

The Public Health Uniform National Data System (PHUND\$): A Platform for Monitoring Fiscal Health and Sustainability of the Public Health System

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ABSTRACT

Context: Leaders of government agencies are responsible for stewardship over taxpayer investments. Stewardship strengthens agency performance that is critical to improving population health. Most industries, including health care, and public enterprises, such as education, have policies for uniform data reporting and financial systems for the application of theoretical analytical techniques to organizations and entire systems. However, this is not a mainstreamed practice in local and state government public health.

Program: The Public Health Uniform National Data System (PHUND\$) is a financial information system for local health departments that advances the application of uniform practices to close financial analytical gaps. A 10-year retrospective overview on the development, implementation, and utility of PHUND\$ is provided and supported by documented program and agency improvements to validate the analytical features and demonstrate a best practice.

Results: Benefits found from utilizing PHUND\$ included reducing financial risks, supporting requests for increased revenues, providing comparative analysis, isolating drivers of costs and deficits, increasing workforce financial management skills, enhancing decision-making processes, and fostering agency sustainability to support continuous improvements in quality and population health. The PHUND\$ financial data definitions in the data dictionary provided the structure needed for standardized data collection and confirmed the feasibility of a standardized public health chart of accounts.

Conclusion: PHUND\$ analysis provided evidence on the relationship between financial and operational performance, as well as informing strategies for managing risks and improving quality. Such analysis is critical to identifying financial and operational problems and essential to mitigating financial crisis, avoiding disruption of services, and fostering agency sustainability. PHUND\$ additionally serves as an instrument that can guide development of standards that measure for agency sound financial management systems.

KEY WORDS: public health financial analysis, public health financial data, public health quality, chart of accounts

Context

System-wide adoption is needed of policies and tools to guide implementation of standardized practices for governmental public health agency financial

reporting and analysis. Standardized financial management practices, a uniform structure for data categories, and analytical platforms for data reporting have trailed those of other health care sectors. Although such problems with public health analytical practices have been documented, public health still lacks the mainstreamed adoption of systems and a skilled workforce to advance appropriate analysis.¹⁻⁶ The inability to undertake robust financial forecasting that the appropriate financial systems would support is a major quality gap in public health, especially given the uncertainty of future events and emergencies (eg, emerging diseases, natural disasters).

The lack of appropriate business and financial training to cultivate workforce competencies has also received an abundance of attention.^{4,7-9} Appropriate business and financial management workforce credentialing is needed to mainstream effective financial management practices. At the same time,

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the mainstreamed use of a platform is needed for practitioners to apply the financial analytical skills acquired through education and training. These realities underscore the urgency to implement policies and practices for standardized financial reporting and analysis across public health departments.

Threats to the public's health make it critical to articulate the financial condition of the governmental public health system in quantifiable terms and metrics familiar to policy makers and the public (eg, surplus, deficit, operating margin, solvency). There are increasing calls for public health officials to serve as the chief health strategists for counties, cities, and other jurisdictions.¹⁰ As such, these practices could help officials garner support to increase and diversify revenue streams needed to improve the health of populations.

From a public health perspective, sustainability is the capacity to maintain service coverage at a level that provides continuing control of a health problem.¹¹ The ability to measure sustainability of local public health departments and that of the entire system is critically important to readiness to address threats such as Ebola virus disease, Zika virus disease, and natural disasters. Supporting this is the fact that the US Department of Health and Human Services identified *sustainability and stewardship* collectively as one of the 6 priority areas for improving quality in public health.¹²

Most private and public sector industries have information systems and related policies for standardized financial management practices that measure and monitor fiscal and operational performance. These information systems collect uniform financial and operational data that yield the information necessary to assess the financial health of individual organizations and entire systems. This knowledge is vital to monitoring internal and external risks (eg, program deficits, costs overruns, quality gaps, duplication of services, economic downturns) that jeopardize organization and service line sustainability. Public health lags in mainstreaming the application of these basic stewardship financial management practices so critical to forecasting financial conditions and basic program planning.¹³

