o$ = Σ(median base salaries for a gross operating budget range)(no. of individuals' salaries in the range) / Σ(median base salaries for gross operating budget of <$2M)(no. of individuals' salaries in the range <$2M)] with gross operating budget ranges and the median base annual salaries used to construct Figure 2, and setting the gross operating budget range of <$2M as a base (= 100%), we can compute a Laspeyres' median salary index for each gross operating budget range: <$2M = 100%; $2M to <$5M = 88.1%; $5M to <$10M = 86.3%; $10M to $15M = 82.3%; >$15M = 80.0%. This provides quantitative values for the overall reductions in aggregate salaries for all five job titles in Figure 2 as we move from laboratories with the smallest gross operating budgets to laboratories with the largest ones.

Figure 2. Median Base Salaries for Public Health Laboratory Bench Scientists and Scientist Supervisor by Laboratory Gross Operating Budget, 2010



You may also want to compare salaries using gross operating budgets compiled by percentile rankings (i.e., $1,228,431 [10th percentile]; $2,063,774 [25th]; $5,671,500 [50th]; $11,652,500 [75th]; and $19,400,000 [90th]).[3] An example of such a percentile ranking is presented in Figure 3.

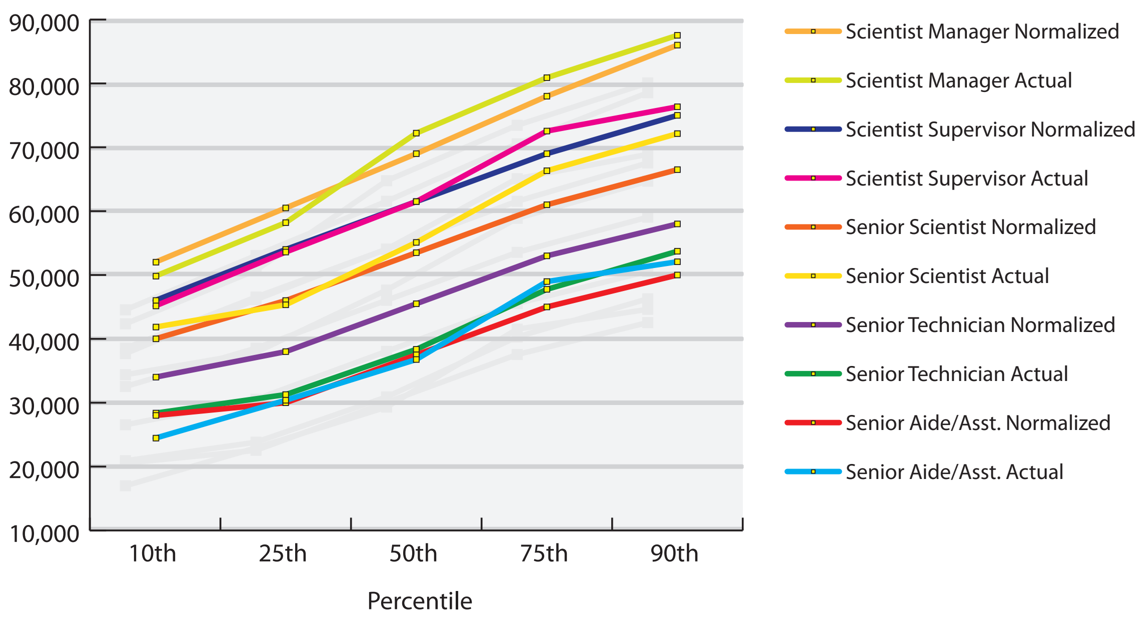
Salary Variability and Normalization refer to unwanted salary differences within and among job classifications and to the development and implementation of equitable salary steps or levels within and among job classifications, respectively. High variability of salary levels observed for and among bench scientist, lead scientist, scientist supervisor, and scientist manager (Figures 2 and 3) is indicative of possible salary inequities and can reduce the value of career paths from scientist through scientist manager. Minimizing unintentional variability makes career paths more dynamic and helps diminish points of salary contention.

