Leadership Matters: Local Health Department Clinician Leaders and Their Relationship to Decreasing Health Disparities

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Objective: The activities that local health departments (LHDs) conduct and their workforce characteristics change over time. We know little, however, about how changes among the services LHDs conduct are associated with the nature of LHD leadership and how these factors impact health. This study investigated changes in LHD services and leadership and how these changes are associated with mortality disparities. **Design:** We conducted regression analyses of secondary data using an exploratory panel time series design. **Measures:** We used secondary data to investigate changes in LHD services and leadership and how these changes were associated with each other and with 1993 to 2005 changes in black-white mortality disparities. Local health department services were examined relative to change in breadth of services within each of 10 program domains between 1993 and 2005. LHD leadership was examined for discipline of the lead executive in 1993 and 2005. **Study Population:** Our sample included 558 county or multicounty "common local areas," representing county-level data for LHDs and their jurisdictions. **Results:** Significant beneficial relationships exist between having a clinician as lead executive in an LHD and reductions in black-white mortality disparities. Local health departments with a clinician (usually a nurse or physician) as their lead executive in 1993 and/or 2005 experienced a significant decrease in black-white mortality disparities for young adults (age 15-44 years) in their jurisdictions from 1993 to 2005 when compared with LHDs with nonclinician leaders. **Conclusions:** The discipline of an LHD's lead executive as a clinician appears to have a significant relationship with the impact of LHD practice on reducing black-white mortality disparities. This study suggests that the discipline of an LHD's leadership may be an important factor to consider in relation to local public health capacity to impact health disparities. Further research related to the mechanisms at play in these relationships is warranted.

KEY WORDS: **clinician leaders, health disparities, local health departments, public health leaders, public health system**

The country's first national guidance toward collaboratively identifying, monitoring, and addressing health disparities for the public health community came with the release of *Healthy People 2000* in 1991.[1] But progress in reducing, much less eliminating, health disparities has been slow. Today health disparities persist among racial and ethnic groups and are increasing on some health indicators.[2-5] Local health departments (LHDs) play critical roles in population-level health improvement and in reducing these disparities in morbidity and mortality in the jurisdictions they serve.[6,7] As such, the leadership of LHDs is key in providing direction, for both the LHD itself and the community, in allocating resources for activities and services that will achieve local priorities and national goals for reducing health disparities.[6,8]

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The 1988 publication on *The Future of Public Health* and the subsequent articulation of public health practice and the development of tools for monitoring public health system characteristics and performance reflect advancements in practice over the last 15 years.[9] These advancements, such as the 10 essential public health services,[10] the national public health performance standards,[11] the profile of LHD (*Profile*) surveys conducted by the National Association of County & City Health Officials (NACCHO),[12] and a more recent focus on accreditation of LHDs,[13] were developed to better describe the nature of public health practice and to ultimately measure and improve the performance of LHD and public health system efforts.[14-16] Local public health practice, however, did not likely change dramatically during the early and middle 1990s while these practice advancements were still under discussion and development.[17] Nonetheless, this period of examination and articulation of practice has led many public health leaders in recent years to more fully invest in broader LHD functions, such as population-level surveillance and population-based interventions, and to look to community providers for delivering many primary care services rather than LHDs directly performing this role themselves.[12] As LHD-provided clinical services were transferred or "privatized" to community providers, a study by Keane and colleagues[18] found that among the "many groups" in a community that were involved in the privatization of public health services, the "most influential decision maker" regarding these services and among these community groups was the LHD's lead executive.

