The Performance of Local Health Departments: A Review of the Literature

Paul Campbell Erwin

Local health department (LHD) performance measurement provides an opportunity to link inputs, outputs, and outcomes in a manner that should facilitate quality improvement. Since inputs flow from LHDs that vary substantially in size, organization, funding, and other characteristics, it is reasonable to assume that these variable inputs may affect LHD performance or outcomes. Documenting this is becoming increasingly important as LHD accreditation is being seen as one approach to standardization of inputs. This article provides a literature review of LHD performance measurement and attempts to identify LHD inputs (or characteristics) that impact performance or outcomes. The literature review identified 23 articles on LHD performance, published in peer-reviewed journals since the 1988 report on the *Future of Public Health*. The most common findings related to LHD size, jurisdictional size, and funding: LHDs with larger staffs, serving populations of more than 50 000 persons, and with higher funding per capita were more often higher performing. Other notable characteristics of higher-performing LHDs included greater community interaction, having a director with higher academic degrees, and leadership functioning within a management team. Prospective studies that examine the linkages among LHD performance measurement, accreditation, and outcomes will be important in achieving performance improvement over time.

KEY WORDS: **accreditation, local health departments, performance measurement, performance standards, quality improvement**

In a 1997 article, Turnock and Handler stated "Performance measurement in the public health system must be able to measure inputs, processes, outputs, and outcomes in ways that allow for changes in one to be linked with another."[1(p279)] If inputs vary, how will this impact outputs or outcomes? This is the challenge when these inputs flow from local health departments (LHDs) that vary tremendously in terms of size, structure, organizational arrangement, governance, and funding. This variability is considered by some to be a fundamental contributing factor to the weak public health infrastructure that was described in the 1988 Institute of Medicine's (IOM's) report on *The Future of Public Health*.[2,3] A weak public health infrastructure leaves communities vulnerable to public health threats, further contributing to the "disarray" of public health.

If variability in inputs stems from a lack of standardization of LHD functions, the temptation is to succumb to what might be intuitively derived—that the answer to this variability and the lack of standardization is standardization, for example, by way of accreditation. Indeed, the recent special issue of the *Journal of Public Health Management and Practice* (*JPHMP*) focusing on public health accreditation (July/August 2007) contained numerous articles that not only described the current landscape of LHDs in a similar fashion but also provided the strongest collective call to-date that LHD accreditation is *an*, if not *the*, answer to the lack of standardization.

But to what extent do LHDs actually vary significantly in capacity, performance, or outcomes by LHD size, organizational structure, and funding? Given that organizations, such as the Centers for Disease Control and Prevention (CDC), the National Association of County and City Health Officials (NACCHO), the Association of State and Territorial Health Officials,

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American Public Health Association, Public Health Foundation, the National Association of Local Boards of Health, and Robert Wood Johnson, all support accreditation, and that in its 2003 report on *The Future of the Public's Health*, the IOM called for a national commission to further consider accreditation, knowing, rather than assuming, that LHD variability is a problem identified through careful research is critically important.[4] The purpose of this review, then, will be to examine the empirical evidence regarding LHD performance and to understand what these studies reveal about the relationship among LHD inputs (including size, organizational structure, and funding) and subsequent outputs (eg, capacity to provide the essential public health services [EPHS] or core functions of public health) and outcomes (such as measured health impact). This review will also attempt to identify other factors—such as characteristics of the population served—that either impact or are impacted by LHD performance.

Methods

The MEDLINE database was searched (via PubMed) to identify relevant articles in the fields of health policy, administration, and management. The key word search included "local health department performance," "public health performance," and "organizational practices." Additional studies were identified through the "related articles" function in PubMed and through an author search for six selected authors (Miller, Turnock, Handler, Richards, Halverson, and Mays).

The CINAHL database was searched to identify potentially relevant articles in nursing and allied health, using key words "local health department performance," "public health performance," and "local health department."