Likewise, the apparent absence of salary distinction between senior aide/assistant and senior technician (Figure 3) depicts a definite salary inequity and could act as a disincentive for employees to seek the higher education needed for promotion from aide/assistant to technician. Using the survey data to identify salary inequities such as flattening and unwanted variability provide justification for implementing salary adjustments that reduce or remove those inequities.

The usual way to remove these types of inequities is to carry out salary normalization. An example of salary normalization is presented in Figure 3. Here, a normalization of five public health laboratory job classifications was constructed to establish recommended salaries for career path levels within and across related job classifications. Normalized salary recommendations were derived using median base annual salaries and gross operating budget by percentile rank. A public health laboratory director who knows the gross operating budget percentile rank for his or her laboratory's operating budget can use Figure 3 to see how the laboratory's salaries compare to peer laboratories in the same percentile rank.

Salary normalization is often needed because over time governmental salary structures that were originally equitable become subject to a gradual accrual of inequitable salary distinctions as individual laboratories absorb budget increases and cuts, job classifications undergo revisions and salary upgrades, and individual employees undergo promotions and salary increases. These types of administrative changes often cause median base salaries within or among job classifications to flatten, overlap, or show undesirable variability and should prompt periodic reviews of salary structures to see if adjustments are needed to reinstitute equitable salaries.

Figure 3. Comparison of Actual and Normalized Median Base Salaries for Five Job Titles by Laboratory Gross Operating Budget Percentile Rank



When undertaking salary normalization, it is important to note that equitable (i.e., fair) does not necessarily mean equal (i.e., the same). Our example of salary normalization in Figure 3 incorporated equal median base salary steps or distinctions within and among job classifications between the 25th and 75th percentiles. However, to reflect actual salary compression and expansion at the lowest and highest percentile rankings, respectively, our example incorporated unequal median base salary steps within and among job classifications in going from the 25th to 10th percentiles and from the 75th to 90th percentiles.

Payscale Indexing refers to a useful tool for monitoring changes in public health laboratory salaries over time, and for comparing public health laboratory salaries to those of other professions using US national average salary data.[4] A payscale index can be developed for specific public health laboratory job classifications using the following formula: [(A-B) / B] [100] = C, and a new salary index of 100 + C, where A is the average base salary for a particular position for the current year, B is the average base salary for that same position in the base (reference) year, and C is the positive or negative index change over the time period.

For example, using our formula to determine the salary index between 2007 and 2010 for scientist supervisor, we have 108.2 [($62,730-$58,000) / $58,000] [100] = +8.2, and 100 + 8.2], meaning the average salary increased 8.2% above that of the average US salary. An example of payscale indices for five laboratory job titles were calculated and compared to a US average total cash compensation for laboratorians in Figure 4. Although the data used for the 2007 base year was adapted from a non-standardized APHL survey[5], it proved adequate for this basic example.

Figure 4. Payscale Index Comparing US Total Mean Cash Compensation to Total Mean Compensation for Six Public Health Laboratory Job Classifications, 2007-2010

