Using Fee-for-Service Testing to Generate Revenue for the 21st Century Public Health Laboratory

Carol Loring, MS[a]
R. Brock Neil, PhD[b]
Laura Gillim-Ross, PhD[c]
Matthew Bashore, BS[d]
Sandip Shah, PhD[d]

ABSTRACT

Objectives. The decrease in appropriations for state public health laboratories (SPHLs) has become a major concern as tax revenues and, subsequently, state and federal funding, have decreased. These reductions have forced SPHLs to pursue revenue-generating opportunities to support their work. We describe the current state of funding in a sampling of SPHLs and the challenges these laboratories face as they implement or expand fee-for-service testing.

Methods. We conducted surveys of SPHLs to collect data concerning laboratory funding sources, test menus, fee-for-service testing, and challenges to implementing fee-for-service testing.

Results. Most SPHLs receive funding through three revenue sources: state appropriation, federal funding, and fee-for-service testing (cash funds). Among SPHLs, state appropriations ranged from $0 to more than $6 per capita, federal funding ranged from $0.10 to $5 per capita, and revenue from fee-for-service testing ranged from $0 to $4 per capita. The tests commonly performed on a fee-for-service basis included assays for sexually transmitted diseases, mycobacterial cultures, newborn screening, and water testing. We found that restrictive legislation, staffing shortages, inadequate software for billing fee-for-service testing, and regulations on how SPHLs use their generated revenue are impediments to implementing fee-for-service testing.

Conclusions. Some SPHLs are considering implementing or expanding fee-for-service testing as a way to recapture funds lost as a result of state and federal budget cuts. This analysis revealed many of the obstacles to implementing fee-for-service testing in SPHLs and the potential impact on SPHLs of continued decreases in funding.

[a]New Hampshire Public Health Laboratories, Virology and STD Laboratory, Concord, NH

[b]Tennessee Division of Laboratory Services, Immunoserology and Virology, Nashville, TN

[c]Colorado Department of Public Health and Environment, Laboratory Services Division, Denver, CO

[d]Michigan Department of Community Health, Lansing, MI

Address correspondence to: Laura Gillim-Ross, PhD, Colorado Department of Public Health and Environment, Laboratory Services Division, 8100 Lowry Blvd., Denver, CO 80230; tel. 303-692-3484; fax 303-344-9989; e-mail <laura.gillim-ross@state.co.us>.

©2013 Association of Schools and Programs of Public Health

The origin of modern state public health laboratories (SPHLs) is rooted in outbreaks of typhoid fever and cholera in the cities of 19th century America. Rapid advances in scientific knowledge were achieved in the ensuing years, including identifying the causative agents of many diseases and developing public health interventions to prevent the spread of disease. The first SPHLs were charged with improving sanitation through the detection and control of bacteria in municipal drinking water. Following successes in this area, SPHLs were at the forefront of vaccine and antitoxin development and diagnosis of infectious diseases. Recognized as a benefit to the health of all, SPHL services were offered free to clinicians and municipalities.[1]

The role of the SPHL has evolved during the last century, and SPHLs are now charged with responsibilities as varied as the states in which they are located. These services include ensuring a safe food supply, biomonitoring for chemical pollutants in the population, surveilling for newly emerging and reemerging communicable diseases, preparing for influenza pandemics, and responding to chemical or biological terrorism attacks.[2] In 2010, the Association of Public Health Laboratories (APHL) defined the 11 Core Functions of SPHLs as (*1*) disease prevention, control, and surveillance; (*2*) integrated data management; (*3*) reference and specialized testing; (*4*) environmental health and protection; (*5*) food safety; (*6*) laboratory improvement and regulation; (*7*) policy development; (*8*) public health preparedness and response; (*9*) public health-related research; (*10*) training and education; and (*11*) partnerships and communication.[3,4] Unfortunately, despite their increasing role in protecting the health of the public from infectious diseases and environmental threats, SPHLs face a crisis of decreased funding.[5]

Funding for SPHLs generally comes from three sources: general funding allocated through state legislatures, federal funding in the form of grants, and revenues generated through fee-for-service testing (e.g., third-party billing of insurance providers, contract work as part of cooperative agreements with grant-funded partners, and direct billing of submitters). Federal grants that support the work of SPHLs include the Epidemiology and Laboratory Capacity grant; the Public Health Emergency Preparedness cooperative agreement; the Food Emergency Response Network; and other grants that support testing for human immunodeficiency virus, tuberculosis (TB), sexually transmitted diseases (STDs), and environmental health analysis.