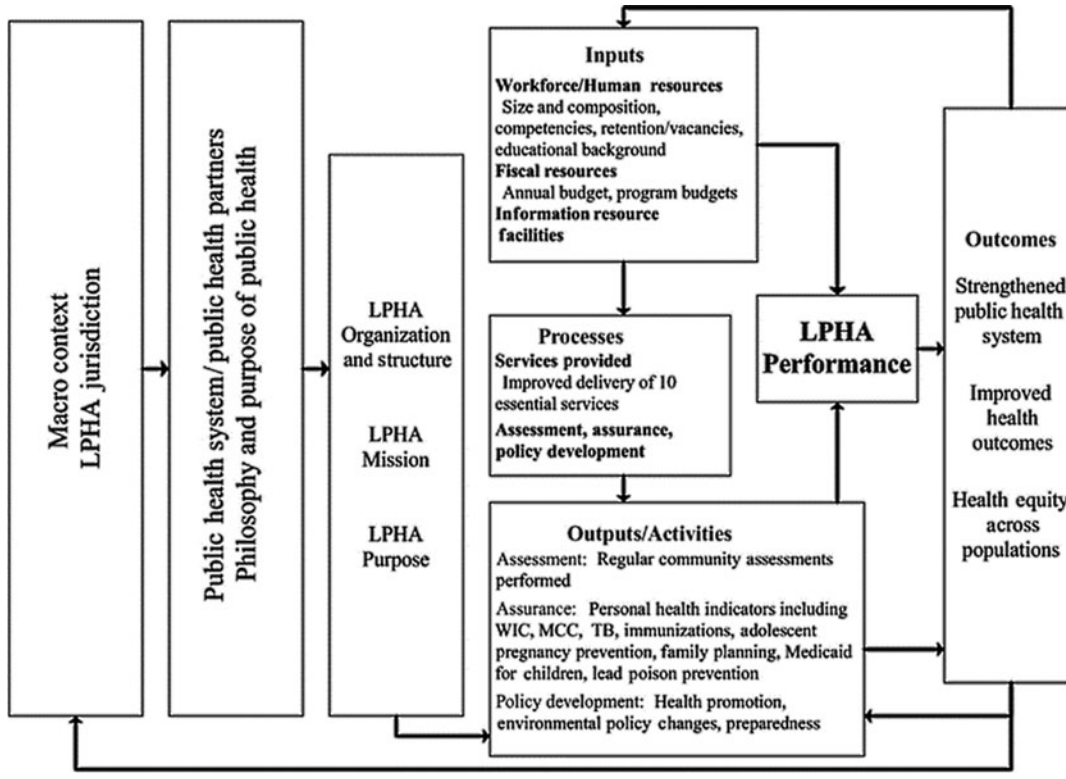
The specific background or training needed by these influential executives remains unclear. Public health leaders decry the need for more LHD senior executives with public health degrees,[19,20] while preliminary findings have been unable to make links between leaders with public health degrees and performance of their LHDs or between professional certification and health outcomes.[21,22] In 2005, NACCHO[12] found that 51% (n = 1173) of the nation's LHD leaders had nursing or medical degrees, even as Iton[23] describes the "medical model" of traditionally trained clinicians to be a barrier to developing a more responsive practice to eliminating underlying causes of health disparities.

Another factor influencing LHD leaders and the nature of public health service delivery was the World Trade Center and the anthrax attacks of 2001. Following these attacks, federal appropriations in 2002 allocated more than a billion dollars to "upgrade state and local public health jurisdictions' preparedness for and response to bioterrorism, other outbreaks of infectious disease, and other public health threats and emergencies."[24(p1)] This allocation, related federal guidance, and preparedness funds that followed for the years after 2002 further altered the landscape of local public health practice,[15] compelling LHD directors to lead and partner around many new emergency planning activities as well as to strengthen their local surveillance capacity to detect and respond to infectious disease.[25]

Apart from a changing public health landscape, LHDs vary dramatically in the sets of services they provide.[6,26] Researchers have identified both organizational and external factors that appear related to what services an LHD provides and how services vary across LHDs. These organizational factors include the LHD leadership,[8,18,27] governance,[28] and the number of employees,[29] whereas external factors include jurisdictional urbanicity,[30] state statutes,[18] and socioeconomic status of the population.[31] In a prior article, we examined the influence of this variation in local public health services on racial and ethnic disparities in mortality over the period of 1993 to 2005 (B. Bekemeier et al, unpublished data, 2011), when major changes in local public health occurred. Findings showed that increases in the breadth of certain domains of clinically focused and directly provided public health services had significant relationships to reductions in black-white disparities for 15- to 44-year-olds from 1993 to 2005 (B. Bekemeier et al, unpublished data, 2011). While relationships have been found to exist between the type of LHD leadership and the set of services that the LHD provides[32] and between the type of leader and LHD performance,[22,33] little is known about the influence of the LHD leadership on the health of a community. Because the activities that LHD leaders choose to conduct vary across jurisdictions and these activities have changed considerably from 1993 to 2005,[34] the activities undertaken by an LHD also likely influence its performance, which, in turn, may affect local population health and health disparities.[35]