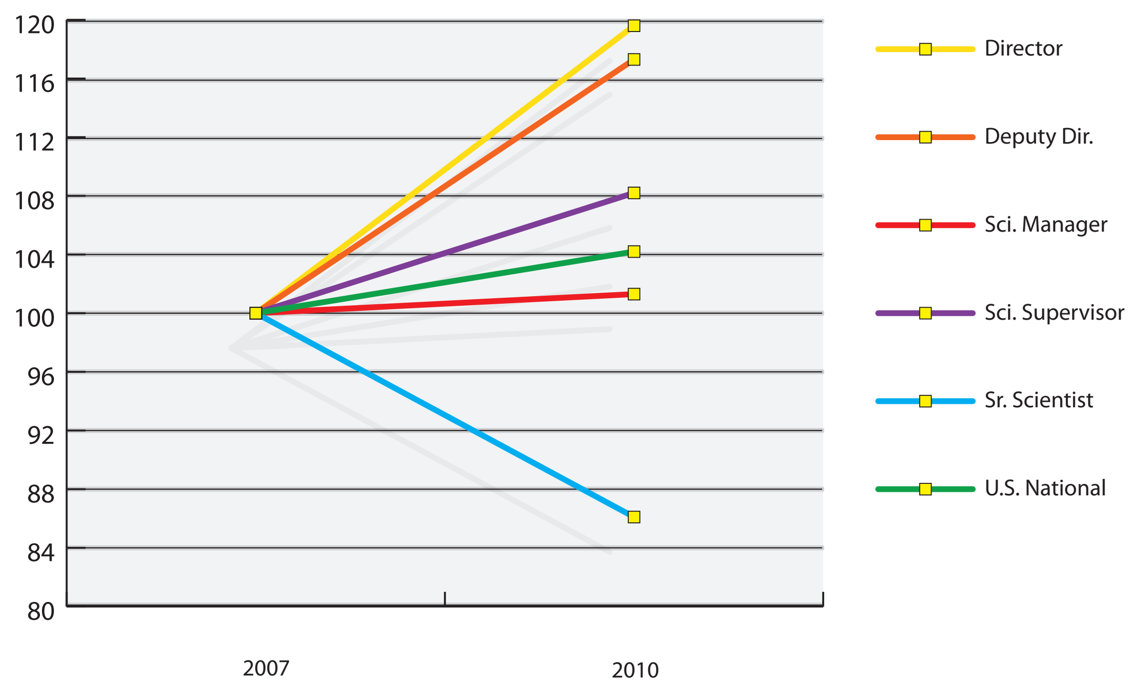


Figure 4 depicts a payscale index showing average base salary for senior scientist decreased between 2007 and 2010, average base salary for scientist manager rose more slowly than the national index, and salaries for director, deputy director, and scientist supervisor increased faster than the national index. A similar drop in salaries for senior scientists was not detected among medical technologists and medical laboratory scientists in the private sector.[6,7] Since government laboratory salaries typically have not been revised in response to the 2008-2010 national economic downturn, the observed drop in public health laboratory senior scientist salary more likely reflected the loss, through budget cuts and retirements, of many highly experienced and more highly paid, long-term employees. Additional analyses over time, using 2010 and future years' survey data, are needed to determine if public health laboratory workforce salaries are catching up to or falling behind those of equivalent positions in the private sector and federal government.

SYSTEMATIC ANALYSIS

The review, updating, and monitoring of a laboratory's salary structure and practices are best undertaken in a planned fashion because of the need to take into account such agency-level variables affecting salaries as gross operating budget, budget percentile rank, and geographic location. You should begin by familiarizing yourself with the survey database and with your own laboratory's salary data. The second step should be to determine the specific components of your laboratory's salary structure you wish to analyze for possible inequities (e.g., salary flattening, inequitable salary variability within and among job classifications, low salary ranges compared to other public health laboratories). Salary normalization then can be performed and further adjusted for factors like local and regional cost-of-living using local and regional pay-scale indices. At a higher level, once you are familiar with your own laboratory's salary data, you are ready to compare compensation levels among peer laboratories in the same geographic region by using descriptive statistics such as percentile graphing. Laboratory geographic location has a major impact on median base annual salaries,[3] and geographic effects must be incorporated into any salary structure to ensure salary competitiveness. Lastly, you may wish to use pay scale indexing to compare compensation levels against pertinent regional and national statistics that broadly affect your laboratory.