Since the economic downturn of 2008, many state legislatures have reduced appropriations to SPHLs, which saw their funding cut by an average of $405,000 per laboratory ($39 million nationally).[5] It has long been known that uncertainty surrounding federal funding is an added threat to the fiscal stability of SPHLs.[6] A 2011 analysis by Trust for America's Health concluded that federal budget cuts are "chipping away at gains made [since 2001] in public health preparedness," with budget cuts directed toward chemical and biological terrorism preparedness programs. The report further concluded that, "Federal funds for state and local preparedness declined by 38% from fiscal year 2005 to 2012 (adjusted for inflation), and additional cuts are expected under budget sequestration."[7]

These economic uncertainties have forced more SPHL directors to consider instituting or expanding fee-for-service testing. Charging fees for services is a radical notion for many SPHLs, which traditionally have not charged fees for their efforts to reduce disease in their communities. In this study, we examined the wide diversity and variability of funding for SPHLs, the challenges of implementing and expanding fee-for-service (i.e., revenue-generating) testing in SPHLs, and the possible consequences of decreased funding for SPHLs to perform their defined core functions.

METHODS

Two surveys were distributed to SPHLs to gather information about their funding levels, funding sources, and experiences with fee-for-service testing. The first survey was developed by the National Center for Public Health Laboratory Leadership (NCPHLL) and distributed to 40 SPHLs in December 2011 with a goal of receiving responses from 25 states. This survey gathered information on the current state of fee-for-service testing practices in SPHLs, including (*1*) which tests were performed as fee for service, (*2*) how fee-for-service testing was implemented, (*3*) types of entities billed for testing, (*4*) percentage of laboratory revenue derived from fee-for-service testing, (*5*) anticipated changes in the fee-for-service testing structure (e.g., addition of third-party billing), and (*6*) impediments to implementing fee-for-service testing.

The second survey, the APHL 2011 Core Survey,[3] was distributed to all SPHL directors in all 50 states in early 2011. This survey gathered information pertaining to fiscal year 2010 and included publicly available financial information. The APHL 2011 Core Survey included questions concerning funding levels from different sources (i.e., federal grants, state appropriations, or fee-for-service cash revenues, including third-party billing), staff positions supported by grant funds, and overall laboratory expenditures.

Data obtained from both surveys were compiled

to illustrate the current state of funding sources and fee-for-service revenue generation for SPHLs. We calculated per capita funding using 2010 national Census data for each state.[8]

RESULTS

Twenty-four of 40 (60%) SPHLs responded to the NCPHLL survey, representing states in the Northeast, Southeast, Midwest, and Mountain West. The median population of responding states was five million, with a range of 0.6–25.0 million residents.[8] Survey respondents represented states with both small and large geographical areas. The APHL 2011 Core Survey was sent to all SPHLs, and 37 of 50 SPHL directors (74%) responded. Fee-for-service testing was defined as any testing from which revenue was generated by charging a fee directly to submitters (i.e., health-care providers or private citizens), third-party payers (i.e., Medicaid and private insurance carriers), or other state agencies. In this analysis, fee-for-service testing did not include testing for which the laboratory directly received state or federal funding.

The percentage of responding SPHLs that have implemented some form of fee-for-service testing for specific assays is shown in the Table. These data indicated a large degree of variation in the tests offered as fee for service in each SPHL. Of the SPHLs answering the survey, the majority have implemented billing for STD-related assays, TB cultures, newborn screening, and water testing. We did not collect information on which specific entities (i.e., health-care providers, private citizens, third-party payers, or other state agencies) were charged a fee for each assay.