Hajat and colleagues[35] created a conceptual framework (Figure), adapted from Handler et al,[36] as a means to consider key components of local public health systems that interact to influence LHD performance and, presumably, health outcomes. The elements in this framework suggest that a change in "inputs" (eg, "human resources") would likely affect processes, activities, and health outcomes; at the same time, external (eg, the nature of the jurisdiction) and organizational (eg, governance by a board of health) features are also likely to influence how an LHD practices and how a change in "inputs" might influence health. The framework of Hajat et al does not explicitly include the influence of an LHD's leadership or the background of its leader, but research by Keane et al[8,37] suggests that the "managerial beliefs" of an LHD leader influence and define an LHD's mission and purpose, thereby shaping the services provided and a department's response

FIGURE ● **Conceptual Framework for Local Health Department's Performance**[a]



From Hajat et al.[35] Used with permission. LPHA indicates local public health agency; MCC, maternity care coordination; TB, tuberculosis; WIC, women, infants, and children.

to changing financial pressures and other influences. Given the potential for an LHD's leadership to influence services and performance of an agency, more research is needed toward understanding how these relationships impact health and health disparities. In this article, we examined whether the type of LHD leader is related to reducing black-white disparities in mortality.

● Methods

Design

We used secondary data to run linear regression models with an exploratory panel time-series design to investigate 1993 to 2005 changes in LHD programs and leadership and how these changes were associated with each other and with 1993 to 2005 changes in black-White mortality disparities. We chose a longitudinal study design, rather than a cross-sectional study design, because alternative explanations for an observed relationship between the change in LHD leadership and the change in mortality rates are reduced but not eliminated in time-trend designs.[38,39] Our study received an exemption from the University of Washington's institutional review board, based on our use of data that did not identify individual subjects or put individuals at risk.

Data sources and measures

Data and measures used in this study were similar to those described in previous studies by B. Bekemeier et al (unpublished data, 2011).[40] The mortality gap was derived from the Centers for Disease Control and Prevention Wonder database, providing county-level black and white all-cause, age-adjusted mortality rates for 1993 and 2005. Change in mortality disparities was depicted by the difference between the 2005 black-white disparity gap and the 1993 black-white disparity gap[41]; negative values, therefore, indicated a decrease in the gap and a reduction in the disparity between black-white mortality rates. Only those counties in which black mortality rates were greater than the white mortality rates in 1993 and 2005 were included.

Control variables related to factors external to LHDs were obtained and compiled from the US Census for 1990 and 2000 and the Health Resources and Services Administration's Area Resource File. Apart from geography and status of a county as rural/urban, control variables were time variant. To control for local-level

socioeconomic factors and their change over time, we used Robert and Reither's[42] Socioeconomic Disadvantage Index, which was computed using the county-level percentage of households on public assistance, percentage of families below the local median family income, and percentage of unemployment from the 1990 and 2000 US Census (B. Bekemeier et al, unpublished data, 2011).[40] We also included, as additionally relevant characteristics of community context, the changes in county-level percentage of foreign-born residents and percentage of residents with high school diplomas in our model.[43] Control measures depicting a change in other general health resources in a county were included as change in the density of nurses per 100 000 and of primary care physicians per 100 000 population.[44,45]

Control variables related to LHD services, workforce, and board of health governance were also time variant and were obtained from the NACCHO *Profile* surveys conducted in 1993 and 2005. Local health department services were portrayed as change in the breadth or range of activity directly provided by an LHD in a given service area across 10 service domains (eg, environmental health and maternal/child health) (B. Bekemeier et al, unpublished data, 2011). Breadth of service was depicted as a continuous variable, with a range that varied for each domain and that represented the number of specific activities within a service domain that was provided by the LHD (eg, *Environmental Health* [ground water protection, 'hazmat response,' etc] and *Maternal/Child Health* [family planning, prenatal care, etc]). The number of activities in a domain ranged from as few as 2 activities in *Assessment and Planning* (developed a health improvement plan and completed a community health assessment with an assessment tool) to as many as 7 activities for *Screening* and *Environmental Health* (*Screening* [HIV/AIDS, tuberculosis, cancer, etc] and *Environmental Health* [ground water protection, 'hazmat response,' etc]). The mean number of activities across the 10 domains was 4.7.