CONCLUSION

The APHL compensation survey data and a number of simple tools for compensation analysis allow public health laboratory directors and staff to identify and correct structural salary inequities that reduce the effectiveness of recruiting programs and serve as sources of poor employee morale and retention. This survey data also can be used to show how salaries change over time and to justify salary-range adjustments by comparing (benchmarking) a laboratory's salaries to those of other laboratories, both regionally and nationally.

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Survey Methodology

Written survey questionnaires were used to obtain the compensation data for this study. Survey participants were asked to match positions within their own organization to survey position descriptions.

For the benchmark positions, survey respondents matched the position within their association that is the closest fit for each benchmark, based on the position's primary responsibilities. For positions that combine more than one function, matches were based on the most important skill set necessary for effective performance in the position.

In an effort to present the most meaningful data, and to protect the confidentiality of data from individual organizations, we used the following guidelines in reporting summary results:

Number of Responses	Summary Data Reported
10+	Simple average (mean) and the 10th, 25th, 50th (median), 75th, and 90th percentiles
5 to 9	Simple average (mean) and the 25th, 50th (median), and 75th percentiles
4	Simple average (mean) and 50th percentile (median)
3	Simple average (mean)
0-2	No summary data reported

Summary results are given for each survey benchmark in six separate data cuts:

- All respondents
- Respondents with budgets less than $2.0 million
- Respondents with budgets between $2.0 and $5.0 million
- Respondents with budgets between $5.0 and $10.0 million
- Respondents with budgets between $10.0 and $15.0 million
- Respondents with budgets greater than $15.0 million

Extra cash summary results are based only on those incumbents actually receiving extra cash compensation. As a result, the sum of the summary base salary compensation and summary extra cash compensation will not necessarily equal the summary total cash compensation.

The effective date of the data is January 1, 2011.

**Excerpted from the Association of Public Health Laboratories (APHL) 2011 Member Compensation Survey Summary Report, April 2011, APHL and Quatt Associates.*

Survey Methodology

Definitions

Base Salary	Regular compensation exclusive of bonuses, incentives, or other discretionary or non-regular payments.
Extra Cash	Cash compensation given in addition to and separate from regular base salary, usually in the form of a bonus, incentive compensation or commission payment.
Total Cash	The sum of base salary and extra cash.
Gross Operating Budget	The amount of all estimated expenses that will be incurred during the year. If an association oversees subsidiary organizations -- 501(c)(3) organizations, for-profit subsidiaries, or other types of organizations -- or is divided into multiple entities, this figure represents the combined budget of all entities.
n	The number of data points.
10th Percentile	The amount above which 90% of data points fall.
Q1 (25th Percentile)	The amount above which 75% of data points fall.
Median (50th Percentile)	The amount above which 50% of data points fall.
Q3 (75th Percentile)	The amount above which 25% of data points fall.
90th Percentile	The amount above which 10% of data points fall.
Average	The simple average, or mean, of the data.

**Excerpted from the Association of Public Health Laboratories (APHL) 2011 Member Compensation Survey Summary Report, April 2011, APHL and Quatt Associates.*

Profile of Survey Participants

Actual 2010 Gross Operating Budget

n	10th%ile	Q1	Median	Q3	90th%ile	Average
66	$1,228,431	$2,063,774	$5,671,500	$11,652,500	$19,400,000	$8,609,238

Projected 2011 Gross Operating Budget

n	10th%ile	Q1	Median	Q3	90th%ile	Average
66	$1,275,217	$2,080,000	$5,606,329	$12,223,078	$19,592,197	$8,610,569

Staff Size

Total Number of Full-time Equivalent Employees

n	10th%ile	Q1	Median	Q3	90th%ile	Average
72	12	22	51	96	161	74

Exempt Staff Size

Total Number of Full-time Equivalent Employees

n	10th%ile	Q1	Median	Q3	90th%ile	Average
68	1	3	11	30	93	33

Non-exempt Staff Size

Total Number of Full-time Equivalent Employees

n	10th%ile	Q1	Median	Q3	90th%ile	Average
68	5	11	31	58	93	41

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Profile of Survey Participants