The 2011 APHL Core Survey identified SPHLs that charged a fee for at least one testing service offered (Figure 1). Medicaid, private citizens, and other state agencies were the entities that were most frequently charged a fee for testing. Of the states that responded to the APHL 2011 Core Survey, five of 37 (13.5%) reported that no revenue was generated from fee-for-service testing to private citizens and insurance, while a sixth state indicated negligible revenue from fee-for-service testing to these sources (Figure 2). Responses to the two surveys revealed that, among the states that responded, SPHLs fell into three categories regarding the ability to use fee-for-service testing to generate revenue. The first category included five of 37 states that do not perform fee-for-service testing (13.5%); these states acquire all needed funds through federal and state sources. The second category included two of 37 states reporting that they receive no state appropriations and must acquire all operational funds through federal and/or fee-for-service revenue sources (5.4%). The third and largest category included 30 of 37 states in which the SPHLs acquire operational

Table. Percentage of state public health laboratories (*n*=37) that charge at least one entity for assays: NCPHLL survey,[a] U.S., 2011

Assay	*Percent*	*Assay*	*Percent*
HIV	83	Viral culture	46
Chlamydia/gonorrhea	83	Herpes serology	42
Water testing	75	Susceptibility testing	42
Mycobacteria culture	71	Hepatitis C	38
Hepatitis B	67	Lyme serology	33
Newborn screening	67	Bacteria serogrouping	33
Rapid plasma reagin	58	Genotyping	33
Syphilis confirmation	54	Influenza PCR	29
Parasitology	54	Mumps PCR	25
Shigatoxin screen	54	Food testing	25
Serum immunoglobulin M	50	Blood-lead testing	25
Arbovirus serology	50	Measles PCR	21
Norovirus PCR	50	Parvovirus B19	21
Bacterial culture	50	PFGE	21
Mycology culture	50	Milk testing	21
Serum immunoglobulin G	46	Seawater testing	17

[a]NCPHLL Emerging Leaders Cohort IV environmental scan, 2011

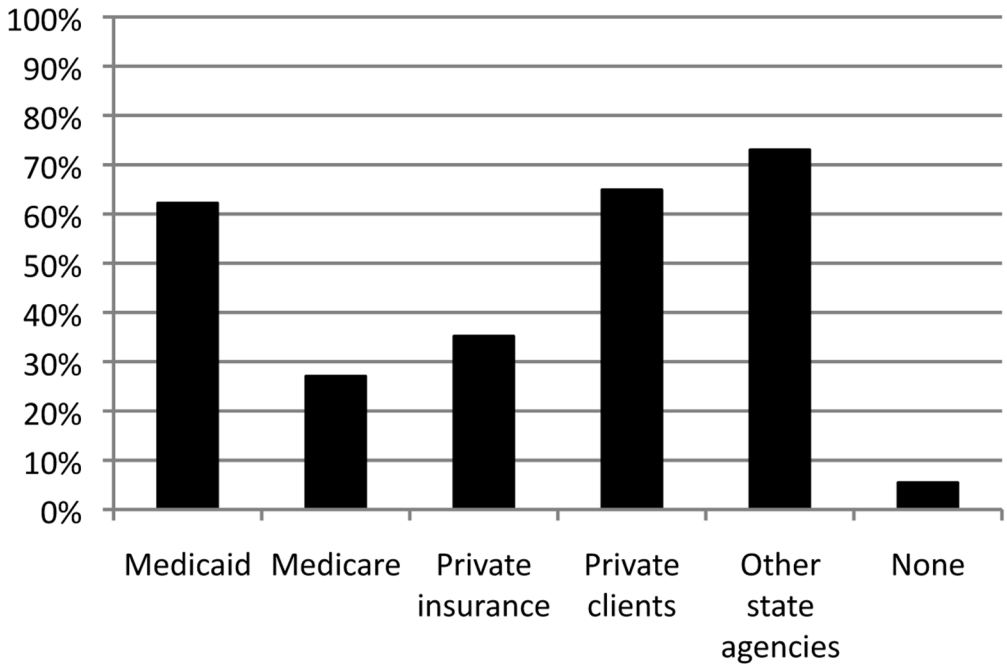
NCPHLL = National Center for Public Health Laboratory Leadership

HIV = human immunodeficiency virus

PCR = polymerase chain reaction

PFGE = pulsed-field gel electrophoresis

Figure 1. Percentage of state public health laboratories (*n*=37) that charge various payers for services provided: APHL Core Survey, U.S., 2011