Google Scholar was searched by selecting six most frequently identified lead authors from the PubMed search. A focused search of selected Web sites was conducted in order to identify potentially relevant "gray" literature. These sites were selected on the basis of recent involvement with public health performance standards and accreditation, and included Robert Wood Johnson, NACCHO, CDC, Association of State and Territorial Health Officials, National Association of Local Boards of Health, American Public Health Association, and Public Health Foundation. Potentially relevant literature that was not published in peer-reviewed journals was reviewed for references.

Finally, based on the preponderance of selected articles having been published in the *JPHMP*, a manual review of all journal issues (1994–2007) was conducted to identify any other potentially relevant articles.

The database searches in PubMed and CINAHL were limited to studies conducted on public health agencies within the United States. An initial reading of the relevant literature showed a striking impact of the 1988 IOM's report on *The Future of Public Health*, particularly in stimulating both the public health practice and academic fields to focus on the three core functions of assessment, policy development, and assurance. In an attempt to make this literature review most relevant for current public health practice, only studies that follow the 1988 report are included for subsequent review and discussion. (Excellent overviews of the efforts to measure public health practice performance before 1988 are provided in studies by Turnock and Handler[1] and Corso et al.[5]) Abstracts were reviewed, and articles were included for further consideration if the following criteria were met: (1) the abstract specifically described a study focused on LHDs and presented new primary data or new analyses of secondary data (ie, review articles were excluded from the final selection); (2) the study included LHD effectiveness, performance, impact, or health outcomes as a dependent variable, and at least one explanatory/independent variable (such as size of LHD, organizational structure, or expenditures per capita); and (3) the article was published in a peer-reviewed journal.

Results

The application of the inclusion-exclusion criteria as noted above resulted in a total of 23 studies for this review. These studies are summarized in Table 1, and are listed chronologically.

Measuring LHD performance

Studies on LHD performance generally used one of two methodologies: (1) investigator-developed surveys of LHDs on the basis of 10 public health practices and (2) National Public Health Performance Standards surveys of the Local Public Health System on the basis of 10 EPHS. Only a small number of studies utilized other methodologies.

Beginning shortly after the 1988 IOM's report, two teams of researchers were predominately involved in developing surveys on the basis of the 10 public health practices—Turnock et al[29] from the University of Illinois–Chicago, and Miller et al[30] from the University of North Carolina–Chapel Hill. Beginning with a survey instrument on the basis of performance expectations for 10 public health practices, the work evolved to the development of a comprehensive survey of 84 indicators of performance, then a screening survey of 26 indicators.[30,31] The 26-indicator survey was used in

TABLE 1 ● Performance measurement of local health departments

Authors	Sample Size (no. of LHDs)	Performance measures framework	Data acquisition/ sources	Dependent variable/ focus	Independent variables/ correlates	Positive correlates of LHD performance
Spain et al[6]	18	Model standards	Interviews and questionnaires	Program objectives	Local-state negotiation	LHDs that negotiated with the state met more program objectives
Miller et al[7]	14	Structured interview examining impact of 20 critical events	Interviews and questionnaires	Impact on LHD performance	20 critical events	HIV/AIDS epidemic, changes in fee income, 1988 IOM's report
Turnock et al[8]	208	10 Public health practices	Survey questionnaire	LHD role, compliance, and effectiveness	LHD jurisdiction size and organizational type	City, LHDs serving population > 50 000
Turnock et al[9]	42	26 Indicators, 10 public health practices	Survey questionnaire	LHD performance	7 capacity-building influences; LHD jurisdiction size	Use of IPLAN and APEXPH; LHDs serving populations of 25 000–100 000
Richards et al[10]	370	26 Indicators, 10 public health practices	Survey questionnaire	LHD performance, adequacy, LHD contribution	LHD jurisdiction size and organizational type	LHDs serving larger populations, especially > 100 000; LHDs in centralized administrative structure
Suen et al[11]	2079	Eight core functions	NACCHO's 1992–93 profile of LHDs	LHD performance	LHD jurisdiction size and organizational type; expenditures; use of planning models	LHDs serving populations > 50 000; higher LHD expenditures; centralized administrative structure
Schenck et al[12]	34	84 Indicators, 10 public health practices	Survey questionnaire; health status and risk measures	LHD performance	Health status and risks	Unfavorable health status and risks
Handler and Turnock[13]	264	10 Public health practices	Survey questionnaire matched to NACCHO's 1992–93 profile of LHDs	LHD effectiveness	LHD characteristics	Higher number of LHD staff; higher total expenditures; private insurance as a significant source of revenue; female head of agency
Mayer et al[14]	93	10 Public health practices, modified for MCH	Survey questionnaire matched to NACCHO's 1992–93 profile of LHDs	LHD performance	LHD characteristics	LHDs serving larger jurisdictions; higher number of LHD staff; community interactions; managed care participation; urban setting
Turnock et al[15]	298	20 Public health practice measures	Survey questionnaire	LHD performance, effectiveness	LHD jurisdiction size and organizational type	LHDs serving populations > 50 000; LHDs organized by city and county