There is no mandate for nationwide uniform public reporting of state or local health department financial data to measure the fiscal health of the entire public health system. Other health care sectors, such as community health centers and hospitals, and other public enterprises, such as education, have mandates imposed by federal law to report financial data to agencies such as the Health Resources and Services Administration (HRSA) and the Centers for Medicare & Medicaid Services (CMS).^{14,15} Identification of gaps in the systematic application of theoretical

financial analytical techniques to the governmental public health enterprise is not new, as evidenced by decades of literature noting these limitations.^{1-3,13}

Identifying Root Causes

Multiple factors contribute to the root causes of the analytical limitations entrenched in public health practice settings. Traditionally, budgets for public health programs and services within local health departments (LHDs) are funded, drawn down, and replenished in each fiscal cycle based on policy maker priorities. As such, a culture that focuses on acquiring funds primarily from public sources has been perpetuated, with less focus on practices that align with entrepreneurial strategies to acquire revenues from private or other nontraditional sources. Consequently, the culture of governmental public health has been slow to implement systematic financial analysis as a necessity of doing business. A line item, titled Governmental Public Health Activities, is included in the National Health Expenditure Accounts compiled annually by the CMS Office of the Actuary. However, because the data used to compile the line item are based on a methodology for aggregated data collection and estimation, it is widely considered as a nonviable source of reliable data for granular levels of LHD analysis.¹⁶

Building the Foundations for a Standardized System

In 2006, with funding from the Robert Wood Johnson Foundation (RWJF), public health stakeholders (eg, state and local practitioners, academics, agency leadership) initiated dialogue through a series of workgroup meetings focused on solutions to address gaps in appropriate financial analytical practices. The workgroup successfully designed the framework for a uniform financial information system that would eventually become the Public Health Uniform National Data System (PHUND\$).

Introduction to PHUND\$

PHUND\$ is a Web-based portal for collecting uniform LHD financial data.¹⁷ PHUND\$ was created to foster system-wide processes for uniform financial data reporting and financial management practices in public health, like the robust systems developed for community health centers, medical clinics, hospitals, and educational institutions. The intended outcomes of PHUND\$ were to provide a platform to better inform decision making for improving the allocation of fiscal resources, make available uniformly categorized financial data to develop standardized public health

financial metrics, facilitate establishment of uniform measurement of agency and public health system financial performance, and build workforce skills by providing a platform for the application of theoretical financial management concepts to the practice of public health.

Designing PHUND\$

The developers of PHUND\$ considered practices and policies recommended by the Government Finance Officers Association and leading financial experts.^{18,19} Accordingly, PHUND\$ is designed to provide LHDs with real-time analysis (within a few days of reporting the data into PHUND\$) that can be used to measure their financial condition by identifying agency strengths and weakness. It provides an infrastructure to measure for financial risks to the system while promoting the development of strategies to manage

any risk—a tactic for quality improvement.²⁰ It promotes transparency by providing local, state, and national leaders with timely information about the system's overall solvency and with standardized categories that align with national interest such as the Foundational Public Health Areas/Services (Table 1).¹³ This is an important advancement and responds to recommendations in 2007 for uniform expense and revenue classifications.¹

PHUND\$ also supports LHD accreditation as a tool for measuring financial management systems consistent with Standard 11.2 of the Public Health Accreditation Board (PHAB) Accreditation Standards.^{21,22} The purpose of PHAB Standard 11.2 is to verify the existence of an established financial management system. Over time, metrics and data generated in PHUND\$ could be used to strengthen and expand the set of PHAB standards and measures specified in Domain 11. PHUND\$ also generates

TABLE 1
Sample of Data Collected and Ratios Calculated in PHUND\$

Data/Ratio	Alert	Current Year	% Change From Prior Year	Prior Year	% Change From Prior Year	Prior Year
Revenue per capita						
Expenditures per capita						
Total margin						
Operating surplus/(deficit)						
Federal revenues as a % of total revenues						
Dedicated property tax revenues as a % of total revenues						
Local city/county revenues as % of total revenues						
Preparedness ^a revenues as a % of total revenues						
Communicable disease ^a revenues as a % of total revenues						
Maternal & child health ^a revenues as a % of total revenues						
Administrative expenditures as a % of total expenditures						
Laboratory ^a expenditures as a % of total expenditures						
Pharmacy expenditures as a % of total expenditures						
Salary expenditures as a % of total expenditures						
Chronic disease prevention ^a program surplus/(deficit)						
Injury prevention ^a program surplus/(deficit)						
Environmental health ^a expenditures per full-time equivalent						
Medical services ^a expenditures per full-time equivalent						
Employee leave liability						
Jurisdiction population						