APHL = Association of Public Health Laboratories

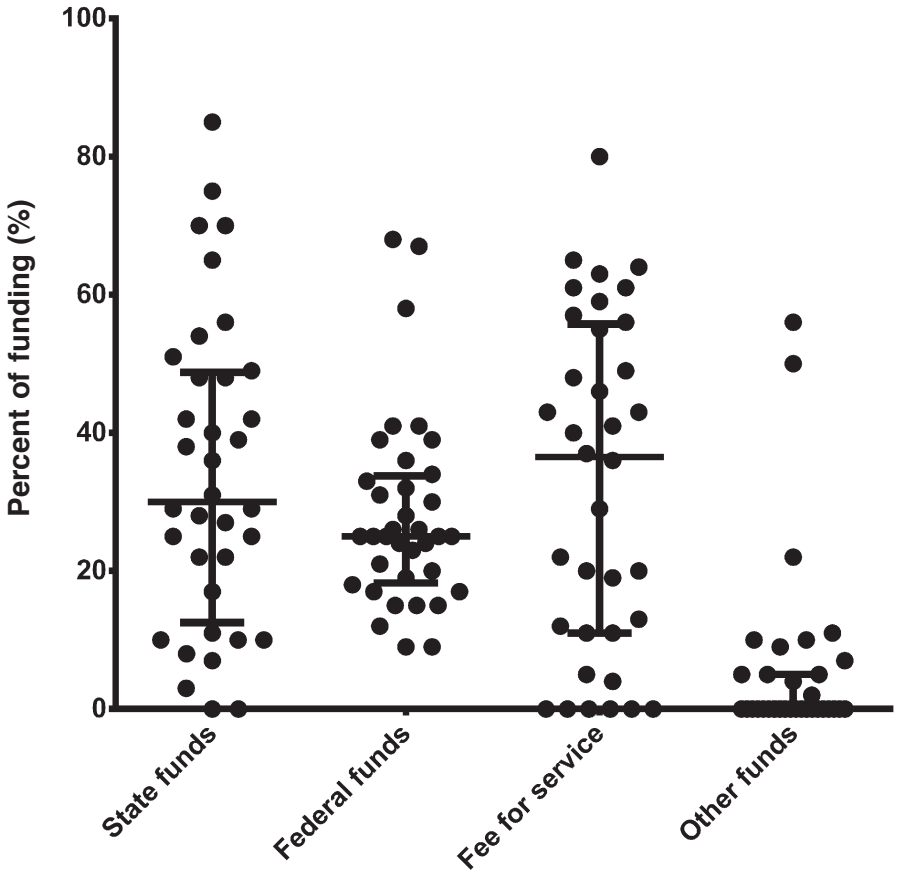
funds through federal, state, and fee-for-service revenue sources (81.1%) (data not shown). Each SPHL varied significantly in the proportion of its budget comprising each of the funding sources (Figure 2).

Of the 37 SPHLs shown in Figure 2, 32 (86%) indicated that they generate some revenue from fee-for-service testing, and the proportion of total revenue that resulted from fee-for-service testing ranged from ~1% to 80% of the SPHL total revenue. Figure 3 illustrates per capita funding by state, federal, and fee-for-service revenue sources. The data indicate that total per capita funding varies significantly among SPHLs, ranging from <$1 per capita to >$9 per capita. The per capita range of funding resulting from fee-for-service testing was $0–$4 per capita. Five of 37 responding states had fee-for-service per capita funding that was >50% of the responding states' total per capita funding.

The remaining questions on the NCPHLL survey identified how fee-for-service testing was implemented in each SPHL and common challenges or obstacles encountered in its implementation. Several barriers to efficient and adequate revenue generation through fee-for-service testing were repeatedly identified by the 17 SPHLs that responded to this portion of the NCPHLL survey. Billing software was listed by 65% of respondents as a major impediment to implementing fee-for-service testing. Several SPHLs specifically mentioned software that can interface with the Laboratory Information Management System (LIMS). The second most common barrier identifed by the NCPHLL survey involved legislative restrictions to both implementing fee-for-service testing and depending on the legislature to set fees (53%). Other barriers included lack of staffing (35%) and obtaining billing information from clients (12%) (data not shown).