(*continues*)

TABLE 1 ● Performance measurement of local health departments (*Continued*)

Authors	Sample Size (no. of LHDs)	Performance measures framework	Data acquisition/ sources	Dependent variable/ focus	Independent variables/ correlates	Positive correlates of LHD performance
Lovelace[16]	64	4 Public health actions	Survey questionnaire	LHD performance	LHD jurisdiction size; community interaction	LHDs serving larger jurisdictions; degree and productivity of community relationships
Freund and Liu[17]	102	26 Indicators, 10 public health practices	Survey questionnaire; demographics; budgets	LHD performance	LHD jurisdiction size; budgets; number of LHD staff	Larger LHD staff per population; serving larger populations; larger budgets
Lovelace[18]	64	4 Public health actions	Survey questionnaire	LHD performance	LHD TMT makeup, process	Presence of a TMT; discussions on assessment and political changes
Kennedy[19]	37	NPHPSP/10 essential services	Survey questionnaire; US census; community health status data; financial data; telephone interviews	Local public health system performance	LHD characteristics, community health status, financial data	Larger LHD jurisdictions; higher per capita income, educational levels, and contribution of LHD to system performance; lower premature death rates
Zahner and Vandermause[20]	93	Analysis of compliance with state statutes and rules	Site visits using an assessment tool; documented evidence of compliance	Compliance rate	LHD characteristics, expenditures, tax per capita, jurisdiction size	Larger LHD jurisdictions; staff size; total expenditures; higher level of certification by state health department
Suen and Magruder[21]	2007	20 Public health practice measures	Survey questionnaire	LHD performance	LHD jurisdiction size and organizational type	LHDs serving larger populations; LHD type other than city/municipal
Scutchfield et al[22]	152	NPHPSP/10 essential services	Survey questionnaire matched with NACCHO's 1996–97 profile of LHDs	Local public health system performance	LHD characteristics	Total expenditures per LHD staff; LHD director with master's or bachelor's degree; experienced LHD director; relationship with universities and businesses
Mauer et al[23]	34	Washington state performance standards for public health	Self-assessment survey, followed by site visits and documentation of evidence of performance	LHD performance	LHD characteristics, jurisdiction size, expenditures	LHDs with higher budgets and larger number of staff

(*continues*)

TABLE 1 ● Performance measurement of local health departments (*Continued*)