Alabama:
Alabama Bureau of Clinical Laboratories
Alaska:
Alaska State Public Health Laboratories
Arizona:
Arizona State Public Health Laboratory
Arkansas:
Arkansas Department of Health Public Health Laboratory
California:
California Department of Toxic Substances Control
City of Santa Cruz WWTF Laboratory
Long Beach Public Health Laboratory
Orange County Public Health Laboratory
San Bernardino County Public Health Laboratory
San Diego County Public Health Laboratory
San Luis Obispo Public Health Laboratories
Santa Clara County Public Health Laboratory
Ventura County Public Health Laboratory
Colorado:
Colorado Department of Agriculture-Biochemistry Laboratory
Colorado Department of Public Health and Environment
Denver Health Public Laboratories
District of Columbia:
DC Public Health Laboratory
Delaware:
Delaware Public Health Laboratory
Guam:
Guam Department of Public Health and Social Services Central Laboratory
Florida:
Florida Department of Agriculture and Consumer Services
Florida Department of Health, Bureau of Laboratories
Georgia:
Georgia Public Health Laboratory
Hawaii:
Hawaii Department of Health State Laboratories Division
Idaho:
Idaho Bureau of Laboratories
Indiana:
Indiana State Dept Health Laboratory
Iowa:
State Hygienic Laboratory at the University of Iowa
Kansas:
Kansas Health and Environmental Laboratory
Maine:
Maine Health & Environmental Testing Laboratory
Maryland:
Maryland Laboratories Administration
Massachusetts:
Massachusetts Department of Public Health
Massachusetts Department of Environmental Protection Laboratory
Michigan:
Michigan Department of Community Health
Minnesota:
Minnesota Department of Health
Mississippi:
Mississippi Public Health Laboratory
Office of the State Chemist - Mississippi State Chemical Laboratory
Missouri:
Missouri Department of Natural Resources
Missouri State Public Health Laboratory
Montana:
Montana Public Health Laboratory
North Dakota:
North Dakota Department of Health, Division of Laboratory Services
New Hampshire:
New Hampshire Public Health Laboratories
New York:
New York City Department of Health and Mental Hygiene
New York State Department of Agriculture
North Carolina:
North Carolina State Laboratory of Public Health
Ohio:
Ohio Department of Health Laboratory
Oklahoma:
Oklahoma Department of Agriculture
Oregon:
Oregon Department of Environmental Quality
Oregon State Public Health Laboratory
Pennsylvania:
Erie County Public Health Laboratories
Pennsylvania Department of Environmental Protection
Pennsylvania Department of Health, Bureau of Laboratories
Philadelphia Public Health Laboratory
New Jersey:
New Jersey Public Health & Environmental Labs
Nevada:
Southern Nevada Public Health Laboratory
Puerto Rico:
Puerto Rico Laboratory of Public Health
Rhode Island:
Rhode Island State Health Laboratories
New Mexico:
New Mexico Scientific Laboratory Division
South Carolina:
South Carolina Bureau of Laboratories
South Dakota:
South Dakota Public Health Laboratory
Texas:
Corpus Christi-Nueces County Public Health
El Paso County Public Health
Houston Department of Health & Human Services
Office of the Texas State Chemist
Public Health Laboratory of East Texas
Tarrant County Public Health Laboratory
Tennessee:
Tennessee Department of Health, Division of Laboratory Services
Utah:
Utah: Unified State Laboratories: Public Health
Vermont:
Vermont Department of Health Laboratory
Virginia:
Virginia Department of General Services
Washington:
Public Health - Seattle & King County Laboratory
Washington State Public Health Laboratories
Wisconsin:
Wisconsin State Laboratory of Hygiene
City of Milwaukee Health Department Laboratory
Wyoming:
Wyoming Public Health laboratory

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