^aFoundational Public Health Areas/Services.

uniform metrics that measure overall agency financial performance (Tables 1 and 2) and is the mechanism for applying knowledge on financial management concepts that would be acquired in education and training. With PHUND\$, practitioners have a tool to apply knowledge gained in trainings on quantitative analytical techniques to perform uniform financial management practices.²³ Finally, PHUND\$ affords the research community with access to data to meet their needs, which are often different from the immediate needs of policy makers and practitioners.

PHUND\$ began in 2006 with the convening of an advisory workgroup represented by both local and state health departments through funding from RWJF to the University of Southern Mississippi (USM). The workgroup’s goals were to identify the specific categories of programs and other data needed to create a method for (1) measuring health department financial condition, (2) conducting comparative analysis between health departments, (3) identifying programs needing improvement and learning from those performing well, (4) gathering quantifiable information for use in advocating for increased funding, and (5) building a data warehouse to support additional analytical techniques (eg, cost analysis, cost-effectiveness, return on investment). For the first phase of the project, the workgroup agreed to focus on the programs and services delivered at the local level with the intent of incorporating state agency functions in subsequent phases of the project.

Through a series of conference calls and meetings, the workgroup identified financial (eg, revenues, expenditures) and program (eg, communicable disease, chronic disease, injury prevention, environmental health) categories to include for data collection. The categories selected were considered critical for monitoring financial and operational performance and assessing the overall financial health of the agency. Most importantly, the program categories selected were concluded to be those most likely to be

performed in LHDs and to have existing closely defined accounts in LHD accounting systems across agencies. It was deemed very important that the individual LHDs be able to crosswalk data from their existing charts of accounts and accounting systems into formats for uniform reporting into the data collection tool. As mentioned earlier, the Foundational Public Health Service categories documented in the 2012 Institute of Medicine report, *For the Public’s Health: Investing in a Healthier Future*, were identified 6 years earlier in 2006 by the advisory workgroup as program categories to include in the proposed data collection system (Table 1).¹³

The early design of PHUND\$ was a preformulated Excel spreadsheet that calculated financial and operational ratios and trends for a single or multiple fiscal periods. A project leadership team directed by USM and composed of a finance expert, along with a current and a former LHD agency director, conducted training sessions on how to use the spreadsheet. Over a 5-year period (2007–2011), training sessions were conducted in 6 states, at 3 American Public Health Association (APHA) Learning Institutes, at 3 annual meetings of the National Association of Local Boards of Health, at State Association of County and City Health Officials meetings in 3 states, and at 2 National Association of County & City Health Officials (NACCHO) annual meetings. Demonstrations on the concepts were also presented on 3 occasions to the Association of State and Territorial Health Officials (ASTHO) chief financial officers’ meeting to demonstrate the applicability for state data collection.

Web portal conversion

The second phase of PHUND\$ development was initiated in 2011 with additional funding from RWJF. The goal was to convert the Excel spreadsheet into a Web-based portal. Conversion to the Web-based

TABLE 2
Sample of PHUND\$ Dashboard and Benchmark Formats

Data/Ratio	Agency Value	Mean Benchmark Value	Median Value	25th Percentile	75th Percentile	Agency Count
Revenue per capita						
Expenditures per capita						
Total margin						
Fringe benefits						
State revenues						
Medicaid revenues						

PHUND\$ platform included data warehousing features that enabled greater functionality, such as a dashboard and benchmarking, across all agencies that report data into PHUND\$. During this phase, the national advisory workgroup was reconvened. In collaboration with NACCHO and ASTHO, the workgroup reexamined the data categories selected for reporting into PHUND\$ to confirm and update them as deemed appropriate. Changes from program categories selected during the 2006 process were minimal and remained aligned with the Foundational Public Health Areas/Services (Table 1).