Authors	Sample Size (no. of LHDs)	Performance measures framework	Data acquisition/ sources	Dependent variable/ focus	Independent variables/ correlates	Positive correlates of LHD performance
Mays et al[24]	285	NPHPSP/10 essential services	Survey questionnaire matched with NACCHO's profile of LHDs, Area Resource File, CFFR 2000	Local public health system performance	LHD characteristics	LHD and federal per capita spending;
Honore et al[25]	50	NPHPSP/10 essential services	Survey questionnaire matched with health status data and US Economic Census for Health Care and Social Assistance	Local public health system performance	LHD characteristics	Higher taxes per capita; higher overall tax rate; LHDs with greater percentage of revenue from taxes; LHDs which deficit spend; higher mortality
Mays et al[26]	356	20 Public health practice measures	Survey questionnaire	Performance in availability, effectiveness	LHD and population characteristics	Higher performance in availability with larger populations, lower poverty rates, higher per capita LHD expenditures, and LHDs in shared or mixed state-local relationship; Higher performance in effectiveness with lower poverty, lower proportion of non-Whites, presence of policy-making board of health
Mays et al[27]	285	NPHPSP/10 essential services	Survey questionnaire matched with NACCHO's 1996–97 profile of LHDs, Area Resource File, and CFFR 2000	Local public health system performance	LHD characteristics	LHD per capita spending; LHDs in shared or mixed state-local organizations
Kanarek et al[28]	304	20 Public health practice measures	Survey questionnaire matched with NACCHO's 1996–97 profile of LHDs, CHSI, Area Resource File	Health status	LHD performance and characteristics	LHD performance contributed 13%–57% of explained variance in health status

Abbreviations: APEXPH, Assessment Protocol for Excellence in Public Health; CFFR, Consolidated Federal Funds Report; CHSI, Community Health Status Indicators; IOM, Institute of Medicine; IPLAN, Illinois Project for Local Assessment of Needs; LHD, local health department; NACCHO, National Association of County and City Health Officials; TMT, top management team.

several studies that followed, including a series of surveys to measure changes in LHD performance in Illinois[9]; a study merging survey data with NACCHO's 1992–93 profile of LHDs[13,32]; a study using a modified survey to measure performance specific to maternal and child health activities[14]; and a study on LHD performance in New Jersey.[17]

In 1998, the two research teams directed separately by Miller and Turnock collaborated to produce a merged panel of 20 practice performance measures.[15] Numerous subsequent studies have utilized this survey, including the CDC/US Department of Justice public health preparedness survey[21] and a survey on effectiveness of public health activities in LHD jurisdictions serving more than 100 000 people.[26]

Following the development of the NPHPSP, several studies matched performance data to LHD characteristics, including the initial pilot efforts in Texas[19] and other states,[25] and studies which linked data from the NPHPSP with the NACCHO profile of LHDs.[22,24] Other investigators measured performance on the basis of *Model Standards for Community Preventive Health Services*[6,33]; a post hoc analysis of NACCHO's 1992–93 profile of LHDs, measuring performance on eight core public health functions[11]; surveys focusing on community interaction[16,18]; an analysis of compliance with state statutes and rules[20]; and a review of LHD performance vis-à-vis state-developed performance standards.[23]

LHD performance and characteristics

Higher performance was generally noted for LHDs that are larger, serve larger populations, and have higher expenditures. Studies showed that both a greater overall number of staff as well as higher staff per population were characteristic of higher-performing LHDs.[13,14,17,19,23] Several studies noted higher performance particularly for LHDs serving populations more than 50 000 than for those serving populations less than 50 000,[29,15,11] with other studies showing a particular drop-off in performance for LHDs serving populations of less than 25 000.[9,21] Larger LHDs, which more frequently provide a greater array of services, were also higher performing as measured by compliance with state statutes and rules.[20]

As with staff size, higher-performing LHDs were more often correlated with both total LHD expenditures and expenditures per capita.[13,17,26],[25,24,11,23] Studies which examined organizational structure provided varying results, with some studies finding higher-performing LHDs in more centralized organizational structures[11,10]—where states have greater oversight and control of LHDs—while other studies found performance higher in mixed or shared organizational structures.[26,27]