One barrier to implementing fee-for-service testing that was identifed by respondents was the inability of many SPHLs to access and use collected revenues generated through testing activities due to legislative mandates and state-specific regulations. Six of 20 respondents (30%) to the NCPHLL survey reported that their SPHLs would not directly receive collected revenue generated from fee-for-service testing; rather, the revenue would be remitted to the state's general fund. Five other states (25%) responded that while their SPHLs would not receive all of the collected revenues generated by fee-for-service testing, they would receive at least a portion of the revenue. Nine of the 20 states (45%) said the SPHLs would receive all the fee-for-service funds. One responding SPHL director strongly recommended the development of a "retained revenue account" (i.e., an account that would enable

Figure 2. Percentage of funding resources for state public health laboratories (*n*=37) in 2010: 2011 APHL Core Survey[a]



[a]Each data point in each column represents one of the 37 responding states. The bars in each column represent 25%, 50%, and 75% of the data in that column.

APHL = Association of Public Health Laboratories

the laboratory to directly access funds generated by fee-for service testing) (data not shown).

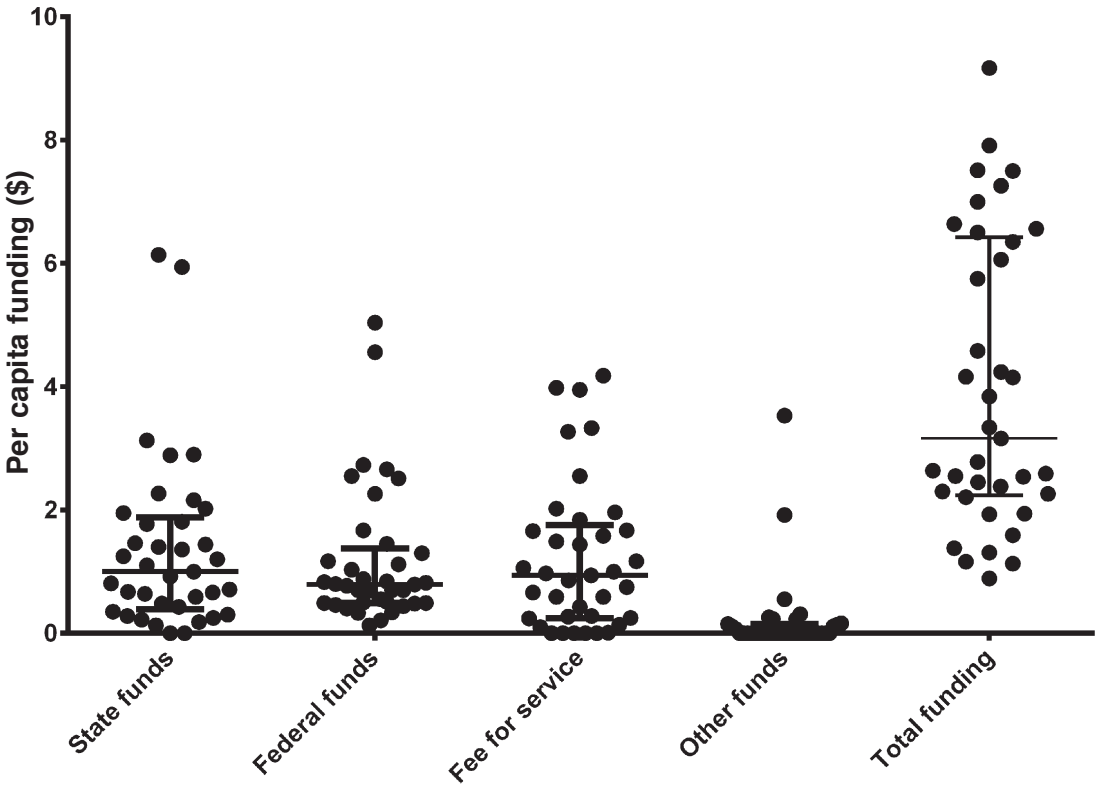
DISCUSSION

According to survey respondents, there is significant variability among SPHLs in the sources and percentage of funding (i.e., state, federal, and fee-for-service) used to support their activities. While many SPHLs currently charge fees to certain entities for selected tests, revenue generated from these tests comprises a smaller proportion of the total SPHL budget in the majority of states surveyed than do state and federal funds. These observations demonstrate SPHLs' continued reliance on state and federal appropriations and grants, even with the implementation of fee-for-service testing. However, one responding SPHL reported receiving up to 80% of its funding through fee-for-service testing, and nine more SPHLs reported receiving more than half of their total funding through fee-for-service testing, indicating that fee-for-service testing could be a major source of revenue for other SPHLs in the future. The heterogeneity in funding from federal, state, and other revenue sources among SPHLs indicates that a one-size-fits-all approach to SPHL funding is unrealistic despite a shared set of core functions. This finding is further illustrated by per capita funding that ranges from $1 to $9 in states responding to the APHL 2011 Core Survey.

Challenges of fee-for-service testing

Responses to the NCPHLL survey indicate that the implementation of fee-for-service testing in SPHLs presents many challenges that hinder broad

Figure 3. Per capita revenue by category at state public health laboratories (*n*=37) for 2010: 2011 APHL Core Survey[a]



[a]Each data point in each column represents one of the 37 responding states. The bars in each column represent 25%, 50%, and 75% of the data in that column.

APHL = Association of Public Health Laboratories

implementation in many state and local public health laboratories (PHLs). Multiple respondents commented on several barriers, which are detailed hereafter.