The workgroup played a key role in delineating system specifications for the benchmarking and dashboard features, identifying reports produced by PHUND\$, parameters for line item *alerts* designated in PHUND\$ (ie, data values needing immediate additional analysis), and validation of definitions for each of the data elements that formed the PHUND\$ data dictionary. The existing uniformity of program accounting definitions across LHDs and prioritization of programs critical to fulfilling the public health mission guided the workgroup's decisions. The workgroup's vision was for the data dictionary to serve as a starting point for a uniform public health chart of accounts where the data collection line items could be crosswalked to existing LHD charts of accounts. Gans et al²⁴ made the case a decade ago for a uniform public health chart of accounts by providing the historical genesis of the 1979 medical group chart of account. A uniform public health chart of accounts is critical, given goals to include a dashboard and benchmarking feature in the new PHUND\$ Web portal design. Expectations for each LHD to create a new chart of accounts would not be feasible or practical, given the diversity of county and state government accounting systems. The system transition was completed in December 2012, and NACCHO immediately assumed the position of PHUND\$ curator.

Validation of analytical techniques

During 2008-2016, the USM Leadership Team and NACCHO used funding provided by RWJF to pilot test PHUND\$ in all 67 counties in Florida, with additional analysis of LHDs in North Dakota, Ohio, North Carolina, West Virginia, Montana, and Michigan. The LHD pilot sites tested and verified the validity of PHUND\$'s analytical capabilities and ability to collect uniformly defined data. Because the LHD pilot tests were conducted statewide, active participation by state health departments was a critical factor for success. Given the scope of statewide analysis and results previously documented to support validation, illustrations from Florida and Ohio are

provided in the following section. As of November 2017, more than 300 LHDs representing 36 states have reported data into PHUND\$. A pilot of 3 LHDs to further evaluate the ability to design quality improvement strategies using PHUND\$ reports and the relationship of technical assistance to workforce training recently concluded with results to be released in an upcoming publication. In addition, at least one statewide pilot is currently underway.

Results

The Florida Department of Health and its LHDs used reports generated by PHUND\$ to facilitate decision making, promote greater awareness, and foster quality improvement practices. For example, approximately 50% of Florida's LHDs were operating in a deficit position as quantitatively measured by total margin values—a financial gold standard for measuring whether expenses are exceeding revenues. The ratios for the chronic disease program revealed dramatic federal funding decreases in a period when greater national emphasis was placed on the economic burden of chronic diseases and the need for disease reductions. Accounts receivable balances uncovered operational areas needing immediate quality improvement, whereas administrative costs highlighted major operational efficiencies across the state when compared with health care organizations. Current Florida benchmarked data continue to confirm this efficiency. State managers suspected that LHDs were experiencing fiscal struggles, but the pilot enumerated the problem and presented it in quantifiable metrics familiar to policy makers (ie, total margin, operating ratio, program services ratio). As part of the corrective action, technical assistance staff members were deployed to agencies that needed quality improvement. Some agencies also used PHUND\$ reports for quantifying differences in revenues per capita and successfully advocated for additional revenues. Collectively, the analysis proved to be a valid technique for assessing financial performance and identifying the root causes of areas needing improvement. Florida State Health Department leadership at the time noted that the analysis was a resource to support sound business decisions and for future agency credentialing activities.²⁵ Given the level of leadership engagement and support provided by the Florida Department of Health, results of the statewide pilot have been posted on its Web site, presented at national conferences, and used for trainings in other states.

Mahoning Health District in Ohio served as a pilot site to validate the analytical methods in PHUND\$.²⁵ The commissioner participated in the initial 2007 APHA Learning Institute that provided training on

the financial analytical concepts. He suspected fiscal distress in the agency, but lacking an adequate description of the situation, he decided to apply the concepts of ratio and trend analysis to the financial data from Mahoning Health District. Results uncovered an agency overall deficit position that was continuing to decline dramatically. Further analysis discovered that 2 programs in the agency were causing approximately 95% of the deficit. The unveiling of this information validated the analytical concepts (ie, ratio and trend analysis) embedded in PHUND\$. The information was instrumental to designing quality improvement projects that put into motion corrective courses of action in program design, cost analysis, revenue enhancements, expenditure reductions, and agency reorganization. As noted in the 2012 published case study on the pilot, a financial turnaround was achieved within months of the analysis, primarily by using the financial data to identify gaps in program quality that was driving the financial instability.²⁶