LHD performance also differed according to characteristics of the agency director, with higher-performing LHDs more likely to have a female head of the agency,[13] a director who was full-time and experienced,[19] having a master's or bachelor's degree,[22] and functioning within a management team (as opposed to autocratically).[18]

LHD performance and community characteristics

The performance of LHDs was also a function of both community characteristics and interactions between the LHDs and the communities they serve. LHDs performed better in communities with greater economic means.[19,25,27] LHDs also tended to perform better where there were more partnerships and community interactions, and more support from local elected officials.[14,19,22],[16] Two studies associated LHD performance with the use of planning tools such as Assessment Protocol for Excellence in Public Health, which includes a community health status assessment component.[9,11]

LHD performance and health outcomes

The relationship between LHD performance and community health status was examined in four studies. Schenck associated higher-performing LHDs with unfavorable health status and risks[12]; Kennedy associated higher-performing local public health systems (LPHS) with lower premature death rates[19] while Honore et al[25] found an association with higher age-adjusted death rates; and Kanarek et al[28] associated LHD performance with various measures of mortality, with LHD performance contributing 13% to 57% of the explained variation in health status.

Discussion

The results of this literature review on LHD performance provide empirical evidence that in general terms, public health performance can be reliably and accurately measured, and that performance varies by LHD characteristics, the populations served, and how LHDs and the communities they serve interact. Several themes emerge from these studies, most notably relating LHD performance to size and organizational structure of the LHD, jurisdictional size, and LHD expenditures. Mays et al[27] showed that the *strongest* predictor of performance was the size of the jurisdiction population, while LHD per capita spending was the most *consistent* predictor of performance.

In general, LHDs serving smaller populations tended to perform at a lower level than LHDs

serving larger populations. Although only 10% of the US population is served by LHDs covering less than 50 000 persons, this represents 62% of all LHD organizations.[34] Of note is that the Emerson Report of 1945, which became the blueprint for post–World War II public health in the United States, called for LHDs to serve jurisdictions of not less than 50 000 persons.[1] Economies of scale and efficiencies of operation likely play into the higher-performing, larger LHDs.

Suen's finding of higher performance in LHDs that were both larger and centralized than LHDs in townships[11] may be the best example of the difficulty in sorting performance by organizational structure: no studies examined organizational structure while controlling for both LHD and jurisdictional size. It is reasonable to surmise that LHDs serving very small jurisdictions (less than 25 000 persons) benefit from state-level resources such as staff expertise (eg, in epidemiology), laboratory resources, and computer systems—all more expensive at a smaller scale. On the other hand, larger health departments (as noted by Mays[26]) may perform better with less direct, centralized control. The association of LHD performance with having a female head of the agency was explained in part by women being more likely than men to be full-time employees, and more likely to have a BSN degree. LHDs that performed better in communities with greater economic means can be explained in part by associating higher-performing LHDs in communities with higher taxes, if higher taxes translate to more funding for LHDs.

The studies relating LHD performance to health outcomes were all cross-sectional in nature, which allows for two seemingly contradictory explanations to hold: higher-performing LHDs may result in improved community health status, and LHDs may be performing at a higher level in attempts to address the needs of lower–health status communities. As Schenck described, LHD performance may *appropriately* differ: in a healthy community a LHD may be judged as low-performing because there is less need for LHD services, while in a lower–health status community, the LHD may be performing at a higher level in response to community need.[12] This is where using performance standards, which attempt to measure the capacity of the *local public health system*, can provide insight into whether the LHD—as one part of that system—is functioning at an appropriate or inappropriate level.

Strengths and weaknesses

When viewed in totality, the clearest strength in all of these studies is that there is now a substantial body of literature on LHD performance, where there was relatively little before the 1988 IOM's report. More attention and greater focus have been given to the three core functions, and in keeping with "what gets measured gets done," the process of LHD performance measurement itself may lead to performance improvement. Turnock notes, "The lesson for the public health community is that the measurement process itself influences the credibility and consistent performance of that which is measured"[35(p20)] The fact that almost all of the 23 articles included in this review were based on either the 10 public health practices or the 10 essential services frameworks, and that accreditation standards are likely to be based on similar domains (such as in the *Operational Definition of a Functional Local Health Department*[36]), the foundation for *what* to include in accreditation is well grounded.