An LHD's workforce was described as a change in the number of full-time equivalent (FTE) staff in the 2 *Profile* survey years (2005-1993) and board of health was identified as an LHD having ever been governed by a board of health in either or both of the 1993 or 2005 surveys. To create our values for change in FTEs, we calculated estimates, based on population size of jurisdiction, to make up for a substantial number of missing values (12.2%, n = 68 missing) from the 1993 *Profile* data for "number of FTEs."

The LHD leadership was measured using *Profile* data, indicating whether or not the agency's "top executive" was a nurse, a medical doctor, or someone other than a clinically trained medical professional. We transformed response choices to indicate that the "top executive" was a clinician (ie, nurse, physician [MD], veterinarian [DVM], dentist [DDS]) or nonclinician. The "top executive" or LHD leader variables we used in our final regression models were binary measures that represented whether an LHD had ever or never had a clinician leader in 1993 and/or 2005.

Sample

Our national sample consisted of 558 "common local areas," with statistically measurable black mortality in both 1993 and 2005 *Profile* surveys. These areas were largely county designations served by an LHD with a county-level jurisdiction (82.4%, n = 460). Because not all LHDs served a county jurisdiction, 11.5% (n = 64 areas) of LHDs in our sample were multiple municipal LHDs aggregated to the county level. Another 4.8% (n = 27) represented multicounty LHDs. The remaining cases (1.3%, n = 7) did not fit standard county or municipal designations and were combined into small, multicounty regions (B. Bekemeier et al, unpublished data, 2011).[40] Finally, we restricted the analysis to local areas where black mortality was greater than white mortality, given our interest in typical patterns of disproportionately higher black mortality rates.

Analysis

Descriptive statistics were computed for LHD leadership characteristics, other LHD characteristics, mortality rates, and the socioeconomic characteristics of the LHD's jurisdiction in 1993 and 2005. We then estimated least-squares regression models to examine whether the type of LHD leadership (clinician and nonclinician) was related to 1993 to 2005 changes in black-white mortality rates, controlling for changes in breadth of LHD services, socioeconomic characteristics, and other factors.

Results

Our study sample of "common local areas" had average mortality rates and declines that tended to be similar to the nation as a whole (Table 1) (B. Bekemeier et al, unpublished data, 2011).[40]

Although the majority of the top executives in our sample were male, nonminorities, and clinicians, each of these characteristics changed significantly from 1993 to 2005 as more females, minority leaders, and nonclinicians moved into these positions (Table 2). There was also a significant increase in the proportion of top executives serving in full-time positions and a significant increase in the proportion of these positions held by nurses.

TABLE 1 ● Descriptive Statistics of 1993, 2005, and 1993 to 2005 Change in Mortality Rates Per 100 000

Mortality Rate	1993 US Mortality	Number of Areas	1993 Average (SD)	2005 Average (SD)	2005-1993 Average Change (SD)	Mortality Gap Between Black and White (Absolute Differences)
All age		519				− 82 (232)
All cause						
Black	1216		1236 (193)	1075 (216)	− 161 (230)	
White	870		942 (107)	863 (130)	− 79 (96)	
Gap	346		294 (195)	212 (183)	− 82 (232)	
Age 15-44 y		166				− 83 (67)
All cause						
Black	321		318 (95)	221 (62)	− 96 (81)	
White	139		142 (37)	129 (38)	− 13 (40)	
Gap	182		175 (81)	92 (53)	− 83 (67)	

In terms of the education of LHD leadership, the comparison of top executives with master's degrees across the 2 surveys was not possible because of changes in *Profile* response choices, but more than half (59.6%, n = 332) of the LHD leaders in 2005 were master's prepared in our sample. In terms of those leaders with public health degrees (MPH or DrPH), these numbers did not change significantly from 1993 (32.2%, n = 180) to 2005 (30.3%, n = 169) and represented nearly one-third of the leaders in our sample. There was a significant drop from 1993 to 2005 in top executives with doctoral degrees, including PhD, MD, and DrPH (Table 2). There was also a drop, from 47% (n = 261) to 29% (n = 162), in those with medical doctorates (ie, MD, DVM, and DDS). Leaders with medical doctorates tended to be largely MDs (95.7% or n = 155 of those LHDs with leaders with medical doctorates in the 2005 sample).