Legislative authority. Commonly, state and local governments must legislate authority to a PHL to charge for testing that is not part of an outbreak or surveillance investigation. While the steps to obtaining the necessary legislation might be manageable, political opposition may exist. One view holds that SPHLs should not compete with private or commercial laboratories. However, within the unique circumstances of each state, there may be very good reasons for the SPHLs to offer fee-for-service testing that is also available through private laboratories. One example is the consolidation of the clinical laboratory industry causing many local laboratories to close, thus leaving a gap in the availability of testing in rural areas. Legislation that permits fee-for-service testing may exclude testing that is fully funded through state or federal grants. Once implemented, another challenge facing some SPHLs is their inability to change the price of testing services without legislative approval. This challenge could be overcome by legislation that allows the price for fee-for-service testing to be changed by rulemaking or to be linked to the Medicaid fee schedule. Doing so would eliminate the need for legislative approval whenever the price to perform a test changes.

Billing processes. Another hurdle to implementing fee-for-service testing is the billing process itself; there is a lack of billing and tracking software that is compatible with the LIMS currently in use in SPHLs. A second challenge is a mandate requiring a state-approved contract with any entity that the SPHL charges for services. It is this mandate for contracts with potentially hundreds of entities that can make fee-for-service testing impractical in some states. Some SPHLs have overcome this obstacle by contracting with a third-party billing company that, for a small fee, can bill

any entity for which the laboratory performs testing. Contracting with a third-party billing company allows the SPHL to have one contract with the third-party biller and let the billing company use its own software to bill and track the laboratory's customers. Several of the smaller or less densely populated states responding to the NCPHLL survey indicated that the cost of contracting out billing services may be cost-prohibitive due to lower testing volumes. Creative solutions to this problem could include partnering with similarly situated SPHLs or other state government entities that charge for services.

Generating revenue through fee-for-service testing

The surveys discussed in this article identified a major question that each SPHL must consider if building a fee-for-service testing menu: Will new or expanded fee-for service testing actually accomplish the desired result of sufficient funds to operate the laboratory? In some of the responding states, revenue received via fee-for-service testing is transferred to the state general fund; in others, the revenue, or a portion of it, is used strictly to support the SPHL's functions. Both scenarios raise issues that are worthy of careful consideration. In the first scenario, revenue that is remitted to the state general fund may not be accessible to the SPHLs. These SPHLs may continue to lose funding and have difficulty maintaining their core functions despite generating revenue through fee-for-service testing.[4] The second scenario concerns potential decreases in state funding for the SPHLs due to increased revenue generated through fee-for-service testing. The state might argue that the laboratory can support itself. In addition, charging for tests could reduce test volume, resulting in decreased fee-for-service revenues. A third scenario is that once fee-for-service testing is implemented, there may be no way to go back to a government-funded model. This latter scenario could become problematic if the private laboratory industry views the change of an SPHL to a fee-for-service model as government-subsidized competition. This changing view could lead to outside efforts to change the SPHL funding model back to government funding only.