Strengths notwithstanding, these studies also reveal a number of weaknesses in LHD performance measurement. As already noted for studies associating LHD performance with health status, almost all of these studies are cross-sectional in design, and thus suffer from the "cause and effect" phenomenon. Do LHDs perform better because they spend more per staff or is a LHD more likely to pay staff more because it is higher performing? Do LHDs perform better because they have better community interactions, or are community interactions better because the LHD performance is better? This cross-sectional design is less of a problem for such characteristics as jurisdictional population and organizational type, but it is a major impediment to providing clues for how to *improve* LHD performance.

The vast majority of these studies depended on self-completion of survey instruments, with little validation of survey results—with notable exceptions for Miller[7] and Turnock.[9] There is also little consistency in who completed the surveys—a single agency head, a leadership team, or partners within the local public health system. Margolis et al[37] has shown the differences in perspectives on performance even among different LHD staff. The absence of a consistent framework for measuring LHD performance is a weakness and yet a sign of the evolutionary nature of the work. Within the space of less than 10 years, study designs used the 10 public health practices outright; an 84-indicator survey, a 26-indicator survey, and a 20-indicator survey all based on the 10 public health practices; and finally, the 10 essential services framework as used in the NPHPSP. This makes comparing LHD performance among different studies very difficult, if not impossible. The change from focusing on LHD performance to LPHS performance (in the NPHPSP) signaled a major shift in thinking about who provides public health in the community.[38] Although systems performance reflects the idea that public health is more than just what the LHD provides,[39] it is a methodological problem for those interested in the performance of the LHD per se, even as a part of the "system." Some of the studies involving the NPHPSP

have linked LHD characteristics with performance of the *system* without necessarily delineating what part of the *system's* performance was specific to the LHD.

Beaulieu et al provide evidence on the face and content validity of the NPHPSP instruments, although they acknowledge the problems of criterion validity when the "gold standard" for measuring LHD performance has yet to be determined.[40,41] Most studies are based on a nonrandomized selection of LHDs, and even in studies drawing on a random sample, study results hinged on responses from LHDs choosing or declining to participate—making it difficult to generalize findings. Finally, definitions of variables such as organizational type are not always clear within studies and not consistent across studies.

Policy implications

The policy implications of this review relate to both issues of performance measurement and LHD standardization through accreditation. Although LHDs varied in performance, these differences often related to LHD size and jurisdictional population—factors that are not readily amenable to change and not necessarily under the control of the LHD. The switch from examining LHD performance to LPHS performance is an important recognition of the extent to which agencies, organizations, and individuals outside the LHD contribute to the public's health. Yet, the *governmental* entity for assuring the health of the public through provision of EPHS remains the LHD, and without some means to measure, track, and relate LHD to systems performance, it will be extremely difficult if not impossible to measure and document LHD performance *improvement*.

This may be the place, then, for LHD accreditation, which would hold LHDs, not the systems, accountable. LHD accreditation might lead to a reconsideration of factors mentioned above that may not be amenable to LHD control: accreditation might push the issue of consolidation or at least the sharing of resources of smaller LHDs serving smaller populations. Is it realistic, for example, for every LHD serving less than 25 000 persons to have an epidemiologist? But what about an epidemiologist serving in a district or regional office that provides such higher-level expertise to a group of 10 or 15 small LHDs? There are further policy implications for establishing a single set of accreditation standards: if the same accreditation standards are applied to LHDs serving less than 25 000 persons as those serving more than 100 000, then either one accepts that many small LHDs will fail accreditation or the bar will be set so low that accreditation for the larger LHDs will be meaningless. These and many other aspects of LHD accreditation are addressed thoroughly in the recent special issue of the *JPHMP* focusing on accreditation. In particular, a useful framework for exploring inputs, outputs, and outcomes vis-à-vis both performance measurement and accreditation can be found in the logic model provided by Joly et al.[42]