TABLE 2 ● 1993 and 2005 Characteristics of Local Health Department Top Executives in Sample

	1993 (N = 558)		2005 (N = 558)	
	n	%	n	%
Full time[a]	493	88	509	91
Gender (male)[b]	392	70	300	54
Minority (including Hispanic)[b]	45	8	83	15
Selected education				
Masters	. . .	. . .	332	59.5[c]
Doctoral degree, including PhD, MD, DrPH[b]	279	50.0	179	32.1
RN + BSN[b]	93	16.7	125	22.4
Leader type[b]				
Clinician	352	63.1	285	51.9
Nonclinician	206	36.9	273	48.2

[a] $P < .05$.
[b] $P < .01$.
[c] Note that these selected education categories do not sum up to 100%, as some top executives have multiple degrees or have none of the degrees listed here.

In the sample as a whole, 71.0% (n = 396) of the LHDs had a clinician LHD leader in either or both of the survey periods. Among the clinician leaders in our sample, 16.7% (n = 93) of them were nurses in 1993 and 22.4% (n = 125) of the clinician leaders were nurses in 2005. About 38% (n = 150) of clinician leaders in both of the *Profile* years in our sample held public health degrees. We found no significant differences in the distribution of clinician/nonclinician top executives between urban, large-town, and small-town/rural settings, and there was no significant change from 1993 to 2005 in this distribution across these settings.

Regression results indicated that significant relationships exist between whether or not an LHD had a clinician top executive in 1993 and/or 2005 and reductions in black-white mortality disparities. The results for 3 models are shown (Table 3), with each regression model estimated separately for all-age mortality and for 15- to 44-year-old group mortality as the dependent variable. The 3 models display the results of the group of control variables added sequentially. It is only with model 3 and for 15- to 44-year-olds, however, that the estimated coefficient is significant and negative, with negative scores representing a reduction in the disparity gap for 15- to 44-year-olds by 2005. The addition of the range and breadth of LHD services accounts for a substantial part of the significant outcome in model 3 and reverses the sign from positive (disparity increase) to negative (disparity decrease) for clinicians when added to the model. When these influential service domains shown in Table 3 are controlled for, clinician leaders have a

TABLE 3 ● Relationships Between Local Health Department Clinician Top Executives and Change in the Black-White Mortality "Gap," 2005-1993[a]

	Black-White Mortality Gap Coefficient					
	All-Age			Age 15-44 y		
	Model 1 (N = 511)	Model 2 (N = 448)	Model 3 (N = 423)	Model 1 (N = 166)	Model 2 (N = 145)	Model 3 (N = 136)
LHD clinician top executive in 1993 and/or 2005[b]	− 36.246	− 31.662	− 25.536	7.857	13.492	− 21.095[c]
2000-1990 SDI		− 105.614	− 41.980		97.257[d]	114.416
2000-1990 change in % foreign born		5.456	2.417		− 1.601	0.355
2000-1990 change in % black		6.751[c]	6.648[d]		3.273[c]	3.880[c]
2000-1990 change in % with high school diploma		− 0.804	− 0.703		− 1.382	− 1.645
Large town rural/micropolitan[e]		85.468[f]	103.554[f]		41.278[d]	37.693[d]
Small town/rural[e]		96.101	114.328[d]		(dropped)	(dropped)
RNs per 100 000		− 0.043	− 0.041		− 0.003	− 0.012
MDs per 100 000		0.855	0.738		− 0.456	− 0.373
2005-1993 change in no. of LHD FTEs		0.013	0.018		− 0.028	− 0.032
2005-1993 change in governance by BOH		− 0.018	0.002		0.023	0.037
2005-1993 change in breadth of						
Screening			2.087			6.210[c]
Treatment			17.110			− 1.442
Maternal child health			8.503			− 10.701[d]
Health services			3.278			− 7.736
Epidemiology			3.219			− 0.948
Population-based service			− 4.225			− 0.920
Regulation			5.007			1.077
Environmental health			− 6.798			0.920
Other activities			− 5.084			− 7.685[c]
Assessment and planning			− 10.425			− 1.289