The SPHL system has historically been a government-funded entity with the role of protecting the public's health, especially the populations most at risk for disease. In the United States, the populations most at risk are the underinsured; thus, many of the customers served by SPHLs are either covered by Medicaid or have no health insurance. Consequently, the majority of responding SPHLs that have implemented fee-for-service testing have developed, or are in the process of developing, a mechanism to bill Medicaid for services provided. The data generated from providing these services are used by state epidemiologists and the Centers for Disease Control and Prevention to deliver disease surveillance in the U.S. and are not intended to compete with private industry.

The surveys discussed in this study also highlighted the disparity of state and federal per capita funding for SPHL testing. This disparity deserves further investigation to determine if lower per capita funding for SPHLs has a negative effect on the overall health of the population of that state or if the services are being provided by another entity within the state. Other issues that will affect funding for SPHLs in the future include population shifts; immigration; climate change; natural disasters; environmental insult and contamination; and the rapid spread of infectious, vector-borne, and antimicrobial-resistant organisms. It is imperative that SPHLs, as well as state and federal funding entities, develop contingency plans to maintain the core functions as PHLs face these issues.

Limitations

The surveys discussed in this article were limited by the number of states providing responses; as such, all findings must be taken as general observations that may not apply to those states that did not respond.

CONCLUSION

As a result of the national economic downturn, SPHLs face significant challenges in acquiring the funding necessary to perform their core functions. These challenges have already led to tough decisions to reduce the workforce, eliminate laboratory programs, and shutter smaller laboratories, all of which futher erode SPHLs' ability to fulfill their core functions.[9] SPHL revenue from fee-for-service testing may enable service continuity during these uncertain economic times. The methods and experiences of SPHLs that have already implemented fee-for-service testing mechanisms can serve as a framework by which other PHLs can address funding challenges and continue to meet their core functions.

This manuscript was supported by Cooperative Agreement #U60HM000803 from the Centers for Disease Control and Prevention (CDC) and/or Assistant Secretary for Preparedness and Response. Its contents are solely the responsibility of the authors and do not necessarily represent the views of CDC and/or Assistant Secretary for Preparedness and Response. The National Center for Public Health Laboratory Leadership program was funded 100% from federal funds, with a budget of $958,233.

REFERENCES

1. Institute of Medicine. The future of public health. Washington: National Academy Press; 1988.
2. Centers for Disease Control and Prevention (US). Public health preparedness: 2011 state-by-state update on laboratory capabilities and response readiness planning. 2011 [cited 2013 Feb 22]. Available from: URL: http://www.cdc.gov/phpr/pubs-links/2011/download.htm
3. Association of Public Health Laboratories. The core functions of state public health laboratories. 2010 [cited 2013 Feb 22]. Available from: URL: http://www.aphl.org/AboutAPHL/publications/Documents/COM_2010_CoreFunctionsPHLs.pdf
4. Inhorn SL, Astles JR, Gradus S, Malmberg V, Snippes PM, Wilcke BW Jr, et al. The state public health laboratory system. Public Health Rep 2010;125 Suppl 2:4-17.
5. Association of Public Health Laboratories. Public health laboratories: analysis, answers, action [cited 2013 Feb 22]. Available from: URL: http://www.aphl.org/AboutAPHL/reporters/Documents/COM_2012_Public-Health-Laboratories-Analysis-Answers-Action.pdf
6. Ahn R, Gaylin DS, Keiller A, Mendelson DN, Moiduddin A, Rubin RJ. Public health laboratories and health system change. Washington: Department of Health and Human Services (US); 1997. Also available from: URL: http://aspe.hhs.gov/health/reports/phlabs/front.htm [cited 2013 Feb 22].
7. Trust for America's Health. Ready or not? Protecting the public from diseases, disasters, and bioterrorism. 2011 [cited 2013 Feb 22]. Available from: URL: http://healthyamericans.org/report/92
8. Census Bureau (US). Census 2010 [cited 2013 Feb 22]. Available from: URL: http://2010.census.gov/2010census/data
9. Becker SJ. Public health laboratories ride a funding roller coaster—and it's dangerous. Appl Biosaf 2009;14:163-4.