Future research

These studies point to at least three areas for meaningful future research. First, longitudinal studies of LHD performance are needed to address the "cause and effect" problems of cross-sectional studies. Mays et al (unpublished data) are conducting such studies on the cohort of LHDs first studied by Turnock, Richards, and Miller in 1995, and this longitudinal perspective can be used to better understand how LHD performance changes over time, and the determinants of those changes. Conducting such studies might also provide an avenue into focusing on the "outliers," for example, the small LHDs that serve less than 25 000 persons, but which are high-performing—what can be learned about these distinctly different LHDs that could be of benefit to other LHDs of similar size?

Second, further empirical evidence is needed to show that measuring LHD performance results in well-defined and described changes in *what* LHDs do and *how much better* they do it. How do LHDs use the results of the NPHPSP to improve both LHD and *systems* performance? What changes in the LHD performance have the greatest impact on *systems* performance over time, and vice versa? By more directly linking NPHPSP to beneficial change, answers to these questions might also positively influence other, more reluctant LHDs to utilize performance standards.

Third, as many states are preparing for, or are already engaged in accreditation processes, research directly linking LHD capacity and performance with accreditation can contribute to performance improvement in public health practice. If the mission of public health is to assure conditions in which people can lead healthy lives, and the ultimate desired outcome of public health practice is improved health status of the community, LHDs must be able to connect internal capacities and processes to external performance related to core functions, and ultimately to community needs and health outcomes. This is what Turnock and Handler called for in 1997, as described in the opening sentence of this article. The NPHPSP is based on the 10 EPHS framework, and it is likely that a National Voluntary Accreditation Program will utilize the standards developed in the *Operational Definition of a functional Local Health Department*, which is also based on the 10 EPHS framework.[43] It stands to reason, then, that performance measurement can be an important readiness step toward accreditation, and research linking the two—LHD

performance and LHD accreditation—can document how and why.

Limitations

There are at least two primary limitations to this review. First, limiting the review to studies appearing only in peer-reviewed journals prohibited the inclusion of any federal, state, or local reports on LHD performance. This includes states with well-established external performance measurement and/or accreditation programs. The extent to which such reports could have added to the perspectives on characteristics associated with LHD performance is unknown, although it is reasonable to surmise that states with long-standing programs have collected a large amount of relevant information. Including governmental reports may also lessen publication bias—empirical studies that find no differences in the characteristics associated with LHD performance may not make it to publication.[44]

Second, the very nature of a narrative review lends itself to subjectivity, from the titles scanned to the abstracts read, the articles selected for full review, and the studies included in the final analysis. Although structuring the review process and abstracting articles into a well-defined database may help decrease subjectivity, it cannot be eliminated entirely. Electronic database searches may be incomplete, and again, to some extent, depend on the subjective selection of key words. These types of bias in the review process itself may be lessened, as more LHDs implement the NPHPSP, and as further empirical studies document the characteristics associated with LHD performance.

Conclusions

The purpose of this review was to examine the empirical evidence that variation of LHD size, structure, organization, and other measurable characteristics actually affects performance, health outcomes, or both. Although most of the relevant literature is cross-sectional and thus does not provide useful information on "cause and effect," there are consistent findings that performance does indeed vary by measurable LHD characteristics. Having a national program (NPHPSP) in place, and utilizing more consistent and stable performance measurement processes will likely yield more reliable and valid information on LHD performance. Longitudinal studies will be important for more clearly understanding how LHDs can improve performance, and such information can help inform the development of a national accreditation program by linking LHD internal processes, core functions, and community needs.

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