Abbreviations: BOH, board of health; FTE, full-time equivalent; LHD, local health department; SDI, Socioeconomic Disadvantage Index.
[a]Only areas with black mortality rates that were higher than white mortality rates were included in the regression models.
[b]Local health department never having a nonclinician top executive in 1993 or 2005 was used as the referent.
[c]$P < .05$.
[d]$P < .1$.
[e]Large town rural/micropolitan = areas with populations of 10 000-49 999; small town/rural = county/multicounty areas with populations less than 10 000; urban/metropolitan areas were used as the referent.
[f]$P < .01$.

significant relationship with reducing mortality disparities. Similar results were found when clinician leaders were included as a change variable in which 1993 and 2005 *Profile* data indicated that an LHD consistently had a clinician or a nonclinician leader in both years or had made a change from clinician to nonclinician or from nonclinician to clinician leader in those *Profile* years. No significant relationship between LHD leader and mortality outcomes was found when changes in education or public health degree for the top executive were trialed as primary independent variables.

When model 3 was run separately with black mortality and then with white mortality as an outcome, both for all-age mortality and for 15- to 44-year-old group mortality, there was a significant decrease in black mortality (-27.053; $P < .01$) for 15- to 44-year-olds. This suggests that the association between LHD clinician leadership and the reduction in the 15- to 44-year-old black-white mortality gap may be driven partly by the reduction in black mortality in this age range.

● Discussion

Our findings suggest that when community-level and organizational factors are taken into account, it is not just the type or breadth of certain domains of services that LHDs provide but also the type of LHD leader himself or herself that appears to have some significant relationship with improvements in mortality disparities for 15- to 44-year-olds. This notion that specific LHD leadership characteristics are associated not only with public health practice activities but perhaps also

with the outcomes of these activities themselves reflects and expands upon the previous findings that have identified relationships between the educational level or type of clinical leader and an LHD's performance[22,33] and types of services provided.[32]

This study also reinforces some of the links in the model of Hajat et al (Figure). Findings from the study of Hajat et al[35] reinforce the strong role that the LHD workforce appears to play in LHD performance. While controlling for overall changes in FTEs and other agency and environmental factors, our findings examined the influence of an individual aspect of that workforce—the LHD leader—and found the leader's role to be seemingly influential. Studies by Keane[37] suggest that the specific "beliefs" and managerial perspective of an LHD's director play strong roles in the perceived agency mission and in shaping resources and that specific beliefs were stronger predictors of changes in LHD services, in terms of greater privatization or contracting out some activities to local providers, than was "declining resources." The LHD leader, therefore, may be represented in the model of Hajat et al in terms of the "LPHA [local public health agency] mission," as well as the "philosophy and purpose of public health."

Our study suggests that LHDs that had had a clinician leader during at least part of our study period tended to have had local reductions in black-white mortality disparities. While we found no other study that examines the relationships between LHD clinician versus nonclinician leaders and population health, studies by Scutchfield et al[33] and Bhandari et al[22] have linked clinical degrees with higher LHD performance in certain areas of the 10 essential public health services such as mobilizing communities and developing policies and plans. Bhandari and colleagues[22] found particularly positive relationships between nurse leaders and performance—relationships that did not hold for physician top executives or for those with public health degrees in their study. Our findings reinforce and extend this relationship between clinician leaders and performance, expanding the apparent link to a broad health outcome.

The study by Santerre[35] on LHD resource allocations estimates that approximately one-third of all services provided by LHDs are "clinical in nature." While our study controlled for changes in the breadth of types of services provided, our findings could be reflective of a high degree of services that are more clinically oriented (eg, maternal/child health and communicable disease control) and that LHDs with clinician leaders in 1993 and/or 2005 were better suited to effectively tailor these services, understand clinical practice, relate to other local providers, and manage other clinical staff than their nonclinician counterparts. As LHD clinical services tend to be focused on specific populations in need,[6,26] it is conceivable that an LHD that has or has had a clinician leader also provides more clinical services in ways that benefit local black populations—populations that tend to have greater disadvantage over local white populations. The probable existence of many of these clinical services (and clinician leaders) well before the years in our study also likely impacted infants and children prior to 1993 and can help account for mortality disparity differences among the 15- to 44-year-olds from 1993 to 2005.