Operational Features

The workgroup recommended PHUND\$ have both mandatory and optional data entry modules. The rationale was to accommodate the level of agency analytical capabilities, given that some LHDs had staff members with greater proficiencies in financial analysis skills than others. Agencies have the choice of completing only the short form with 15 data fields for a single or multiple fiscal years (Table 1), or both the short form and a comprehensive longer form with about 100 additional data fields. Up to 5 years of LHD data can be reported and analyzed in PHUND\$.

The LHD chief financial officer, the accounting contractor hired to perform the LHD's fiscal functions, and the county or city government staff person assigned with the LHD's financial responsibilities, are key personnel who can efficiently enter accurate data into PHUND\$. LHDs report that it takes roughly 45 minutes to complete this process and note that the benefits outweighed the time commitment costs. Users of PHUND\$ report that the comprehensive data dictionary aided tremendously in crosswalking and simplifying the data collecting and reporting process, especially given the diversity and inability to alter the structure of local government accounting systems. Chief financial officers who participated in the 2014 Public Health Informatics Institute's chart of accounts analysis project further examined these definitions' uniformity and the method's reliability.²⁷

Primary analytical features

PHUND\$ has multiple layers of analytical features. These are segmented into 3 topic areas, and related

Implication for Policy & Practice

- PHUND\$ aids in mainstreaming methods for quality assurance in LHDs through its enhanced ability to identify and prevent root causes of financial and operational crisis such as those recently experienced in a state health department.^{28,29}
- Decades ago, the quality movement grew out of a desire to deliver better programs and services at lower costs. PHUND\$ demonstrated the ability to guide practices for program-specific costs analysis.
- Routine staff training on the use of PHUND\$ would build workforce financial management skills that currently are not commensurate with the workforce skillset in other fields. PHUND\$ aids in applying the theoretical financial management concepts directly to the field of public health. Such training absent a tool to apply the concepts in practice is not productive.
- If data are compiled over time, financial standards specific to the field of public health could be developed identical to those of other industries. At a minimum, national leaders would be able to:
 1. Establish uniform metrics to clearly articulate nationally the overall financial condition of the public health system
 2. Link the standardized financial metrics to the PHAB national standards and accreditation process
 3. Conduct forecasting for insights into national trends that drive revenues and expenditures
 4. Make informed decisions for the continuation or elimination of programs
 5. Increase accountability over public health investments
 6. Advance desired fiscal policy
 7. Advocate for additional funding

analytical features under each topic are noted as follows:

- I. Assessment of LHD Financial Condition and Performance (Table 1)
 - Availability of metrics such as total margin, operating surplus or deficit, and operating ratio to assess agency solvency and sustainability
 - Comprehensive ratio and trend analysis of all reported categories of revenues and expenses
 - Assessment of LHD uniform financial data in standardized categories of national interest, such as the Foundational Public Health Areas/Services
- II. Program Sustainability (Table 1)
 - Analysis of individual programs to determine surplus or deficit positions

- Analysis of program costs
- Staffing efficiency analysis for comparison across program areas

III. Dashboards and Benchmarking (Table 2)

- Automatic calculation of 13 dashboard line items
- Peer comparative benchmarking (ie, based on population size, services provided, region of the country, state-only benchmarking)

Conclusion

Standardized financial management practices in LHDs provide valuable information about the finances and operations of agencies, as well as about the entire public health system. These data inform agency decision makers and boards about the overall financial status and about measures of performance—both financial and operational. Such knowledge, if available across the country, can be valuable for assessing and reporting publicly on the overall sustainability of the entire public health system such as what is done by HRSA for federally qualified health centers and others in health care. This information can play a critical role with informing strategies and validating budgetary requirements that enable action plans for ensuring a healthy population. The increasing pressure for LHDs to sustain effective programs and services while strengthening their ability to react to emerging threats underscores the need for the standardized use of metrics and a rapid acceleration in the nationwide adoption of a tool such as PHUND\$.

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