Trends in the practice of LHDs suggest that services are increasingly becoming less clinically focused and more population-oriented (eg, reducing smoking rates via broad-based prevention campaigns rather than individually oriented smoking cessation programs),[47] and, indeed, there were significantly fewer clinician leaders by 2005 in our sample. As LHD practice becomes more population-focused, it is possible that the apparent relationship between clinician leaders and health outcomes could change, unless clinician leaders bring both a knowledge of human health and disease and population-level skills to this changing practice landscape. Public health nursing leaders are already grappling with this, looking for methods to measure and grow the competencies and contributions of public health nurses in terms of their population-level practice and leadership.[48] In terms of physician leaders, a commentary by Erwin[49] states that there are "fundamental commonalities" among those trained as physicians, even without formal public health training, and that these skills can translate to "caring for populations." Erwin[49] suggests that these common skills in assessment, diagnosis, interpretation, and the "art and science of healing" have natural relationships to skills needed for carrying out leadership in each of the 10 essential public health services. Given prior or ongoing close and "privileged" provider relationships to the difficult experiences of those they serve, treat, or become deeply involved with, some nurses and physicians may also bring strong beliefs to their LHD leadership positions in a particular responsibility to meet the needs of the most marginalized in their communities and to promote equity.[50,51]

Clinician leaders also have characteristics unique to LHD practice that differ from the diverse backgrounds of nonclinician leaders and which may have contributed to our findings. Clinicians generally, for example, need regular continuing education units to maintain their licensure. Because the data we used could not elucidate common disciplines among nonclinicians in our sample, we do not know whether these nonclinicians may also have credentialing or licensure expectations that require them to maintain their skills (eg, health educators with CHES [Certified Health Education Specialist] certification and environmental health specialists with REHS/RS [Registered

Environmental Health Specialist/Registered Sanitarian] certification). If researchers find that regular continuing education in a health-related discipline influences the effectiveness of clinician leaders, then perhaps the Credential for Public Health Graduates, which started credentialing public health professionals (clinicians and nonclinicians alike) in 2008 and requires continuing education, may eventually modify apparent differences between clinicians and nonclinicians.[52]

Findings from our study are timely as shifts in practice are clearly occurring and little evidence exists regarding what types of workers and leaders are needed for LHDs to be effective. So as not to inadvertently introduce "harmful" effects on populations served by an inadequately prepared public health workforce and leadership,[53] more research is needed regarding what type of professionals will most effectively lead a more population-focused practice and a local public health system capable of addressing health disparities. This study is also timely, given current efforts underway in relation to an LHD accreditation system that "raises the bar" even further in terms of what is expected among LHDs and their leaders to perform effectively and to adequately address complex challenges such as health disparities.[13] Further research will be necessary to ensure that ongoing shifts in types of LHD leadership can identify, retain, and enhance those qualities that the clinician leaders appear to have brought to the LHDs and local populations in our study and to ensure the leadership qualities needed for a changing practice.

This study has limitations related to the data used, the short time trajectory under examination, the broad outcome indicators serving as dependent variables, and the nature of our sample. Our study was strengthened by using *Profile* data that could be compared across years. However, more nuanced variables and comparable leader education data across more years are needed through subsequent *Profile* surveys and via additional studies to be able to make inferences regarding causation and to better rule out issues of endogeneity. Variables that may also have controlled for other community-wide efforts underway to address disparities were not measured in this study. The 12 years covered during the period of our study are also a limitation, given that public health prevention measures are understood to impact population health, especially mortality change, over a long period of time. With more years of data and more proximal health outcomes, we will likely be able to advance our understanding of the relationships we found. Finally, our study sample overrepresented jurisdictions in the US south and in the urban areas, potentially limiting generalizability.

Conclusions

Public health practitioners currently have a dearth of evidence with which to guide practice and the adaptations demanded of public health systems. Our study found that the clinical nature of the lead executive in an LHD appears to have a significant relationship to the nature of the services and changes to practice that occur at the local level, but even as these changes in service are controlled for, LHD clinician leaders have a significant relationship to reductions in black-white mortality disparities in their jurisdictions.

Although the existing research does not explain the nature of a potential link between LHD clinician leaders and changes in mortality disparities, the limited evidence to date continues to point to the influence of LHD leaders in the direction, performance, and outcomes of LHD activities and a unique role that clinicians may play. Further research related to the underlying mechanisms that link LHD leadership to health outcomes and disparities is warranted.

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